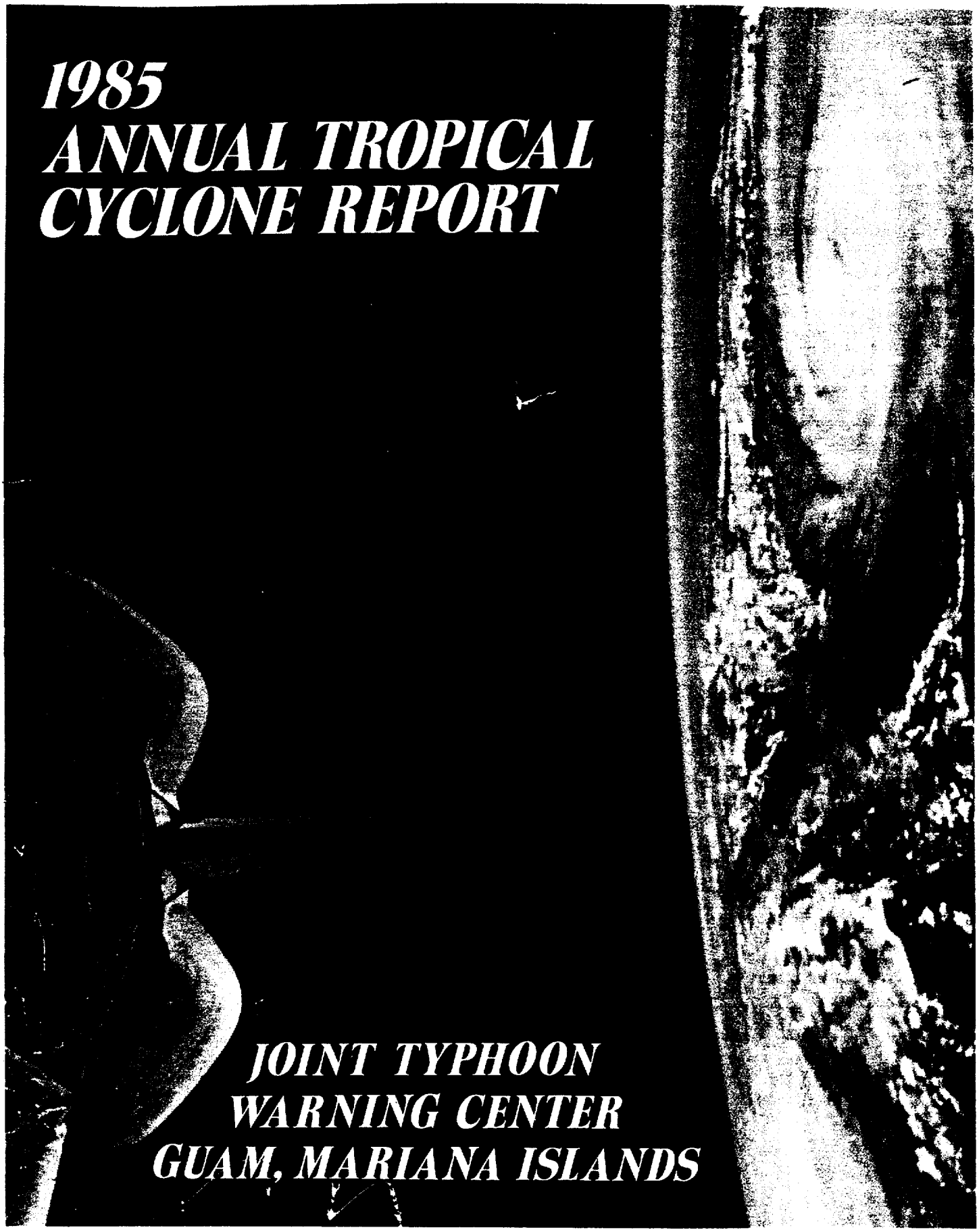
1985 ANNUAL TROPICAL CYCLONE REPORT



JOINT TYPHOON WARNING CENTER
GUAM, MARIANA ISLANDS

FRONT COVER: *Typhoon Odessa (above right) as viewed through the cargo bay of the NASA Space Shuttle. The cloudiness at the lower right is associated with Typhoon Pat. Odessa and Pat, along with Skip, Ruby and Tess, became part of the single most active tropical cyclone day during the the 1985 northwestern Pacific season, when all five systems existed at the same time. At picture time, 282220Z August 1985, the Shuttle was passing eastward across the position 24.1N latitude 143.4E longitude (NASA slide #35-078 provided by CDR D.A. Mautner, OIC NAVPOLAROCEANCEN Detachment, Johnson Space Center, Texas).*

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FOREWORD

The Annual Tropical Cyclone Report is prepared by the staff of the Joint Typhoon Warning Center (JTWC), a combined USAF/USN organization operating under the command of the Commanding Officer, U.S. Naval Oceanography Command Center/Joint Typhoon Warning Center, Guam. JTWC was established in April 1959 when USCINCPAC directed USCINCPACFLT to provide a single tropical cyclone warning center for the western North Pacific region. The operations of JTWC are guided by CINCPACINST 3140.1 (series).

The mission of the Joint Typhoon Warning Center is multi-faceted and includes:

1. Continuous monitoring of all tropical weather activity in the Northern and Southern Hemispheres, from 180 degrees longitude westward to the east coast of Africa, and the prompt issuance of appropriate advisories and alerts when tropical cyclone development is anticipated.

2. Issuing warnings on all significant tropical cyclones in the above area of responsibility.

3. Determination of reconnaissance requirements for tropical cyclone surveillance and assignment of appropriate priorities.

4. Post-storm analysis of all significant tropical cyclones occurring within the western North Pacific and North Indian Oceans, which includes an in-depth analysis of tropical cyclones of note and all typhoons. Also for the first time a summary of the South Pacific and South Indian Ocean significant tropical cyclones for the period 1 July 1984 through 30 June 1985 are included.

5. Cooperation with the Naval Environmental Prediction Research Facility, Monterey, California, on the operational evaluation of tropical cyclone models and forecast aids, and the development of new techniques to support operational forecast scenarios.

Satellite imagery used throughout this report represents data obtained by the tropical cyclone satellite surveillance network. The personnel of Detachment 1, 1WW, collocated with JTWC at Nimitz Hill, Guam, coordinate the satellite acquisitions and tropical cyclone surveillance with the following units:

Det 4, 20WS, Hickam AFB, Hawaii

Det 5, 20WS, Clark AB, RP

Det 8, 20WS, Kadena AB, Japan

Det 15, 30WS, Osan AB, Korea

Air Force Global Weather Central, Offutt AFB, Nebraska

In addition, the Naval Oceanography Command Detachment, Diego Garcia, and DMSP equipped U.S. Navy aircraft carriers have been instrumental in providing vital satellite position fixes of tropical cyclones in the Indian Ocean.

Should JTWC become incapacitated, the Alternate Joint Typhoon Warning Center (AJTWC) located at the U.S. Naval Western Oceanography Center, Pearl Harbor, Hawaii, assumes warning responsibilities. Assistance in determining satellite reconnaissance requirements, and in obtaining the resultant data, is provided by Det 4, 20WS Hickam AFB, Hawaii.

A special thanks is extended to the men and women of: 27th Information Systems Squadron, Operating Location C, for their continuing support by providing high quality real-time satellite imagery; the Pacific Fleet Audio-Visual Center, Guam, for their assistance in the reproduction of satellite and graphics data for this report; to the Navy Publications and Printing Service Branch Office, Guam, for their efforts to meet deadlines; and to AG3 S. A. Murdock for typing the many drafts and assistance with the final manuscript of this report. Thanks is also extended to Lt. G. H. Carpenter and Lt. R. A. Wimmer for submitting Tropical Cyclone write-ups on Typhoon Tess and Typhoon Kit respectively. A special thanks to TSGT W. H. Taylor for gridding the numerous satellite images for this report and to Mrs. Leah M. Foster of the Xerox Corporation, Guam for her assistance with the preparation of the script font portions of this document.

Note: Appendix IV contains information on how to obtain past issues of the Annual Tropical Cyclone Report (titled Annual Typhoon Report prior to 1980).

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CONTRACTIONS

ACCRY	Accuracy
ACFT	Aircraft
ADP	Automated Data Processing
AFGWC	Air Force Global Weather Central
AIREP	Aircraft Weather Report(s) (Commercial and Military)
ANT	Antenna
AOR	Area of Responsibility
APRNT	Apparent
APT	Automatic Picture Transmission
ARWO	Aircraft Reconnaissance Weather Officer
ATT	Attenuated
AVG	Average
AWN	Automated Weather Network
BPAC	Blended Persistence and Climatology
BRG	Bearing
CDO	Central Dense Overcast
CI	Cirriform Cloud or Cirrus also Current Intensity (Dvorak)
CINCPAC	Commander-in-Chief Pacific AF - Air Force, FLT - Fleet (Navy)
CLD	Cloud
CLIM	Climatology
CLSD	Closed
CM	Centimeter
CNTR	Center
CPA	Closest Point to Approach
CSC	Cloud System Center
CYCLOPS	Tropical Cyclone Steering Program (HATTRACK and MOHATT)
DEG	Degree
DIAM	Diameter
DIR	Direction
DMSP	Defense Meterological Satellite Program
DST	Distance
EL	Elongated
ELEV	Elevation
EXP	Exposed
FI	Forecast Intensity (Dvorak)
FLT	Flight
FNOC	Fleet Numerical Oceanography Center
FT	Feet
GMT	Greenwich Mean Time
GOES	Geostationary Operational Environmental Satellite
HATRACK	Hurricane and Typhoon Tracking (Steering) Program
HGT	Height
HPAC	Mean of XTRP and CLIM Techniques (Half Persistence and Climatology)
HR(s)	Hour(s)
HVY	Heavy
ICAO	International Civil Aviation Organization
INIT	Initial
INJAH	North Indian Ocean Component of TYAN
INST	Instruction
IR	Infrared
KM	Kilometer(s)
KT	Knot(s)
LLCC	Low-Level Circulation Center
LVL	Level
M	Meter(s)
M/S	Meter(s) per Second
MAX	Maximum
MB	Millibar(s)
MET	Meteorological
MIN	Minimum
MOHATT	Modified HATTRACK
MOVG	Moving

MSLP	Minimum Sea-Level Pressure
MSN	Mission
NAV	Navigational
NEDN	Naval Environmental Data Network
NEDS	Naval Environmental Display Station
NEPRF	Naval Environmental Prediction Research Facility
NESDIS	National Environmental Satellite, Data, and Information Service
NET	Near Equatorial Trough
NM	Nautical Mile(s)
N/O	Not Observed
NOAA	National Oceanic and Atmospheric Administration
NOCC	Naval Oceanography Command Center
NOGAPS	Navy Operational Global Atmospheric Prediction System
NTCM	Nested Tropical Cyclone Model
NWOC	Naval Western Oceanography Center
NR	Number
NRL	Naval Research Laboratory
OBS	Observations
OTCM	One Way (Interactive) Tropical Cyclone Model
PACOM	Pacific Command
PCN	Position Code Number
PSBL	Possible
PTLY	Partly
QUAD	Quadrant
RADOB	Radar Observations
RECON	Reconnaissance
RNG	Range
RT	Right
SAT	Satellite
SFC	Surface
SLP	Sea-Level Pressure
SRP	Selective Reconnaissance Program
STNRY	Stationary
SST	Sea Surface Temperature
ST	Subtropical
STR	Subtropical Ridge
STY	Super Typhoon
TAPT	Typhoon Acceleration Prediction Technique
TC	Tropical Cyclone
TCARC	Tropical Cyclone Aircraft Reconnaissance Coordinator
TCFA	Tropical Cyclone Formation Alert
TCM	Tropical Cyclone Model
TD	Tropical Depression
TDO	Typhoon Duty Officer
TIROS	Television Infrared Observational Satellite
TPAC	Extrapolation and Climatology Blend
TS	Tropical Storm
TY	Typhoon
TYAN	Typhoon Analog Program
TYFN	Western North Pacific Component (Revised) of TYAN
TUTT	Tropical Upper-Tropospheric Trough
ULAC	Upper-Level Anticyclone
ULCC	Upper-Level Circulation Center
VEL	Velocity
VIS	Visual
VMNT	Vector Movement (ddff)
WESTPAC	Western (North) Pacific
WMO	World Meteorology Organization
WND	Wind
WRNG(s)	Warning(s)
WRS	Weather Reconnaissance Squadron
XTRP	Extrapolation
Z	Zulu Time (Greenwich Mean Time)

CHAPTER I - OPERATIONAL PROCEDURES

1. GENERAL

The Joint Typhoon Warning Center (JTWC) provides a variety of routine services to the organizations within its area of responsibility, including:

a. Significant Tropical Weather Advisories: issued daily, these products describe all tropical disturbances and assess their potential for further development during the advisory period;

b. Tropical Cyclone Formation Alerts: issued when synoptic, satellite and/or aircraft reconnaissance data indicate development of a significant tropical cyclone in a specified area is likely;

c. Tropical Cyclone Warnings: issued periodically throughout each day for significant tropical cyclones, giving forecasts of position and intensity of the system; and

d. Prognostic Reasoning Messages: issued twice daily for tropical storms and typhoons in the western North Pacific; these messages discuss the rationale behind the most recent JTWC warnings.

The recipients of the services of JTWC essentially determine the content of JTWC's products according to their ever changing requirements. Therefore, the spectrum of routine services is subject to change from year to year. Such changes are usually the result of deliberations held at the Annual Tropical Cyclone Conference.

2. DATA SOURCES

a. COMPUTER PRODUCTS:

A standard array of synoptic-scale computer analyses and prognostic charts are available from the Fleet Numerical Oceanography Center (FLENUMOCEANCEN) at Monterey, California. These products are provided to JTWC via the Naval Environmental Data Network (NEDN).

b. CONVENTIONAL DATA:

This data set is comprised of land-based and shipboard surface and upper-air observations taken at, or near, synoptic times, cloud-motion winds derived twice daily from satellite data, and enroute meteorological observations from commercial and military aircraft (AIREPS) within six hours of synoptic times. Conventional data charts are prepared daily at 0000Z and 1200Z using hand- and computer-plotted data for the surface/gradient and 200mb (upper-tropospheric) levels. In addition to these analyses, charts at the 850, 700, and 500 mb levels are computer-plotted from rawinsonde/pibal observations at the 12-hour synoptic times.

c. AIRCRAFT RECONNAISSANCE:

Aircraft weather reconnaissance data are invaluable for locating the position of the center of developing systems and essential for the accurate determination of:

- maximum surface and flight level wind
- minimum sea-level pressure
- horizontal surface and flight level wind distribution
- eye/center temperature and dewpoint

In addition, wind and pressure-height data at the 500 and/or 400 mb levels, provided by the aircraft while enroute to, or from fix missions, or during dedicated synoptic-scale flights, provide a valuable supplement to the all too sparse data fields of JTWC's area of responsibility. A more detailed discussion of aircraft weather reconnaissance is presented in Chapter II.

d. SATELLITE RECONNAISSANCE:

Meteorological satellite data obtained from the Defense Meteorological Satellite Program (DMSP) and National Oceanic and Atmospheric Administration (NOAA) spacecraft played a major role in the early detection and tracking of tropical cyclones in 1985. A discussion of the role of these programs is presented in Chapter II.

e. RADAR RECONNAISSANCE:

During 1985, as in previous years, land based radar coverage was utilized extensively when available. Once a tropical cyclone moved within the range of land based radar sites, their reports were essential for determination of small scale movement. Use of radar reports during 1985 is discussed in Chapter II.

3. COMMUNICATIONS

a. JTWC currently has access to three primary communications circuits.

(1) The Automated Digital Network (AUTODIN) is used for dissemination of warnings, alerts and other related bulletins to Department of Defense installations. These messages are relayed for further transmission over U.S. Navy Fleet Broadcasts, and U.S. Coast Guard CW (continuous wave Morse Code) and voice broadcasts. Inbound message traffic for JTWC is received via AUTODIN addressed to NAVOCEANCOMCEN GQ, JTWC GQ, or DET 1 1WW NIMITZ HILL GQ.

(2) The Air Force Automated Weather Network (AWN) provides weather data to JTWC through a dedicated circuit from the Automated Digital Weather Switch (ADWS) at Hickam AFB, Hawaii. The ADWS selects and routes the large volume meteorological reports necessary to satisfy JTWC requirements for the right data at the right time. Weather bulletins prepared by JTWC are inserted into the AWN circuit via the Naval Environmental Display Station (NEDS) through the Nimitz Hill Naval Telecommunications Center (NTCC) of the Naval Communications Area Master Station Western Pacific.

(3) The Naval Environmental Data Network (NEDN) is the communications link with the computers at FLENUMOCEANCEN. JTWC is able to receive environmental data from FLENUMOCEANCEN and provide data directly to the computers to execute numerical techniques.

b. NEDS is the backbone of the JTWC communications system. It is the terminal that provides a direct interface with the NEDN and AWN circuits, and is capable of preparing messages for indirect AUTODIN transmission.

4. ANALYSES

A composite surface/gradient level (3000 ft (915 m)) manual analysis of the JTWC area of responsibility is accomplished on the 0000Z and 1200Z conventional data. Analysis of the wind field using streamlines is stressed for tropical and subtropical regions. Analysis of the pressure field outside the tropics is accomplished routinely by the Naval Oceanography Command Center (NOCC) Operations watch team and is used by JTWC in conjunction with their analysis of the tropical wind fields.

A composite upper-tropospheric manual streamline analysis is accomplished daily utilizing rawinsonde data from 300 mb through 100 mb, winds obtained from satellite-derived cloud motion analysis, and AIREPS (taken plus or minus six hours of chart valid time) at or above 29,000 feet (8,839m). Wind and height data are used to generate a representative analysis of tropical cyclone outflow patterns, mid-latitude steering currents, and features that may influence tropical cyclone intensity. All charts are hand-plotted in the tropics to provide all available data as soon as possible to the TDO. These charts are augmented by computer-plotted charts for the final analysis.

Computer-plotted charts for the 850, 700, and 500 mb levels are available for streamline and/or height-change analysis from the 0000Z and 1200Z data base. Additional sectional charts at intermediate synoptic times and auxilary charts such as station-time plot diagrams and pressure-change charts are also analyzed during periods of significant tropical cyclone activity.

5. FORECAST AIDS

The following objective techniques were employed in tropical cyclone forecasting during 1985 (a description of these techniques is presented in Chapter V):

a. MOVEMENT

(1) 12-HOUR EXTRAPOLATION

(2) CLIMATOLOGY

(3) TPAC (Extrapolation and Climatology Blend)

(4) TYAN78 (Analog)

(5) COSMOS (Model Output Statistics)

(6) OTCM (Dynamic Model)

(7) NTCM (Nested Grid Dynamic Model)

(8) TAPT (Empirical)

b. INTENSITY

(1) THETA E (Empirical)

(2) DVORAK (Empirical)

(3) CLIMATOLOGY

(4) WIND RADIUS (Analytical)

6. FORECAST PROCEDURES

a. INITIAL POSITIONING

The warning position is the best estimate of the center of the surface circulation at synoptic time. It is estimated from an analysis of all fix information received up to one and one-half hours after synoptic time. This analysis is based on a semi-objective weighting of fix information based on the historical accuracy of the fix platform and the meteorology features used for the fix. The interpolated warning position reduces the weighting of any single fix and results in a more consistent movement and a warning position that is more representative of the larger-scale circulation. If the fix data are not available due to reconnaissance platform malfunction or communication problems, synoptic data or extra- polation from previous fixes are used.

b. TRACK FORECASTING

A preliminary forecast track is developed based on an evaluation of the rationale behind the previous warning and the guidance given by the most recent set of objective techniques and numerical prognoses. This preliminary track is then subjectively modified based on the following considerations:

(1) The prospects for recurvature or erratic movement are evaluated. This evaluation is based primarily on the present and forecast positions and amplitudes of the middle-tropospheric, mid-latitude troughs and ridges as depicted on the latest upper-air analysis and numerical forecasts.

(2) Determination of the best steering level is partly influenced by the maturity and vertical extent of the tropical cyclone. For mature tropical cyclones located south of the subtropical ridge, forecast changes in speed of movement are closely correlated with anticipated changes in the intensity or relative position of the ridge. When steering currents are relatively weak, the tendency for tropical cyclones to move northward due to internal forces is an important consideration.

(3) Over the 12- to 72-hour (12- to 48-hour in the Southern Hemisphere) forecast period, speed of movement during the early forecast period is usually biased towards persistence, while the subsequent forecast periods are biased towards objective techniques. When a tropical cyclone moves poleward, and toward the mid-latitude steering currents, speed of movement becomes increasingly more biased toward a selective group of objective techniques capable of estimating significant increases in speed of movement.

(4) The proximity of the tropical cyclone to other tropical cyclones is closely evaluated to determine if there is a possibility of interaction.

A final check is made against climatology to

determine whether the forecast track is reasonable. If the forecast deviates greatly from one of the climatological tracks, the forecast rationale may be reappraised.

c. INTENSITY FORECASTING

For this parameter, heavy reliance is placed on intensity trends from aircraft reconnaissance reports, wind and pressure data from ships and land stations in the vicinity of the tropical cyclone, the Dvorak satellite empirical model and climatology. An evaluation of the entire synoptic situation is made, including the location of major troughs and ridges, the position and intensity of any nearby tropical upper-tropospheric troughs (TUTTs), the vertical and horizontal extent of the tropical cyclone's circulation and the extent of the associated upper-level outflow pattern. An essential element affecting each intensity forecast is the accompanying forecast track and the environmental influences along that track, such as terrain, vertical wind shear, and the existence of an extratropical environment.

Once the forecast intensities have been derived, the horizontal distribution of surface winds (winds greater than 30-, 50-, and 100-knots) is determined. The most recent wind radii and associated asymmetrics are deduced from all available surface wind observations and reconnaissance aircraft reports. Based on the current surface wind distribution, preliminary estimates of future wind radii are provided by an empirically derived objective technique. These estimates may be subjectively modified based upon the anticipated interaction of the tropical cyclone's circulation with forecast locations of large-scale wind regimes and significant land masses. Other factors including the tropical cyclone's speed of movement and possible extratropical transition are also considered.

7. WARNINGS

Tropical cyclone warnings are issued when a closed circulation is evident and maximum sustained winds are forecast to increase to 34 knots (18 meters per second) within 48 hours, or if the tropical cyclone is in such a position that life or property may be endangered within 72 hours. Warnings may also be issued in other situations if it is determined that there is a need to alert military or civil interests to conditions which may become hazardous in short period of time.

Each tropical cyclone warning is numbered sequentially and includes the following information: the position of the surface center; estimate of the position accuracy and the supporting reconnaissance (fix) platforms; the direction and speed of movement during the past six hours (past 12 hours in the southern hemsiphere); and the intensity and radial extent of surface winds over 30-, 50-, and 100-knots, when applicable. At forecast intervals of 12-, 24-, 48-, and 72-hours (12-, 24-, and 48-hours in the southern hemisphere), information on the tropical cyclone's anticipated position, intensity and wind radii are also provided. Vectors indicating the mean direction and mean speed between forecast positions were also included in all warnings.

Warnings in the western North Pacific and North Indian Oceans are issued every six hours valid at standard times; 0000Z, 0600Z, 1200Z and 1800Z (every twelve hours; 0000Z, 1200Z or 0600Z, 1800Z in the Southern Hemisphere). All warnings are released to the communications network no earlier than synoptic time and no later than synoptic time plus two and one-half hours so that recipients will have a reasonable expectation of having all warnings "in hand" by synoptic time plus three hours (0300Z, 0900Z, 1500Z and 2100Z).

Warning forecast positions are later verified against the corresponding "best track" positions (obtained during detailed post-storm analysis to determine the actual path and intensity of the cyclone). A summary of the verification results for 1985 is present in Chapter V.

8. PROGNOSTIC REASONING MESSAGES

For tropical storms and typhoons in the western North Pacific Ocean, prognostic reasoning messages are transmitted following the 0000Z and 1200Z warnings, or whenever the forecast reasoning is no longer valid. This plain language message is intended to provide meteorologists with the reasoning behind the latest forecast.

In addition to this message, prognostic reasoning information applicable to all customers is provided in the remarks section of warnings when significant forecast changes are made or when deemed appropriate by the TDO.

9. TROPICAL CYCLONE FORMATION ALERT

Tropical Cyclone Formation Alerts (TCFAs) are issued whenever interpretation of satellite imagery and other meteorological data indicates that the formation of a significant tropical cyclone is likely. These formation alerts will specify a valid period not to exceed twenty-four hours and must either be cancelled, reissued, or superseded by a tropical cyclone warning prior to the expiration of the valid time.

10. SIGNIFICANT TROPICAL WEATHER ADVISORY

This product contains a general, non-technical description of all tropical disturbances in the JTWC area of responsibility (AOR) and an assessment of their potential for further (tropical cyclone) development. In addition, all tropical cyclones in warning status are briefly discussed. This message is issued once daily at 0600Z and is valid for a 24-hour period. (As of 1 August 1985 this single message was divided into two separate messages to better handle the meteorological watch of the AOR. The AOR east of 100 degrees East longitude is covered by message at 0600Z daily and the AOR west of 100 degrees East longitude at 1800Z daily. Both remain valid for a twenty-four hour period.) It is reissued whenever the situation warrants. For each suspect area, the words "poor", "fair", and "good" are used to describe the potential for further development. "Poor" is used to describe a tropical disturbance that is not expected to require a TCFA during the advisory period; "fair" is used to describe a tropical disturbance that is currently not covered by a TCFA, but for which it is likely that a TCFA will be issued during the advisory period; and "good" is used when the tropical disturbance is covered by a TCFA.

CHAPTER II - RECONNAISSANCE AND FIXES

1. GENERAL

The Joint Typhoon Warning Center depends on reconnaissance to provide necessary, accurate, and timely meteorological information in support of each warning. JTWC relies primarily on three reconnaissance platforms: aircraft, satellite, and radar. In data rich areas synoptic data are also used to supplement the above. Optimum utilization of all available reconnaissance resources is obtained through the Selective Reconnaissance Program (SRP); various factors are considered in selecting a specific reconnaissance platform including capabilities and limitations, and the tropical cyclone's threat to life and property both afloat and ashore. A summary of reconnaissance fixes received during 1985 is included in Section 6 of this chapter.

2. RECONNAISSANCE AVAILABILITY

a. Aircraft

Aircraft weather reconnaissance for the JTWC is performed by the 54th Weather Reconnaissance Squadron (54th WRS) located at Andersen Air Force Base, Guam. The 54th WRS is presently equipped with six WC-130 aircraft and, from July through October, is normally augmented by two additional aircraft from the 53rd WRS, Keesler Air Force Base, Mississippi, bringing the total number of available aircraft to eight. The JTWC reconnaissance requirements are provided daily to the Tropical Cyclone Aircraft Reconnaissance Coordinator (TCARC), who marries the tasking from the JTWC with the available airframes from the 54th WRS.

As in previous years, aircraft reconnaissance provides direct measurements of standard pressure-level height, temperature, flight-level winds, sea-level pressure, estimated surface winds (when observable), and numerous additional parameters. The meteorological data are gathered by the Aerial Reconnaissance Weather Officer (ARWO) and dropsonde operators of Detachment 3, 1st Weather Wing who fly with the 54th WRS. These data provide the Typhoon Duty Officer (TDO) with indications of tropical cyclone position and intensity. Another important aspect is the availability of the data for technique development and tropical cyclone research.

b. Satellite

Satellite fixes from USAF/USN ground sites and USN ships provide day and night coverage in the JTWC area of responsibility. Interpretation of this satellite imagery provides tropical cyclone positions and estimates of current and forecast intensities through the Dvorak technique.

c. Radar

Land radar provides positioning data on well developed tropical cyclones when in the proximity (usually within 175 nm (324 km)) of the radar sites in the Philippines, Taiwan, Hong Kong, Japan, South Korea, Kwajalein, and Guam.

d. Synoptic

JTWC also determined tropical cyclone positions based on the analysis of the surface/ gradient level synoptic data. These positions were helpful in situations where the vertical structure of the tropical cyclone was weak or accurate surface positions from aircraft of satellite were not available.

3. AIRCRAFT RECONNAISSANCE SUMMARY

During 1985, JTWC levied requirements for 192 vortex fixes and 59 investigative missions of which 12 were flown into disturbances that did not develop. In addition to the levied fixes, 167 intermediate fixes were also obtained. Eighteen synoptic missions were requested and flown to provide mid-level steering information. The average vector error for all aircraft fixes received at the JTWC during 1985 was 11 nm (20 km).

Aircraft reconnaissance effectiveness is summarized in Table 2-1 using the criteria set forth in CINCPACINST 3140.1 (series).

4. SATELLITE RECONNAISSANCE SUMMARY

The Air Force provides satellite reconnaissance support to JTWC using imagery from a variety of spacecraft. The tropical cyclone satellite surveillance network consists of both tactical and centralized facilities. Tactical DMSP sites are located at Nimitz Hill, Guam; Clark AB, Republic of the Philippines; Kadena AB, Japan; Osan AB, Korea; and Hickam AFB, Hawaii. These sites provide a combined coverage that includes most of the JTWC area of responsibility in the western North Pacific from near

TABLE 2-1. AIRCRAFT RECONNAISSANCE EFFECTIVENESS

EFFECTIVENESS	NUMBER OF LEVIED FIXES	PERCENT
COMPLETED ON TIME	174	90.6
EARLY	4	2.1
LATE	4	2.1
MISSED	10	5.2
TOTAL	192	100.0

LEVIED VS. MISSED FIXES

	LEVIED	MISSED	PERCENT
AVERAGE 1965-1970	507	10	2.0
1971	802	61	2.0
1972	624	126	20.2
1973	227	13	5.7
1974	358	30	8.4
1975	217	7	3.2
1976	317	11	3.5
1977	203	3	1.5
1978	290	2	0.7
1979	289	14	4.8
1980	213	4	1.9
1981	201	3	1.5
1982	276	17	6.2
1983	157	3	1.9
1984	210	2	1.0
1985	192	10	5.2

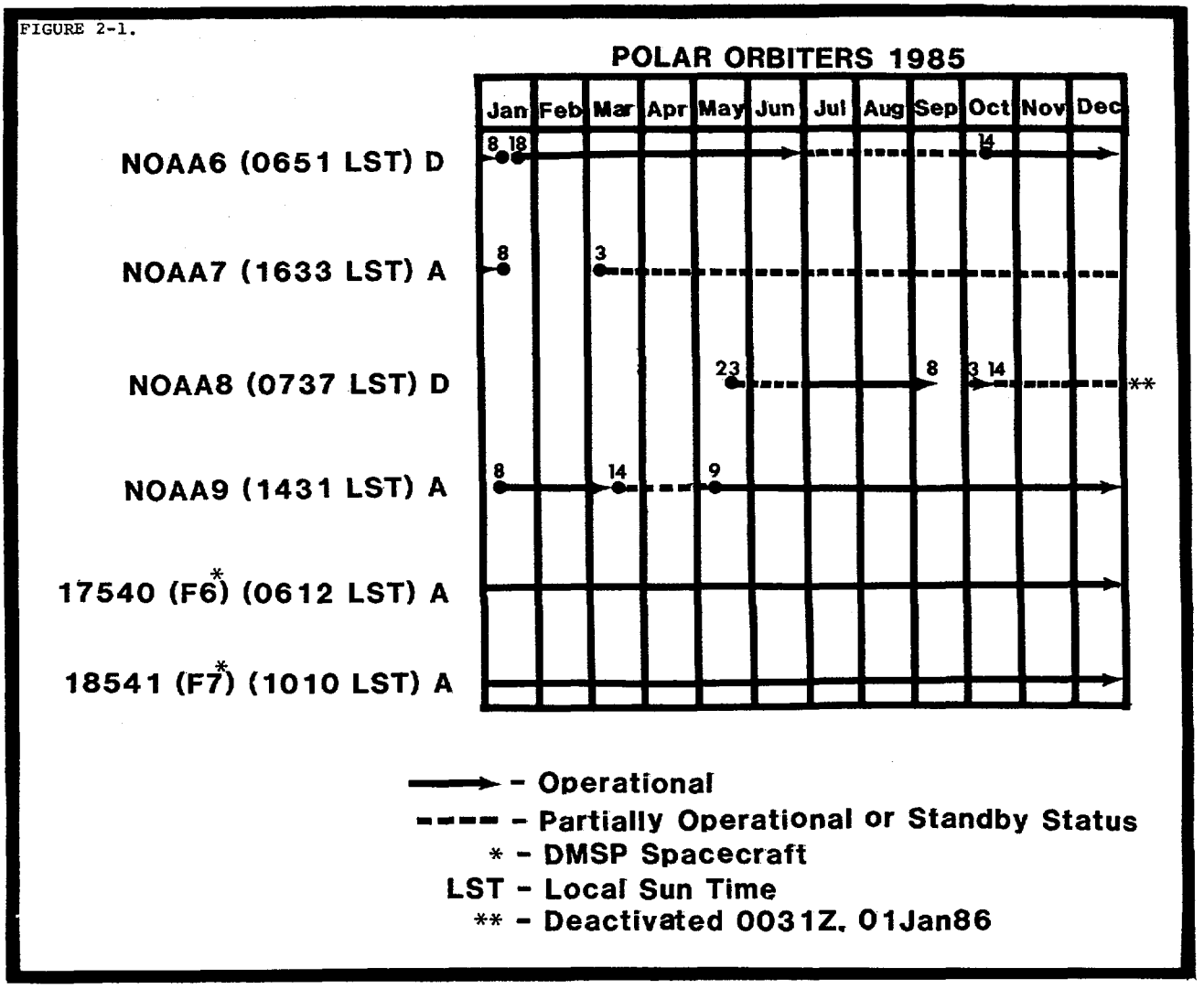
the dateline westward to the Malay Peninsula. JTWC relies on the Air Force Global Weather Central (AFGWC) to provide coverage over the remainder of its area of responsibility using stored satellite data. The Naval Oceanography Command Detachment, Diego Garcia, provides NOAA polar-orbiting coverage in the central Indian Ocean as a supplement to this support. U.S. Navy ships equipped for direct readout also provide supplementary support.

AFGWC, located at Offutt AFB, Nebraska, is the centralized member of the tropical cyclone satellite surveillance network. In support of JTWC, AFGWC processes stored imagery from DMSP and NOAA spacecraft. Imagery processed at AFGWC is recorded onboard the spacecraft as it passes over the earth. Later, these data are downlinked to AFGWC via a network of command readout sites and communication satellites. This enables AFGWC to obtain the coverage necessary to fix all tropical systems of interest to JTWC. AFGWC has the primary responsibility to provide tropical cyclone surveillance over the entire Indian Ocean, southwest Pacific, and the area near the dateline. Additionally, AFGWC can be tasked to provide tropical cyclone positions in the entire western North Pacific as backup to coverage routinely available in that region.

The hub of the network is Det 1, 1WW, collocated with JTWC on Nimitz Hill, Guam. Based on available satellite coverage, Det 1 coordinates satellite reconnaissance requirements with JTWC and tasks the individual network sites for the necessary tropical cyclone fixes. When a position from a polar-orbiting satellite is required as the basis for a warning, it is called a "levied fix". To satisfy the "levied fix", two sites are tasked to fix the tropical cyclone from the same satellite pass. This provides the necessary redundancy to virtually guarantee JTWC a successful satellite fix on the tropical cyclone. Using this "dual-site" concept, the satellite reconnaissance network is capable of meeting all of JTWC's levied satellite fix requirements.

The network provides JTWC with several products and services. The main service is one of surveillance. Each site reviews its daily satellite coverage for indications of tropical cyclone development. If an area exhibits the potential for development, JTWC is notified. Once JTWC issues either a formation alert or warning, the network is tasked to provide three products: tropical cyclone positions, intensity estimates, and 24-hour intensity forecasts. Satellite tropical cyclone positions are assigned Position Code Numbers (PCN) to indicate the accuracy of the fix position. This is dependent upon the availability of visible landmarks in the image for precise gridding, and the degree of organization of the tropical cyclone's cloud system (Table 2-2). During 1985, the network provided JTWC with a total of 2505 satellite fixes on tropical systems in the western North Pacific. This is a record number of fixes for the year. Another 195 fixes were made for tropical systems in the North Indian Ocean. A

FIGURE 2-1.



comparison of those fixes of numbered tropical cyclones in the western North Pacific with their corresponding JTWC best track positions is shown in Table 2-3a (Comparison of fixes with the corresponding best track for the South Pacific and Indian Oceans is presented in Table 2-3b). Estimates of the tropical cyclone's current intensity and 24-hour intensity forecast are made every 12 hours by applying the Dvorak technique (NOAA Technical Report NESDIS 11) to visual and enhanced infrared imagery.

Figure 2-1 shows the status of operational polar orbiting spacecraft. Six were available at various times in 1985. NOAA 6 suffered low power problems from the 8th of January to the 18th. It continued to operate with degraded imagery until July, when it was placed on standby and replaced by the repaired NOAA 8. NOAA 8 suffered from continuing oscillator problems until finally deactivated on 1 January 1986,

TABLE 2-2. POSITION CODE NUMBERS

PCN	METHOD OF CENTER DETERMINATION/GRIDDING
1	EYE/GEOGRAPHY
2	EYE/EPHEMERIS
3	WELL DEFINED CC/GEOGRAPHY
4	WELL DEFINED CC/EPHEMERIS
5	POORLY DEFINED CC/GEOGRAPHY
6	POORLY DEFINED CC/EPHEMERIS

leaving NOAA 6, once again, as the primary morning spacecraft. NOAA 7 was placed on standby March 3rd after operating with impaired high resolution picture transmissions (HRPT) since 8 January. It was replaced by NOAA 9, (launched 12 December 1984) which became fully operational 9 May. At the end of the year, NOAA 9 was the only fully operational NOAA satellite.

5. RADAR RECONNAISSANCE SUMMARY

Seventeen of the 27 significant tropical cyclones in the western North Pacific during 1985 passed within range of land-based radar with sufficient cloud pattern organization to be fixed. The land radar fixes that were obtained and transmitted to JTWC totaled 1360. Three radar fixes were obtained by reconnaissance aircraft.

The WMO radar code defines three categories of accuracy: good (within 10 km (5nm)), fair (within 10-30 km (5-16 nm)), and poor (within 30-50 km (16-27nm)). Of the 1091 radar fixes coded in this manner; 299 were good, 413 were fair, and 379 were poor. Compared to the JTWC best track, the mean vector deviation for land radar sites was 13 nm (24 km). Excellent support through timely and accurate radar fix positioning allowed JTWC to track and forecast tropical cyclone movement through even the most difficult erratic tracks.

As in previous years, no radar reports were received on North Indian Ocean tropical cyclones.

TABLE 2-3b. MEAN DEVIATION (NM) OF ALL SATELLITE DERIVED TROPICAL CYCLONE POSITIONS IN THE SOUTH PACIFIC AND SOUTH INDIAN OCEANS. NUMBER OF CASES IN (PARENTHESES).

	1985
PCN	(ALL SITES)
1	15.8 (20)
2	15.5 (168)
3	26.1 (42)
4	29.2 (190)
5	46.9 (241)
6	39.8 (1140)
1&2	15.5 (188)
3&4	28.7 (232)
5&6	41.1 (1381)
TOTAL NUMBER OF CASES	(1801)

6. TROPICAL CYCLONE FIX DATA

A total of 4268 fixes on 27 western North Pacific tropical cyclones and 195 fixes on 6 North Indian Ocean tropical cyclones were received at JTWC. Table 2-4a, Fix Platform Summary, delineates the number of fixes per platform for each individual tropical cyclone. Season totals and percentages are

TABLE 2-3a. MEAN DEVIATION (NM) OF ALL SATELLITE DERIVED TROPICAL CYCLONE POSITIONS FROM THE JTWC BEST TRACK POSITIONS IN THE WESTERN NORTH PACIFIC AND NORTH INDIAN OCEANS. NUMBER OF CASES (IN PARENTHESES).

	WESTERN NORTH PACIFIC OCEAN				NORTH INDIAN OCEAN			
	1975-1984 AVERAGE		1985		1980-1984 AVERAGE		1985	
PCN	(ALL SITES)		(ALL SITES)		(ALL SITES)		(ALL SITES)	
1	13.3	(1505)	17.7	(127)	16.7	(40)	----	(0)
2	17.0	(1617)	13.2	(175)	18.9	(7)	----	(0)
3	20.6	(2176)	24.8	(191)	21.4	(13)	11.5	(8)
4	23.9	(1000)	19.5	(300)	64.6	(8)	33.1	(2)
5	37.4	(4070)	37.0	(311)	34.8	(171)	28.9	(49)
6	42.4	(2278)	32.8	(972)	41.1	(106)	33.6	(97)
1&2	15.2	(3122)	15.1	(302)	17.2	(47)	----	(0)
3&4	21.6	(3176)	21.6	(491)	41.3	(21)	15.8	(10)
5&6	39.2	(6348)	33.8	(1283)	36.1	(277)	32.1	(146)
TOTAL NUMBER OF CASES		(12646)		(2076)		(345)		(156)

TABLE 2-4a. FIX PLATFORM SUMMARY FOR 1985.

FIX PLATFORM SUMMARY

WESTERN NORTH PACIFIC	AIRCRAFT	SATELLITE	RADAR	SYNOPTIC	TOTAL
TS ELSIE (01W)	3	23	-	1	27
TS FABIAN (02W)	7	82	-	8	97
TY GAY (03W)	10	127	-	-	137
TD (04W)	-	40	-	4	44
TY HAL (05W)	12	119	79	4	214
TY IRMA (06W)	22	110	83	-	215
TY JEFF (07W)	23	180	99	12	314
TY KIT (08W)	29	165	289	4	487
TS LEE (09W)	10	61	28	-	99
TY MAMIE (10W)	2	70	9	7	88
TY NELSON (11W)	20	113	141	1	275
TY ODESSA (12W)	31	135	144	-	310
TY PAT (13W)	16	101	88	1	206
TS RUBY (14W)	8	52	52	-	112
TY SKIP (02C)	20	118	-	-	138
TY TESS (15W)	12	86	54	-	152
TS VAL (16W)	3	64	-	-	67
TS WINONA (17W)	-	47	19	3	69
TY ANDY (18W)	-	60	14	2	76
TY BRENDA (19W)	21	95	57	4	177
TY CECIL (20W)	8	70	8	-	86
STY DOT (21W)	24	144	57	-	225
TS ELLIS (22W)	14	64	-	3	81
TY FAY (23W)	31	144	139	-	314
TS GORDON (24W)	3	86	-	-	89
TY HOPE (25W)	17	90	-	-	107
TS IRVING (26W)	3	59	-	-	62
TOTAL	349	2505	1360	54	4268
% OF TOTAL NR OF FIXES	8.2	58.7	31.9	1.2	100.0

NORTH INDIAN OCEAN	SATELLITE	TOTAL
TC 01B	36	36
TC 02A	25	25
TC 03B	26	26
TC 04B	20	20
TC 05B	30	30
TC 06B	58	58
TOTAL	195	195
% OF TOTAL NR OF FIXES	100.0	100.0

TABLE 2-4b. FIX PLATFORM SUMMARY FOR 1985

FIX PLATFORM SUMMARY

THE SOUTH PACIFIC AND SOUTH INDIAN OCEANS.	SATELLITE	RADAR	SYNOPTIC	TOTAL
TC 01S ----	41	-	-	41
TC 02S BOBALAHY	63	-	-	63
TC 03S EMMA	48	-	1	49
TC 04P ----	51	-	-	51
TC 05S FRANK	64	8	1	73
TC 06P ----	25	-	2	27
TC 07P MONICA	43	-	-	43
TC 08P ----	47	-	-	47
TC 09P DRENA	20	-	-	20
TC 10S CELESTINA	56	-	1	57
TC 11P ERIC	61	-	-	61
TC 12S ----	29	-	-	29
TC 13P NIGEL	75	-	-	75
TC 14P ODDETTE	65	-	-	65
TC 15S DITRA	36	-	-	36
TC 16P FREDA	26	-	-	26
TC 17S GERTIE	17	-	-	17
TC 18P ----	66	-	-	66
TC 19S ESITERA	36	-	3	39
TC 20S HUBERT	87	-	-	87
TC 21S FELIKSA	32	-	1	33
TC 22S ISOBEL	92	-	-	92
TC 23S GERIMENA	86	-	-	86
TC 24S ----	21	-	-	21
TC 25S JACOB	121	-	-	121
TC 26P PIERRE	46	-	-	46
TC 27P GAVIN	58	-	-	58
TC 28S KIRSTY	98	-	-	98
TC 29S LINDSAY	30	-	-	30
TC 30P HINA	90	-	-	90
TC 31P SANDY	116	-	-	116
TC 32P TANYA	86	-	1	87
TC 33S HELISAONINA	51	-	-	51
TC 34S GRETEL	53	8	1	62
TC 35S MARGOT	87	-	-	87
TOTAL	2023	16	11	2050
% OF TOTAL NR OF FIXES	98.7	0.8	0.5	100.0

also indicated. (Table 2-4b provides the same information for the South Pacific and South Indian Oceans.)

Annex A includes individual fix data for each tropical cyclone in the western North Pacific and North Indian Oceans. (Additionally, it includes individual fix data for each tropical cyclone in the South Pacific and South Indian Oceans.) Fix data are divided into four categories: satellite, aircraft, radar, and synoptic. Those fixes labeled with an asterisk (*) were determined to be unrepresentative of the surface center and were not used in determining the best tracks. Within each category, the first three columns are as follows:

FIX NO. - Sequential fix number

TIME (Z) - GMT time in day, hours, and minutes

FIX POSITION - Latitude and longitude to the nearest tenth of a degree

Depending on the category, the remainder of the format varies as follows:

a. Satellite

(1) ACCRY - Position Code Number is used to indicate the accuracy of the fix position. A "1" or "2" indicates relatively high accuracy and a "5" or "6" relatively low accuracy (reference Table 2-2, Postion Code Numbers).

(2) DVORAK CODE - Intensity evaluation and trend (Figure 2-2, Table 2-5). (For specifics, refer to NOAA Technical Report NESDIS 11.)

(3) COMMENTS - For an explanation of the contractions, see pages vi and vii.

(4) SITE - ICAO call sign of the specific satellite tracking station.

b. Aircraft

(1) FLT LVL - The constant pressure surface level, in millibars, or altitude, in feet, maintained during the penetration. The usual flight level flown in developing tropical cyclones is 700 mb, due to turbulence considerations. Low-level missions are normally flown at 1500 ft (457 m).

(2) 700 MB HGT - Minimum height of the 700 mb pressure surface within the vortex recorded in meters.

(3) OBS MSLP - If the surface center can be visually detected (e.g., in the eye), the minimum sea-level pressure is obtained by a dropsonde release above the surface vortex center. If the fix is made at the 1500-foot level, the sea-level pressure is extrapolated from that level.

(4) MAX-SFC-WND - The maximum surface wind (knots) is an estimate made by the ARWO based on sea state. This observation is limited to the region of the flight path and may not be representative of the entire tropical cyclone. Availability of data is also dependent upon the absence of undercast conditions and the presence of adequate illumination. The positions of the maximum flight level wind and the maximum observed surface wind do not necessarily coincide.

(5) MAX-FLT-LVL-WND - Wind speed (knots) at fight level is measured by the AN/APN 147 doppler radar system aboard the WC-130 aircraft. This measurement may not represent the maximum flight level wind associated with the tropical cyclone

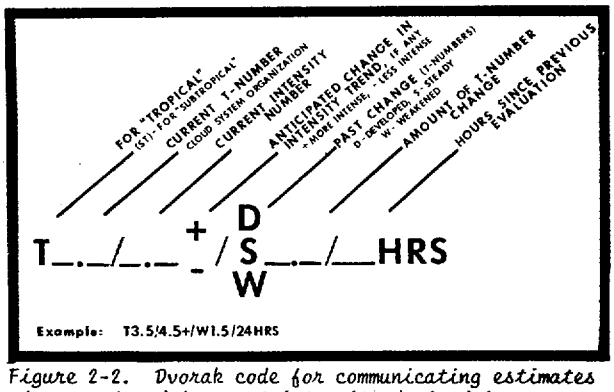


Figure 2-2. Dvorak code for communicating estimates of current and forecast intensity derived from satellite data. In the example the current T-number is 3.5 but the current intensity estimate is 4.5 (equivalent to 77 kt). The cloud system has weakened by 1.5 T-numbers since the previous evaluation conducted 24 hours earlier. The plus (+) symbol indicates an expected reversal of the weakening trend or very little further weakening of the tropical cyclone during the next 24-hour period.

TABLE 2-5. MAXIMUM SUSTAINED WIND SPEED (KT) AS A FUNCTION OF DVORAK CI & FI (CURRENT & FORECAST INTENSITY) NUMBER AND MINIMUM SEA-LEVEL PRESSURE (MSLP)

TROPICAL CYCLONE INTENSITY NUMBER	WIND SPEED	MSLP (NW PACIFIC)
0.0	<25	--
0.5	25	--
1.0	25	--
1.5	25	--
2.0	30	1000
2.5	35	997
3.0	45	991
3.5	55	984
4.0	65	976
4.5	77	966
5.0	90	953
5.5	102	941
6.0	115	927
6.5	127	914
7.0	140	898
7.5	155	879
8.0	170	858

because the aircraft only samples those portions of the tropical cyclone along the flight path. In many instances, the flight path is through the weakest sector of the tropical cyclone. In areas of heavy rainfall, the doppler radar may track energy reflected from precipitation rather than from the sea surface, thus, preventing accurate wind speed measurement. In obvious cases, such erroneous wind data will not be reported. In addition, the doppler radar system on the WC-130 restricts wind measurements to drift angles less than or equal to 27 degrees if the wind is normal (perpendicular) to the aircraft heading.

(6) ACCY - Fix position accuracy. Both navigational (OMEGA and LORAN) and meteorological (by the ARWO) estimates are given in nautical miles.

(7) EYE SHAPE - Geometrical representation of the eye based on the aircraft radar presentation. The eye shape is reported only if the center is 50 percent or more surrounded by wall cloud.

(8) EYE DIA/ORIENTATION - Diameter of the eye in nautical miles. When an elliptical eye is present, the lengths of the major and minor axes and the orientation of the major axis are respectively listed. When concentric eye walls are present, each diameter is listed.

c. Radar

(1) RADAR - Specific type of platform (land, aircraft, or ship) utilized for fix.

(2) ACCY - Accuracy of fix position (good, fair, or poor) as given in the WMO ground radar weather observation code (FM20-V).

(3) EYE SHAPE - Geometrical representation of the eye given in plain language (circular, elliptical, etc.).

(4) EYE DIA - Diameter of eye given in kilometers.

(5) RADOB CODE - Taken directly from WMO ground weather radar observation code FM20-V. The first group specifies the vortex parameters, while the second group describes the movement of the vortex center.

(6) RADAR POSITION - Latitude and longitude of tracking station given in tenths of a degree.

(7) SITE - WMO station number of the specific tracking station.

d. Synoptic

(1) INTENSITY ESTIMATE - An estimate of the tropical cyclone's maximum sustained surface wind in knots is based on the tropical cyclone forecaster's analysis of low-level synoptic data.

(2) NEAREST DATA - The accuracy of a synoptic fix is based on the distance in nautical miles from the estimated fix position to the nearest synoptic report or to the average distance of reports in data sparse areas.

(3) COMMENTS - For an explanation of the contractions see pages vi and vii.

CHAPTER III - SUMMARY OF WESTERN NORTH PACIFIC AND NORTH INDIAN OCEAN TROPICAL CYCLONES

1. GENERAL

During 1985, JTWC issued warnings on 27 western North Pacific tropical cyclones (1 tropical depression, 9 tropical storms, 16 typhoons and one supertyphoon). This was almost an average year when compared to the climatological mean of 27 for the frequency of tropical storms and typhoons. Six north Indian Ocean tropical cyclones, all of tropical storm intensity, developed as compared to the climatological average of four. In summary, JTWC issued warnings on 33 northern hemisphere tropical cyclones.

In 1985 for the western North Pacific there were 127 warning days - a warning day is defined as a day during which JTWC issues warnings on at least one tropical cyclone. For 38 of these 127 days, warnings were being issued on two tropical cyclones. There were also 2 three-cyclone days, 2 four-cyclone days, and one day in which JTWC issued warnings on five different WESTPAC tropical cyclones at the same time. When the north Indian Ocean tropical cyclones are included, there were 141 warning days, 41 two-cyclone days, 3 three-cyclone days, 3 four-cyclone days and 1 five-cyclone day.

Six hundred and fifteen warnings were issued on the 27 western North Pacific tropical cyclones and 54 were issued on the six north Indian Ocean tropical cyclones. There were 39 initial Tropical Cyclone Formation Alerts (TCFA) for WESTPAC and 8 for the north Indian Ocean. In WESTPAC, TCFAs were issued for all except one of the significant tropical cyclones that developed during 1985. The false alarm rate of 33% for WESTPAC seems fairly high, however, it did enable JTWC to provide the customer with an mean lead time of 27.5 hours on significant tropical cyclone development. For the North Indian Ocean TCFAs were issued for all but one of the significant tropical cyclones. The false alarm rate for TCFAs was 38% with a mean lead time of 20.2 hours.

2. WESTERN NORTH PACIFIC TROPICAL CYCLONES

There are several interesting aspects of the 1985 tropical cyclone activity. In general, it can be neatly divided into two periods: the early part, January to August and the late, September to December (see composite tropical cyclone best tracks on pages 15 and 16). The early 1985 composite best tracks show that the overwhelming majority of the tropical cyclones during that period recurved, that is: 11 recurvers versus 3 west-northwest straight runners and one low-latitude tropical storm (Fabian) which behaved erratically. This is somewhat atypical since, normally, the majority of the recurvers occur during the later part of the year when breaks in the subtropical high pressure ridge develop as the influence of the mid-latitude troughs extends further south with the approach of fall. The Philippine Islands were spared during the first part of the year, except for a glancing blow from Typhoon Hal in June. However, during that period, no less than 8 tropical cyclones affected, or posed a direct threat to, Okinawa, Korea and Japan. In some cases the same tropical cyclone affected all three. Notice the point 200 nm (370km) south-southeast of Okinawa — four, and nearly five, different tropical cyclone tracks intersected at that location. The major generation areas during the first part of the year were: a two-to-three degree swath centered on six degrees north latitude, from the southeastern coast of the Philippine Islands to near Ponape; another area north of Guam; and a third area south of Okinawa.

A major shift in tropical cyclone activity occurred during the second part of the year (see composite best tracks on page 16). Notice that only 2 tropical cyclones recurved. Whereas, Japan and Korea received the brunt of the tropical cyclone activity the first half of the year, it was the Philippines and Vietnam which suffered most during the second. Three typhoons and one supertyphoon transited Luzon. In addition, one typhoon crossed the southern Philippine Islands. Three typhoons affected northern Vietnam and a total of 4 typhoons and 4 tropical storms struck the Asian mainland from southern Vietnam to the vicinity of Hong Kong. The major generation areas were: one west of Palawan Island in the South China Sea, and the other south and southeast of Guam. This contrasts with the first part of the year, when generation locations were more evenly distributed over WESTPAC.

In the western North Pacific, tropical cyclones reaching tropical storm intensity, or greater, are assigned names in alphabetical order from a list of alternating male/female names (refer to Appendix II). Table 3-1 provides a summary of key statistics for all western North Pacific tropical cyclones. Each tropical cyclone's maximum surface wind and minimum sea-level pressure (in millibars) were obtained from best estimates based on all available data. The distance traveled was calculated from the JTWC official best tracks (see Annex A).

Tables 3-2 through 3-5 provide further information on the monthly and yearly distribution of tropical cyclones, warnings and Tropical Cyclone Formation Alerts.

TABLE 3-1. WESTERN NORTH PACIFIC

1985 SIGNIFICANT TROPICAL CYCLONES

TROPICAL CYCLONE	PERIOD OF WARNING	CALENDAR DAYS OF WARNING	NUMBER OF WARNINGS ISSUED	MAXIMUM SURFACE WINDS-KT (M/S)	ESTIMATED MSLP- MB	BEST TRACK DISTANCE TRAVELED-NM (KM)
01W TS ELSIE	07 JAN - 09 JAN	3	9	40 (21)	995	976 (1808)
02W TS FABIAN	09 JAN - 13 JAN	5	16	55 (28)	989	507 (939)
03W TY GAY	21 MAY - 26 MAY	6	22	100 (51)	951	1464 (2711)
04W TD 04W	18 JUN - 20 JUN	3	10	30 (15)	992	441 (817)
05W TY HAL	19 JUN - 25 JUN	6	22	100 (51)	942	1305 (2417)
06W TY IRMA	25 JUN - 01 JUL	7	27	90 (46)	957	2413 (4469)
07W TY JEFF	22 JUL - 02 AUG	12	43	75 (39)	967	2668 (4941)
08W TY KIT	03 AUG - 11 AUG	9	33	85 (44)	959	1953 (3617)
09W TS LEE	11 AUG - 14 AUG	4	15	60 (31)	985	1326 (2456)
10W TY MAMIE	16 AUG - 20 AUG	5	17	70 (36)	975	1335 (2472)
11W TY NELSON	17 AUG - 24 AUG	8	27	95 (49)	961	1651 (3058)
12W TY ODESSA	23 AUG - 01 SEP	10	39	90 (46)	957	2328 (4311)
13W TY PAT	27 AUG - 01 SEP	6	23	95 (49)	961	1337 (2476)
14W TS RUBY	28 AUG - 01 SEP	5	19	55 (28)	982	1310 (2426)
02C TY SKIP	30 AUG - 08 SEP	10	34	80 (41)	974	1822 (3374)
15W TY TESS	01 SEP - 06 SEP	7	22	75 (39)	967	1470 (2722)
16W TS VAL	15 SEP - 18 SEP	4	14	50 (26)	992	1630 (3019)
17W TS WINONA	19 SEP - 22 SEP	4	11	50 (26)	990	518 (959)
18W TY ANDY	28 SEP - 02 OCT	5	16	70 (36)	970	705 (1306)
19W TY BRENDA	29 SEP - 05 OCT	7	25	90 (46)	964	1551 (2872)
20W TY CECIL	12 OCT - 16 OCT	5	16	100 (51)	944	1034 (1915)
21W STY DOT	13 OCT - 22 OCT	10	34	150 (77)	897	3074 (5693)
22W TS ELLIS	16 OCT - 20 OCT	5	19	50 (26)	995	1046 (1937)
23W TY FAYE	23 OCT - 01 NOV	10	39	100 (51)	960	1849 (3424)
24W TS GORDON	20 NOV - 26 NOV	7	23	45 (23)	997	797 (1476)
25W TY HOPE	17 DEC - 24 DEC	8	26	100 (51)	948	1444 (2674)
26W TS IRVING	18 DEC - 21 DEC	4	14	60 (31)	994	806 (1493)
	1985 TOTALS:	127*	715			

* OVERLAPPING DAYS INCLUDED ONLY ONCE IN SUM.

TABLE 3-2. 1985 SIGNIFICANT TROPICAL CYCLONES

WESTERN NORTH PACIFIC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL	(1959-1985) AVERAGE	CASES
TROPICAL DEPRESSIONS	0	0	0	0	0	1	0	0	0	0	0	0	1	3.7	99
TROPICAL STORMS	2	0	0	0	0	0	0	2	2	1	1	1	9	9.9	268
TYPHOONS	0	0	0	0	1	2	1	5	3	4	0	1	17	17.3	468
ALL TROPICAL CYCLONES	2	0	0	0	1	3	1	7	5	5	1	2	27	30.9	835
1959 - 198[illegible] AVERAGE	.6	.3	.7	.8	1.3	2.0	4.7	6.3	5.7	4.6	2.6	1.4	30.9		
CASES	15	8	18	22	34	54	128	170	153	124	71	38	835		

FORMATION ALERTS: 26 of 39 Formation Alerts developed into significant tropical cyclones. Tropical Cyclone Formation Alerts were issued for all except one of the significant tropical cyclones that developed in 1985.

WARNINGS:

Number of calendar warning days:	127
Number of calendar warning days with two tropical cyclones in region:	32
Number of calendar warning days with three or more tropical cyclones in region:	6

TABLE 3-3.

FREQUENCY OF TYPHOONS BY MONTH AND YEAR

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
(1945-1958) AVERAGE	.4	.1	.3	.4	.7	1.1	2.0	2.9	3.2	2.4	2.0	.9	16.3
1959	0	0	0	1	0	0	1	5	3	3	2	2	17
1960	0	0	0	1	0	2	2	8	0	4	1	1	19
1961	0	0	1	0	2	1	3	3	5	3	1	1	20
1962	0	0	0	1	2	0	5	7	2	4	3	0	24
1963	0	0	0	1	1	2	3	3	3	4	0	2	19
1964	0	0	0	0	2	2	6	3	5	3	4	1	26
1965	1	0	0	1	2	2	4	3	5	2	1	0	21
1966	0	0	0	1	2	1	3	6	4	2	0	1	20
1967	0	0	1	1	0	1	3	4	4	3	3	0	20
1968	0	0	0	1	1	1	1	4	3	5	4	0	20
1969	1	0	0	1	0	0	2	3	2	3	1	0	13
1970	0	1	0	0	0	1	0	4	2	3	1	0	12
1971	0	0	0	3	1	2	6	3	5	3	1	0	24
1972	1	0	0	0	1	1	4	4	3	4	2	2	22
1973	0	0	0	0	0	0	4	2	2	4	0	0	12
1974	0	0	0	0	1	2	1	2	3	4	2	0	15
1975	1	0	0	0	0	0	1	3	4	3	2	0	14
1976	1	0	0	1	2	2	2	1	4	1	1	0	15
1977	0	0	0	0	0	0	3	0	2	3	2	1	11
1978	0	0	0	1	0	0	3	2	4	3	2	0	15
1979	1	0	1	1	0	0	2	2	3	2	1	1	14
1980	0	0	0	0	2	0	3	2	5	2	1	0	15
1981	0	0	1	0	0	2	2	2	4	1	2	2	16
1982	0	0	2	0	1	1	2	5	3	3	1	1	19
1983	0	0	0	0	0	0	3	2	1	4	2	0	12
1984	0	0	0	0	0	0	4	2	1	5	3	1	16
1985	0	0	0	0	1	2	1	5	3	4	0	1	17
(1959 - 1985) AVERAGE	.2	.04	.2	.6	.8	.9	2.7	3.3	3.1	3.1	1.6	.6	17.3
CASES	6	1	6	15	21	25	74	90	85	85	43	17	468

TABLE 3-4.

FREQUENCY OF TROPICAL STORMS AND TYPHOONS BY MONTH AND YEAR

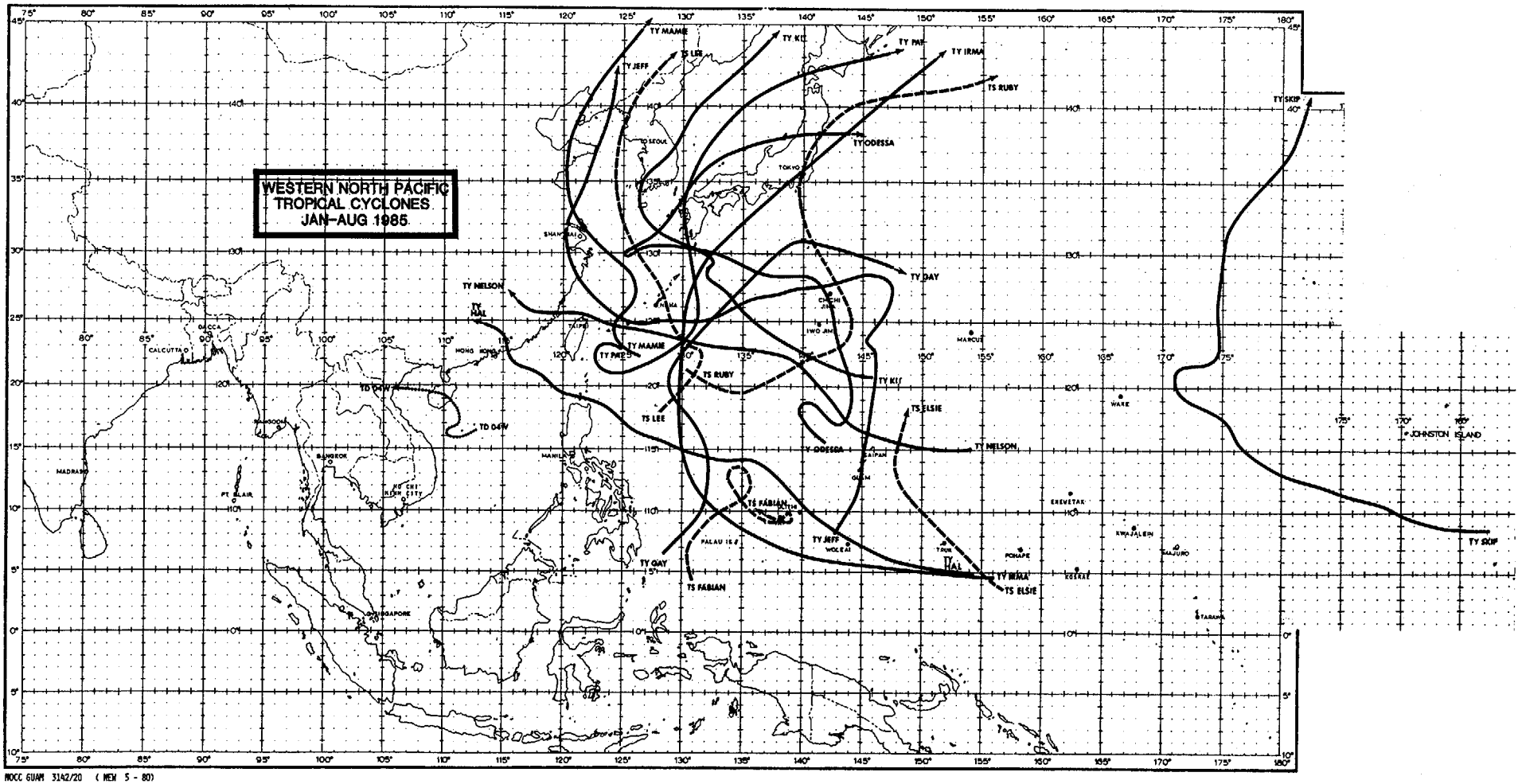
YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
(1945-1958) AVERAGE	.4	.1	.4	.5	.8	1.3	3.0	3.9	4.1	3.3	2.7	1.1	21.6
1959	0	1	1	1	0	0	3	6	6	4	2	2	26
1960	0	0	0	1	1	3	3	10	3	4	1	1	27
1961	1	1	1	1	3	2	5	4	6	5	1	1	31
1962	0	1	0	1	2	0	6	7	3	5	3	2	30
1963	0	0	0	1	1	3	4	3	5	5	0	3	25
1964	0	0	0	0	2	2	7	9	7	6	6	1	40
1965	2	2	1	1	2	3	5	6	7	2	2	1	34
1966	0	0	0	1	2	1	5	8	7	3	2	1	30
1967	1	0	2	1	1	1	6	8	7	4	3	1	35
1968	0	0	0	1	1	1	3	8	3	6	4	0	27
1969	1	0	1	1	0	0	3	4	3	3	2	1	19
1970	0	1	0	0	0	2	2	6	4	5	4	0	24
1971	1	0	1	3	4	2	8	4	6	4	2	0	35
1972	1	0	0	0	1	3	6	5	4	5	2	3	30
1973	0	0	0	0	0	0	7	5	2	4	3	0	21
1974	1	0	1	1	1	4	4	5	5	4	4	2	32
1975	1	0	0	0	0	0	2	4	5	5	3	0	20
1976	1	1	0	2	2	2	4	4	5	1	1	2	25
1977	0	0	1	0	0	1	4	1	5	4	2	1	19
1978	1	0	0	1	0	3	4	7	5	4	3	0	28
1979	1	0	1	1	1	0	4	2	7	3	2	2	24
1980	0	0	0	1	4	1	4	2	6	4	1	1	24
1981	0	0	1	2	0	2	5	7	4	2	3	2	28
1982	0	0	3	0	1	3	4	5	5	3	1	1	26
1983	0	0	0	0	0	1	3	5	2	5	5	2	23
1984	0	0	0	0	0	2	5	5	4	7	3	1	27
1985	2	0	0	0	1	2	1	7	5	5	1	2	26
(1959-1985) AVERAGE	.5	.3	.5	.8	1.1	1.6	4.3	5.4	4.9	4.1	2.4	1.2	27.3
CASES	14	7	14	21	30	44	117	147	131	112	66	33	736

TABLE 3-5.

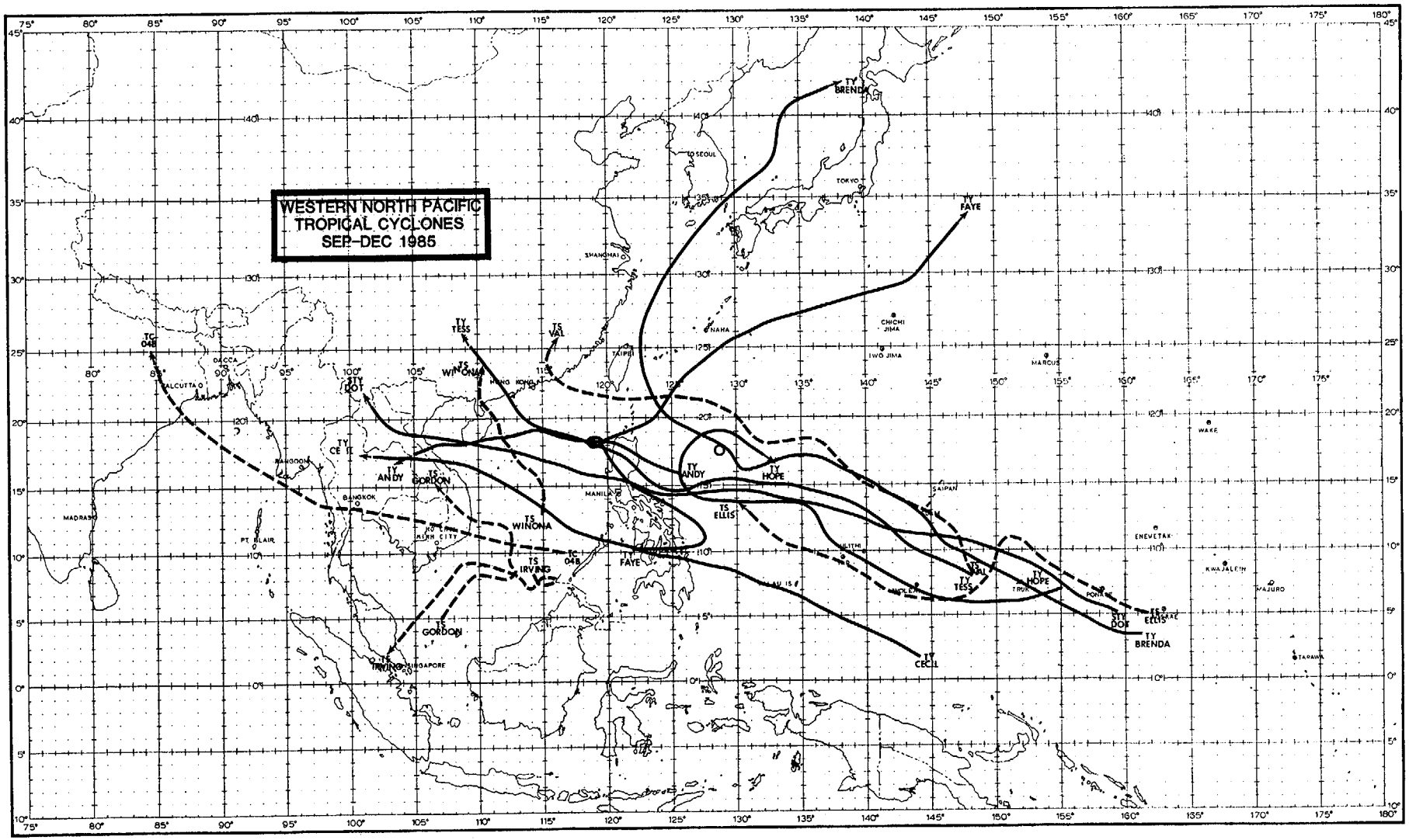
FORMATION ALERT SUMMARY

WESTERN NORTH PACIFIC

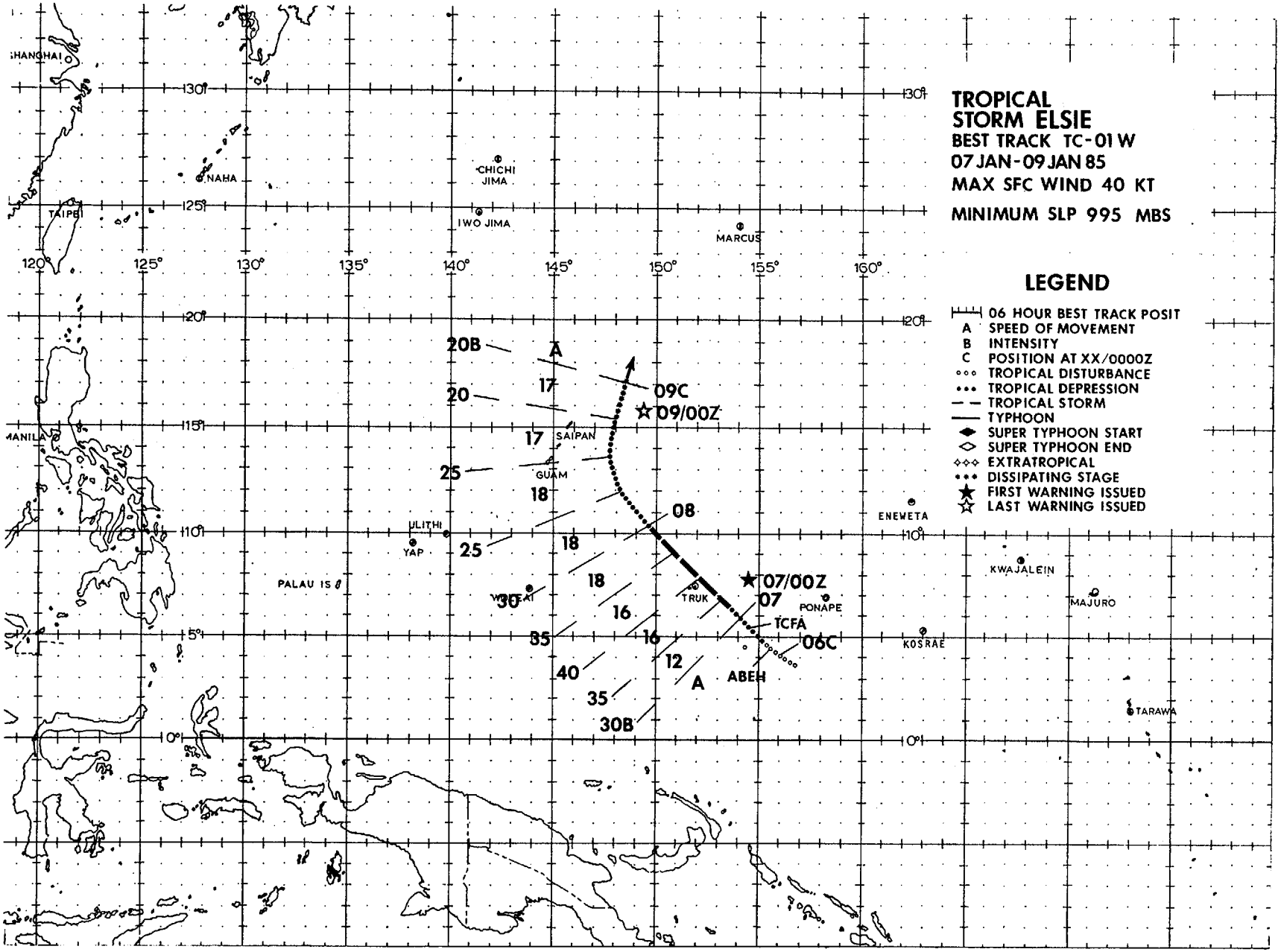
YEAR	NUMBER OF ALERT SYSTEMS	ALERT SYSTEMS WHICH BECAME NUMBERED TROPICAL CYCLONES	TOTAL NUMBERED TROPICAL CYCLONES	DEVELOPMENT RATE
1975	34	25	25	74%
1976	34	25	25	74%
1977	26	20	21	77%
1978	32	27	32	84%
1979	27	23	28	85%
1980	37	28	28	76%
1981	29	28	29	97%
1982	36	26	28	72%
1983	31	25	25	81%
1984	37	30	30	81%
1985	39	26	27	67%
(1975-1985) AVERAGE	32.9	25.7	27.1	78%
CASES	362	283	298	



NOCC GUAM 3142/20 (MEM 5 - 80)



NOCC GUAM 3142/20 (NEW 5 - 80)


TROPICAL
STORM ELSIE
BEST TRACK TC-01W
07 JAN-09 JAN 85
MAX SFC WIND 40 KT
MINIMUM SLP 995 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
SHANGHAI
NAHA
TAIPEI
CHICHI JIMA
IWO JIMA
MARCUS
MANILA
SAIPAN
GUAM
ULITHI
YAP
PALAU IS
TRUK
PONAPE
ENEWETA
KWAJALEIN
MAJURO
KOSRAE
TARAWA
ABEH
TCFA
09C
09/00Z
08
07/00Z
07
06C
120°
125°
130°
135°
140°
145°
150°
155°
160°
30°
25°
20°
15°
10°
5°
0°

Tropical Storm Elsie, the first tropical cyclone of the 1985 season, was also the first tropical storm to develop during January in six years. Warnings were issued for only two days and it never intensified beyond 40 kt (21 m/s).

During the first week of January the near-equatorial trough was quite active, and extended from the southern Philippines southeast to the vicinity of the Equator and 160E. Embedded in this trough were two weak circulations, one southwest of Guam which would later develop into Tropical Storm Fabian and another southeast of Guam which would eventually develop into Elsie. Enhanced convective activity persisted throughout the region.

The cloud system that was to become Elsie first appeared on 4 January as an area of weak convection southwest of Pohnpei (Ponape WMO 91348). The convection persisted through the 4th, and on the 5th began to increase in strength and organization. At 0000Z on the 6th, analysis of satellite imagery gave the first indications that a low-level circulation center was developing. Sparse synoptic data up to this time had only indicated that a very broad 10 to 15 kt (5 to 8 m/s) cyclonic circulation was present. The persistence and improved organization of the convection resulted in the disturbance being mentioned in the 060600Z Significant Tropical Weather Advisory (ABEH PGTW). The disturbance was assessed as having a "fair" potential for further development (meaning that it was considered likely that a TCFA would be issued during the next 24 hours). Indeed, this was the case.

Analysis of satellite imagery during the next ten hours showed continued development, with Dvorak intensity analysis of the 061600Z imagery estimating surface winds of 25 kt (13 m/s). This was confirmed by a late 061200Z ship report near the Mortlock Islands (Satawan Atoll WMO 91338) which observed northwest winds of 30 kt (15 m/s). As a result, a TCFA was issued at 061700Z.

Just prior to 070000Z, the first aircraft reconnaissance mission was conducted into the disturbance. It located a 25 kt (13 m/s) circulation center at 062238Z approximately 60 nm (111 km) northeast of the Mortlock Islands near 5.8N 154.4E. As the WC-130 exited to the southwest a short time later, a small area of 30 kt (15 m/s) surface winds was observed. This prompted the first warning on Elsie, as a 30 kt (15 m/s) tropical depression, valid at 070000Z.

Elsie was upgraded to a 35 kt (18 m/s) tropical storm at 070600Z based on synoptic data received from the Mortlock Islands. The tropical cyclone briefly attained an intensity of 40 kt at 071200Z.

From the time Elsie was detected until the time JTWC went to warning status, the disturbance had moved to the northwest at about 7 kts (13 km/hr). After 070000Z, however, Elsie accelerated to the northwest as it moved around the western periphery of the subtropical ridge, passing east of Truk (WMO 91334) at about 071000Z. As Elsie moved further north (Figure 3-01-1) it encountered strong southerly winds aloft from an upper-level anticyclone south of Wake Island (WMO 91245). These winds sheared off the central convection. As a result, Elsie quickly lost all organization and rapidly weakened. Its low-level circulation could not be located on satellite imagery or by aircraft reconnaissance after 082100Z. The final warning was issued at 090000Z.

As Elsie passed east of Guam it did enhance the tradewinds, with gusts to 31 kt (16 m/s) observed at the U. S. Naval Oceanography Command Center/Joint Typhoon Warning Center building on Nimitz Hill. After Elsie dissipated, a secondary circulation formed in its wake near Guam and persisted for two days until it also moved to the northeast and dissipated.

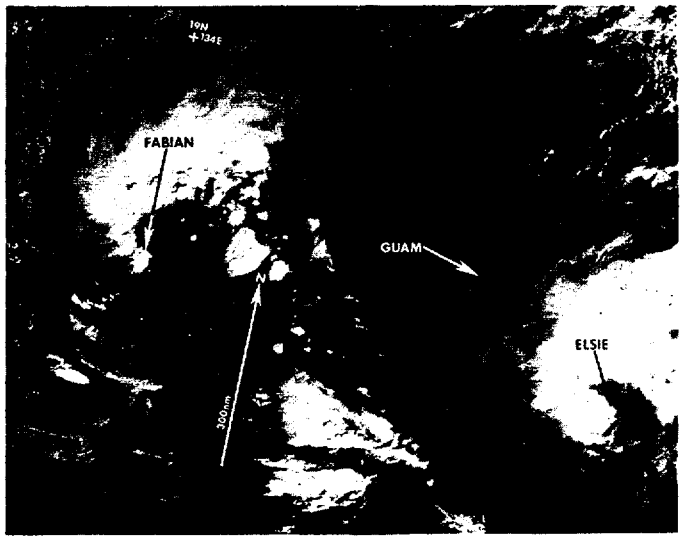
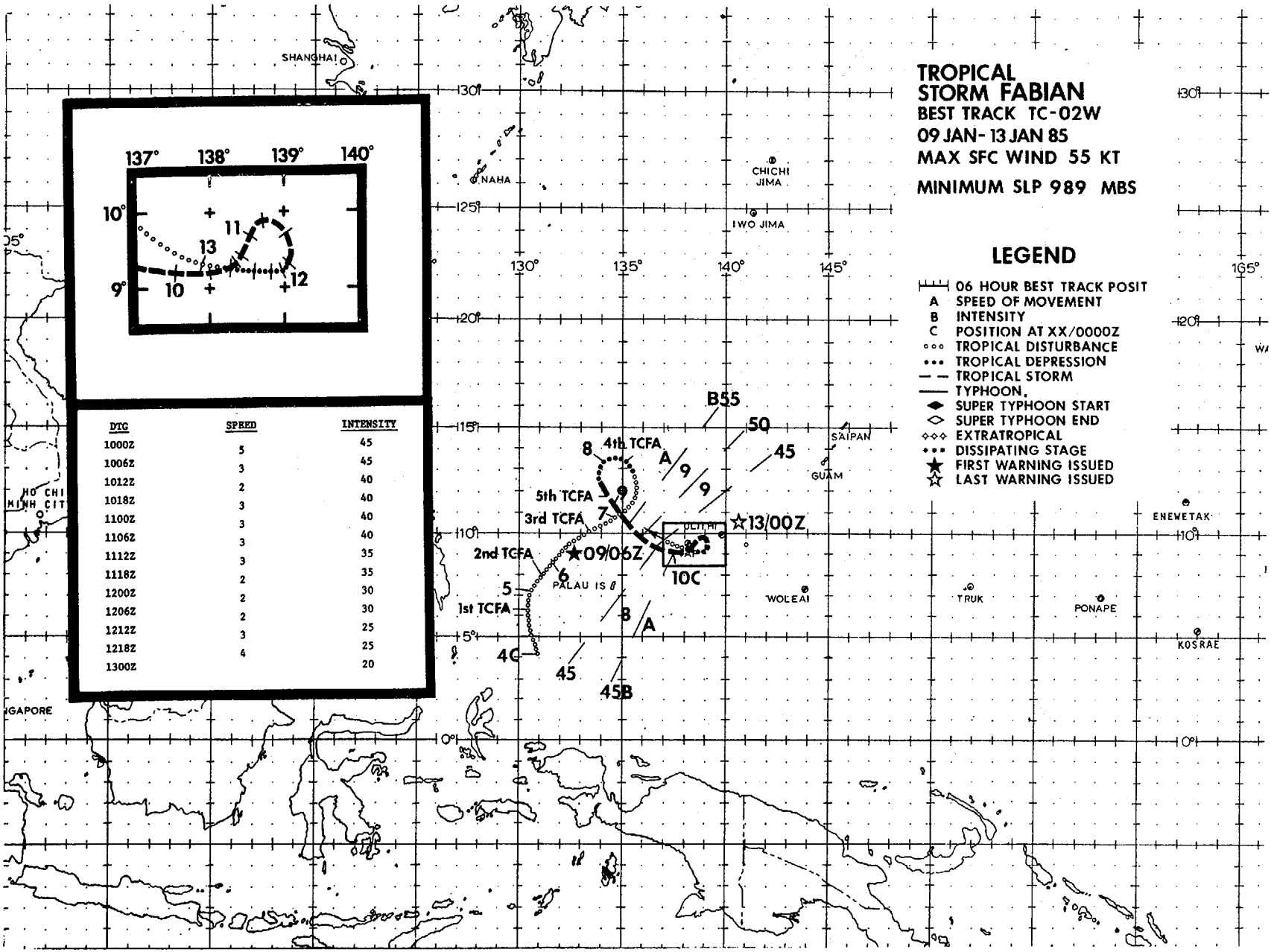


Figure 3-01-1. Tropical Storm Elsie weakening southeast of Guam. Later, strong upper-level winds north of Elsie sheared away the central convection. Rapid weakening and dissipation quickly followed. (The disturbance that would soon develop into Tropical Storm Fabian is located to the northwest of Elsie) (080047Z January DMSP visual imagery).


TROPICAL
STORM FABIAN
BEST TRACK TC-02W
09 JAN- 13 JAN 85
MAX SFC WIND 55 KT
MINIMUM SLP 989 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
DTG SPEED INTENSITY
1000Z 5 45
1006Z 3 45
1012Z 2 40
1018Z 3 40
1100Z 3 40
1106Z 3 40
1112Z 3 35
1118Z 2 35
1200Z 2 30
1206Z 2 30
1212Z 3 25
1218Z 4 25
1300Z 20
137° 138° 139° 140°
10° 9°
11 12 13
SHANGHAI
NAHA
CHICHI JIMA
IWO JIMA
SAIPAN
GUAM
ENEWETAK
WOLEAI
TRUK
PONAPE
KOSRAE
PALAU IS
HO CHI MINH CIT
GAPORE
4th TCFA
5th TCFA
3rd TCFA
2nd TCFA
1st TCFA
☆13/00Z
★09/06Z
10C
B55
50
45
4C
45
45B

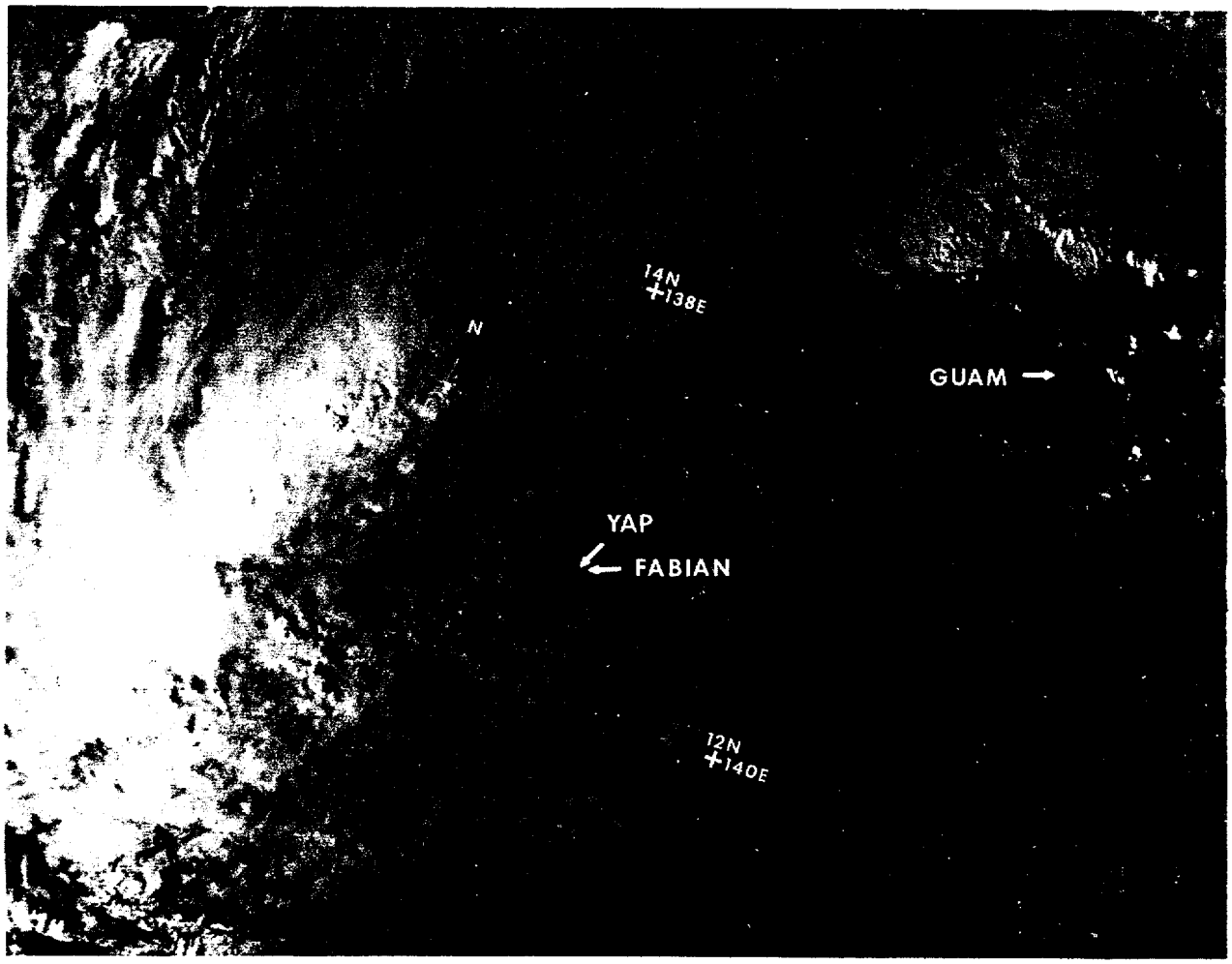
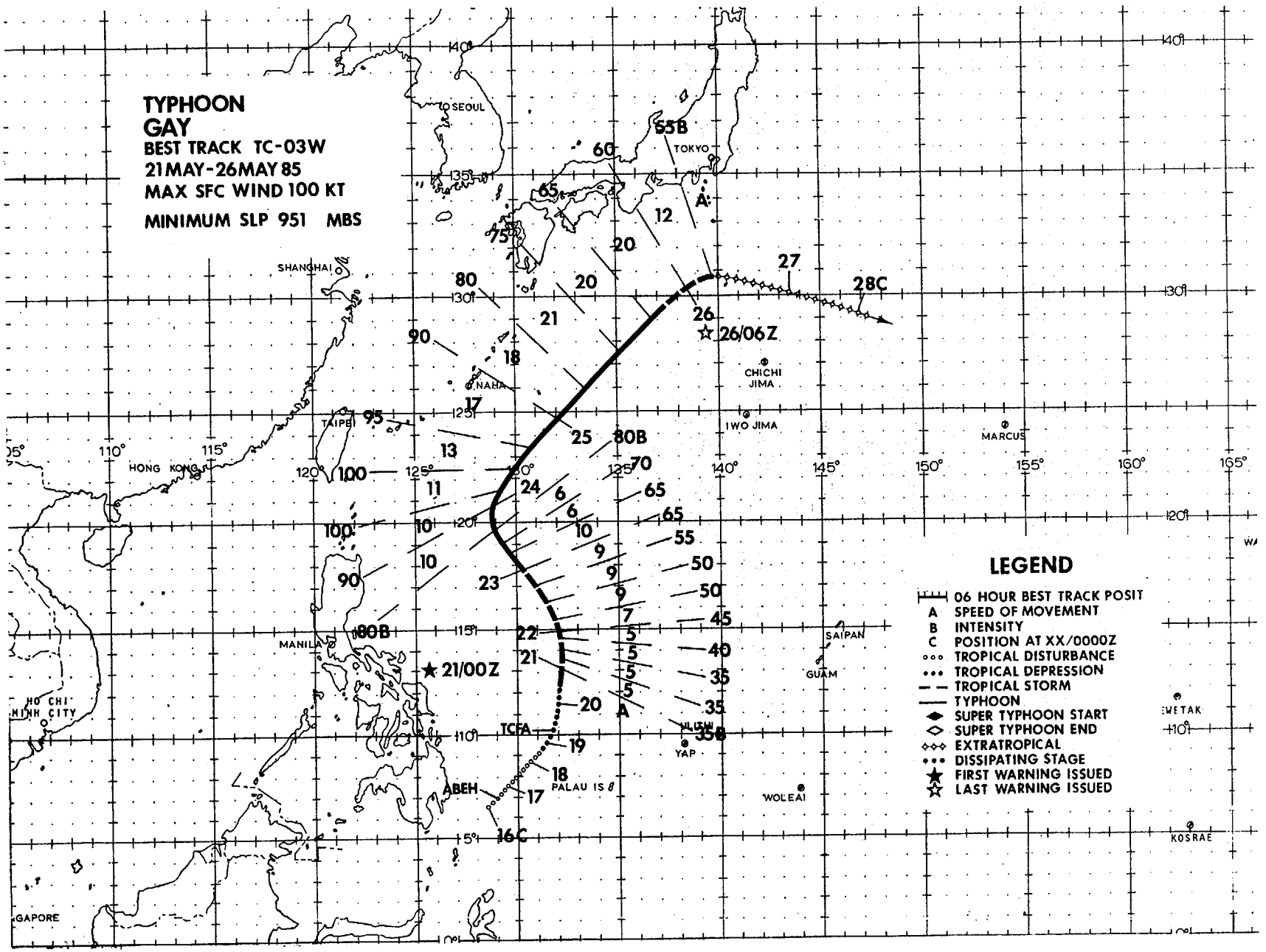


Figure 3-02-1. The development of Tropical Storm Fabian marked the first time in twenty years that two tropical storms formed in WESTPAC during January. Fabian developed at the western end of the near-equatorial trough, and as a result had major interactions with the northeast monsoon. Not surprisingly, the strongest winds were consistently observed in the tropical cyclone's western semi-circle, where the gradient between the low central pressure of Fabian and the higher pressures of the Siberian anticyclone was the greatest. The (above) satellite imagery shows Fabian, as a weakening Tropical Storm, with a well-defined low-level circulation. Fabian's low-level circulation was exposed for much of its lifetime due to strong upper-level winds from the south which sheared the convection to the north. The Tropical Storm passed very close to Yap (WMO 91413) and caused considerable crop damage on some of the outer islands (100630Z January NOAA visual imagery).


TYPHOON
GAY
BEST TRACK TC-03W
21MAY-26MAY 85
MAX SFC WIND 100 KT
MINIMUM SLP 951 MBS
TO SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
HONG KONG
MANILA
HO CHI MINH CITY
GAPORE
CHICHI JIMA
IWO JIMA
MARCUS
SAIPAN
GUAM
YAP
WOLEAI
PALAU IS
ABEH
TCFA
WETAK
KOSRAE
★ 21/00Z
☆ 26/06Z
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED

Typhoon Gay was the first tropical cyclone to reach typhoon intensity in 1985. It was also the season's first to enter the mid-latitude westerlies and recurve. The formation of Gay followed more than four months of inactivity in WESTPAC and marked the start of the 1985 summer tropical cyclone season.

The tropical disturbance that eventually intensified into Typhoon Gay was first detected by synoptic data on 16 May as a weak surface circulation 380 nm (704 km) west-southwest of Koror (WMO 91408). The convection in this area appeared to be random. Another area of disorganized convection was developing further east along 139E under an area of upper-level diffluence associated with a westward moving upper-level anticyclone. To the north, a tropical upper-tropospheric trough (TUTT) extended from the Volcano Islands southwest to just east of the Philippines. Figure 3-03-1 shows the movements and locations of the upper-level anticyclonic and low-level cyclonic circulations over a five day period as Gay went through its formative stages. Although the upper-level and low-level circulations became nearly vertically aligned on 19 May, the disturbance still struggled for two more days before reaching tropical storm intensity. The most probable cause for this slow intensification was the close proximity of the TUTT to the north, which restricted the upper-level outflow to the northwest (Figure 3-03-2).

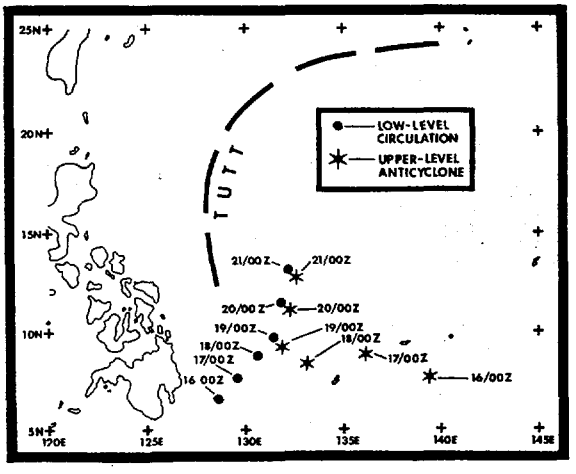


Figure 3-03-1. These plots show the positions and movements of the upper-level anticyclonic and low-level cyclonic circulations during Gay's formative period. The juxtaposition of these upper- and low-level circulations on 19 May usually indicates the tropical cyclone is reaching maturity. However, the presence of the TUTT to the north and northwest is thought to have impeded development through the 21st.

Between 0000Z and 0600Z on the 19th two different tactical DMSP sites, based upon Dvorak intensity analyses of satellite imagery, estimated that the disturbance had 30 kt (15 m/s) surface winds. These increased intensity estimates were founded on the more organized intense convection associated with the upper-level circulation center, which was then displaced approximately 50 nm (93 km) southeast of the surface center. These satellite reconnaissance inputs prompted a TCFA to be issued at 190800Z. At the time of the TCFA, sparse synoptic data near the disturbance center could not confirm the satellite derived intensities. However, synoptic data on the periphery of the disturbance implied that at least a 15 kt (8 m/s) circulation was present. Until this time, the only reported stronger wind was the gradient-level wind at Koror (WMO 91408) which increased from 9 kt (5 m/s) at 171200Z to 27 kt (14 m/s) at 180000Z as the disturbance passed west of the island late on the 17th. For the remainder of the 19th and into the 20th, with the TUTT continuing to exert influence on the disturbance, there was no significant improvement in the tropical cyclone's organization. As a result, the TCFA was reissued at 200700Z.

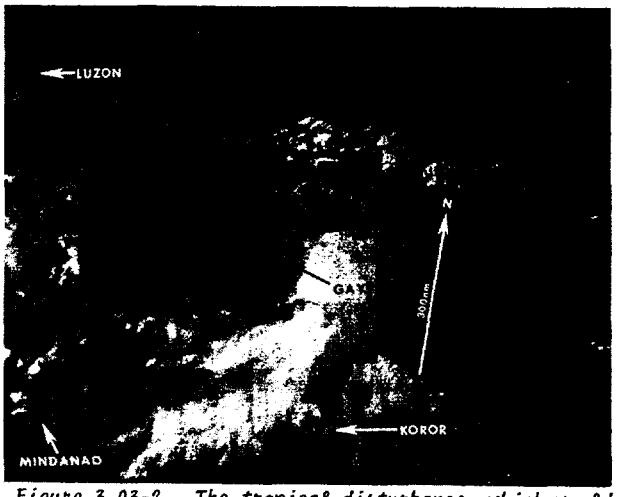


Figure 3-03-2. The tropical disturbance, which would later develop into Typhoon Gay, is interacting with the upper-level trough to the northwest. The outflow is restricted on the northwest side of the tropical cyclone (200518Z May NOAA visual imagery).

The first warning on Gay was issued at 210000Z after visual satellite imagery showed the convection was developing over the low-level circulation and Dvorak intensity analysis estimated that 35 kt (18 m/s) surface winds were present. The presence of the upper-level trough and its restrictive influence on outflow aloft strongly influenced the intensity forecasts on the first nine JTWC warnings. Gay was expected to strengthen only slowly, then maintain

intensity or weaken slightly in the extended outlook periods. These scenarios appeared valid based on satellite derived intensity analyses and forecasts, and on expectations that the upper-level trough would persist. Post-analysis revealed these intensities were consistently low. This was primarily due to the lack of any aircraft reconnaissance or synoptic data confirming the intensity, and partially due to the TUTT weakening faster than expected.

Gay attained typhoon intensity at about 230000Z just prior to the first aircraft reconnaissance penetration at 230830Z. The Aerial Reconnaissance Weather Officer (ARWO) reported Gay as very compact, with 65 kt (33 m/s) surface winds surrounding a 15 nm (28 km) diameter eye, and a 971 mb minimum sea-level pressure (MSLP). Gay's intensification to typhoon strength can be attributed to the significant weakening of the TUTT on the 22nd and to its tight circulation. In this case, the Typhoon's small size allowed it to mature in an area where a larger circulation would have interacted unfavorably with the surrounding atmosphere. Consequently, Gay became vertically stacked and developed a ragged eye while moving northwest with the mid-level steering flow around the western periphery of the subtropical ridge. This set the stage for Typhoon Gay's final phase.

By 230000Z, with a frontal boundary and associated mid-latitude trough quasi-stationary across the Ryukyu Islands, a recurvature scenario seemed most probable. JTWC incorporated this into the warnings and called for recurvature along the subtropical ridge axis near 22N in 48 hours. This scenario was ahead of all forecast aids (Figure 3-03-3), especially the OTCM (One-way Interactive Tropical Cyclone Model), JTWC's best forecast aid. With Gay continuing to intensify and move northwest, Kadena AB (WMO 47931) set Condition of Readiness III at 232230Z. Fortunately, Gay came under the influence of the mid-latitude westerlies and recurved earlier than forecast passing well south of Okinawa. Just prior to Gay's recurvature, another mid-latitude mid-level trough began to dig unseasonably southward across eastern China northwest of Gay. This apparently increased the upper-level outflow ahead of the trough and may be the reason why Gay continued to intensify for 6 to 12 hours after recurvature. Gay reached a peak intensity of 100 kt (51 m/s) between 240600Z and 241200Z (Figure 3-03-4). This intensification correlates well with the studies by Riehl (1972) and Guard (1983) on the intensification of recurving tropical cyclones in WESTPAC.

After recurvature, Gay started a gradual acceleration to the northeast with satellite imagery indicating interaction with the frontal boundary beginning at 241200Z. By 0600Z on the 25th, Gay was entraining modified polar air into the low-level circulation and the eyewall was disintegrating. Extratropical transition had begun and the intense central convection started displacing outward. A steady decrease in convective organization and intensity continued as the mid-latitude trough moved rapidly eastward from the Yellow Sea over Japan. Gay was downgraded to a Tropical Storm at 260000Z.

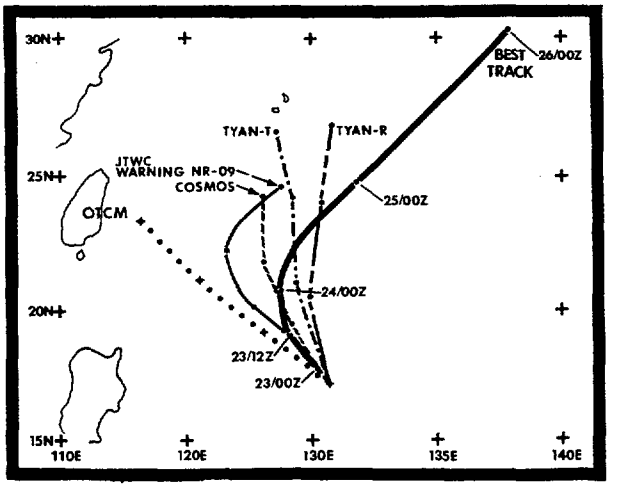


Figure 3-03-3. These plotted forecast aids were available to the Typhoon Duty Officer (TDO) at the time the first recurvature forecast was issued. OTCM, JTWC's best aid, failed to predict the recurvature. OTCM guidance repeatedly failed to forecast recurvature, in this case, until after it had actually occurred!

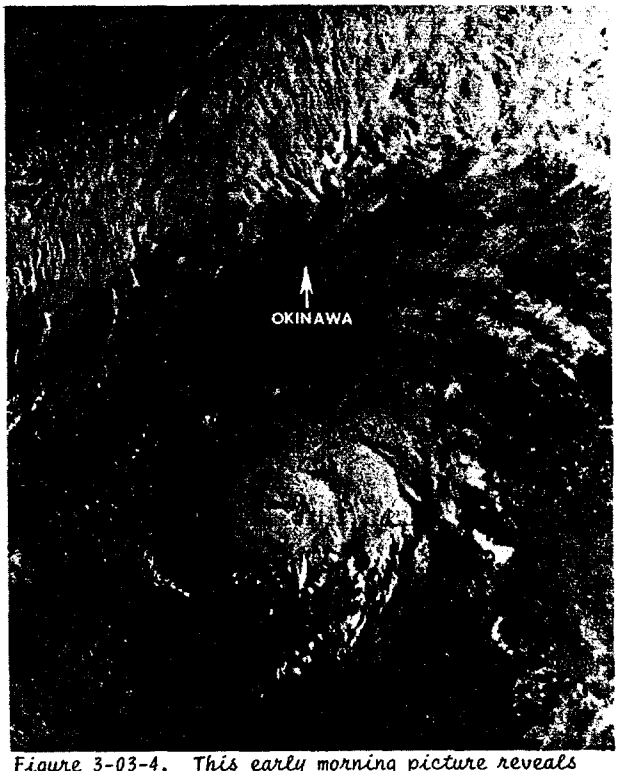


Figure 3-03-4. This early morning picture reveals Typhoon Gay near maximum intensity. (Note Gay's developing eye). The proximity of the frontal boundary to the north led to a recurvature forecast, overruling the the incorrect guidance from the forecast aids (232127Z May DMSP visual imagery).

Figure 3-03-5 shows the effect of the strong vertical wind shear on the remaining convection from the storm's circulation. Gay completed extratropical transition at 260600Z when the final warning was issued.

After completing extratropical transition, the nearly convection free low-level circulation drifted eastward and eventually dissipated. There were no reports of lives lost or damage to shipping from Typhoon Gay.

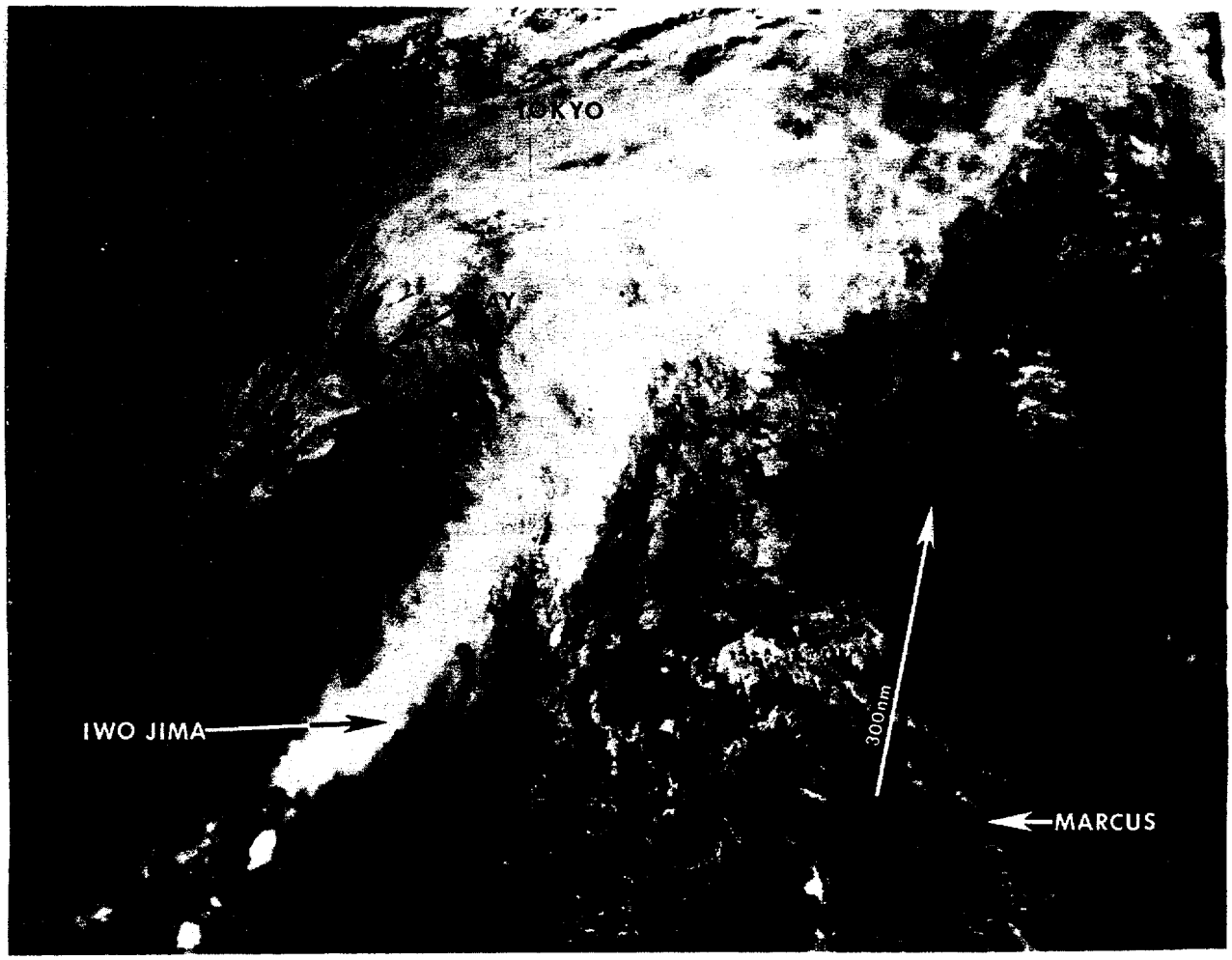
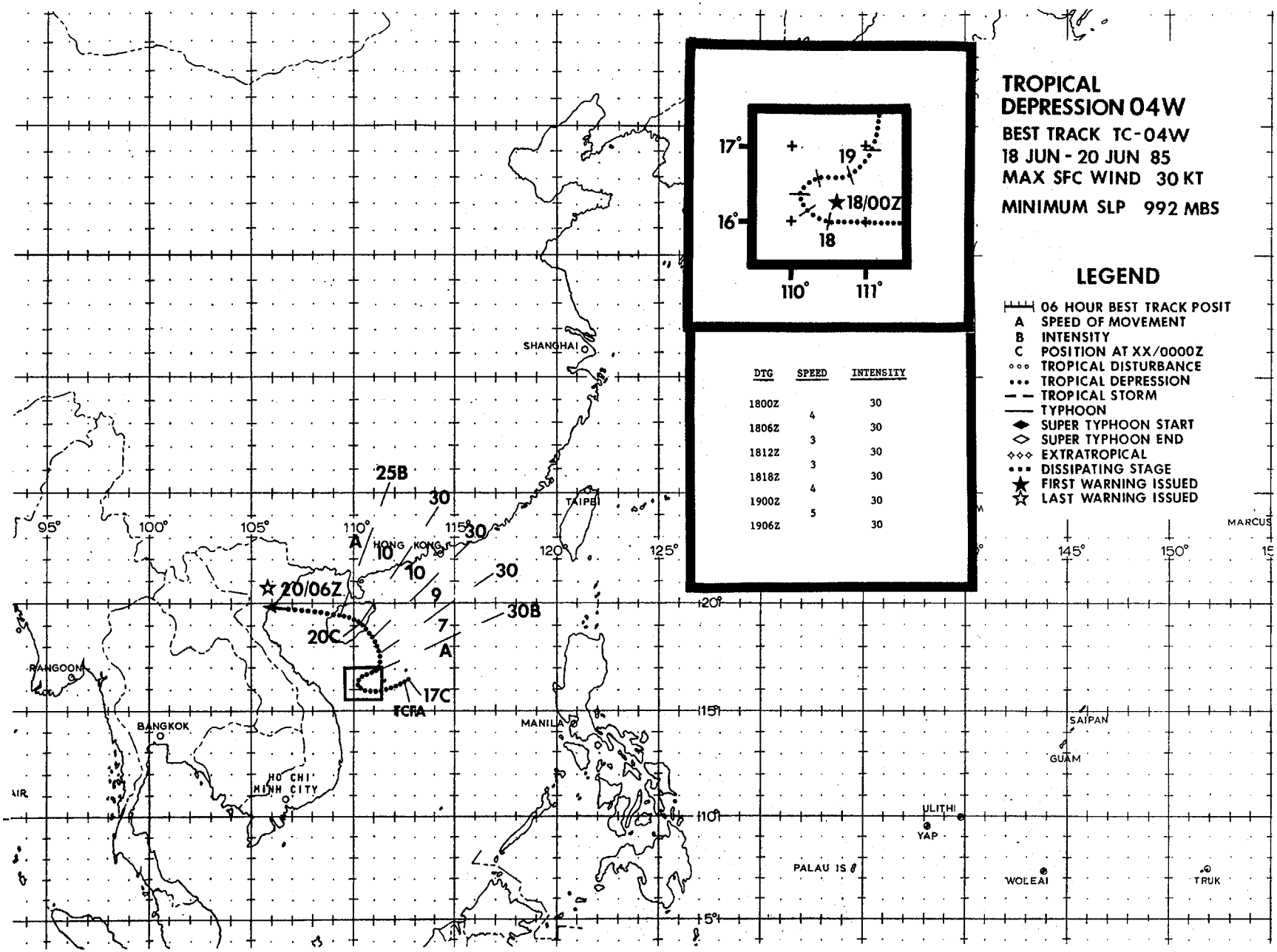


Figure 3-03-5. As Gay completes extratropical transition, the upper-level westerlies are shearing the convection away to the northeast of the low-level circulation center (260413Z May NOAA visual imagery).


TROPICAL
DEPRESSION 04W
BEST TRACK TC-04W
18 JUN - 20 JUN 85
MAX SFC WIND 30 KT
MINIMUM SLP 992 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
DTG SPEED INTENSITY
1800Z 30
1806Z 4 30
1812Z 3 30
1818Z 3 30
1900Z 4 30
1906Z 5 30
17°
16°
110°
111°
19
18/00Z
18
SHANGHAI
TAIPEI
HONG KONG
20/06Z
25B
30
10
9
7
A
20C
30B
17C
FCFA
RANGOON
BANGKOK
HO CHI MINH CITY
MANILA
SAIPAN
GUAM
ULITHI
YAP
PALAU IS
WOLEAI
TRUK
MARCUS
95°
100°
105°
110°
115°
120°
125°
145°
150°
20°
15°
10°
5°

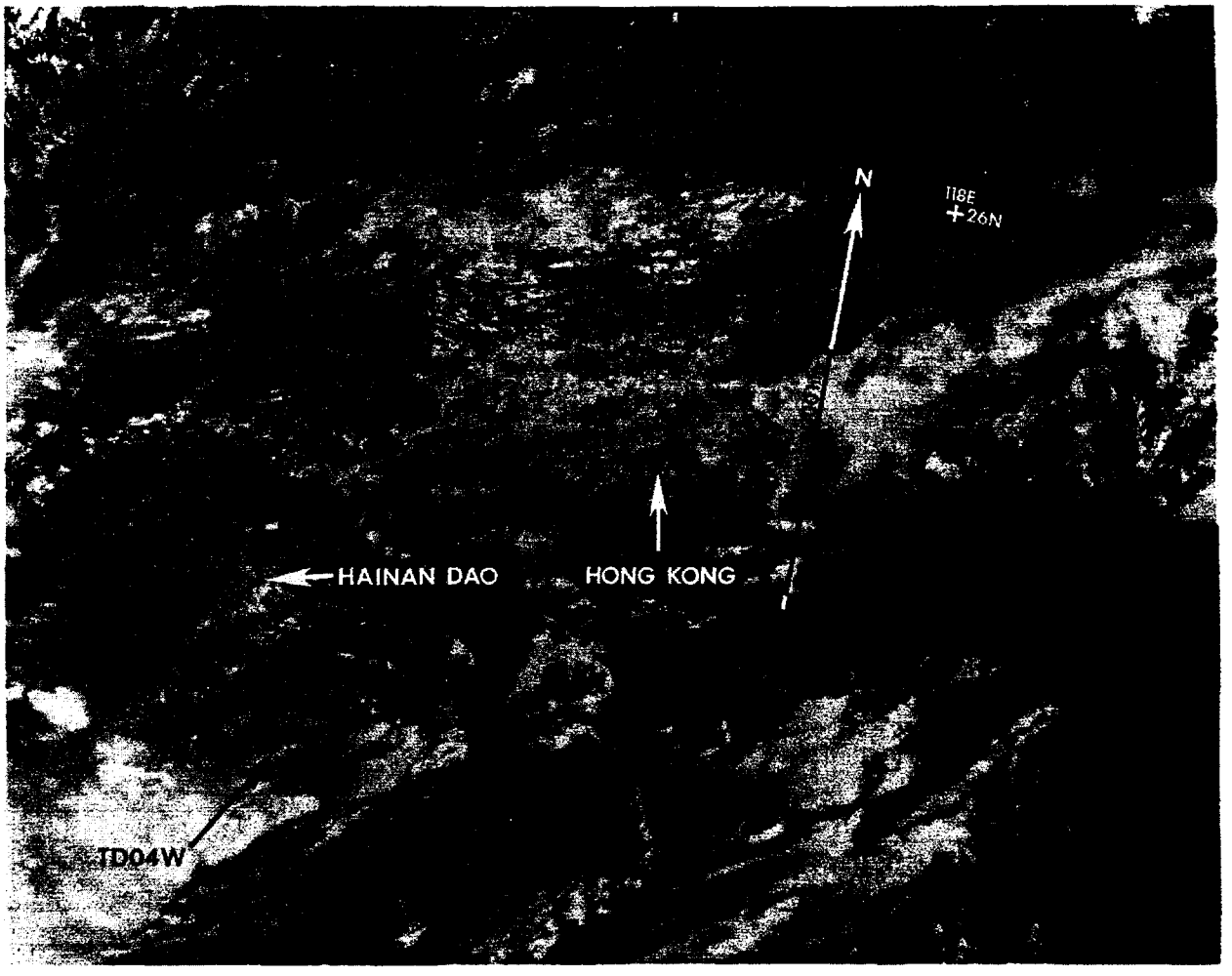
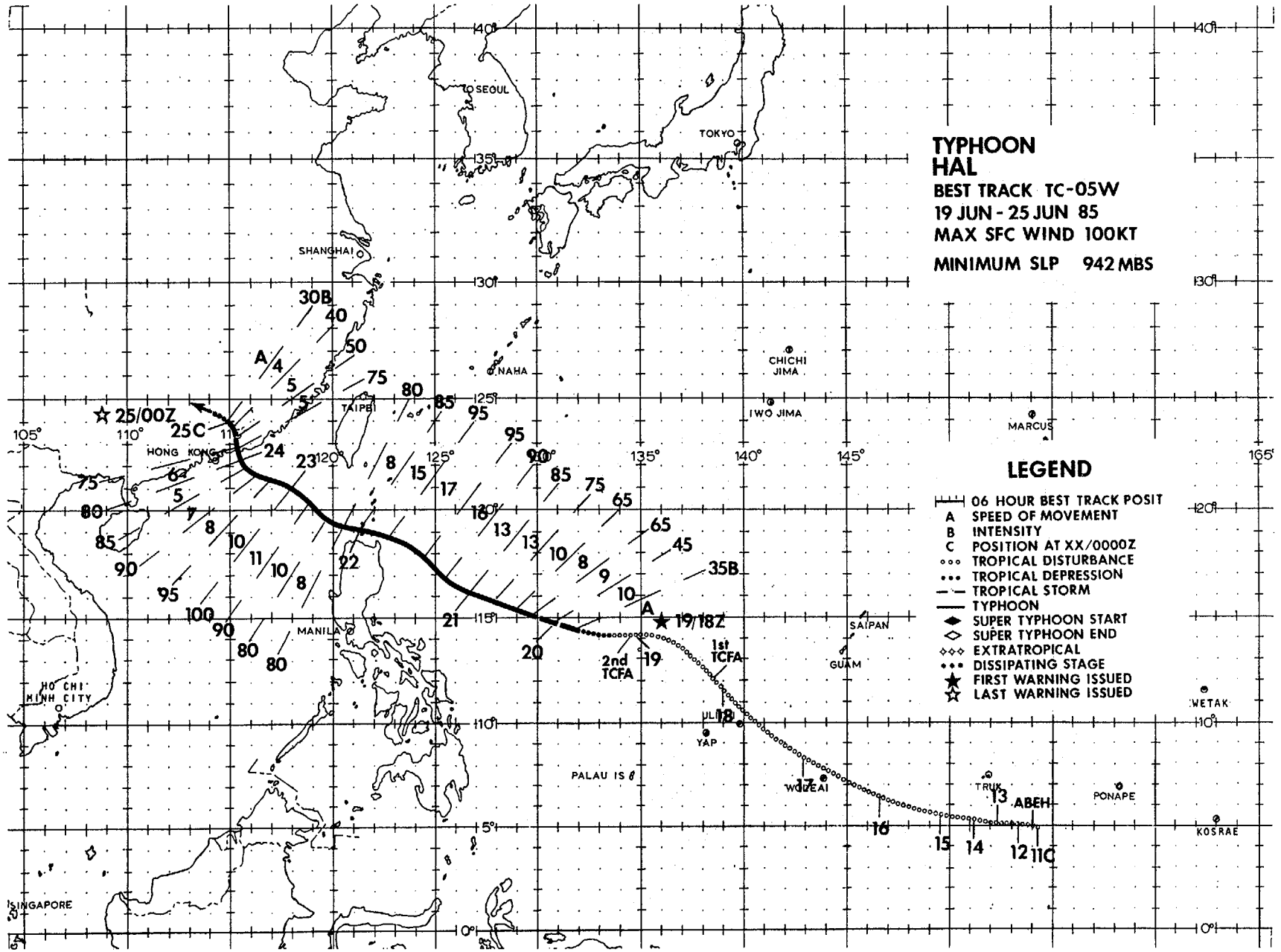


Figure 3-04-1. Tropical Depression 04W developed in the northern end of the monsoon trough in late June and remained embedded in the trough throughout its lifetime. Due to strong vertical wind shear aloft from the northeast, the low-level circulation center was often observed near the northeast edge of the convection (see the above imagery). This strong shearing environment prevented Tropical Depression 04W from intensifying above 30 kt (15 m/s) (1901532 June DMSP visual imagery).


TYPHOON
HAL
BEST TRACK TC-05W
19 JUN - 25 JUN 85
MAX SFC WIND 100KT
MINIMUM SLP 942 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
☆ 25/00Z
25C
30B
35B
A
★ 19/18Z
1st TCFA
2nd TCFA
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
HONG KONG
MANILA
HO CHI MINH CITY
SINGAPORE
PALAU IS
YAP
ULITHI
WOLEAI
TRUK
ABEH
PONAPE
KOSRAE
WETAK
GUAM
SAIPAN
IWO JIMA
CHICHI JIMA
MARCUS

Typhoon Hal, the fifth tropical cyclone of the 1985 WESTPAC season, developed from a southwest monsoon trough disturbance. Hal caused considerable forecast difficulties because JTWC's primary forecast aid, OTCM, was unable to resolve a narrow mid-level subtropical ridge due to its relatively coarse grid spacing.

After Typhoon Gay completed extratropical transition on 26 May, a springtime weather pattern returned to the tropical western North Pacific. A strong tropical upper-tropospheric trough (TUTT) became established over most of the area, resulting in strong surface ridging from the Dateline westward to the Malay Peninsula and a large-scale suppression of convective activity. Transient mid-latitude short wave troughs passed north of a quasi-stationary Polar front that extended from near Hainan Island to about 300 nm (556 km) north of Minami-Torishima (WMO 47991). By 1 June, a weak low-level southwest monsoon flow had returned to the South China Sea. There was a significant surge in the southwest monsoon commencing on 8 June, and by 12 June the low-level southwest monsoon flow extended as far eastward as Guam (WMO 91212).

Typhoon Hal was first detected as a weak tropical disturbance in the near-equatorial trough at 05N 154E on 11 June. The disturbance showed poor organization as it moved slowly westward during the next three days. Most of the intense convection was located west of the low-level circulation center and showed signs of cross-equatorial outflow after 14 June. On the 15th, the disturbance began moving west-northwest and showed signs of increasing organization. By 18 June, the disturbance had merged with the strong low-level southwest monsoon flow and had taken on the characteristics of a monsoon trough disturbance. As shown in Figure 3-05-1, the disturbance was sheared from the north by upper-level flow which left a broad, weak low-level circulation in

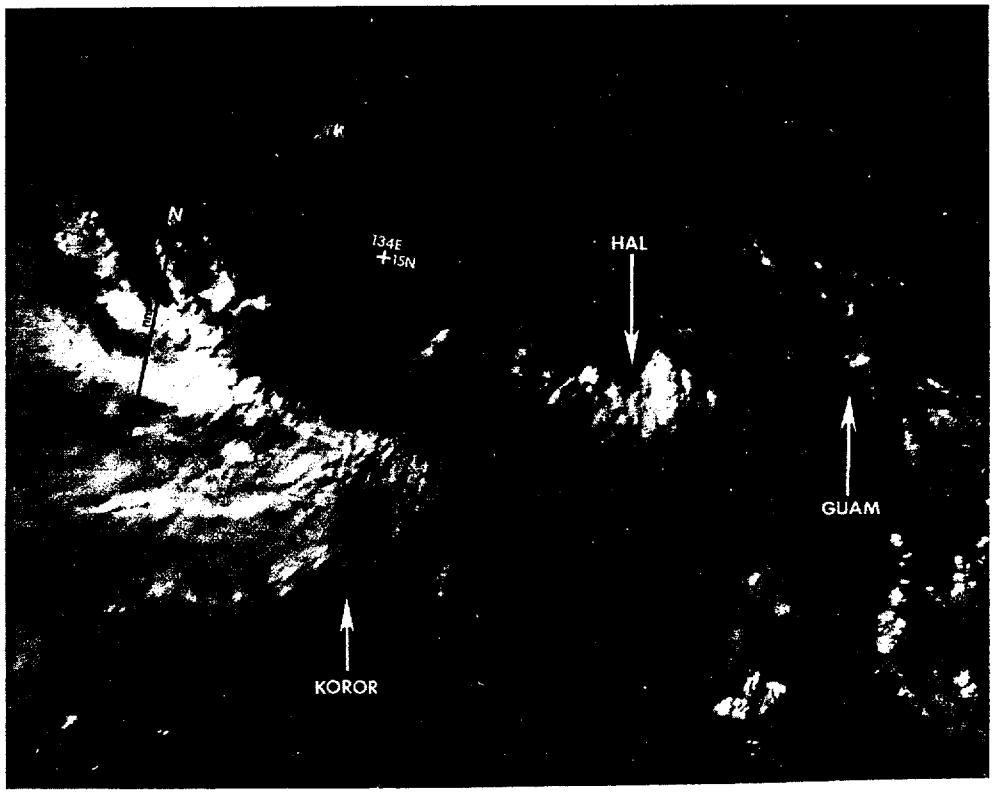


Figure 3-05-1. The tropical disturbance that developed into Typhoon Hal with strong upper-level shear from the north confining the intense convection to the south semicircle. Only scattered cumulus are evident in the north semicircle. The low-level circulation is in the form of a broad trough at this time (1805112 June NOAA visual imagery).

the north semicircle with scattered cumulus clouds. The intense convection was located in the south semicircle where the upper-level flow was divergent toward the southwest. By 1800Z on the 19th, satellite imagery indicated that the upper-level shear from the north had decreased and that a tropical cyclone scale low-level circulation had formed. The system had been the subject of a TCFA for 40-hours when the first warning was issued at 191800Z. Once convection started to appear in the north semicircle and the system showed signs of cirrus outflow toward the north, intensification proceeded quickly. By 200600Z, only 12-hours after the first warning, the cyclone had reached typhoon intensity. Figure 3-05-2 shows a plot of the aircraft reconnaissance mission flown at that time. Notice the location of the maximum surface winds. In this case, the maximum surface winds are located approximately 90 nm (167 km) from the center of the cyclone. This large separation is a characteristic of many cyclones that evolve from strong monsoon troughs. Typhoon Hal continued intensifying during the next 24-hours and developed a large, ragged eye as shown in Figure 3-05-3. This feature is also a characteristic of this type of cyclone. The satellite picture also shows a TUTT cell located east of

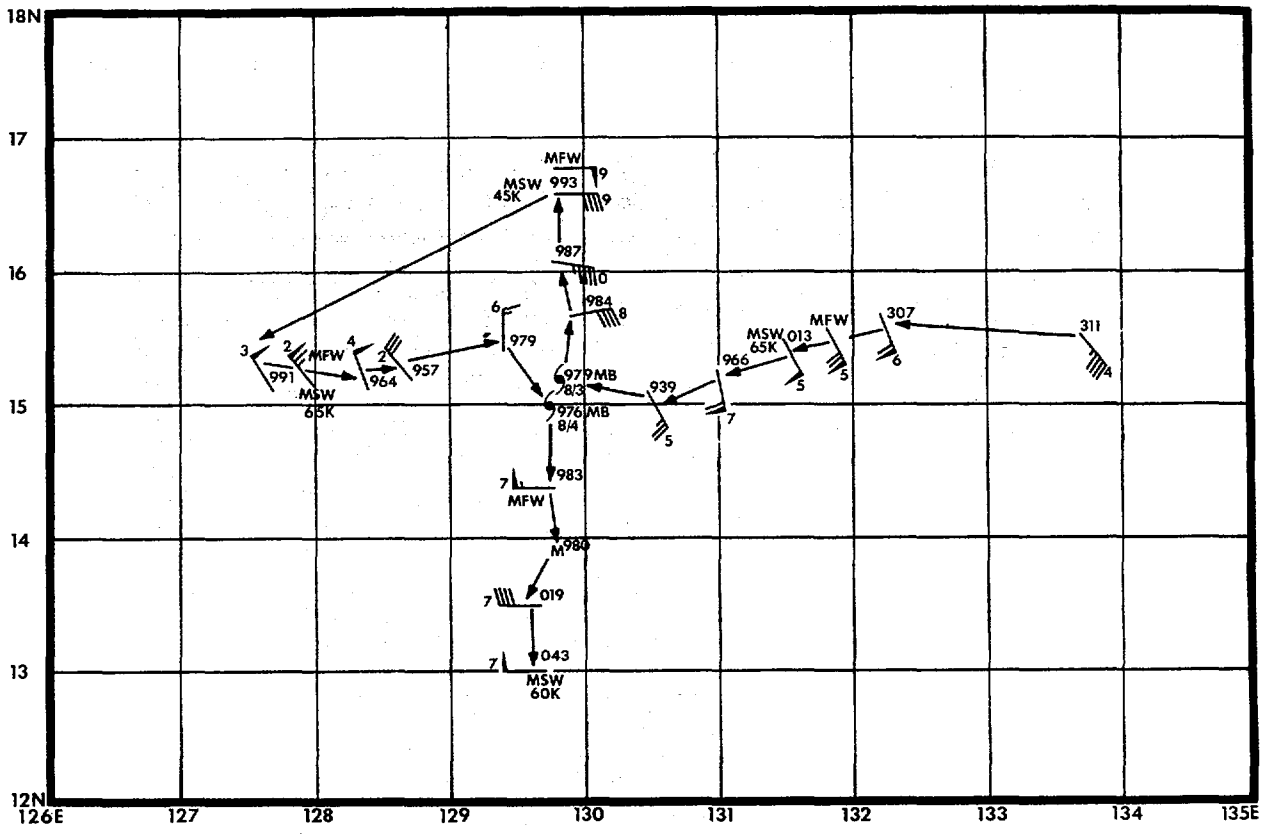


Figure 3-05-2. Plot of aircraft reconnaissance data from 200500Z to 201000Z June showing the maximum surface winds located approximately 90 nm (167 km) from the cyclone center. "MFW" represents the maximum observed flight level winds and "MSW" represents the maximum surface winds observed.

Figure 3-05-3. Typhoon Hal with a large, ragged eye. Most of the intense convection is in the south semicircle. (210109Z June DMSP visual imagery).

Hal that enhanced the upper-level outflow pattern in that direction. Figure 3-05-4 shows Typhoon Hal near the time of its maximum intensity.

Except for a few short-term variations, Hal moved in a west-northwestward direction during its five-day lifetime as a tropical storm and typhoon. This is interpreted in post-analysis as a normal south-of-the-subtropical ridge track movement. Figure 3-05-5 shows the 500 mb wind pattern at 201200Z, 18-hours after the first warning was issued, but still representative of the environment present throughout Hal's lifetime. Note the narrow sub-tropical ridge north of Hal that extends westward towards China. Based on just this pattern and assuming that it would persist, a forecast track of west-northwest would have been a good choice. However, JTWC's primary forecast guidance, the OTCM (One-way Interactive Tropical Cyclone Model)

Figure 3-05-4. Typhoon Hal near the time of maximum intensity (230559Z June NOAA visual imagery).

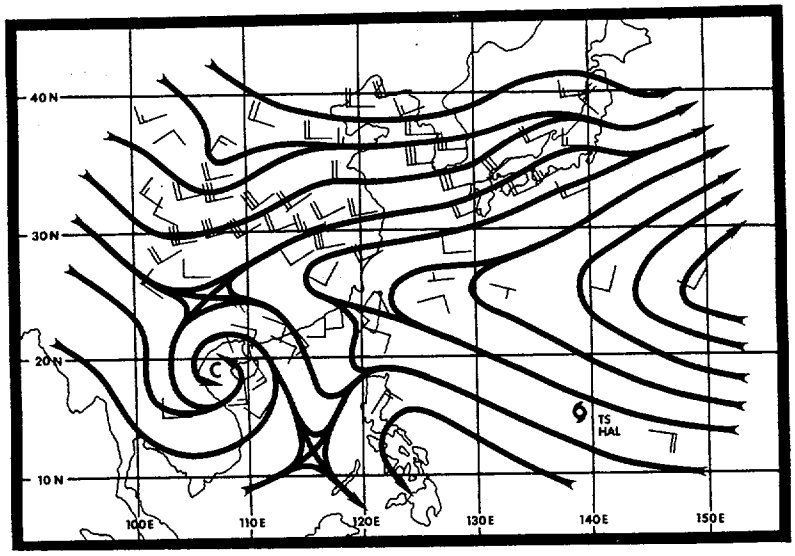


Figure 3-05-5. The 201200Z June 500 mb analysis showing the narrow mid-level subtropical ridge north of Hal. This ridge kept Hal from taking a more northerly course and entering the westerlies, contrary to the guidance provided by OTCM.

consistently indicated a more northward, and even a recurving northeastward, track. Figure 3-05-6 is a plot of the OTCM forecast tracks starting with the one on which the first warning was based. JTWC followed the guidance offered by the OTCM, and as a result, the forecast tracks were consistently north of Hal's actual track. In post-analysis it is apparent that OTCM was unable to resolve the narrow mid-level ridge because of the relatively coarse grid size (205 km) that the model uses. The flow that OTCM "saw" influencing the movement of Hal was the westerlies on the north side of the ridge. This resulted in the northward and recurving component in the OTCM forecasts. This situation will likely arise again in the future years, and will be closely watched for by the forecasters at JTWC as a result of this experience.

The Philippine island of Luzon experienced the strongest effects as the center of Typhoon Hal passed just 30 nm (56 km) off the north coast and westward through the Luzon Straits. The death toll was 23 persons with nine others reported as missing. There was widespread flooding and crop damage. Total damage was estimated at more than $10 million. Eight crewmen of the US Navy frigate Kirk (FF-1087) were injured when a large wave crashed over the bow. The ship was operating in the South China Sea about 5 nm (9 km) southwest of Subic Bay. High winds caused superficial damage to the hull of the destroyer USS Oldendorf (DD-972) when a drifting, unmanned barge struck the ship while it was moored at Subic Bay. Strong winds tore the barge from its mooring in mid-harbor shortly before the incident occurred. As Typhoon Irma approached from the east, Subic Bay received 30 in (762 mm) of rainfall during the period 26-28 June as a result of the strong low-level southwest monsoon flow that continued over the area after Hal had moved into China and dissipated as a significant tropical cyclone.

Taiwan was also affected by Typhoon Hal as it caused strong winds and heavy rains. Two people died, 18 injured, and five people listed as missing as a result of the typhoon. Eastern Taiwan experienced the heaviest rainfall, with almost 9 inches (229 mm) being reported. The heavy rainfall caused flooding that was responsible for most of the death, injury, and damage.

Typhoon Hal made landfall approximately 75 nm (139 km) east-northeast of Hong Kong (WMO 45005) at 240500Z. Maximum mean hourly wind speed reported at the Royal Observatory was 22 kt (11 m/s) from the west-northwest, with a peak gust to 49 kt (25 m/s). A gust to 50 kt (26 m/s) was recorded at the Hong Kong International Airport (WMO 45007). Some minor injuries were reported and the property damage was slight. All modes of transportation were disrupted on 23 and 24 June. Heavy rain on 25 and 26 June, after Hal had moved inland, caused numerous landslides in the Hong Kong area with only a few minor injuries.

Over mainland China, 13 more people died with some 40,000 homes and 321,000 acres (130,000 hectares) of crops damaged.

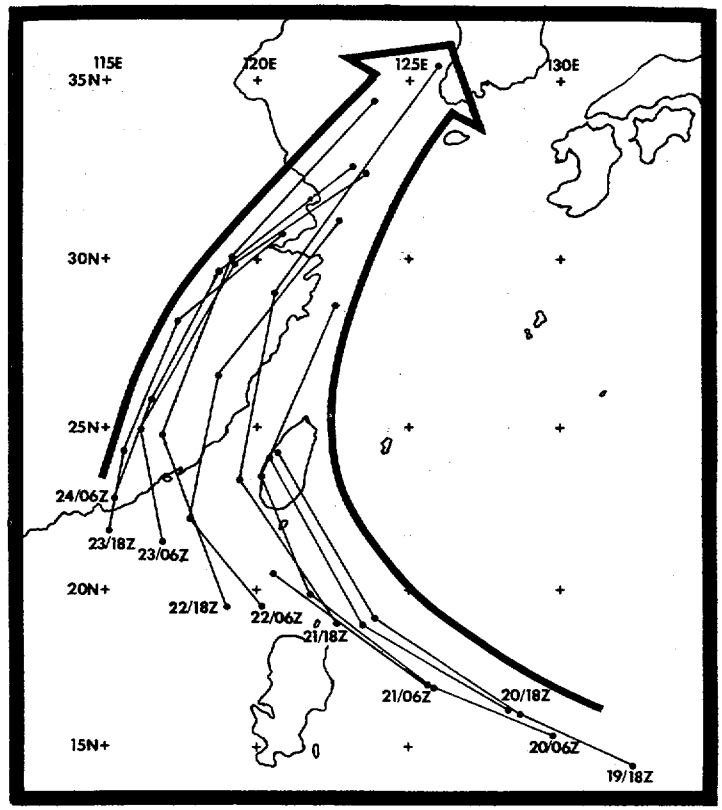
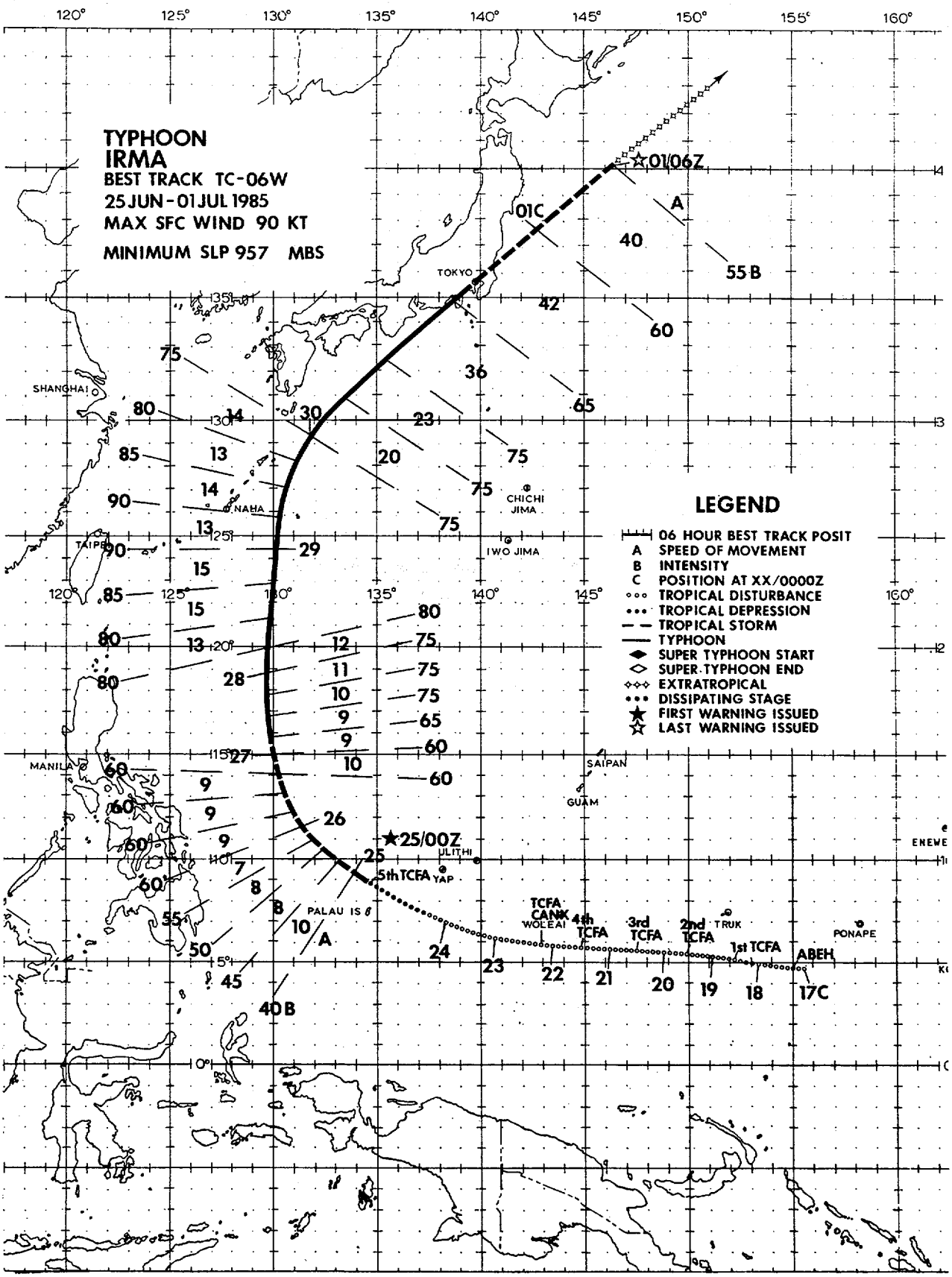


Figure 3-05-6. Plot of the OTCM (One-Way Interactive Tropical Cyclone Model) forecast guidance at 12-hourly intervals starting when the first warning was issued.


TYPHOON
IRMA
BEST TRACK TC-06W
25 JUN - 01 JUL 1985
MAX SFC WIND 90 KT
MINIMUM SLP 957 MBS
01/06Z
01C
TOKYO
SHANGHAI
NAHA
TAIPEI
CHICHI JIMA
IWO JIMA
MANILA
SAIPAN
GUAM
ULITHI
YAP
PALAU IS
25/00Z
5th TCFA
TCFA CANK
WOLEAI
4th TCFA
3rd TCFA
2nd TCFA
1st TCFA
TRUK
PONAPE
ABEH
17C
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED

Although Typhoon Irma was not one of the more intense systems of the year, it became noteworthy due to the magnitude of property damage and loss of life it caused in the Philippines; and later, by passing directly over the Tokyo metropolitan area. It was the third significant tropical cyclone to develop in June within the monsoon trough and the first (in June) to recurve into the mid-latitude westerlies.

Typhoon Irma originated in the eastern extension of the monsoon trough in mid-June. It was slow to develop, taking eight days to become a tropical storm. At 0000Z on the 17th, the disturbance which later developed into Irma was located approximately 220 nm (407 km) southwest of Ponape (WMO 91348). Synoptic data showed a broad weak surface circulation with winds of 5 to 10 kt (3 to 5 m/s). Another disturbance, which would shortly develop into Typhoon Hal, was located to the northwest in the same trough 270 nm (500 km) east-southeast of Yap (WMO 91413). A broad surface ridge north of both disturbances dominated the northwest Pacific.

When the disturbance was initially mentioned on the 170600Z Significant Tropical Cyclone Advisory (ABEH PGTW), satellite imagery indicated that an upper-level cold low in the tropical upper-tropospheric trough (TUTT) was present northeast of Guam. This upper-level low, which was positioned 7 to 10 degrees of latitude north-northwest of Irma, was contributing to the upper-level diffluence and enhancing the convective activity in the vicinity of the disturbance. The potential for significant tropical cyclone development was evaluated as "fair" (meaning that issuing a TCFA during the advisory period was likely). By 0900Z on the 18th, the disturbance had moved west-northwest and was 150 nm (278 km) south-southeast of Truk (WMO 91334). Satellite imagery indicated the amount of convection was increasing and had more organization. Consequently, a TCFA on the system was issued at 181200Z and aircraft reconnaissance requested for the following day.

Over the next three days satellite imagery showed vigorous, but poorly organized, convection. The aircraft reconnaissance flight on the 19th of June at the 1500 ft (457 m) level was unable to locate a circulation center and reported a MSLP of 1006 mb. On the following day, aircraft reconnaissance found a surface circulation with a 5 nm (9 km) diameter area of light and varible surface winds, a drop in the MSLP of 4 millibars from the previous day and surface winds of 10 to 20 kt (5 to 10 m/s). The flow aloft over the disturbance was hampered by increased outflow from Hal to the west. During this period TCFAs were re-issued at 1200Z on the 19th through the 21st of June. Early on the 22nd, the convection within the disturbance became so suppressed that the TCFA was cancelled at 220500Z.

Unfavorable vertical shear from Hal hindered development of the disturbance until the 24th. The 241200Z synoptic data showed increasing southwesterly low-level flow entering the disturbance. This coincided with Typhoon Hal making landfall over southern China. Subsequent satellite imagery at 241600Z revealed a significant increase in the size of the central cloud mass. The fifth, and final, TCFA on this system followed at 241730Z.

With Hal weakening overland in mainland China, Irma now began to intensify in earnest. The first warning on the system was issued at 250143Z, after the Dvorak intensity analysis of the 250000Z satellite imagery showed the disturbance had increased to tropical storm intensity. Aircraft reconnaissance later in the day (250516Z) located a 994 mb circulation center with 45 kt (23 m/s) maximum surface winds 90 nm (167 km) east-northeast of the center.

The initial forecasts called for Irma to follow in Hal's footsteps up the monsoon trough into the South China Sea and around the subtropical ridge. Due to the uncertainty about the analysis over the data sparse Philippine Sea, 400 mb synoptic track aircraft missions were flown on 25 and 26 June to help define the mid-level flow to the north of Irma. These flights confirmed the presence of lower 400 mb heights in the ridge along 130E, which indicated the ridge would not steer Irma into the South China Seas as it had done with Hal. JTWC now forecast a more northward movement with eventual recurvature to the northeast. This forecast scenario proved correct.

Irma slowed slightly as it approached the end of the ridge at 130E longitude and continued to intensify. Early on the 27th, Irma attained typhoon intensity as verified by synoptic ship observations of 65 kt (33 m/s) north-northeast of the center and the Dvorak intensity analysis. For the next two days (Figure 3-06-1) Irma moved northward and reached a maximum intensity of 90 kt (46 m/s) with a MSLP of 957 mb at 290000Z.

Along with reaching maximum intensity, Irma also came under the influence of the mid-latitude westerlies. Within 24-hours, Irma was accelerating rapidly to the northeast headed for Tokyo and the

Kanto Plain area of Japan's Honshu Island. Simultaneously, the system began weakening and undergoing extratropical transition. Aircraft reconnaissance on the 30th indicated entrainment of the cooler, drier air into the system. The Aerial Reconnaissance Weather Officer (ARWO), at 300817Z, reported a 30 nm (56 km) elliptical eye with a slight tilt to the north-northeast.

By 010600Z, Irma had completed extratropical transition and the last warning was issued. The remains of Irma continued to move northeast toward the Kuril Islands where it merged with a complex low pressure area just south of the Kamchatka Peninsula.

In summary, as the Typhoon passed east of the Philippines on 28 and 29 June, heavy rains associated

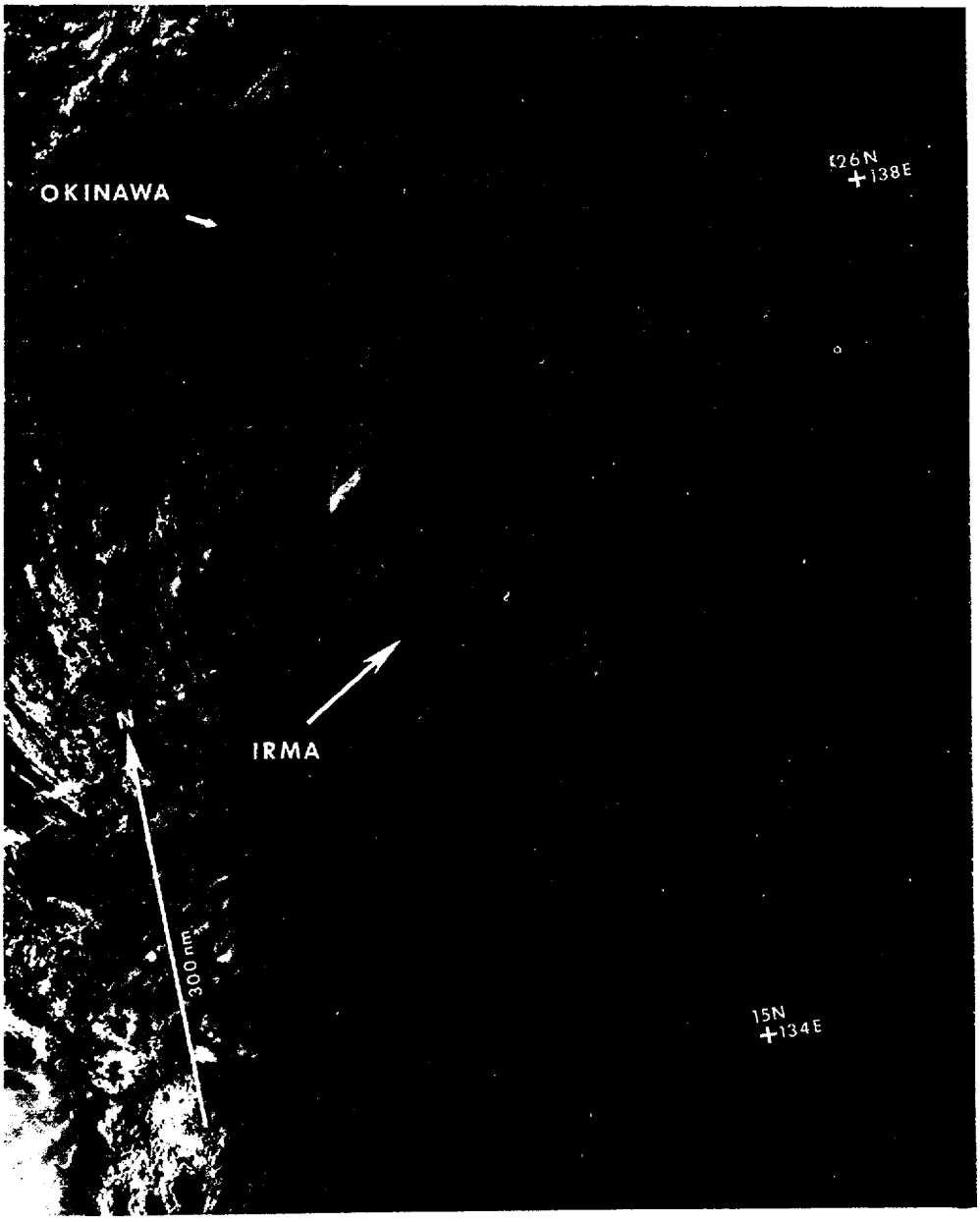


Figure 3-06-1. Irma, with maximum winds of 80 kt (41 m/s), nearing peak intensity south of Okinawa, Japan. (With the sun low in the west the cloud top topography is striking) (280931Z June DMSP visual imagery).

with the strong south westerly monsoon flow from the South China Sea across the island of Luzon produced more than 28 inches (711 mm) of rain. Flooding was widespread across areas of Manila and other sections of Luzon. At least 46 people perished in these floods; additionally, over 1,500 lost their homes. Later, when Irma made landfall on the southeastern tip of Honshu at 301800Z, maximum winds were estimated at 65 kt (33 m/s). The Naval Oceanography Command Facility at Yokosuka reported maximum winds of 51 kt (26 m/s) with a peak gust to 83 kt (43 m/s). The associated barograph trace is shown in Figure 3-06-2. Various military activities at Yokosuka reported minor damage and flooding, but no significant personal injuries. However, Japan police reported three deaths and five people were missing as a result of Irma. Twelve bridges were reported out, flood damage occurred to over 20,000 homes and power outages affected about 440,000 households.

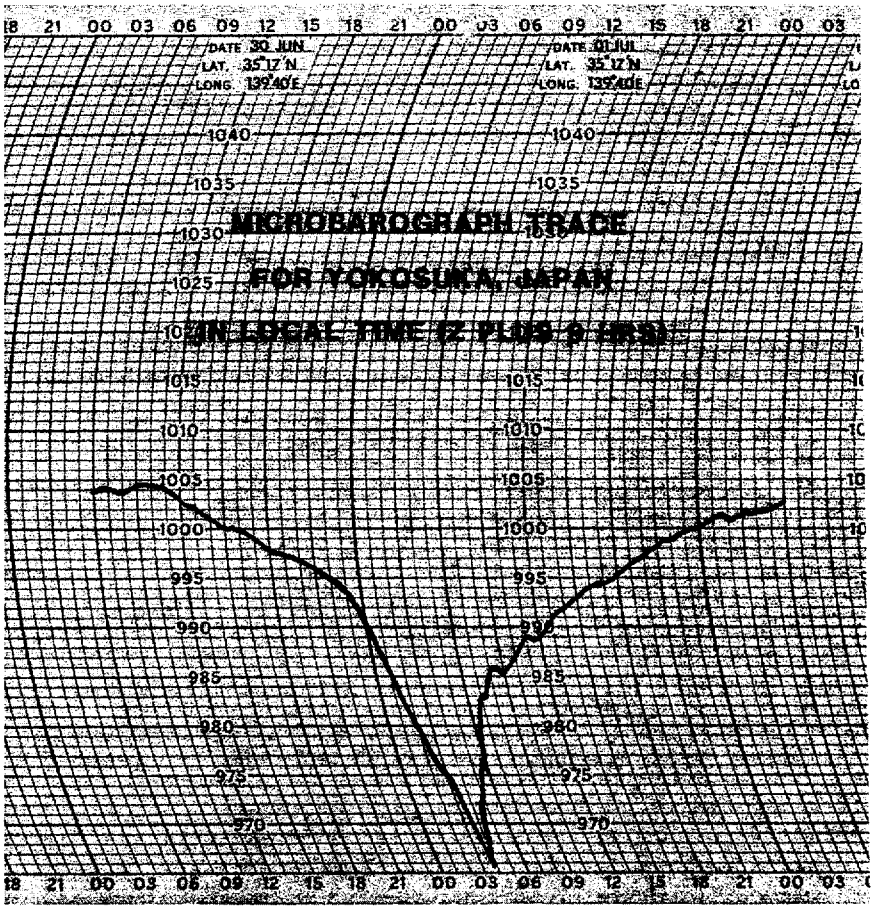
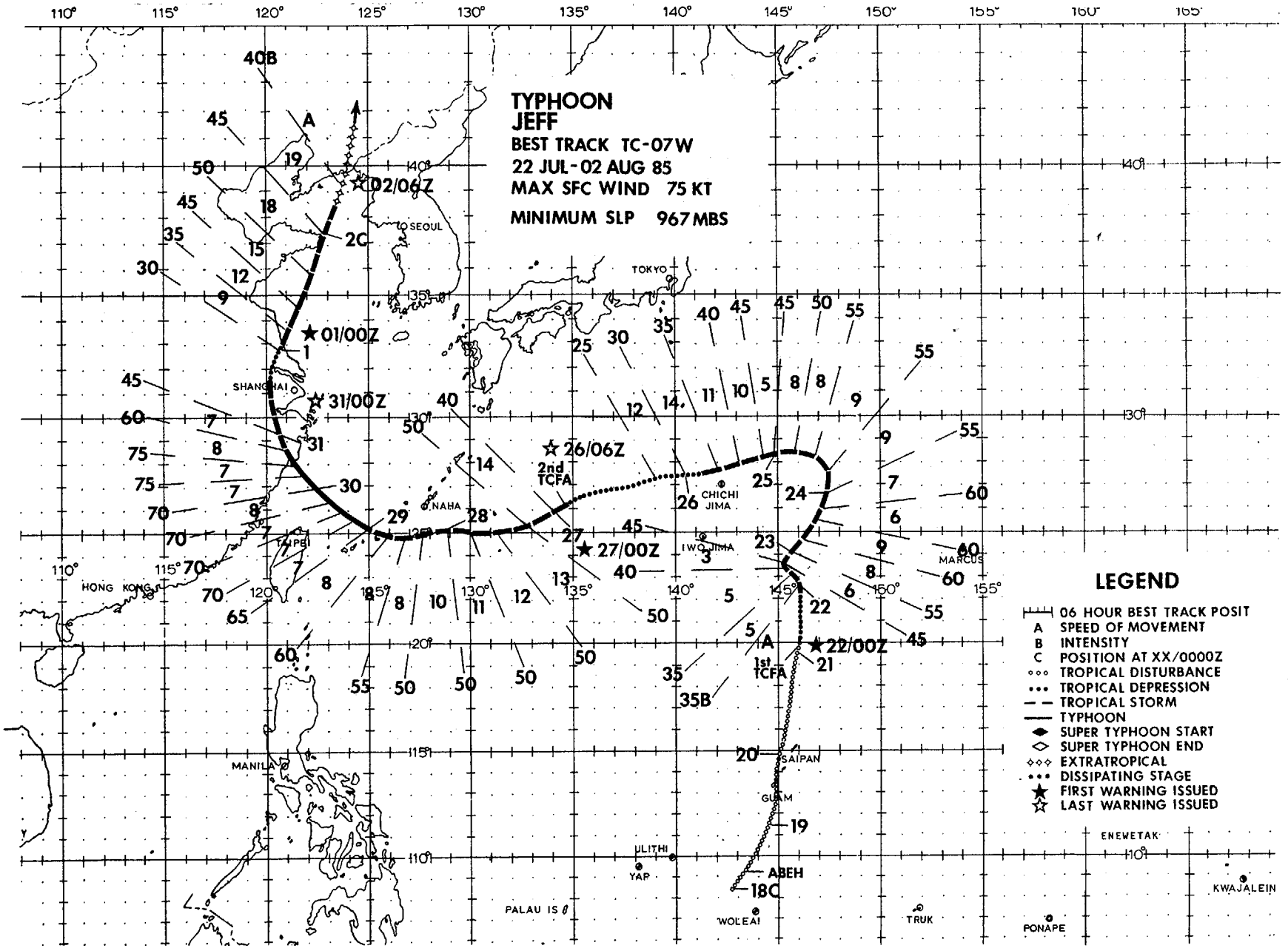


Figure 3-06-2. Barograph trace from the Naval Oceanography Command Facility in Yokosuka documenting Irma's passage over the Kanto Plain. The minimum sea-level pressure recorded was 963.3 mb at 301930Z.


TYPHOON
JEFF
BEST TRACK TC-07W
22 JUL-02 AUG 85
MAX SFC WIND 75 KT
MINIMUM SLP 967 MBS
02/06Z
01/00Z
31/00Z
26/06Z
2nd TCFA
27/00Z
22/00Z
1st TCFA
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
HONG KONG
MANILA
CHICHI JIMA
IWO JIMA
MARCUS
SAIPAN
GUAM
ULITHI
YAP
WOLEAI
PALAU IS
TRUK
PONAPE
ENEWETAK
KWAJALEIN
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED

Typhoon Jeff was the longest-lived tropical cyclone of the 1985 season. It required a total of forty-one warnings and was finalled by JTWC on three separate occasions. During its twelve day life span, Jeff peaked in intensity three times: once east of the island of Iwo Jima; once west of Okinawa, Japan; and the third time over the Yellow Sea. Jeff, as it turned out, would be the only tropical cyclone to develop during July, a month that normally produces five cyclones.

After Typhoon Irma became extratropical on 1 July, tropical activity in the western North Pacific decreased. One significant tropical disturbance developed east of the Philippines on 4 July and moved into the South China Sea on the 6th before dissipating east of Hong Kong (WMO 45005) on 8 July. This disturbance was the subject of a TCFA from the 4th through the 7th. After this disturbance dissipated, the tropics stayed inactive until Typhoon Jeff developed a week later.

The low-level circulation which was to mature into Typhoon Jeff, was spawned in the monsoon trough south of Guam on 18 July in a broad area of disorganized cloudiness that stretched along ten degrees north latitude. Consolidating slowly, the system drifted northward across the island of Guam and through the northern Marianas, bringing little more than increased rainshower activity. Three days after genesis, the development of persistent central convection and better cloud organization prompted a TCFA, valid at 210200Z. Aircraft recon- naissance into the disturbance a few hours later was unable to locate a surface circulation, but instead found a broad trough with 10 to 15 kt (5 to 8 m/s) surface winds and a MSLP of 1006 mb. Early the next morning, a second aircraft reconnaissance mission found a tropical depression with a 1002 mb central pressure. As a result, the first warning was issued at 220000Z. For the next two days Jeff continued to intensify, reaching a peak of 60 kt (31 m/s) on the 23rd.

Up to this point, the steering flow had remained weak. Initially, Jeff's movement had been to the northwest, but then changed to the northeast in response to the approach of a mid-latitude trough from the northwest. Forecasting recurvature into the mid-latitude westerlies ahead of the trough was the most attractive possibility, especially since the tropical cyclone was already at 25N latitude and had been steadily tracking northeastward for nearly 24-hours. In contrast to the persistent northeasterly movement, both numerical forecast aids (NTCM and OTCM) consistently indicated a northwesterly track. Because of the major difference between what was actually happening and the guidance provided by the aids, the possibility of a return to a westerly or northwesterly track was still considered. The "less" likely alternative forecast scenario, i.e. northwestward movement, was repeatedly mentioned in the Prognostic Reasoning Messages (WDPAl PGIW), but the official forecast was for recurvature. Unfortunately, the "more" likely recurvature scenario to the northeast did not last long.

Late on the 23rd as the trough approached, vertical wind shear from the west increased over the system. It soon became apparent that Jeff was weakening and the persistent central convection was shearing away to the east (Figure 3-07-1). The mid-latitude trough passed to the east on the 24th, leaving behind Jeff's exposed low-level circulation.

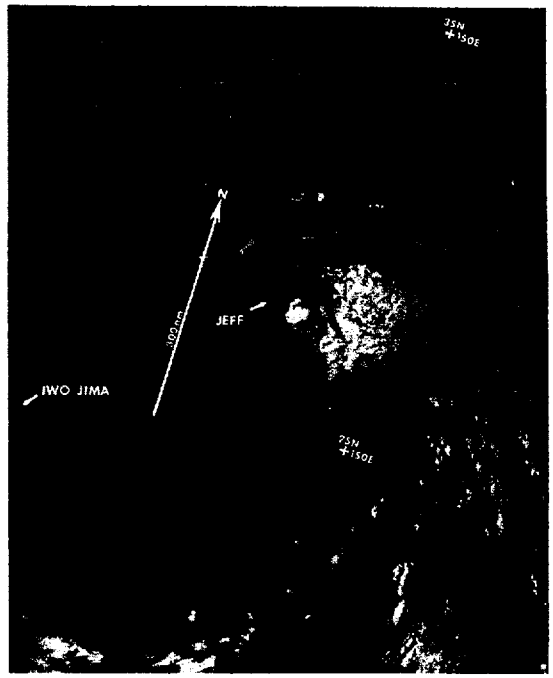


Figure 3-07-1. The low-level center of Tropical Storm Jeff located near the western edge of the central dense overcast. Strong upper-level westerly winds are shearing away the central convection to the east and will soon expose the low-level circulation center (240318Z July NOAA visual imagery).

The residual low-level vortex then began to move westward, embedded in the southeastern portion of the low- to mid-level anticyclone which was centered over northern Honshu. Without any regeneration of the central convection on the 25th or the 26th, Jeff

continued to weaken. By 260600Z the maximum surface winds had dropped below 30 kt (15 m/s). Despite the fact that a well-defined low-level circulation was still present, the lack of persistent central convection and the systems rapid movement to the westsouthwest made further development seem unlikely (Figure 3-07-2). As a consequence, the final warning was issued at 260600Z, with the caveat that "the system will be closely monitored for indications of possible regeneration." That was precisely what happened! Almost immediately after Jeff was finalled, convection began to redevelop about the low-level center since the shearing influence of the trough was absent.

Throughout the night of the 26th Jeff regenerated, and JTWC immediately alerted Kadena AB (WMO 47931) and other customers on Okinawa of the change. Weather satellite reconnaissance revealed a dramatic increase in central convection when warnings were again issued on Jeff, as a 35 kt (18 m/s) Tropical Storm, at 270000Z (Figure 3-07-3). Because Jeff was less than 24-hours from affecting Okinawa, Kadena AB went to Condition of Readiness III as a precaution. As Jeff neared Okinawa it slowed, passing about 75 nm south of Okinawa at 280530Z. The warnings verified well. Maximum sustained winds at Kadena AB were 25 kt (13 m/s), with a peak gust to 39 kt (20 m/s) at 280208Z. Naha (WMO 47930) had a peak gust of 47 kt (24 m/s) at 280355Z. Eighteen hours after passing south of Okinawa, Jeff attained typhoon intensity. By that time, the Typhoon had turned to the west-northwest as it started to move around the western side of the subtropical ridge. Further intensification to a peak of 75 kt (39 m/s) occurred as Typhoon Jeff approached, and made landfall on, the coast of mainland China approximately 180 nm (333 km) south of Shanghai (WMO 58367) (Figure 3-07-4). Once onshore, surface frictional effects caused a rapid decrease in maximum winds. The persistent central convection began to fall apart and, once again, the system was finalled, although "movement back off the coast and regeneration in the Yellow Sea" remained a distinct possibility (Figure 3-07-5).

Indeed, Jeff was not finished yet. Warning number 36 was issued at 0000Z on 1 August as meteorological satellite reconnaissance reported significantly increased convection over water. The track was now to the north-northeast around the western edge of the subtropical ridge. Acceleration was gradual as Jeff redeveloped maximum surface winds of 50 kt (26 m/s) by 1800Z on 1 August. Strong southwesterly winds aloft hindered the system's attempt to further intensify and achieve vertical alignment

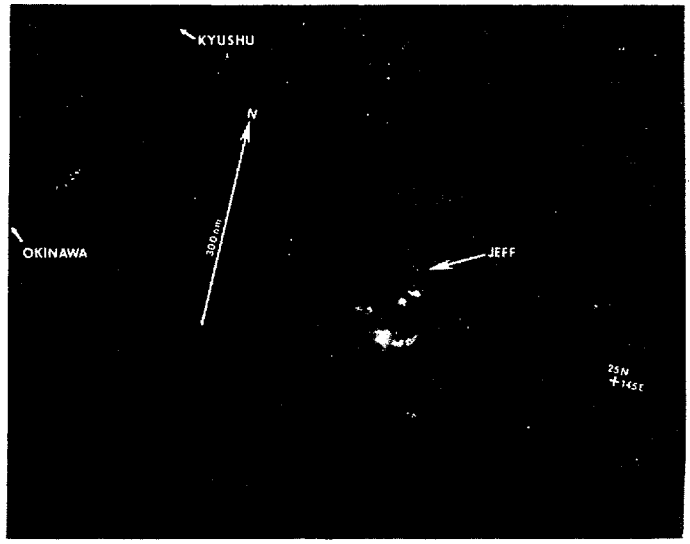


Figure 3-07-2. The nearly convection free low-level circulation of Jeff as it was finalled for the first time [260508Z July NOAA visual imagery].

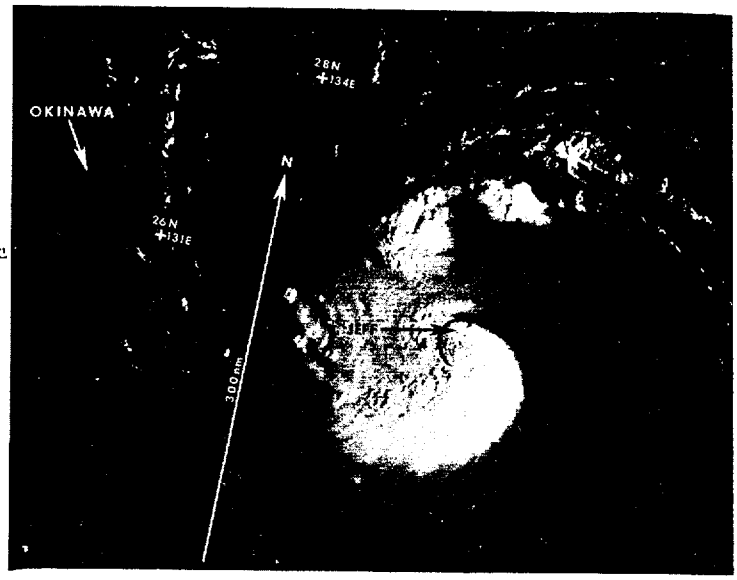


Figure 3-07-3. Typhoon Jeff just after its dramatic regeneration during the night [270048Z July DMSP visual imagery].

between the low-level cyclone and anticyclone aloft. Then, at 0600Z on 2 August Jeff was finalled for the third and last time after completing extratropical transition in the northern Yellow Sea.

In retrospect, eastern China bore the brunt of Typhoon Jeff. The provinces of Shanghai and coastal Zhejiang were battered. News reports indicated at least 180 people were killed, 1400 injured and tens of thousands left homeless. In addition, 1400 watercraft, mostly fishing boats, were lost or badly damaged. Some 75,000 acres (30,352 hectares) of crops were destroyed and another 400,000 acres (161,878 hectares) badly damaged, by the typhoon. China's irrigation network was severly disrupted by flooding.

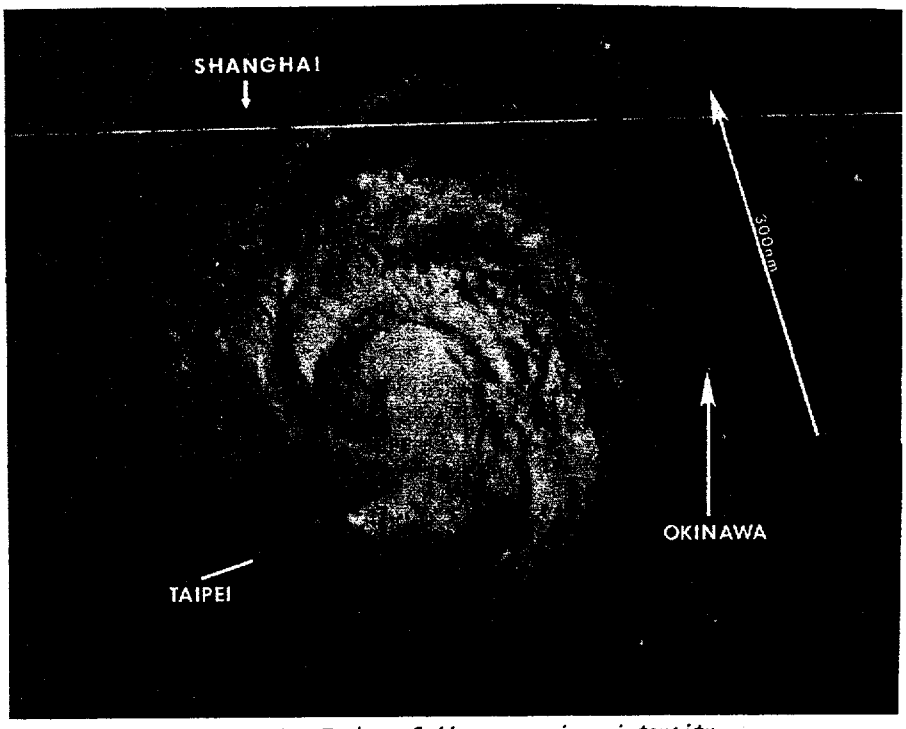


Figure 3-07-4. Typhoon Jeff near maximum intensity less than 18-hours from making landfall over eastern mainland China. During the hours immediately proceeding landfall, a small banding eye formed (292303Z July NOAA visual imagery).

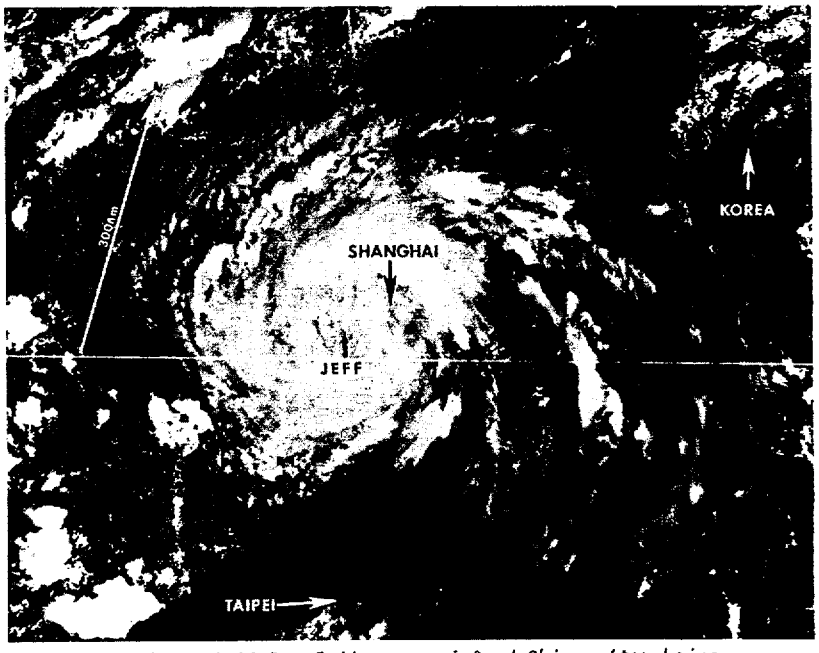
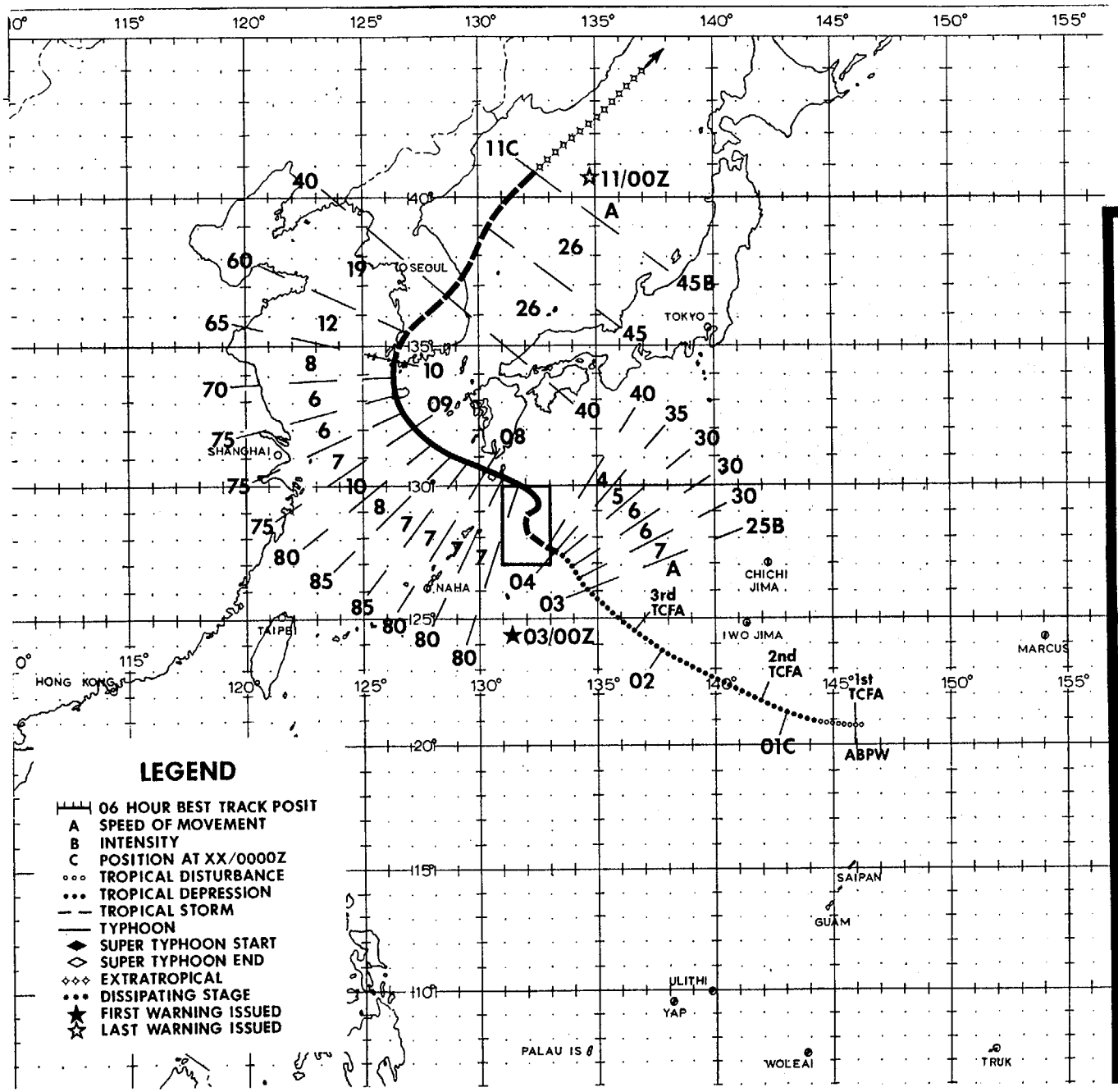


Figure 3-07-5. Jeff over mainland China after being finalled for the second time. Jeff spent nearly 36 hours over mainland China before moving back over open water and reintensifying (310556Z July NOAA visual imagery).

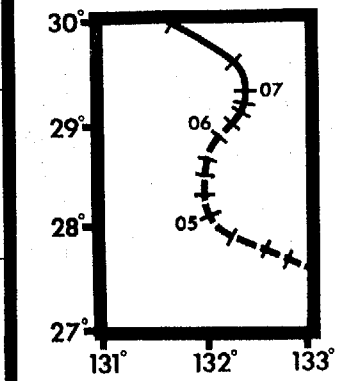


LEGEND

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

TYPHOON KIT

BEST TRACK TC-08W
03 AUG - 11 AUG 1985
MAX SFC WIND 85 KT
MINIMUM SLP 959 MBS



DTG	SPEED	INTENSITY
0406Z		40
	4	
0412Z		45
	3	
0418Z		45
	3	
0500Z		50
	2	
0506Z		55
	2	
0512Z		55
	2	
0518Z		55
	2	
0600Z		60
	2	
0606Z		65
	2	
0612Z		70
	1	
0618Z		75
	1	
0700Z		80
	3	
0706Z		80
	7	
0712Z		80

Typhoon Kit was the first of seven tropical cyclones to reach warning status during August 1985. As was the case with its predecessor, Typhoon Jeff, Kit's recurvature posed considerable forecast problems. Like many WESTPAC tropical cyclones, Kit developed from an area of increased convection in the eastern portion of the monsoon trough.

As the remnants of Typhoon Jeff transited eastern China, satellite imagery early on 31 July showed that a possible circulation with good convective organization was rapidly forming north of Guam. This area of disturbed weather was developing at the northeast end of the monsoon trough, which at the time was linked to the trailing end of an old frontal boundary. The presence of this frontal boundary may have provided some initial low-level cyclonic shear to account for the system's rapid formation. Synoptic data indicated that a low-level circulation was present in the disturbed area with winds of 10 to 20 kt (5 to 10 m/s) and a MSLP of 1004 mb. The disturbance was mentioned on the Significant Tropical Advisory (ABEH PGTW) at 310451Z, but development was so rapid and the satellite signature so impressive, that a TCFA was issued by 310600Z. No significant additional development occurred overnight, however, as the system moved to the west-northwest. The first aircraft reconnaissance mission into the disturbance the following day found winds of only 20 kt (10 m/s) on the west side of a 1004 mb surface trough. The TCFA was reissued on the 1st as development still appeared likely. Follow-on aircraft reconnaissance was requested for the 2nd. This time the investigative mission located a 30 nm (56 km) wide surface circulation center with better organized winds of 10 to 20 kt (5 to 10 m/s) and a MSLP of 1005 mb, one millibar higher than on the previous day. A third TCFA followed at 020600Z as the disturbance tracked to the northwest. Aircraft reconnaissance was again requested.

The next aircraft reconnaissance mission flew into the system late on the 2nd, closed a circulation at 022204Z and reported that the MSLP had decreased to 1000 mb. Both aircraft and synoptic data now indicated 25 kt (13 m/s) surface winds near the center. JTWC responded by issuing the first warning on Tropical Depression 08W valid at 030000Z. During the next 24-hours the tropical depression slowly intensified while moving to the northwest along the southern periphery of a high pressure ridge located over Japan.

Tropical Depression 08W was upgraded to Tropical Storm Kit at 040000Z after aircraft reconnaissance reported 35 kt (18 m/s) winds in all quadrants. Once upgraded, Kit continued to intensify and move slowly west-northwestward for the next 24 hours. Extended forecasts, based on FNOC's NOGAPS prognoses, indicated that Kit would move northwestward around the ridge which was expected to be displaced southeastward in advance of an approaching trough. This would result in Kit recurving to the northeast after 36 hours and eventually make landfall on Japan (Figure 3-08-1). However, the trough was weaker than forecast so instead of eroding the ridge and allowing Kit to recurve into the westerlies, the trough only temporarily weakened the ridge as it passed to the north. Kit responded to the trough passage by slowing and turning to the north on the 5th. Typhoon Kit then moved slowly northward through the 6th and into the 7th while continuing to intensify. By the 7th the trough had passed to the east and the tropical cyclone was left in the weakness between the subtropical ridge to the east and a weaker anticyclone over mainland China. With the passage of the mid-latitude trough over the subtropical ridge, the ridge began to build westward on the 7th. Kit responded by resuming a course to the west-northwest and intensifying (Figure 3-08-2). Kit attained its maximum intensity of 85 kt (44 m/s) at 080600Z southwest of Kyushu as it moved into the East China Sea. With FNOC's NOGAPS progs indicating another mid-latitude trough approaching from the west, and Kit definitely nearing the western end of the subtropical ridge axis, recurvature over South Korea, with extratropical transition in the Sea of Japan, appeared likely. After 081200Z, Kit began to weaken as relatively cooler and drier low-level air was entrained into the vortex's southwest quadrant.

Kit recurved south of the Korean peninsula and was barely at typhoon strength when landfall occurred on the southwest tip of South Korea early on the 10th. Kit still packed quite a punch, however. Torrential rains on the island of Cheju and southern coastal Korea caused extensive property and crop damage. At least ten people were reported missing or killed. Additionally a Department of Defense communications site in the area received an estimated 1.5 million dollars damage. With extratropical transition in progress, Kit rapidly lost strength while accelerating northeastward into the Sea of Japan. Extratropical transition was completed and JTWC issued the final warning on Kit at 110000Z. Subsequent warnings on the extratropical remnants of Kit were contained in the NAVOCEANCOMCEN GUAM Northwest Pacific Extratopical Wind Warning bulletins.

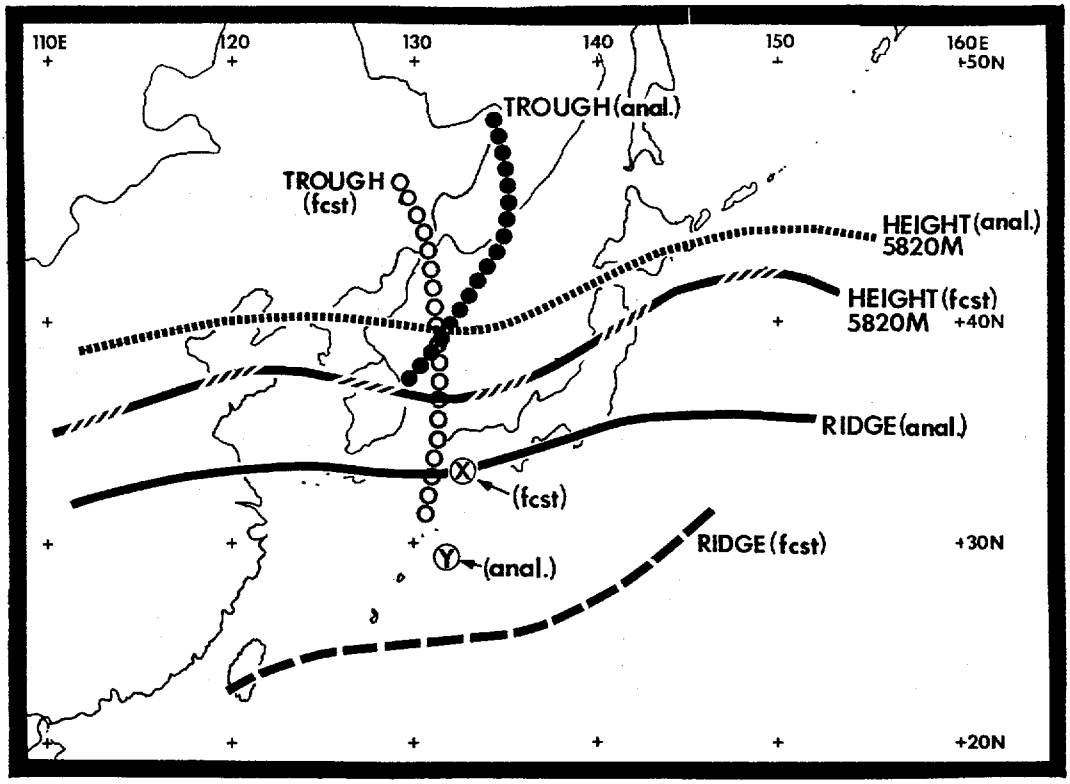


Figure 3-08-1. Comparison of 500mb 48-hour prognosis with verifying 500mb analysis. This chart depicts the major 500mb features available from the 48-hour prognosis valid 060000Z August: ridge axis (dashed line), trough line (open dots), 5280 meter height isopleth (▬▬▬), and forecast warning point (X). The verifying 500mb analysis is shown for 060000Z August: ridge axis (solid line), trough line (solid dots), 5280 meter height isopleth (▪▪▪▪▪▪▪▪▪▪), and Best Track position (Y) for Kit. In retrospect, with the 48- hour prognosis and the location of the forecast warning position (X) - north of the ridge (forecast) and east of the trough (forecast) - a recurvature scenario looks valid. The tropical cyclone is an immediate threat to Japan. However, with the verifying analysis, Kit's position (Y) remains south of the ridge (analysis) and the trough (analysis). This is not favorable for recurvature. This pattern suggests weakened steering flow, with slow and erratic tropical cyclone movement - which is what occurred on the 6th.

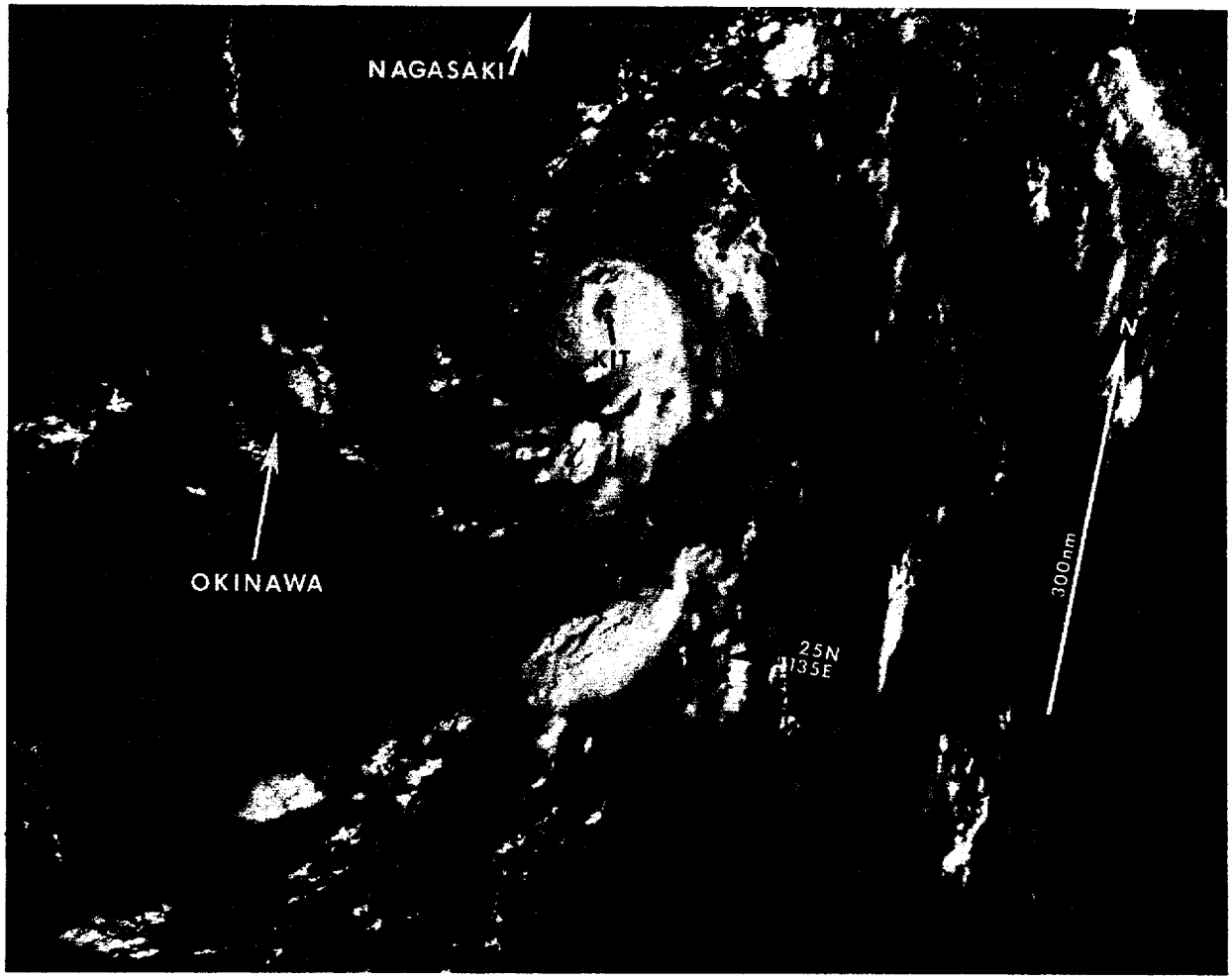
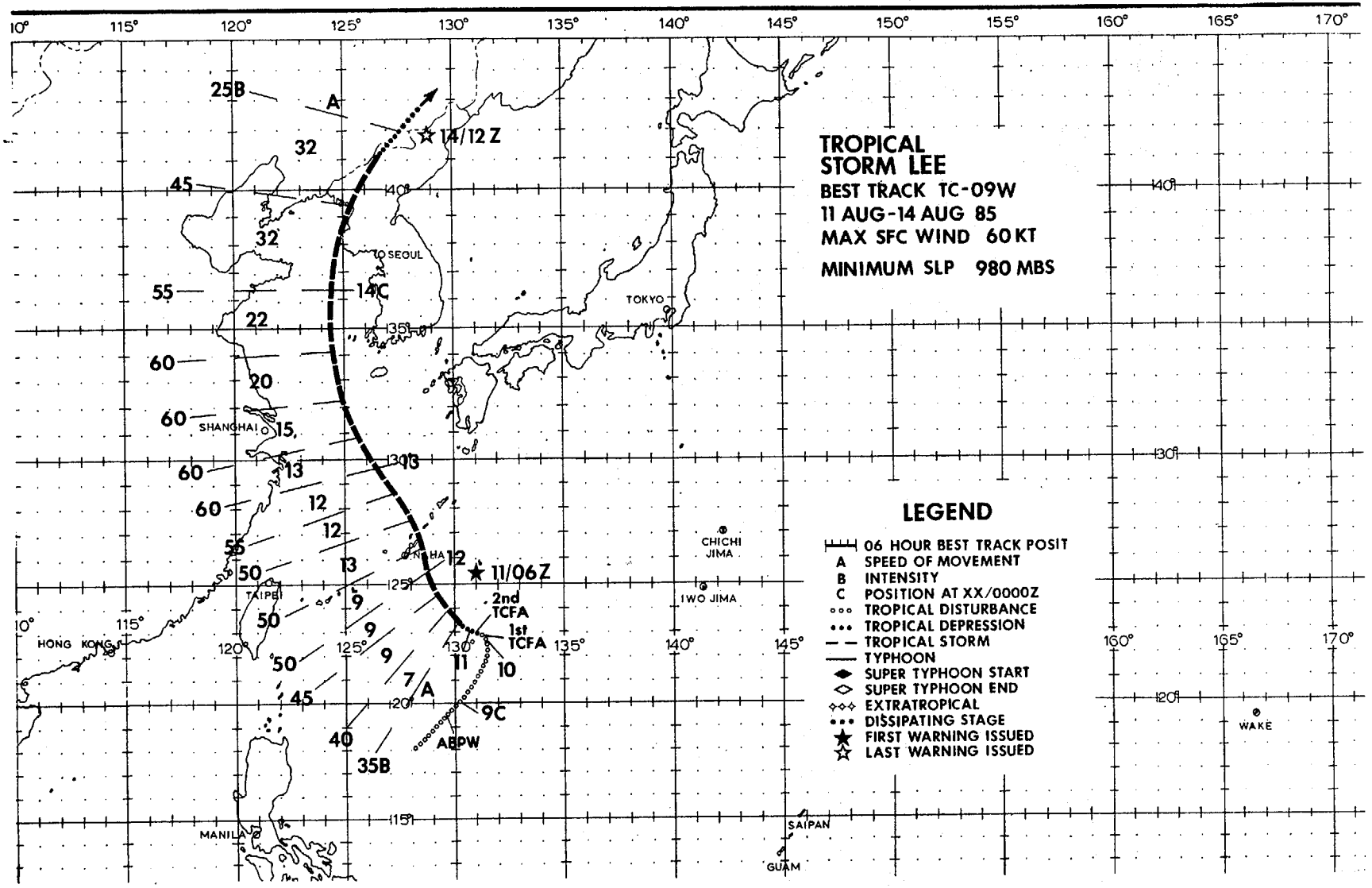


Figure 3-08-2. Typhoon Kit near maximum intensity south of the island of Kyushu, Japan. Kit remained a very compact storm for much of its lifetime, with the over-30 kt (15 m/s) and over-50 kt (26 m/s) wind radii remaining smaller than normal (070028Z August DMSP visual imagery).


TROPICAL
STORM LEE
BEST TRACK TC-09W
11 AUG-14 AUG 85
MAX SFC WIND 60 KT
MINIMUM SLP 980 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
14/12Z
11/06Z
2nd TCFA
1st TCFA
ABPW
SEOUL
TOKYO
SHANGHAI
TAIPEI
HONG KONG
MANILA
CHICHI JIMA
IWO JIMA
WAKE
SAIPAN
GUAM

Unlike its predecessors, Typhoons Irma, Jeff, and Kit, that developed on the northeast periphery of the southwest monsoon trough, Lee formed in the trough in the central Philippine Sea. Lee's initial development and movement within the monsoon trough was influenced by Typhoon Kit, which was located further to the north.

On the 31st of July, the monsoon trough was oriented southwest to northeast, extending from the central Philippine Sea eastward across the northern Mariana Islands. To set the stage, Typhoon Kit, which developed on the northeastern end of the trough, moved northwestward and intensified. As Kit's low pressure area migrated northwestward, the axis of the monsoon trough repositioned along with it until finally, on the 8th of August the monsoon trough was oriented almost north to south.

Ship reports at 081200Z indicated a broad circulation in the trough 480 nm (889 km) south of the island of Okinawa with a minimum sea-level pressure (MSLP) of 1002 mb. Satellite imagery also showed that the convection associated with this disturbance had some curvature. Since good outflow channels were present aloft to the south and southwest, the Significant Tropical Weather Advisory (ABPW PGTW) was reissued at 082000Z to include this system.

During the following 24-hours, as the disturbance moved to the north-northeast, the convection remained on the equatorward side of the circulation center, associated with the 15-25 kt (8-13 m/s) convergent low-level wind flow. Synoptic data showed only 5 kt (3 m/s) winds on the northwest side of the circulation. This area of lighter winds underwent a change on the 10th of August. The low-level subtropical ridge built back to the north of the disturbance and across the Rhukyu Islands in the wake of Kit and the pressure gradient increased over the north side of the disturbance. In response, the broad low-level circulation consolidated with increased winds of 10-15 kt (5-8 m/s) over the northwest quadrant (Figure 3-09-1). Simultaneously, the upper-level wind reports showed an anticyclonic circulation was developing over an area of comma-shaped convection. The cloudiness increased in

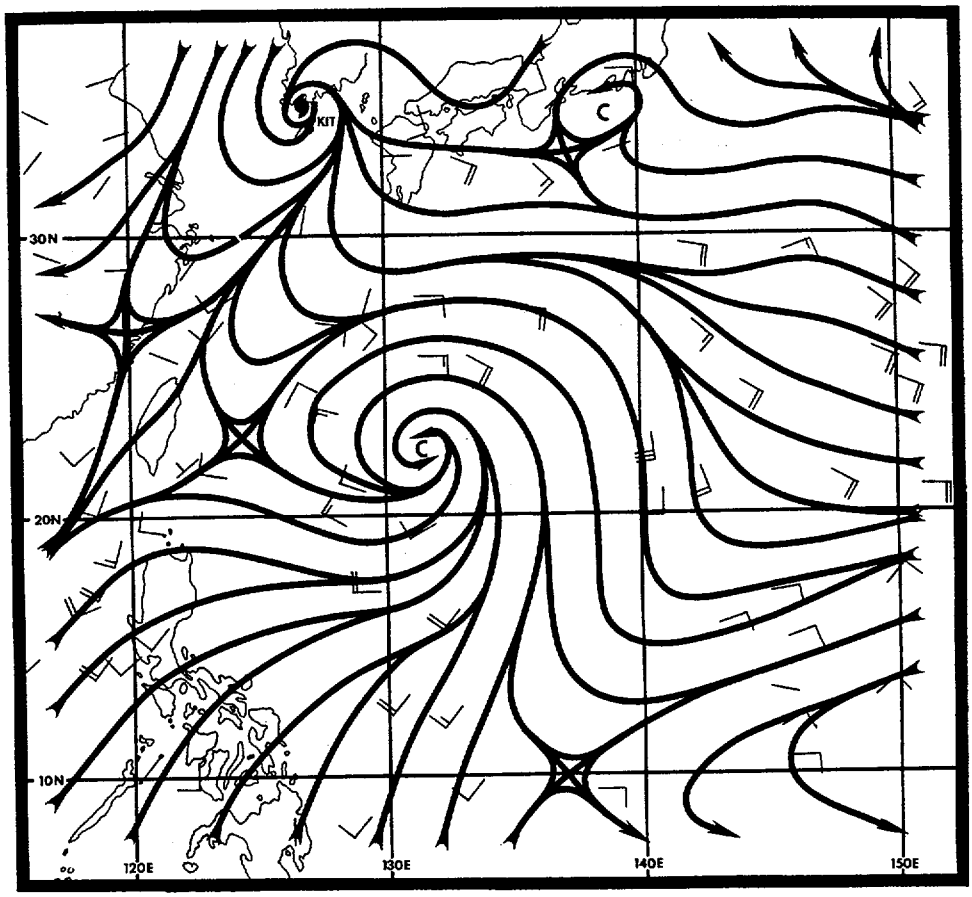


Figure 3-09-1. Surface analysis at 100000Z August showing the subtropical ridge which built across to the north of the disturbance in the wake of typhoon Kit. The monsoon depression is beginning to consolidate. The convergent flow is only on the south and east sides of the broad circulation center.

amount and was near the surface center. These events prompted the issuance of the first TCFA at 100230Z.

The initial aircraft reconnaissance mission, at 100650Z, into the disturbance reported a broad surface circulation with dimensions of 60 nm (111 km) north to south by 90 nm (167 km) east to west and a 997 mb MSLP. The new location of the circulation center, as determined by the aircraft, required the issuance of a second TCFA at 100800Z. The circulation center was relocated 115 nm (213 km) further to the east-southeast and outside of the original TCFA area which was based on an earlier position derived from visual satellite data.

During the following twenty-four hours, Lee turned towards the northwest, moved very slowly, and showed little intensification. This slow intensification could be related to the persistent strong flow aloft from the north over the disturbance (Figure 3-09-2). Satellite imagery for the same period is shown in Figure 3-09-3).

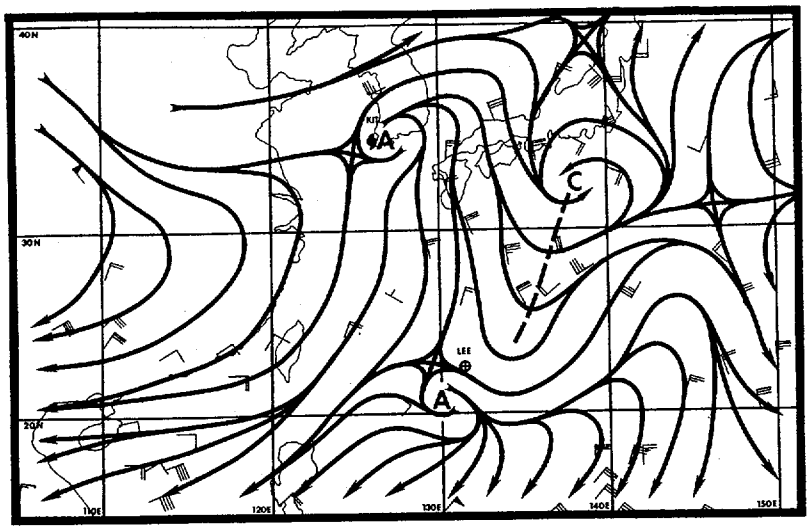


Figure 3-09-2. The 100000Z August 200 mb analysis showing the northerly flow aloft across the disturbance.

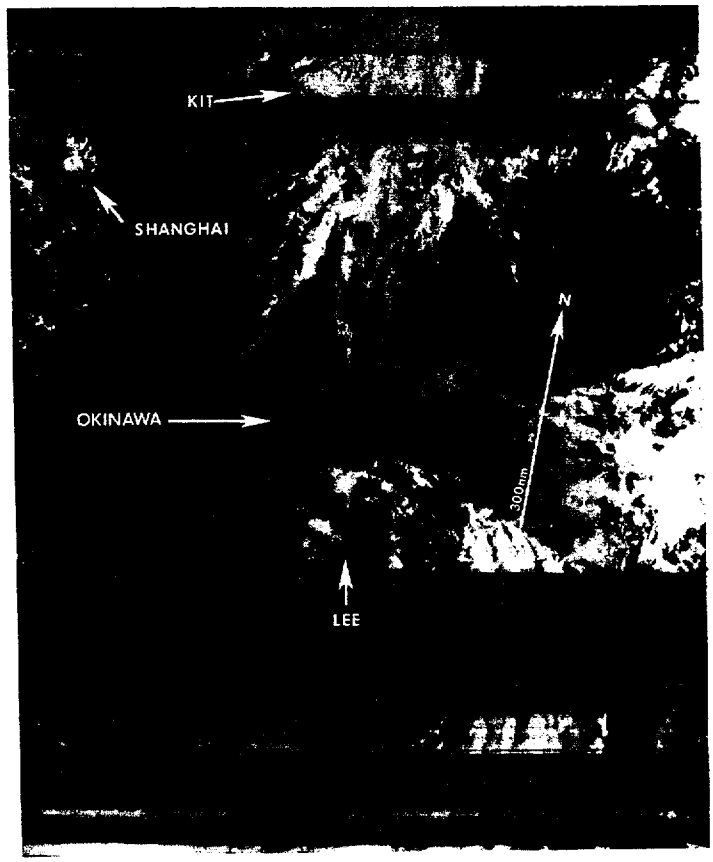


Figure 3-09-3. With the northerly flow aloft there is little convection on the poleward side of the disturbance's circulation center. The cloudiness persists over the low-level southwesterly flow (1001082 August DMSP visual imagery).

An aircraft reconnaissance flight into the disturbance at 110656Z found a 25 nm (46 km) diameter light and variable wind center with only 15 kt (8 m/s) maximum surface winds around it. However, the MSLP had dropped another 5 mb during the previous twenty-four hours to 992 mb. This supported maximum winds of 40-45 kt (21-23 m/s) based on the Atkinson/Holliday wind/pressure relationship. Aircraft, synoptic and satellite data indicated that stronger winds of 25-35 kt (15-18 m/s) were located in a band displaced 60-180 nm (111-333 km) to the east of the center. These data led to the issuance of the first warning at 110600Z. As a result, Kadena AB, Japan (WMO 47931) immediately set a Condition of Readiness III.

Fortunately, Lee continued to exhibit typical characteristics of a monsoon depression where the maximum surface winds and intense convection never consolidate at the surface center. Instead, the maximum surface winds remained in the eastern semi-circle. As a consequence, when Lee passed within 15 nm (28 km) northeast of Okinawa at 120430Z, the maximum sustained winds stayed well to the east of the island. In fact, the strongest winds experienced at Kadena AB were from the west-southwest at 22 kt (11 m/s) with 32 kt (16m/s) approximately twelve hours later. Naha (WMO 47936) located on an elevated and exposed part of the island of Okinawa reported highest winds (in association with the southwest monsoon flow) of 27 kt (14 m/s) with gusts to 40 kt (21 m/s) at 121948Z. At that time Lee was 170 nm (315 km) to the north-northwest of the station. Overall, Lee's track and asymmetrical wind distribution spared Okinawa, but the western coast of South Korea appeared to be the next target and preparations had begun for the tropical cyclone's approach.

On the synoptic scale, lower standard pressure-level heights prevailed over the East China Sea between the two ridges. As the mid-latitude trough (Figure 3-09-4) approached the Yellow Sea on the 13th of August, it came into phase with the short wave trough extending south-southwestward from a deepening Siberian low near 52N 116E. By 131200Z the trough was oriented along 118E longitude and the ridge over Japan continued to build northward across the Seas of Japan and Okhotsk. This caused the mid-level steering flow from the south to increase over Lee. In response, Lee steadily accelerated across the East China Sea and passed 240 nm (444 km) west of the island of Kyushu, Japan. Coastal stations on Kyushu reported 10-25 kt (5-13 m/s) sustained winds. Aircraft reconnaissance reported the band of 40-60 kt (21-31 m/s) maximum winds remained about 120 nm (222 km) west of the coast.

As Lee began to break free of the monsoon trough, it reached it's peak intensity of 60 kt

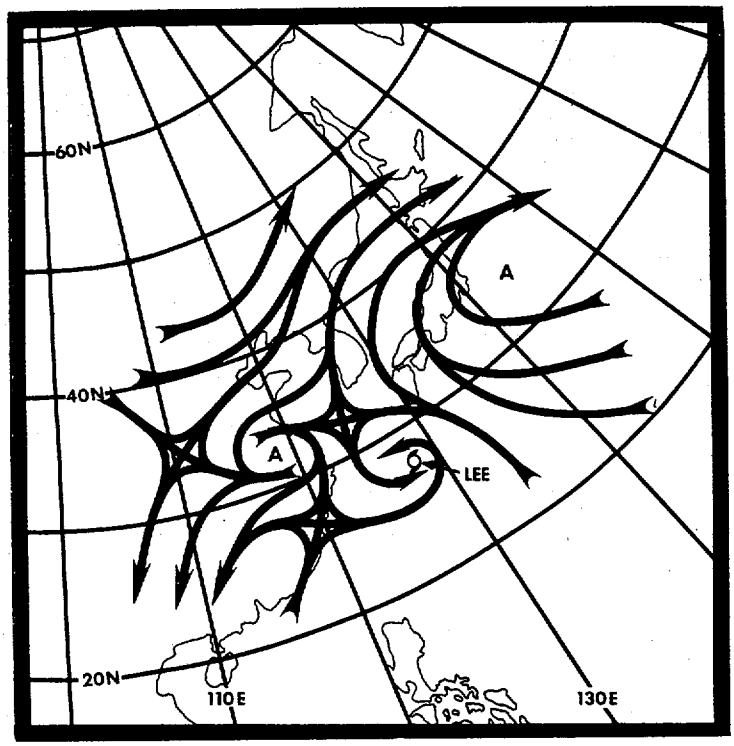


Figure 3-09-4. The 121200Z August 500 mb analysis with troughing in the subtropical ridge over the East China Sea.

(31 m/s) (Figure 3-09-5). Satellite imagery showed orientation of the supporting convection was changing, too. The strong upper-level westerlies were already pushing Lee's outflow to the northeast towards the southwest coast of South Korea.

Lee continued to accelerate and followed a northerly track across the Yellow Sea on 14 August, staying approximately 120 nm (222 km) offshore. This spared the coastline from any significant damage. A few reports of 35 kt (18 m/s) sustained winds were recorded at the southwest portion of the Korean peninsula. Later, Lee transited the North Korean coastline 60 nm (111 km) southeast of Sinuiju (WMO 54498) at 140600Z, and dissipated rapidly inland over the mountainous terrain. No reports of damage were available.

Of note, the tracks of Jeff, Kit, Lee, and later, Mamie in the Yellow Sea came under the influence of the same synoptic scale pattern during the first three weeks of August with ridging over Japan and troughing over northeast mainland China. This pattern maintained semi-persistent south-to-north mid-level steering flow over the Yellow Sea. Each tropical system in its own time recurved around the western periphery of the subtropical ridge and accelerated. Figures 3-09-6 and 3-09-7 show the approximate location and orientation of the synoptic scale trough with respect to the point of recurvature of each tropical system. The pattern shifted eastward from Jeff to Kit, then retrograded westward with Lee, and later, Mamie's track. The points of recurvature also indicate the western extent of the subtropical ridge in each case plus the northward displacement of the ridge axis which was well north of its climatological position.

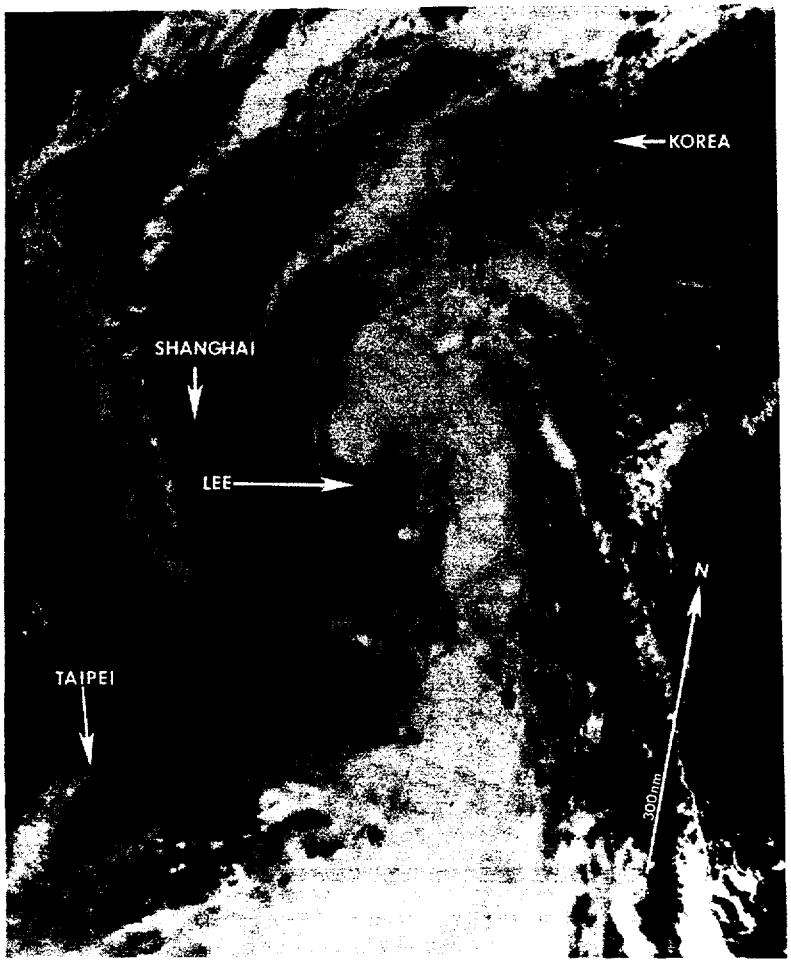


Figure 3-09-5. Tropical Storm Lee at its maximum intensity of 60 kt (31 m/s). The upper-level anticyclonic circulation displaced slightly to the northeast of the exposed low-level circulation center (130518Z August NOAA visual imagery).

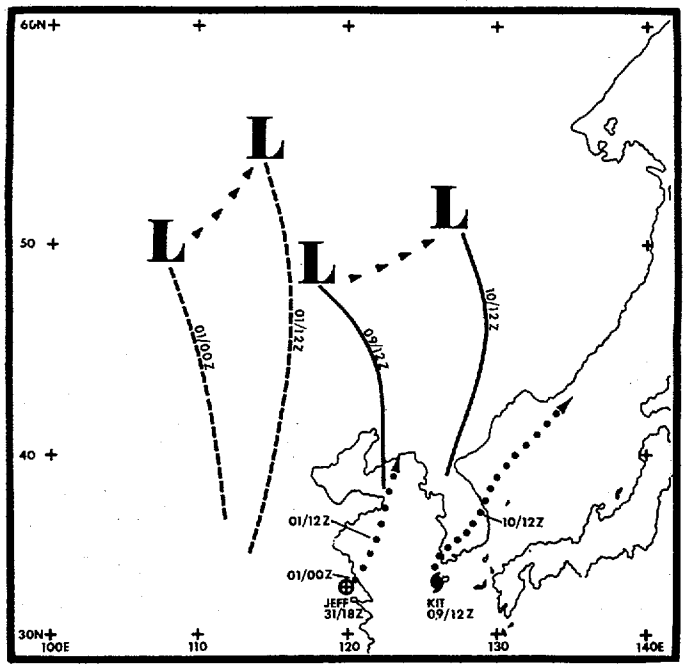


Figure 3-09-6. The best tracks (dotted line) of Jeff and Kit from the point of recurvature through the final warning are depicted. The times along the dotted lines at, or after, the recurvature point correspond with the respective positions of the mid-latitude troughs (dashed and solid lines). The arrows show the movement of the Siberian mid-level lows. Notice the Siberian low track is displaced further southeast during Kit.

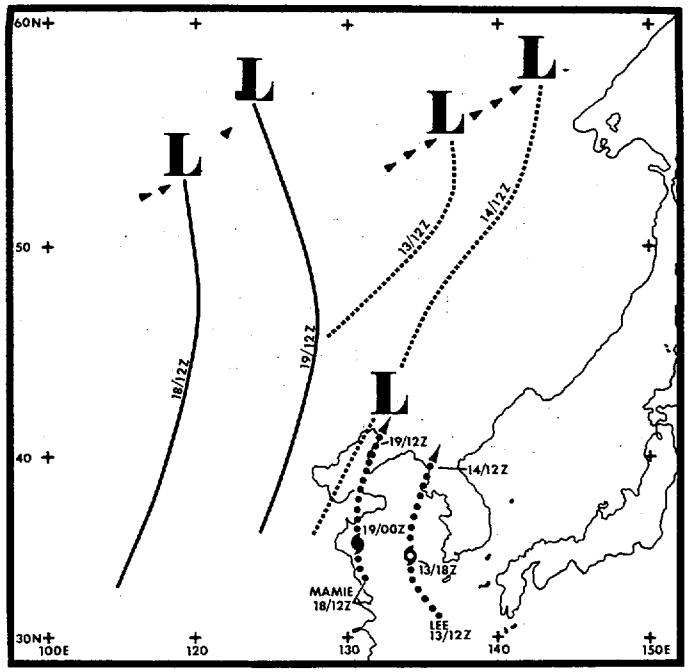
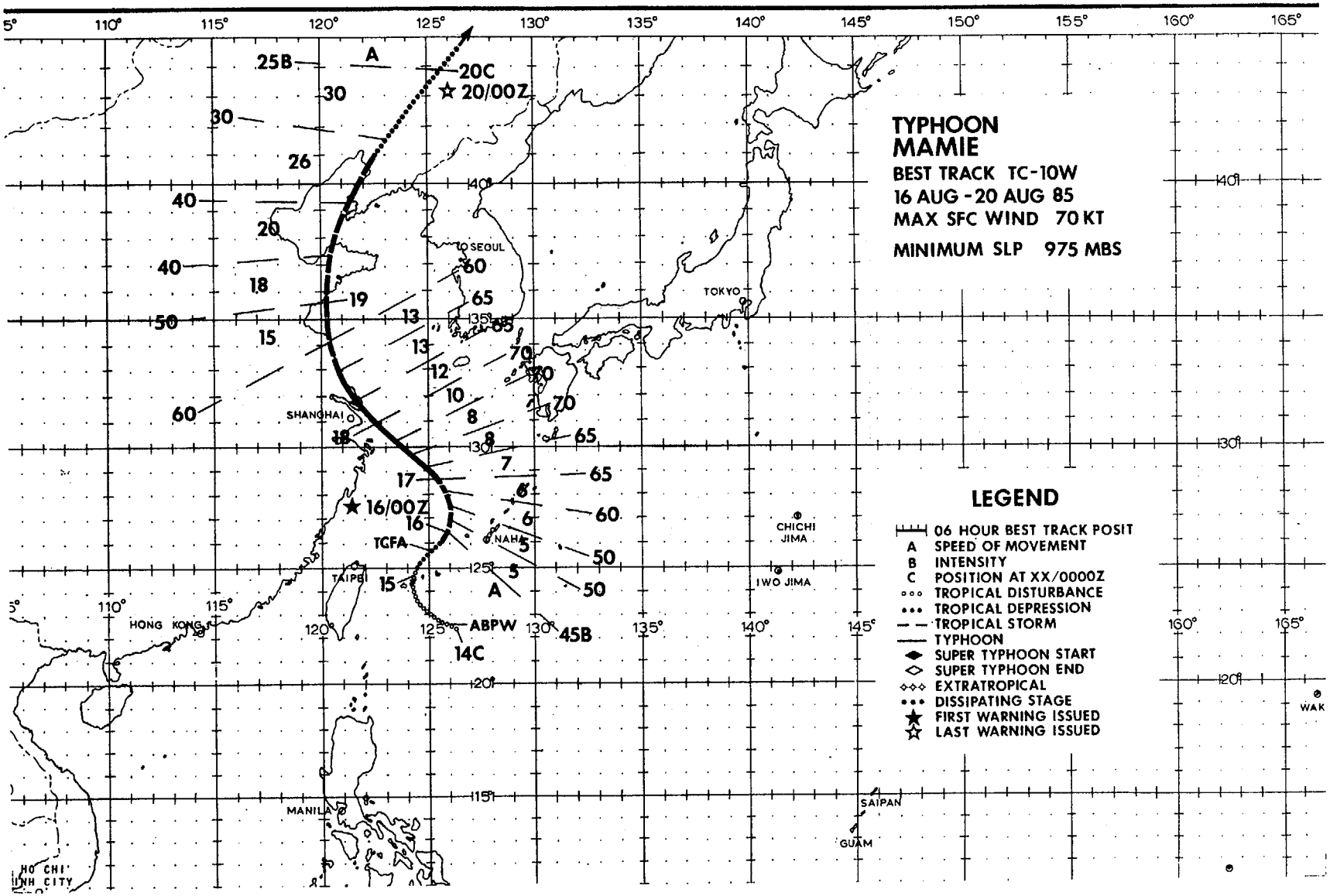


Figure 3-09-7. The best tracks (dotted line) of Lee and Mamie from the point of recurvature through the final warning are shown. The times along the dotted lines at, or after, the recurvature point correspond with the respective positions of the mid-latitude troughs (dashed and solid lines). Notice that the track of the Siberian lows retrogrades between the second and third week of August.


TYPHOON
MAMIE
BEST TRACK TC-10W
16 AUG - 20 AUG 85
MAX SFC WIND 70 KT
MINIMUM SLP 975 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
20C
20/00Z
16/00Z
ABPW
14C
45B
TGFA
SEOUL
TOKYO
SHANGHAI
TAIPEI
NAHA
HONG KONG
MANILA
CHICHI JIMA
IWO JIMA
SAIPAN
GUAM
WAK
HO CHI MINH CITY

Despite reaching a maximum intensity of only 70 kt (36 m/s), Typhoon Mamie was one of the more destructive tropical cyclones of the 1985 western North Pacific season. Following a path similar to its predecessor, Tropical Storm Lee, Mamie was responsible for at least 35 deaths and caused heavy damage to crops, homes, and shipping. For two days, Mamie skirted a 400 nm (740 km) stretch of the eastern Chinese coast from Shanghai (WMO 58367) to the Shantung Peninsula, inundating farmland and washing away many dikes and dams with its torrential rains. More than 800,000 civilians and soldiers were mobilized to combat the flooding and repair damage. Estimates of the destruction caused by Mamie were staggering: over 6.5 million trees uprooted, 2.9 million metric tons of high stalk farm crops ruined, more than 120,000 houses destroyed or damaged, over 200 watercraft of various types sunk or driven aground, and over 122,000 domestic livestock drowned.

Mamie formed from an area of convection that was originally part of the southwest monsoon flow into Tropical Storm Lee. At 0129Z on 14 August, visual satellite imagery indicated slight curvature in an area of convection due east of Taiwan that had separated from Lee's inflow. Figure 3-10-1 shows this area and its relationship to Lee. Subsequently, the area was included as a "poor" on the 140600Z Significant Tropical Weather Advisory (ABPW PGTW). Satellite imagery through the remainder of the 14th showed the disturbance was turning to the north and becoming more organized as the separation from Lee's wind field increased. The 150600Z ABPW PGTW bulletin reflected this development by upgrading the potential for development to "fair" and aircraft reconnaissance of the disturbance was requested for the following morning.

At 151200Z, a TCFA was issued, based on increased curvature of the convective bands and anticyclonic cirrus outflow indicated by satellite imagery. At this point, the area was beginning to intensify more rapidly than before, due partly to Lee's waning influence on the new circulation. At 152340Z, aircraft reconnaissance closed-off a circulation of tropical storm intensity 90 nm (167 km) due west of Okinawa, prompting the issuance of the first warning on Mamie at 160000Z. Less than three hours later Kadena AB on Okinawa reported its strongest winds from Mamie - south at 20 kt (10 m/s) with a peak gust to 35 kt (18 m/s).

On 16 August Mamie began to turn to the northwest. This turn was due to the low-level ridge north of Mamie strengthening slightly as the mid-latitude trough that had interacted with the remnants of Tropical Storm Lee began to move rapidly to the east in the mid-latitude westerlies. However, the ridge never became strong enough to stop Mamie from heading north-northwest, then north through a weak area in the ridge that persisted throughout Mamie's lifetime. Mamie continued to intensify, reaching typhoon intensity at about 170000Z as it moved northwest at 7 kt (13 km/hr) toward Shanghai (WMO 58367).

The Typhoon reached a peak intensity of 70 kt (36 m/s) 12-hours later at 171200Z, just prior to affecting the Chinese coast near Shanghai (Figure 3-10-2). Mamie traversed the Chinese coastline, hitting Tsingtao, with decreased winds of 50 kt (26 m/s) at about 190200Z. Mamie then turned north around the western periphery of the subtropical ridge and crossed the Shantung Peninsula, striking Yantai, China (near Fushan WMO 54764) at about 190600Z.

Mamie accelerated to 20 kt (37 km/hr) and weakened to a 40 kt (21 m/s) tropical storm just prior to crossing the Yellow Sea and moving toward Dairen, China (WMO 54662). After making landfall just west of Dairen at 191200Z, Mamie began to dissipate over land. Because Mamie's intensity decreased to an estimated 25 kt (13 m/s) and due to its location over the mountains of northeast China, the last warning was issued at 200000Z.

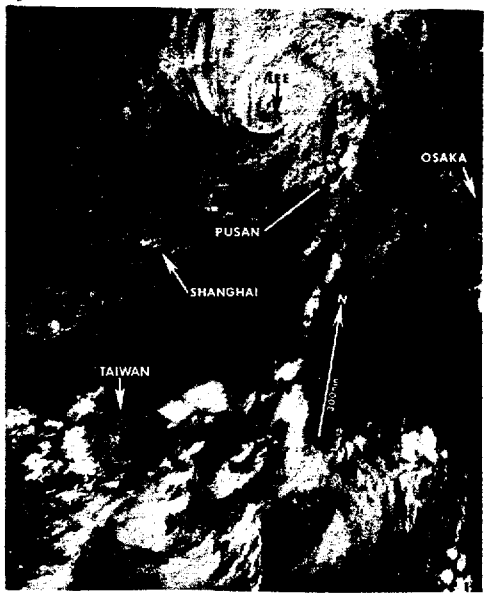


Figure 3-10-1. The tropical disturbance that became Typhoon Mamie is located east of the island of Taiwan. The slightly curved convective band and separation from the cloudiness associated with Tropical Storm Lee to the north were the first signs of organization (1401Z92 August DMSP visual imagery).

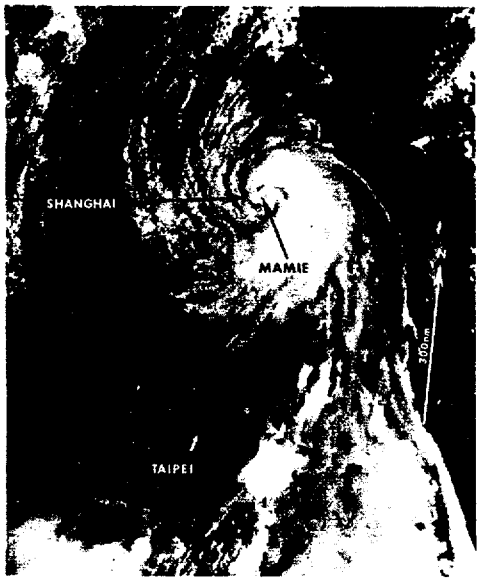
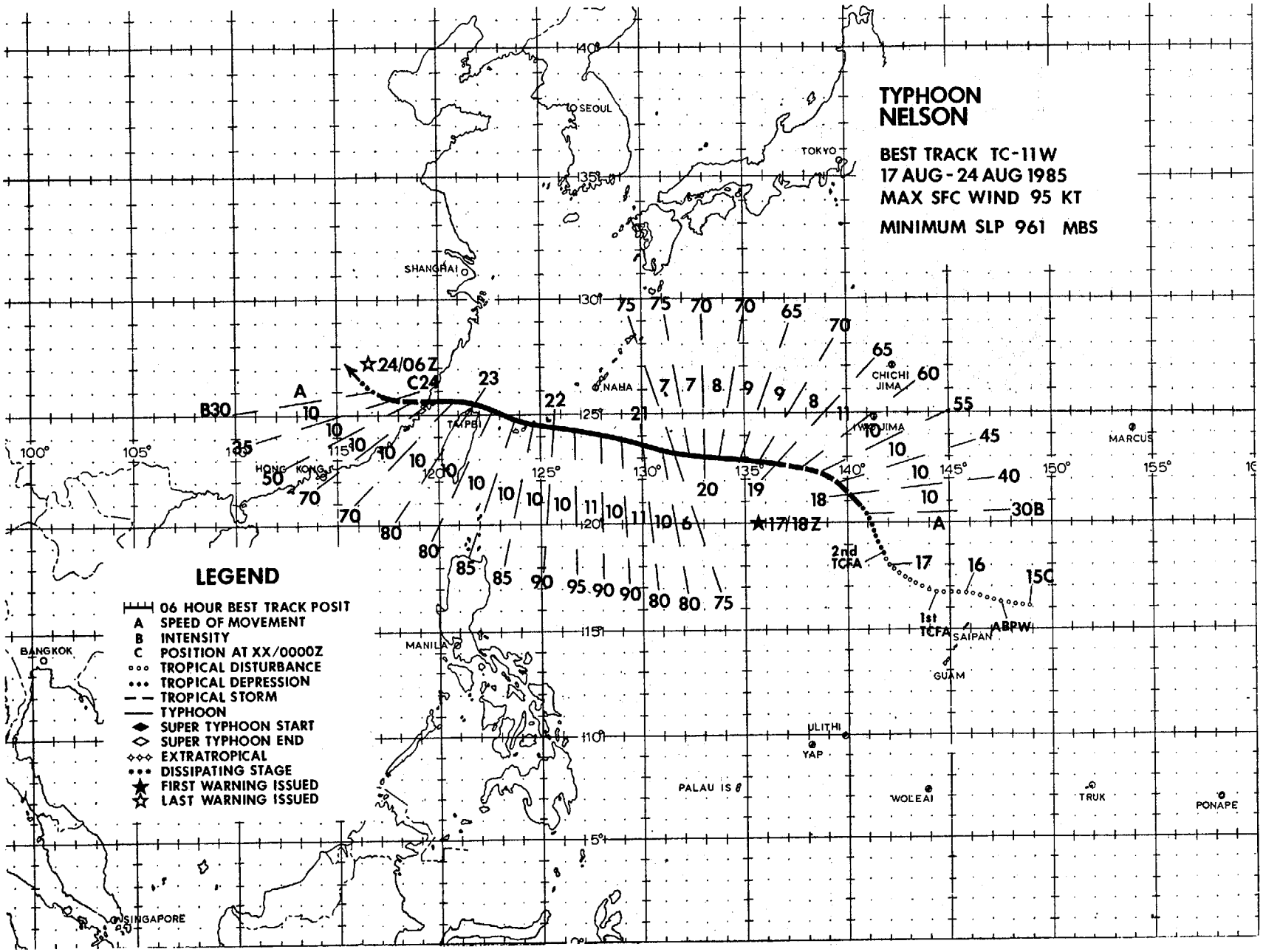


Figure 3-10-2. Mamie with typhoon force winds passing just east of Shanghai, China (1801Z92 August DMSP visual imagery).


TYPHOON
NELSON
BEST TRACK TC-11W
17 AUG - 24 AUG 1985
MAX SFC WIND 95 KT
MINIMUM SLP 961 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
SEOUL
TOKYO
SHANGHAI
NAHA
CHICHI JIMA
HONG KONG
TAIPEI
MARCUS
BANGKOK
MANILA
SAIPAN
GUAM
ULITHI
YAP
PALAU IS
WOLEAI
TRUK
PONAPE
SINGAPORE
☆24/06Z
★17/18Z
2nd TCFA
1st TCFA
ABPW

Typhoon Nelson was the fourth of seven tropical cyclones that developed over the Northwest Pacific in August. It caused substantial damage and loss of life as it passed through the southern Ryukyu Islands, brushed by northern Taiwan and crossed into mainland China.

On 14 August Tropical Storm Lee was dissipating as it moved across North Korea and Typhoon Mamie was building near the southern Ryukyu Islands just east of Taiwan. The following day the disturbance that developed into Typhoon Nelson was first noticed as a small, but persistent, area of poorly organized convection 150 nm (278 km) east-northeast of the island of Saipan in the Marianas. The area was located in the near-equatorial trough where the convective cloudiness was enhanced by the divergent upper-level flow associated with an upper cold low in the tropical upper-tropospheric trough (TUTT). Synoptic data at 150000Z indicated that southwesterly gradient-level flow from the Philippine Sea was near the disturbance. These factors, plus the satellite imagery at 150300Z which showed a slight cyclonic curvature in the convection, prompted mention of the area on the 150600Z Significant Tropical Weather Advisory (ABPW PGTW).

During the next 24-four hours, satellite imagery revealed a marked increase in the amount of convection over the northeastern portion of the disturbance with another larger area of unorganized convection moving toward the disturbance from the west-southwest. By 160000Z, synoptic data indicated that the soutwesterly gradient flow had propagated eastward to the disturbance and an associated upper- level anticyclone had formed over the disturbance. A Tropical Cyclone Formation Alert (TCFA) followed at 160625Z.

Aircraft reconnaissance late on the sixteenth was unable to locate a surface circulation. However, the aircraft reconnaissance weather officer (ARWO) did report: a narrow low-level trough that was 200 nm (370 km) in extent and elongated northeast-southwest; three possible 1002 mb pressure centers; and maximum winds of 10-20 kt (5-10 m/s) to the north of the trough. The TCFA was reissued at 170555Z.

A dramatic increase in both the cyclonic curvature and amount of central convection occurred at 171600Z. The Dvorak intensity estimate of the system was 35 kt (18 m/s). This intensity estimate together with the continuing development of the system led to the first warning on Nelson at 171800Z. Aircraft reconnaissance at 172131Z confirmed this development, and more, when gale force surface winds were located north of a 989 mb low pressure center. Specifically, the flight revealed the 700 mb center was displaced 31 nm (57 km) to the northwest of the surface center and a band of 45 kt (23 m/s) low-level winds was located 90 nm (167 km) to the north-northwest.

Due to the uncertainty in the Fleet Numerical Oceanography Center (FNOC) mid-level wind fields in the data sparse region south of Japan, a 400 mb synoptic track mission was flown early on the 18th to better define the mid-level steering flow north of Nelson. Data from this flight confirmed that the ridge extended westward over Nelson and indicated forecasts for an "under the ridge" scenario were appropriate. This forecast scenario proved to be correct.

Further intensification occurred as Nelson assumed a more west-northwesterly track. At 190000Z, Nelson was upgraded to a typhoon after aircraft reconnaissance indicated the system had a 5 nm (9 km) diameter light/variable wind center with a 979 mb MSLP and 65 kt (33 m/s) maximum surface winds displaced 40-120 nm (74-220 km) northwest of the center. Almost three days later, at 211800Z, Nelson reached a peak intensity of 95 kt (49 m/s) with a MSLP of 961 mb (see Figure 3-11-1).

Nelson passed between the Ryukyu Islands of Yaeyama and Miyako early on 22 August and continued moving west-northwestward under the ridge. Early on 23 August (Figure 3-11-2), the typhoon skirted northern Taiwan passing within 25 nm (46 km) of Taipei(WMO 58968). The tropical cyclone quickly transited the Formosa Straits and made landfall 40 nm (74 km) southwest of Fuchou (WMO 58847) in China's Fuchien province at 241400Z.

In retrospect Nelson's passage between Yaeyama and Miyako Islands resulted in more than 1.5 million dollars in damage to banana and sugar cane crops. As Nelson skirted northern Taiwan, four people were reported killed from the associated winds and torrential rains. At landfall in China's Fuchien province, another forty-eight people perished, with an additional 329 reported injured, more than 5,000 homes destroyed, 969 fishing boats sunk and about 178,500 acres of crops lost.

After Nelson dissipated, an additional three days of heavy rains associated with the remains of the system affected many areas of eastern China. At least 147 people were killed and more than 30,000 persons were driven from their homes by flooding in Hunan province further inland. Later, Shanghai reported 50,000 homes with flood damage resulting from these heavy rains inland.

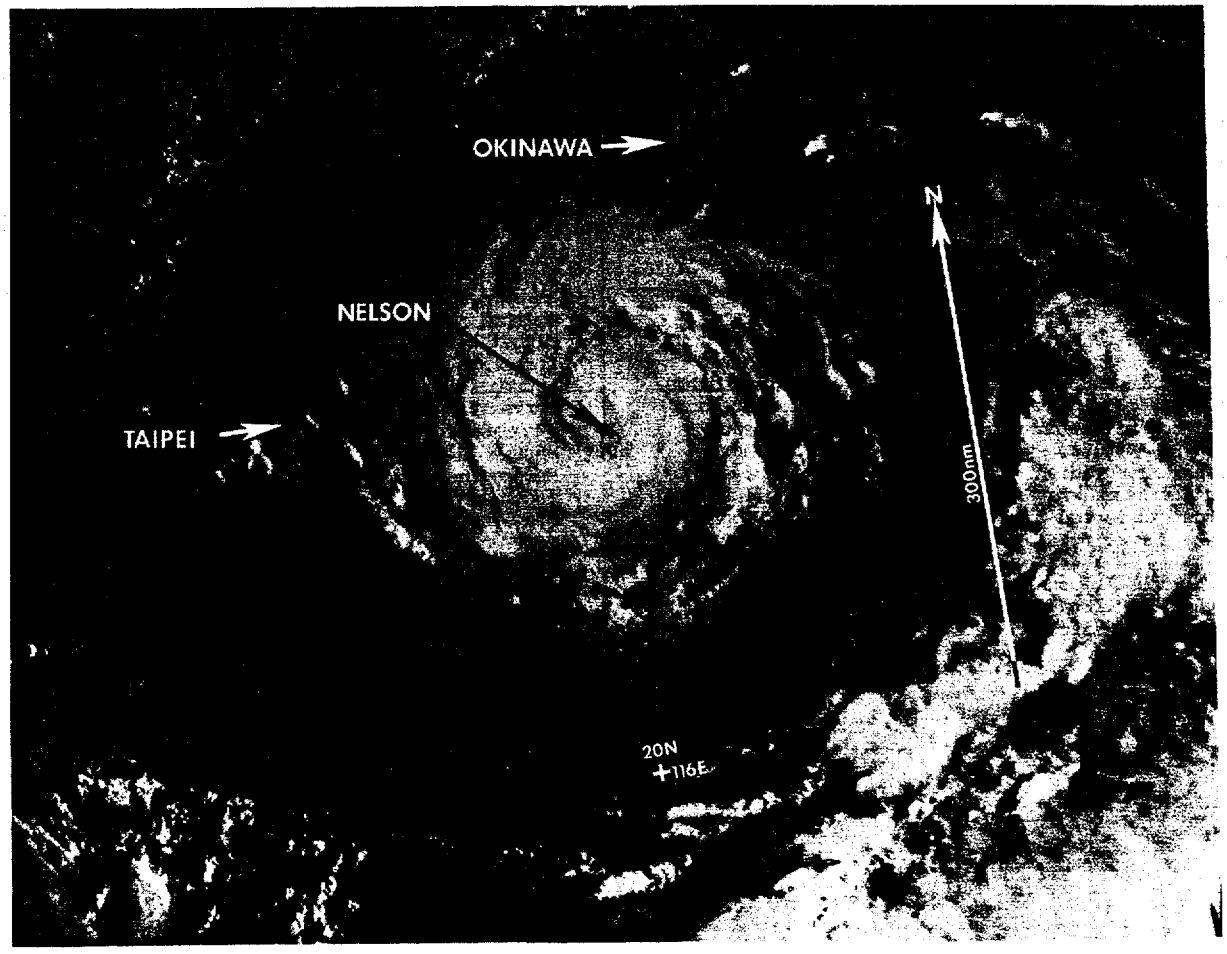


Figure 3-11-1. Typhoon Nelson near maximum intensity (212355Z August NOAA visual imagery).

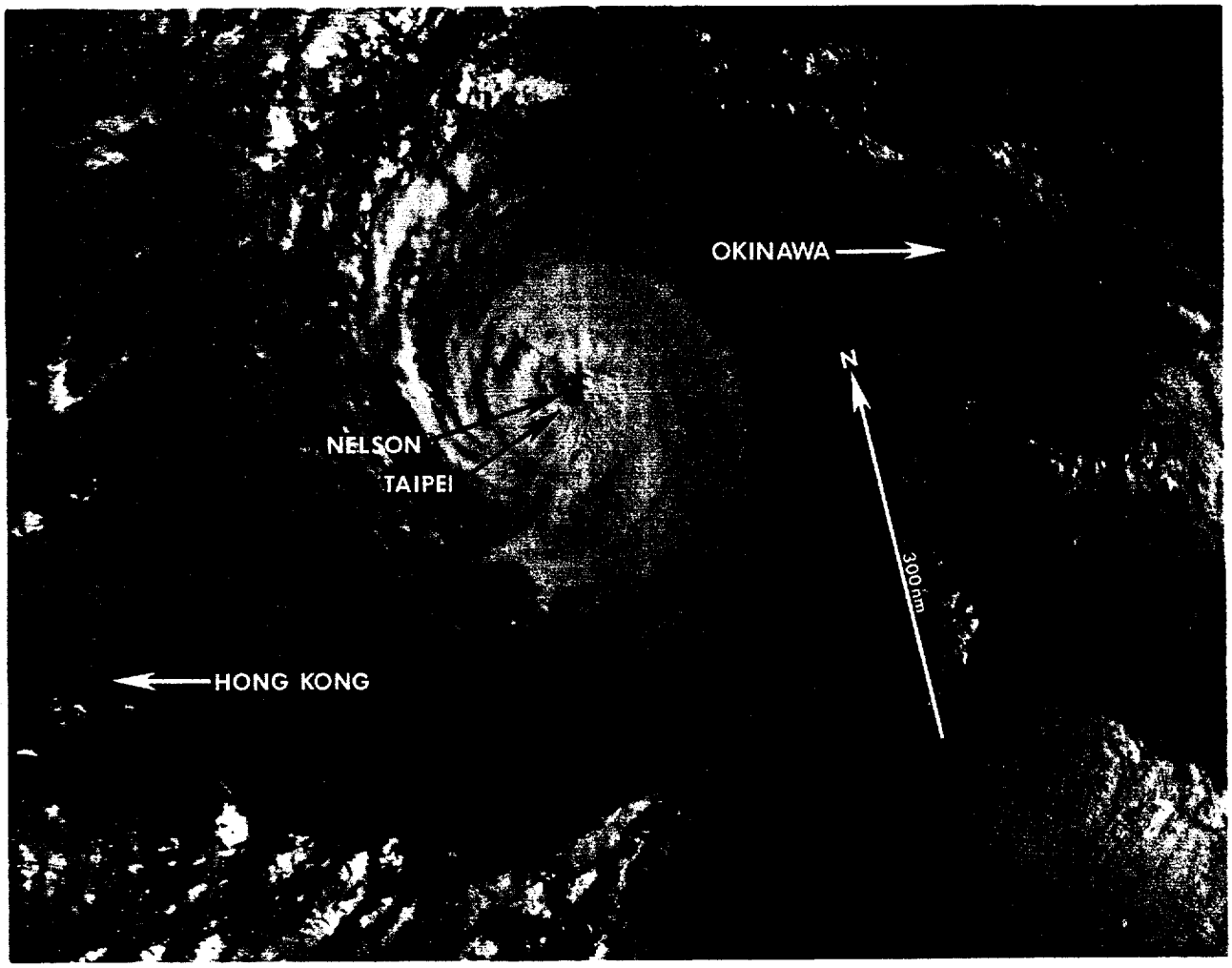
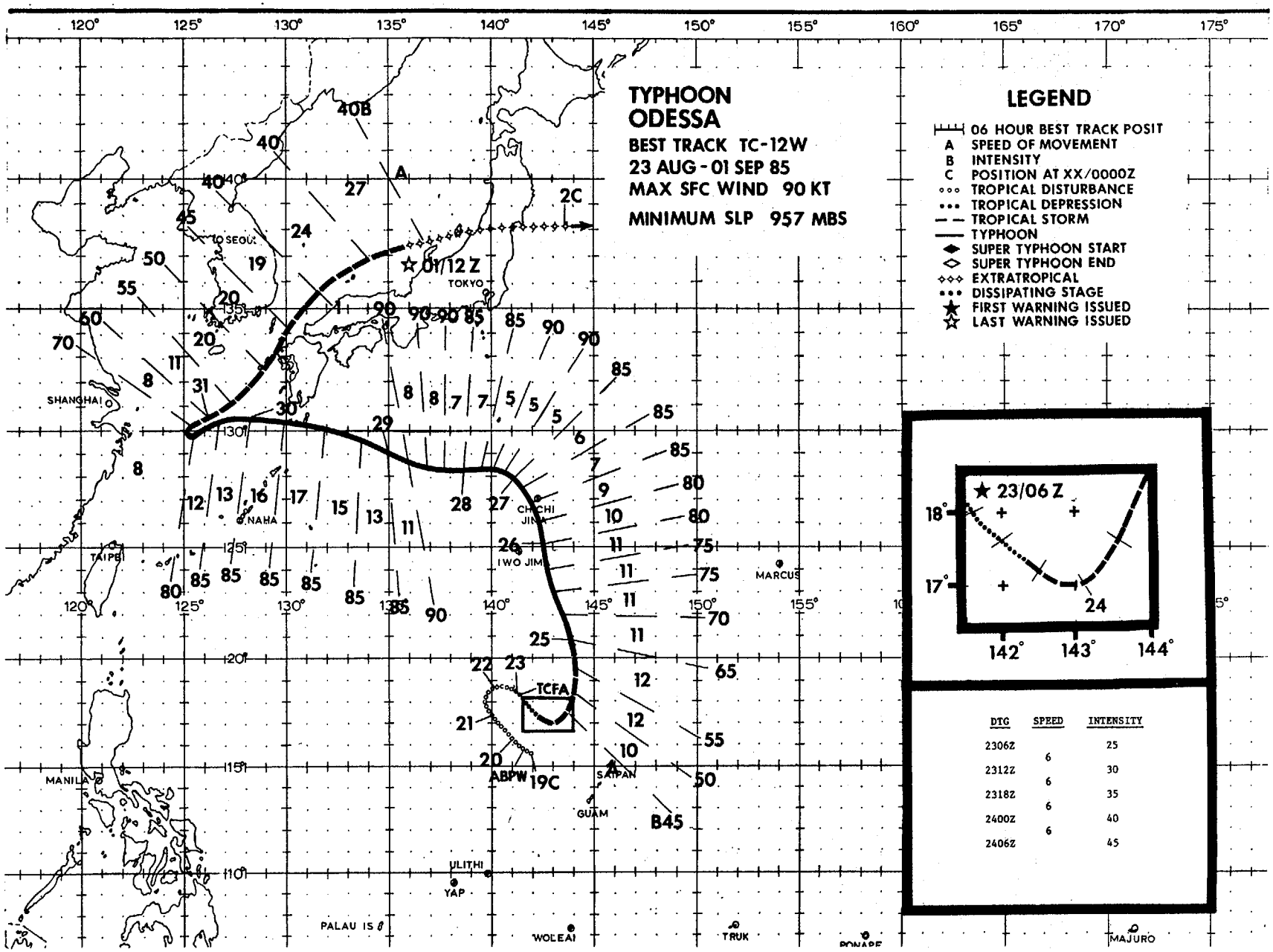


Figure 3-11-2. Nelson skirting the island of Taiwan (222334Z August NOAA visual imagery).


TYPHOON
ODESSA
BEST TRACK TC-12W
23 AUG - 01 SEP 85
MAX SFC WIND 90 KT
MINIMUM SLP 957 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
01/12 Z
23/06 Z
TCFA
ABPW
19C
2C
B45
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
CHICHI JIMA
IWO JIM
MARCUS
SAIPAN
GUAM
MANILA
ULITHI
YAP
PALAU IS
WOLEAI
TRUK
MAJURO
DTG SPEED INTENSITY
2306Z 25
6
2312Z 30
6
2318Z 35
6
2400Z 40
6
2406Z 45

Odessa persisted for almost two weeks and required a total of thirty-eight warnings - in this regard, only Typhoon Jeff with forty-one exceeded Odessa's total during 1985 season. The system became part of a multiple tropical cyclone outbreak along with Typhoon Pat and Tropical Storm Ruby. At one time five tropical cyclones were in warning status. Ultimately, Odessa underwent a complex binary interaction with Typhoon Pat south of Japan before completing extratropical transition over the Sea of Japan.

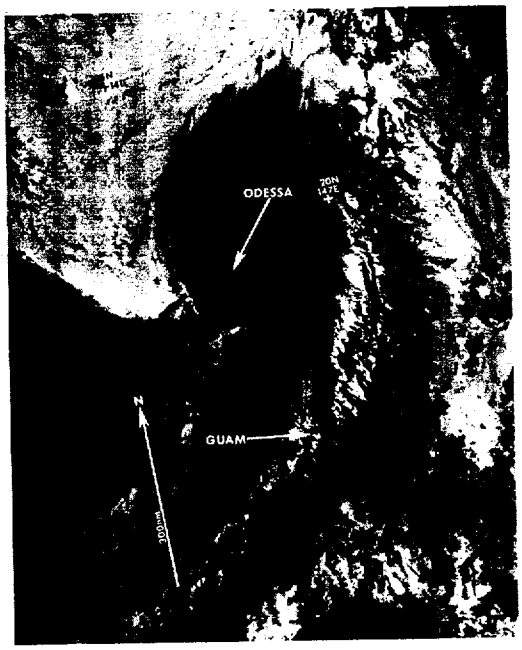


Figure 3-12-1. Nighttime imagery of Odessa with a single outflow channel that is directed equatorward (241227Z August DMSP infrared imagery).

By the third week of August, Typhoon Nelson had moved westward across the northern Philippine Sea. At that time, the eastern end of the monsoon trough extended across the Philippine Sea to the vicinity of Guam. The eastern end of the low latitude westerly monsoonal flow, where it interacted with the easterly tradewinds, became the preferred location for maximum cloudiness. Initially, on 19 August, the deep convection in this area appeared random with little, or no, curvature, but its persistence was sufficient reason for its inclusion on the Significant Tropical Weather Advisory (ABPW PGTW). With maximum surface winds in the monsoonal flow of 15 to 20 kt (8 to 10 m/s) and a minimum surface pressure of 1006 mb, the potential for development was rated as poor.

This potential for intensification changed to fair at 220600Z as the convective mass began to increase in size over a low-level circulation which began to separate from the surrounding cloudiness. A TCFA followed at 230230Z based on meteorological satellite imagery which showed a Central Dense Overcast (CDO). Aircraft reconnaissance was scheduled for the next day. The persistent CDO, a favorable outflow channel aloft to the south, and a pre-existing low-level circulation center, prompted the first warning for Tropical Depression 12W a short time later at 230600Z. The Depression was upgraded at 240000Z when aircraft reconnaissance observed sustained surface winds of 30 kt (15 m/s) that were gusting to 55 kt (28 m/s) southeast of the center - the MSLP was estimated to be 1000 mb (Post analyses revealed that Odessa reached tropical storm intensity shortly before 231800Z). The aircraft also discovered that the low-level center had drifted southeastward during the night, when interpretation of infrared satellite imagery was restricted to positioning the poorly defined upper-level circulation center.

Erratic movement became less of a concern as Odessa matured and assumed a north-northwestly track. Aircraft reconnaissance at 242340Z reported typhoon

Figure 3-12-2. Odessa with channel-less or no-channel outflow (281024Z August NOAA infrared imagery).

intensity winds and a circular eye 15 nm (28 km) in diameter. The warning valid at 250000Z, upgraded Odessa to a Typhoon. Odessa remained a compact typhoon for the following six days. Of interest in this regard was the change in the outflow channel from equatorward, during the maturation process, to the absence of the channel, during the small, but intense, typhoon stage. Compare Figures 3-12-1 and 3-12-2 to appreciate the shift of outflow.

Odessa's north-northwesterly movement slowed as it approached the subtropical ridge axis. The critical forecast - whether to go through the ridge or westward under the ridge - was handled well. The primary aids, the One-way Interactive Tropical Cyclone Model (OTCM) and Nested Tropical Cyclone Model (NTCM), (Figure 3-12-3) were at odds apparently due to their respective sensitivities to the narrow ridge to the north. NTCM provided the better guidance in this case. Odessa tracked, as forecast, and turned westward under the influence of the narrow subtropical ridge over Japan.

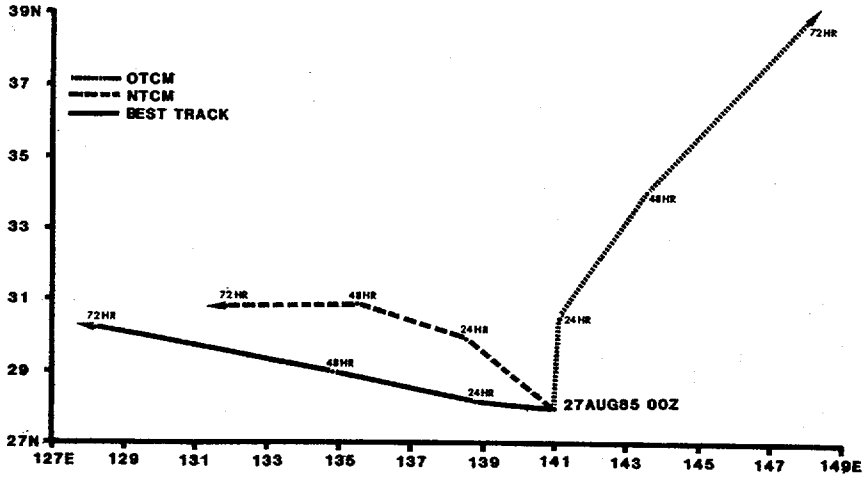


Figure 3-12-3. Primary aids, NTCM and OTCM, provide conflicting guidance. NTCM correctly senses the track to the West. The best track position is a solid line.

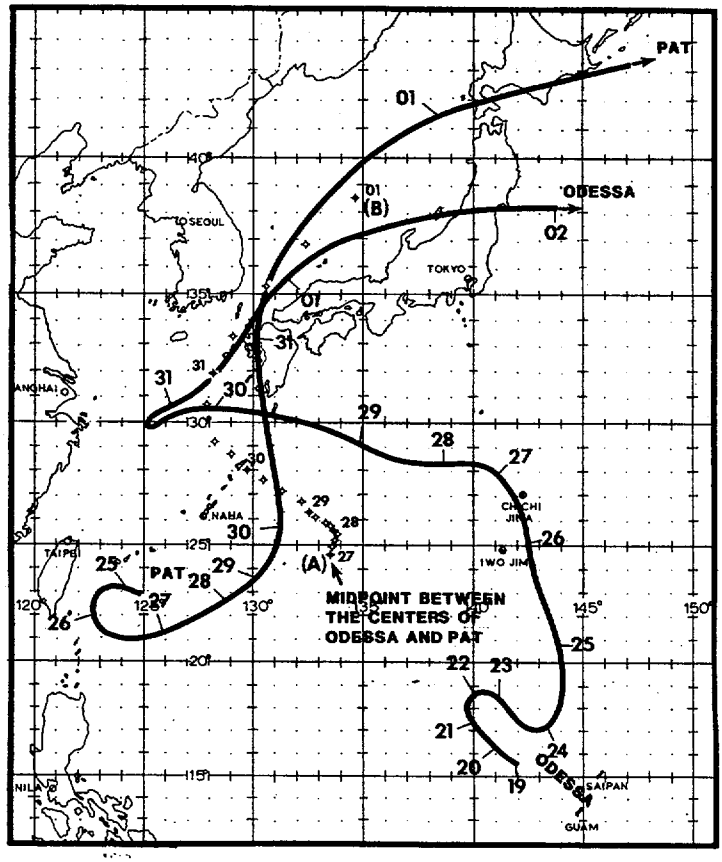


Figure 3-12-4. Best track positions for Pat and Odessa. The small symbols from (A) to (B) are the midpoints between the respective centers of Pat and Odessa at each six hourly interval.

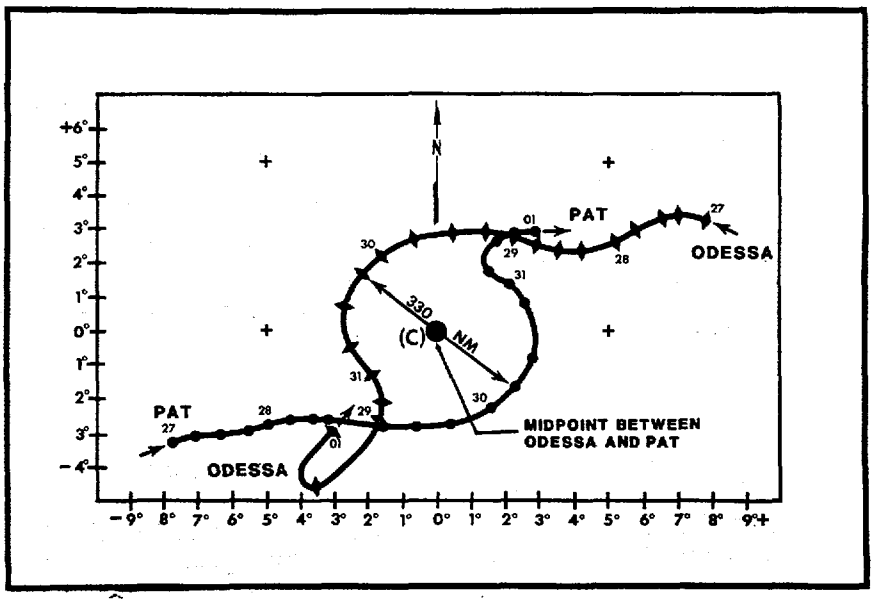


Figure 3-12-5. The singular point at (C) contains all the midpoints taken from the (A) to (B) in the previous Figure 3-12-4. The positions of both Pat and Odessa relative to the midpoint reflect the inward, spiralling interaction between the two systems with time.

As the tropical cyclone pressed ahead on its new track, it began to accelerate in response to the approach of Typhoon Pat from the south. The complex interaction between the spatially proximate cyclones, or binarys, is not readily apparent from Figure 3-12-4, which depicts the superimposed tracks. If the midpoint is determined for each six hourly time period, the locus of midpoints from A to B results (see Figure 3-12-4). When this locus becomes a singular point (C) in Figure 3-12-5 and the respective positions of the two typhoons are replotted relative to (C), the subtle attraction and cyclonic rotation into a circle of 330 nm (611 km) becomes apparent. It is interesting to compare the relative sizes of Pat, which is average, and Odessa, which is small and compact (reference the surface isobaric analysis in Figure 3-12-6). Returning to Figure 3-12-5, it is important (next) to note the departure of both typhoons from the 330 nm (611 km) circle at 310000Z. This was the beginning of extratropical transition and separation. Satellite imagery is provided in Figure 3-12-7.

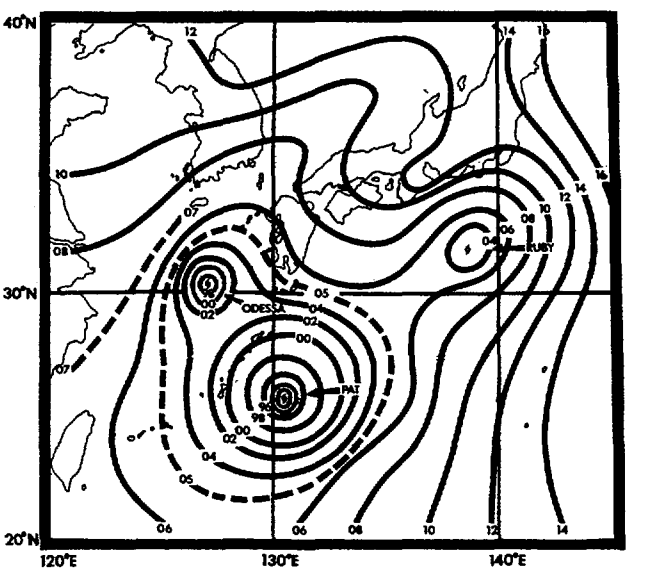


Figure 3-12-6. Isobaric analysis for 300000Z August indicates the size difference between Pat and the small compact Odessa. The weaker system to the northeast is Tropical Storm Ruby, which remained solitary and apparently didn't enter into the interaction.

The movement of Odessa under the ridge had served the prognostic reasoning well since the 27th. The forecast remained conservative and held to persistence as Odessa began to display erratic behavior, but the ridge to the north had changed. Both aids, OTCM and NTCM, indicated north to north-easterly movement (see Figure 3-12-8). When Pat started accelerating northeastward across Japan, Odessa executed an abrupt turn to the northeast and followed on its heels. Forecasts for Odessa's forward motion proved too slow as it accelerated into the Sea of Japan and began extratropical transition. Fortunately the system was compact and weakening or damage might have been more widespread. In Kyushu and other southern islands of Japan strong rains and winds from Odessa knocked out power and caused fishing vessels to capsize. Ships remained in port at Sasebo, Japan (WMO 47812)as Odessa passed sixty miles to the north. The final warning was issued at 011200Z September as the extratropical remains of Odessa approached northern Honshu.

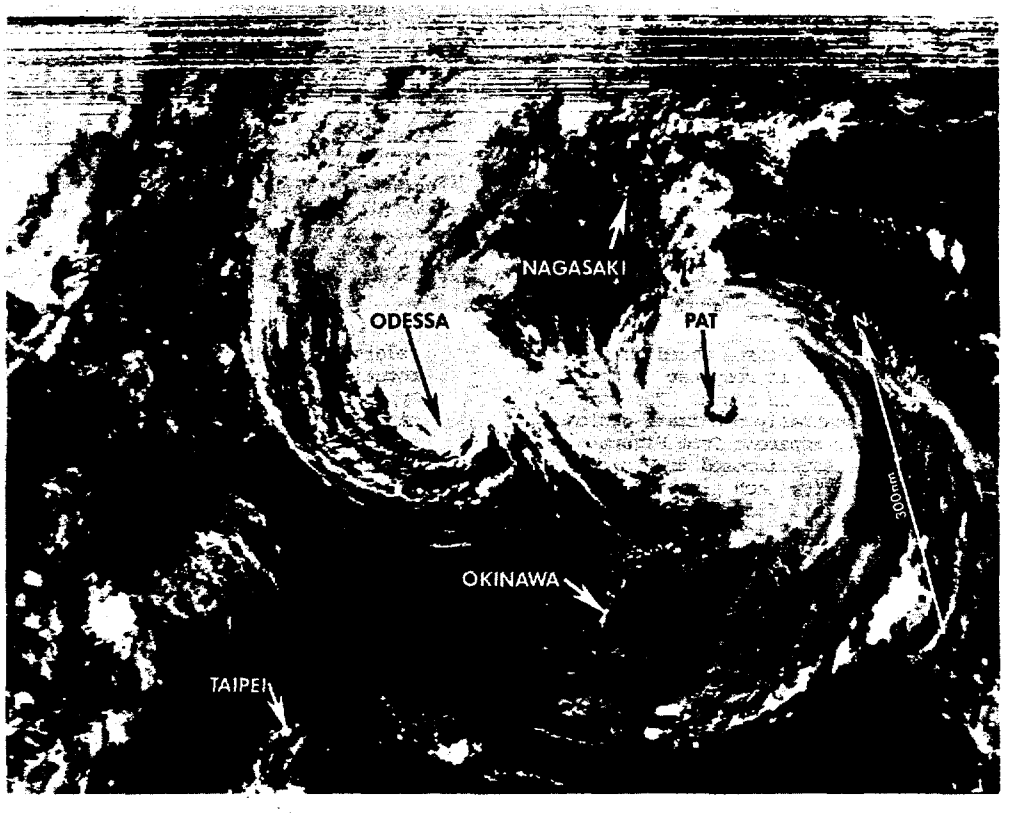


Figure 3-12-7. In this moonlight photo Pat's ragged eye and large surrounding cloud mass dwarf Odessa, which is also at typhoon intensity (301348Z August DMSP visual imagery).

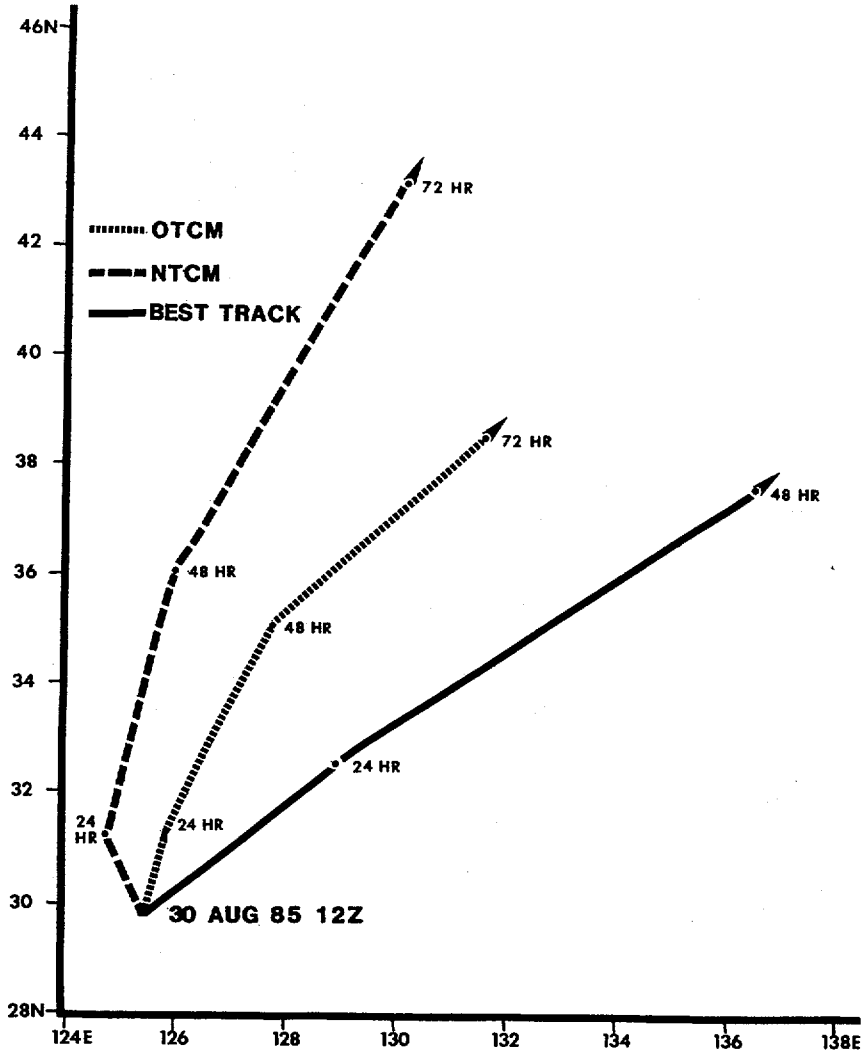
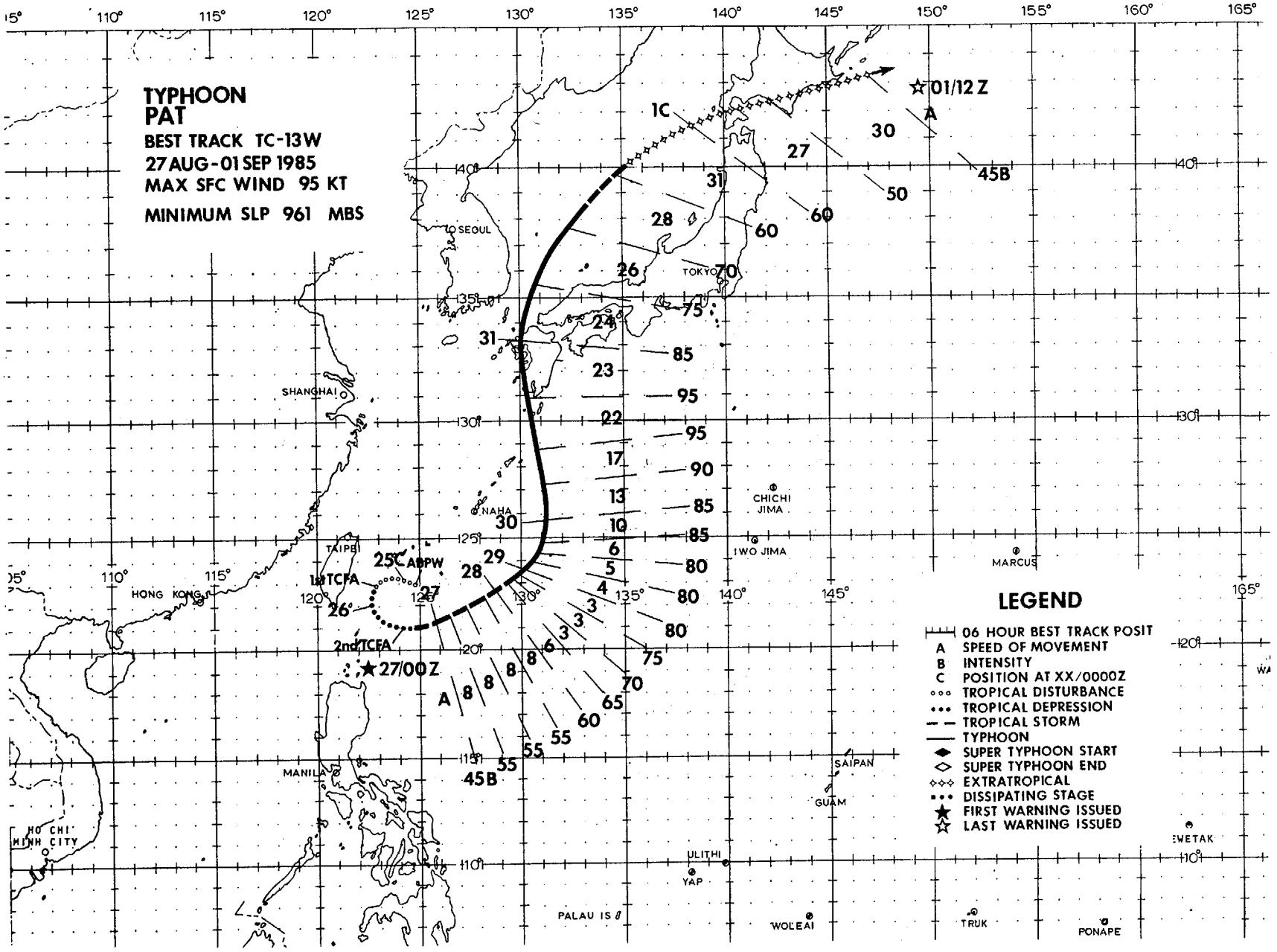


Figure 3-12-8. Primary aids, NTCM and OTCM, at 3012002 August reflect a north to northeasterly track. The best track positions (solid line) indicate the guidance was basically correct.


TYPHOON
PAT
BEST TRACK TC-13W
27 AUG - 01 SEP 1985
MAX SFC WIND 95 KT
MINIMUM SLP 961 MBS
01/12 Z
1C
A
30
27
45B
50
31
28
60
60
26
70
24
75
31
85
23
95
22
95
17
90
13
85
10
85
6
80
5
80
4
80
3
3
3
75
70
65
60
55
55
55
45B
8
8
8
6
A
25C ABPW
1st TCFA
2nd TCFA
27/00Z
26
29
28
27
30
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
HONG KONG
MANILA
HO CHI MINH CITY
CHICHI JIMA
IWO JIMA
MARCUS
SAIPAN
GUAM
ULITHI
YAP
PALAU IS
WOLEAI
TRUK
PONAPE
EWETAK
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED

Typhoon Pat developed east of Taiwan in the monsoon trough a few days after Typhoon Odessa and one day before Tropical Storm Ruby. Pat was significant due to the complex forecasting problems it caused and the damage it inflicted in Japan. The presence of two other storms (Odessa and Ruby) presented a variety of possible forecast interactions. The movement of each cyclone had to be considered in combination with the changing synoptic pattern.

The monsoon trough remained quite active the last two weeks of August. The disturbance which eventually evolved into Pat, originated in the wake of Typhoon Nelson as it moved into eastern China. The 241900Z Significant Tropical Weather Advisory (ABPW PGTW) first identified this disturbance as an area of enhanced convection in the monsoon trough. The convergence in the southwest monsoon flow combined with upper-level divergence provided an environment favorable for continued development.

The first Tropical Cyclone Formation Alert (TCFA) was issued at 251530Z when synoptic data indicated the minimum sea-level pressure (MSLP) had dropped to 1002 mb and winds of 25 kt (13 m/s) were present. An aircraft reconnaissance mission flew to investigate the region on the 26th. Although it was unable to locate a circulation, the data collected indicated the disturbance was developing - the MSLP had fallen to 999 mb and 40 kt (21 m/s) winds were observed on the south side of the monsoon trough. As a result, the TCFA was renewed at 261530Z. Figure 3-13-1 shows the active monsoon trough at this time. The disturbance is visible on the western side of the imagery with Typhoon Odessa further to the east.

Aircraft reconnaissance early on the 27th located the circulation center, prompting issuance of the first warning, valid at 270000Z. By this time

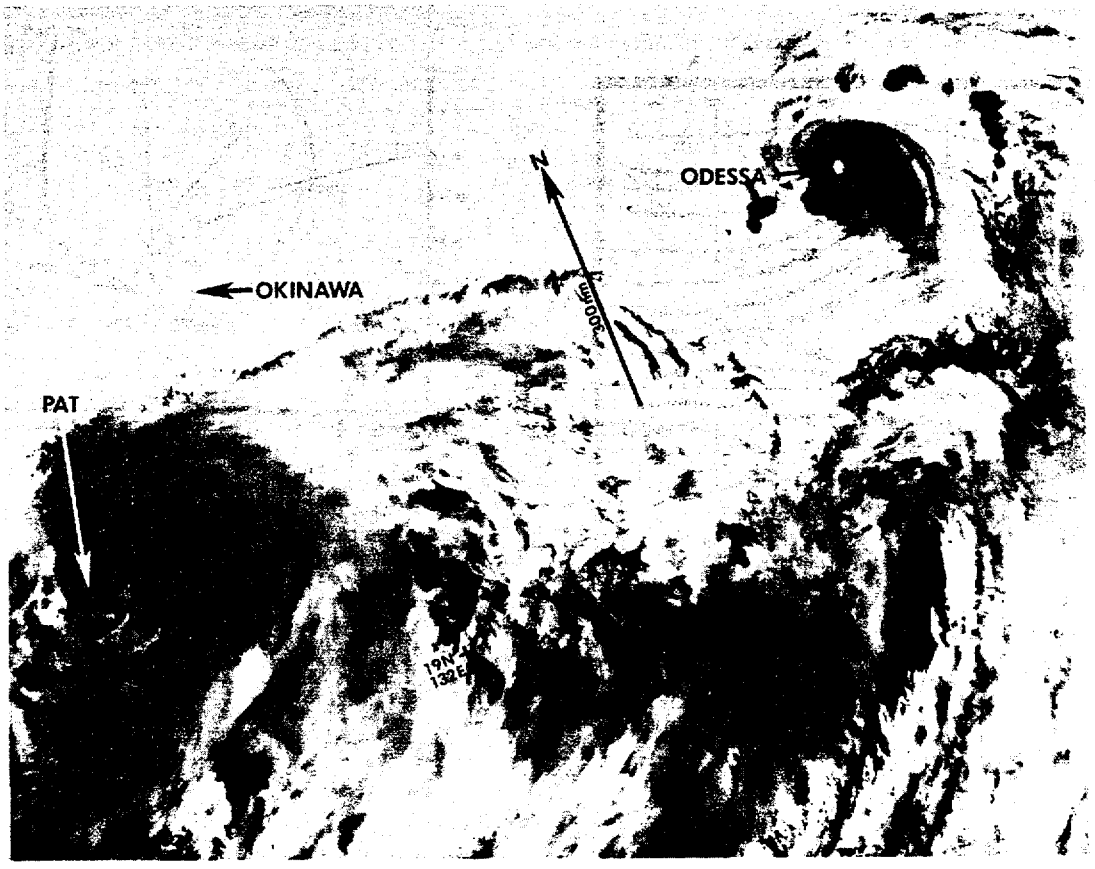
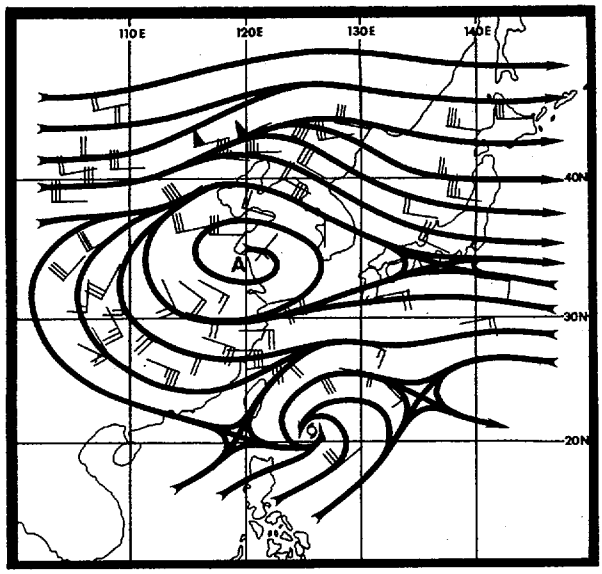


Figure 3-13-1. The tropical disturbance which became Typhoon Pat is visible as an organized area of convection in the monsoon trough. (Typhoon Odessa can also be seen) (261328Z August DMSP infrared imagery).

Pat, due to the enhanced southwesterly monsoon flow, already was at tropical storm intensity. As mentioned earlier, a large number of different factors needed to be taken into account in Pat's forecast.

Determining the direction of the track was the first problem. Because the cyclone was poorly defined on satellite imagery and as a consequence difficult to position, Pat was believed to be moving west-northwest for the first two warnings, when it was actually moving east-northeast. This was critical since persistence from past movement is often a major forecast consideration, especially in the short term forecasts. Figures 3-13-2 and 3-13-3 show some of the data available to the forecasters. A streamline analysis of the 270000Z August 500 mb data has been completed in Figure 3-13-2 to show the location of the subtropical ridge north of Pat. Figure 3-13-3 depicts the first set of forecast aids, using the east-northeast persistence track as a basis, along with the forecast and best track. The most striking feature is, that despite a lot of different options provided by the aids, none really hit the mark at seventy-two hours.

Figure 3-13-2. Mid-tropospheric (500 mb) wind flow at 270000Z August. The dominant synoptic feature is the subtropical ridge extending across China and Japan to the north of Pat.



hit the mark at seventy-two hours.

The forecast called for Pat to move along the monsoon trough to the east-northeast; separate from the trough, and turn back to the west-northwest under the subtropical ridge. This was in reasonable agreement with the One-way Interactive Tropical Cyclone Model (OTCM) model which is usually the best performing forecast aid. The Fleet Numerical Oceanography Center (FNOC) 72-hour 500 mb Navy Operational Global Atmospheric Prediction System (NOGAPS) prognosis called for the ridge to weaken as a trough moved eastward across Mongolia. It appeared, however, that the ridge would remain strong enough to keep Pat south and west of Japan. As it turned out, the prognosis was slow on the movement of the trough, which resulted in the ridge weakening over western Japan.

For the rest of the 27th and all of the 28th, Pat remained in the monsoon trough and continued drifting to the northeast. The forecast situation was further complicated by the presence of Typhoon

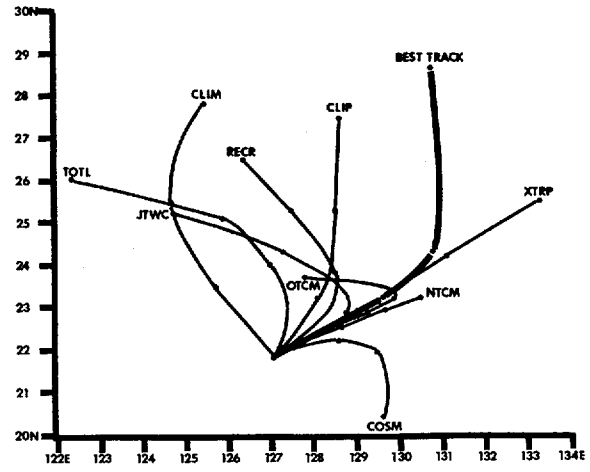


Figure 3-13-3. The primary forecast aids at 271200Z, along with the forecast and post analysis best track; all valid for 72-hours. None of the aids are able to provide correct guidance at seventy-two hours.

Odessa and Tropical Storm Ruby. Figure 3-13-4 shows Pat on the 28th - Odessa and Ruby are also visible. Despite the three cyclones being so close, each was moving a different direction. Pat was moving northeastward, Odessa west, and Ruby north-northwest. According to the OTCM, Pat should stay under the ridge. The forecast reflected this guidance and continued to show a turn to the northwest.

The 290600Z OTCM was the first to suggest a track change for Pat, taking it around the ridge and into the Sea of Japan. In analyzing this change, the presence of Odessa was closely examined. Odessa was moving west and located only 380 nm (704 km) north-northeast of Pat. The OTCM, however, had Odessa moving north into the Sea of Japan, despite the fact Odessa was continuing to move westward under the ridge.

On the 29th, the OTCM guidance was rejected and Pat was forecast to turn to the northwest. It was believed that the ridge over Japan was too narrow for the OTCM to pick up with its relatively large grid spacing. The fact that the OTCM was consistently wrong with Odessa reinforced this belief. In post analysis, however, it is believed Odessa kept moving

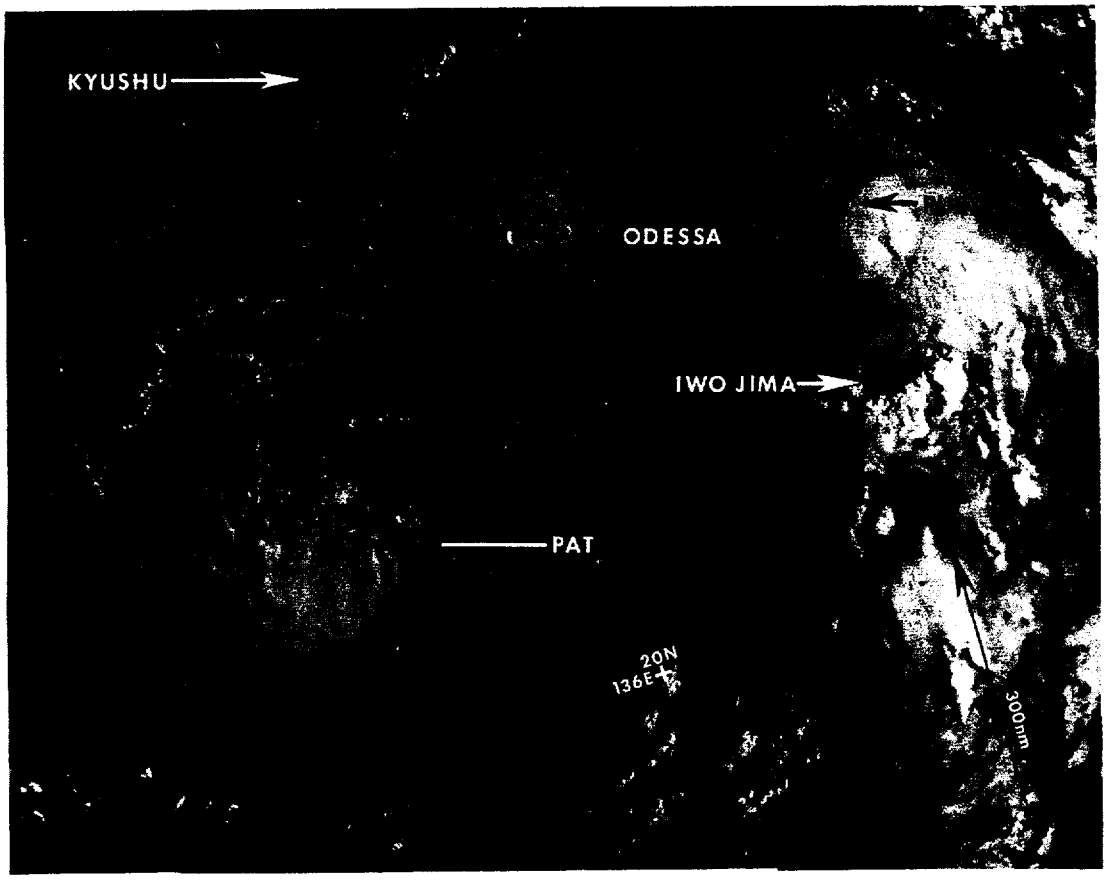


Figure 3-13-4. Three active tropical cyclones south of Japan and all moving different directions. Typhoon Pat is heading northeast, Typhoon Odessa is heading west, and Tropical Storm Ruby is heading north-northwest (282303Z August NOAA visual imagery).

westward at this stage due to binary interaction with Pat rather than from a response to the ridge. Visual satellite imagery early on the 30th (Figure 3-13-5) shows the two were spatially proximate. It is reasonable to believe that if Pat had been the only tropical cyclone in the region at this time, the forecast probably would have been changed on the 29th rather than on the 30th; providing Japan an additional 24 hours of warning time.

With the additional data received on the 30th, it became evident that Pat was not responding to the steering flow of the ridge and was going to hit the Japanese island of Kyushu. The 301200Z forecast was the first to reflect this change. Figure 3-13-6 shows the 500 mb data available at that time. When comparing it with Figure 3-13-2, it is evident that major synoptic changes took place in seventy-two hours. The anticyclone over the China coast was gone and a trough was located just northwest of the Korean Peninsula.

An in-depth look at the interaction between Pat and Odessa, revealed the two typhoons rotated cyclonically around each other. The affect on Odessa's track was greater, however, since Pat was the larger system. Odessa kept moving westward, aided by interaction with Pat. It was interesting to note that Pat did not turn to the north and accelerate until Odessa rotated across to the north-northwest. Then, as soon as Pat was east-northeast of Odessa, Odessa turned to the northeast and both cyclones accelerated into the Sea of Japan. The closest point of approach between the two was 270 nm (500 km).

At that point, the forecast was straightforward with extratropical transition taking place in the Sea of Japan. Figure 3-13-7 shows Pat during its transition with stable stratocumulus clouds present around a large open center and convection limited to the northeast quadrant. Pat completed extratropical transition at approximately 312100Z. The warnings continued warning on the system until it moved across the island of Hokkaido in northeastern Japan. The final warning was issued at 011200Z.

Typhoon Pat caused significant damage in southwestern and northeastern Japan; primarily on the islands on Kyushu and Hokkaido. Kyushu was hit the hardest with wind gusts of 107 kt (55 m/s) reported at 301940Z in Kagoshima (WMO 47851). Misawa AB (WMO 47580) recorded sustained winds of 33 kt (17 m/s) with a peak gust to 52 kt (27 m/s) at 010710Z when extratropical remnants of Pat crossed the northern Japanese islands. A total of 23 people were reported killed with over 180 people injured. An estimated 3,000 homes were damaged and 148 watercraft of varying sizes lost. Pat also severely disrupted transportation by land, sea and air.

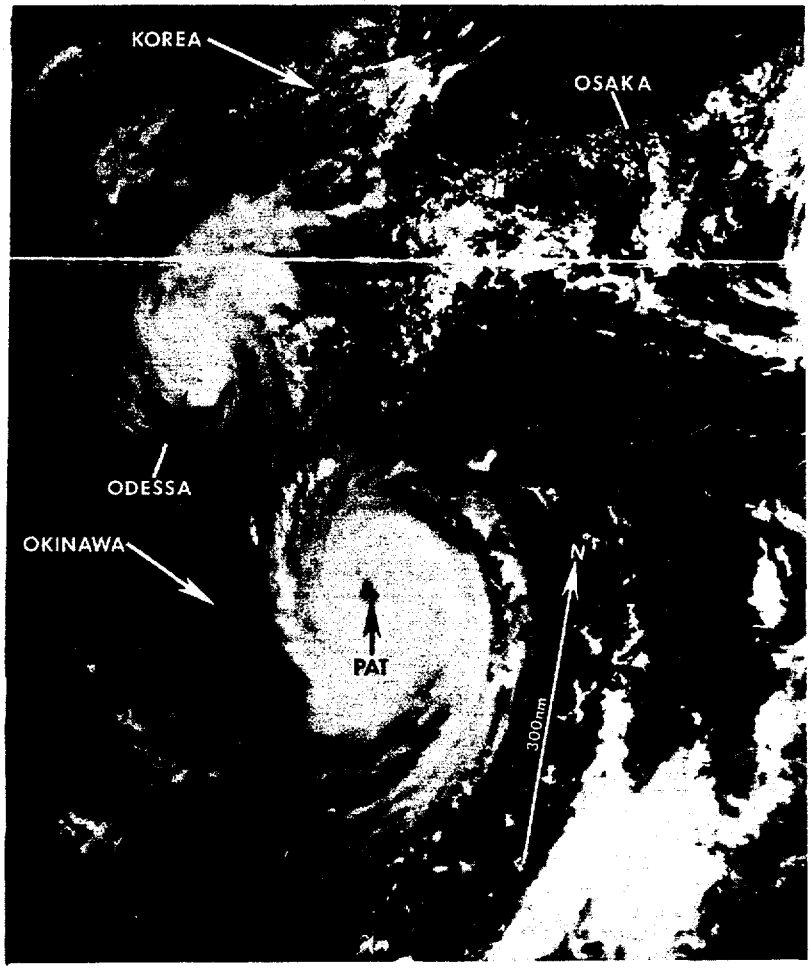


Figure 3-13-5. Typhoon Pat moving northward towards Kyushu and interacting with Typhoon Odessa. Pat is the larger of the two typhoons (300538Z August NOAA visual imagery).

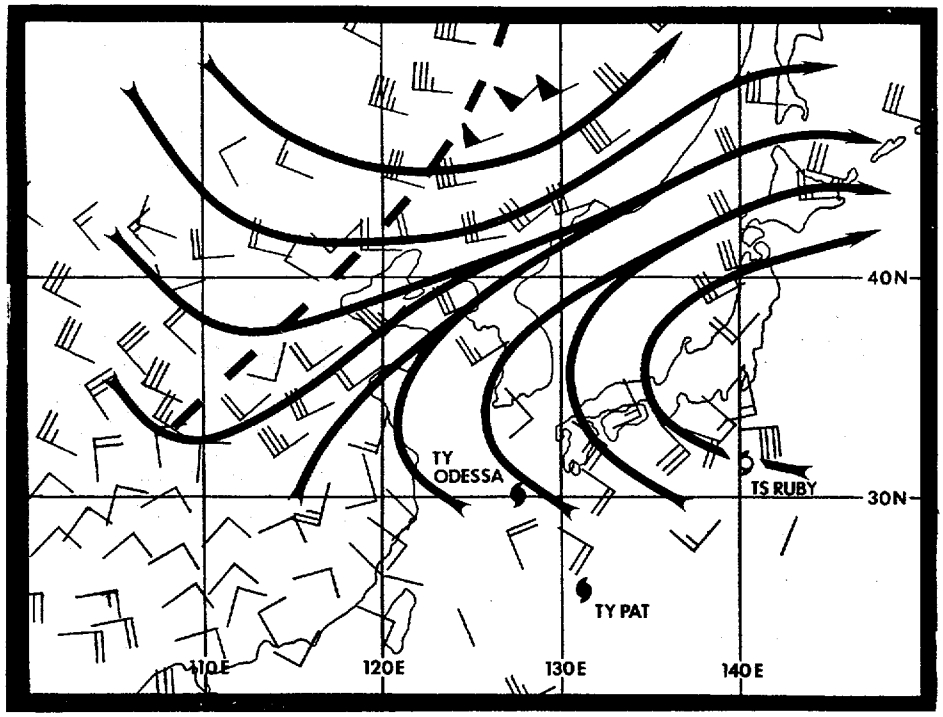


Figure 3-13-6. Mid-tropospheric (500 mb) wind flow at 300000Z August seventy-two hours after Figure 3-13-2. The anticyclone over the coast of China is gone and a trough is moving into the region from the northwest.

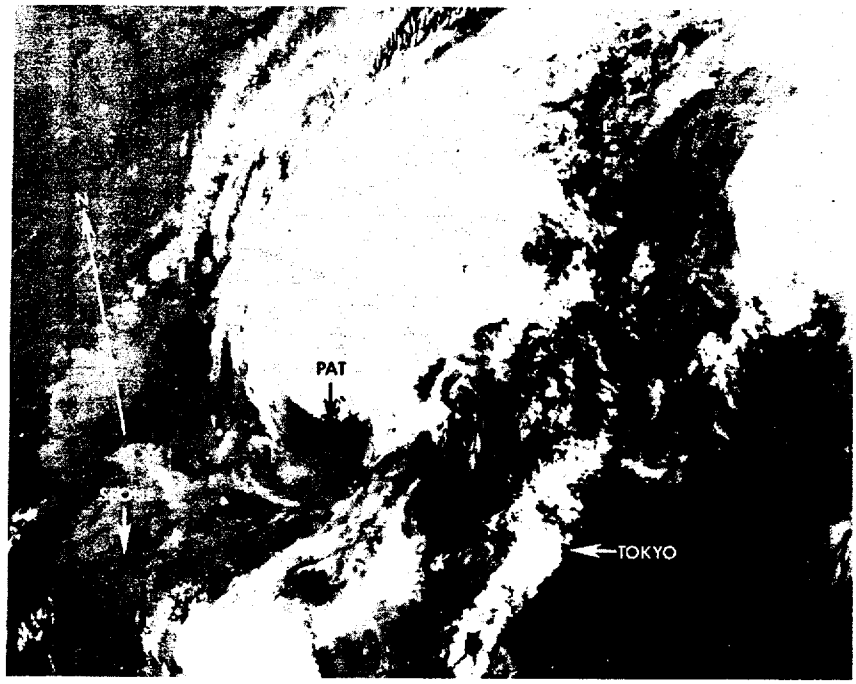
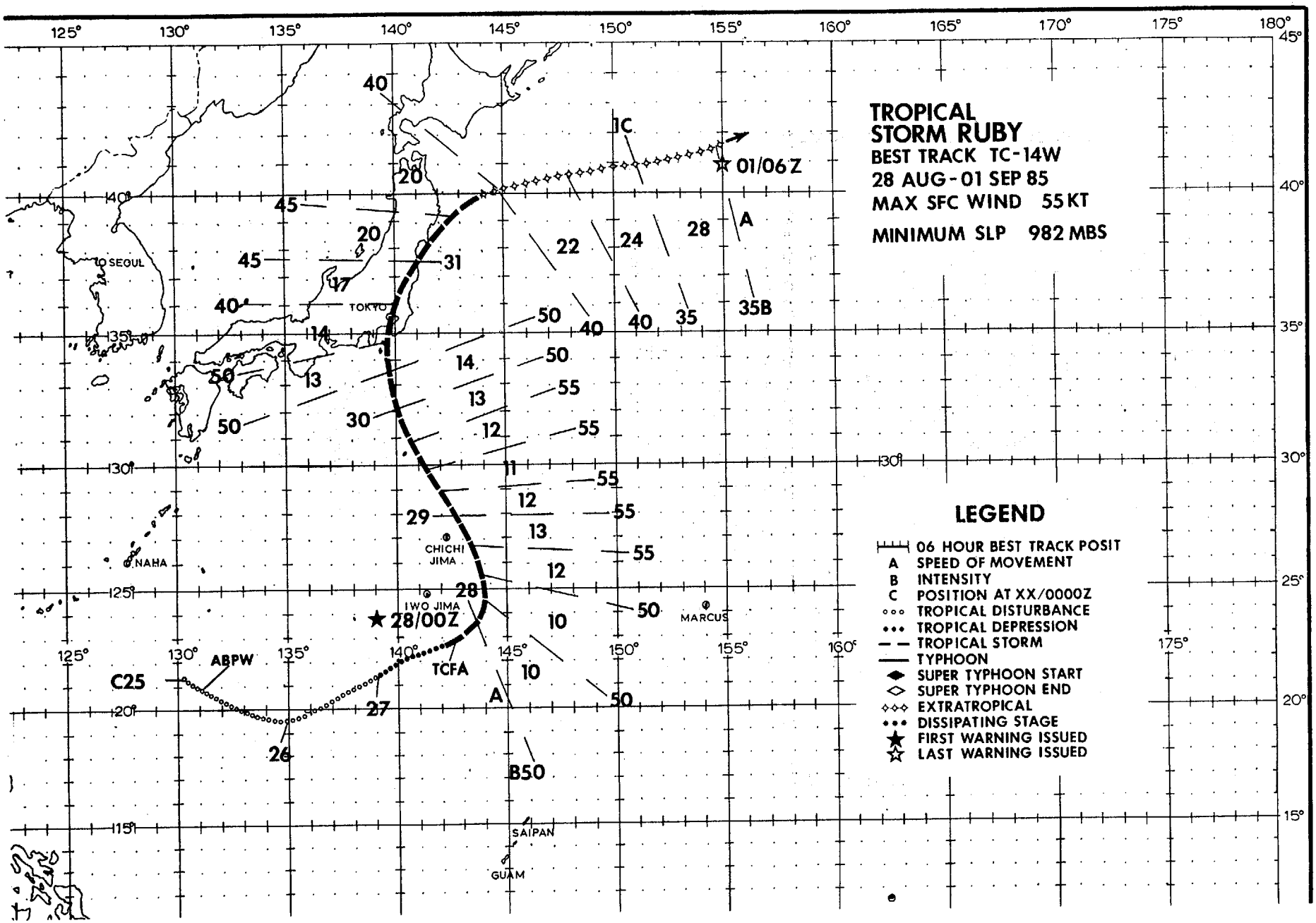


Figure 3-13-7. Pat has nearly completed its transition to an extratropical low in the Sea of Japan. The convection is moving to the northeast leaving behind a broad, exposed low-level circulation center (311813Z August NOAA infrared imagery).


TROPICAL
STORM RUBY
BEST TRACK TC-14W
28 AUG-01 SEP 85
MAX SFC WIND 55 KT
MINIMUM SLP 982 MBS
01/06Z
28/00Z
TCFA
ABPW
C25
B50
TO SEOUL
TOKYO
NAHA
CHICHI JIMA
IWO JIMA
MARCUS
SAIPAN
GUAM
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED

Ruby was the last of three disturbances to develop in the active southwest monsoon trough near 20N latitude during late August. Unlike its' predecessors, Typhoons Odessa and Pat, Ruby did not engage in any complex binary interaction, but appeared to remain a solitary system. Ruby was noteworthy in that it tracked directly over the Tokyo metropolitan area.

On 24 August the well-developed monsoon trough was displaced north of its climatological position and provided large scale low-level converging flow. This flow was the combination of the southwest monsoon and the southeast trades around the southwest periphery of the strong subtropical ridge located east of Japan. The low-level monsoon trough had a narrow, but active, tropical upper-tropospheric trough (TUTT) located aloft and to the north, and the upper-level near-equatorial ridge to the south.

Synoptic data on the 25th of August revealed a small (60 nm (111 km) diameter) circulation with a minimum sea level pressure (MSLP) of 1006 mb 330 nm (611 km) south-southeast of the island of Okinawa. Initial mention of this area appeared on the 250600Z Significant Tropical Weather Advisory (ABPW PGTW). The disturbance weakened a day later. Post-analysis showed the circulation tracked eastward and the convection associated with the disturbance exhibited typical monsoon depression characteristics - some curvature, but the enhanced convection only on the equatorward side of the trough. Increased surface winds of 25 kt (13 m/s) on the eastern side of the circulation and a steady drop of sea-level pressure to 1002 mb, prompted new mention of the disturbance on the Significant Tropical Weather Advisory (ABPW PGTW) at 270600Z. A Tropical Cyclone Formation Alert (TCFA) followed at 271800Z based on a 25 kt (13 m/s) satellite intensity estimate based on convection that had consolidated into a ragged central dense overcast (CDO) feature. Aircraft reconnaissance was subsequently scheduled for the daylight hours of the 28th of August. At that time the typhoon forecaster was faced with a dilemma: was the flare-up of convection at the end of the monsoon trough just another clash of the low-level southeasterlies, or was the signature that of a maturing tropical cyclone? Ruby's relatively close proximity to Typhoon Odessa (to the northwest) and the apparent weak surface inflow in the northwest quadrant, as depicted by the sparse synoptic data, deepened the uncertainty concerning the intensity of the system.

The question was answered when the initial aircraft reconnaissance mission at 280020Z reported an ellipitical eye forming and a minimum sea-level pressure of 982 mb. Based on this information, the first warning on Tropical Storm Ruby was issued immediately. Satellite imagery showed the cloudiness was coma shaped with a large band of convection coming into the center from the southeast. This convective band was positioned over the strong zone of convergence between the monsoon and the southeast trades. The data sparse analysis at 280000Z, shown in Figure 3-14-1, depicts this convergent area. Additionally, aircraft reconnaissance reported that

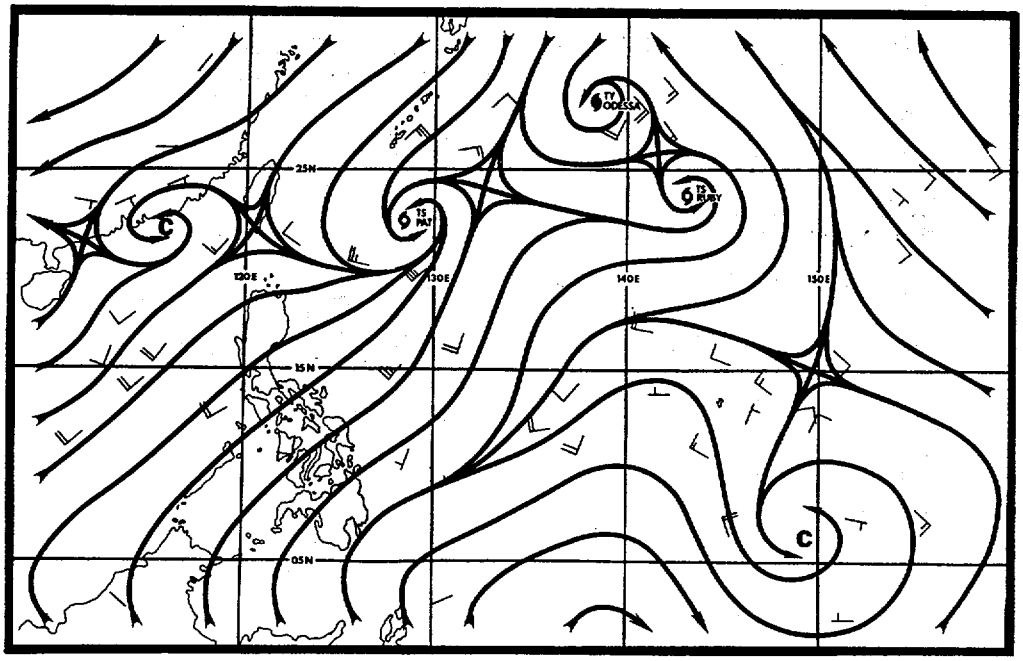


Figure 3-14-1. Surface/gradient analysis at 280000Z showing Tropical Storm Ruby located at the eastern end of the southwest monsoon flow where it converges with the southeast trades.

maximum sustained winds of 50 kt (26 m/s) with gusts to 65 kt (33 m/s) were restricted to the area of the low-level convergence and cloud band. Elsewhere, to the west and southwest, the aircraft found only 15-30 kt (8-15 m/s) surface winds. Figure 3-14-2 shows the proximity of Odessa to Ruby. The continuous vertical shear from the outflow of Odessa to the northwest appears to have hampered Ruby's further development.

During the following twenty-four hours, Ruby turned northwestward and gradually increased speed. Finally, late on the 29th, Ruby appeared to be breaking free of the monsoon trough. The forecast philosophy throughout the 28th and 29th of August was for Ruby, like Odessa, to turn more westward, stay equatorward of the narrow subtropical ridge and pass south of Honshu, Japan. This forecast scenario was based on Ruby's interaction with Typhoon Pat. Ruby was forecast to be pulled around the northern periphery of Pat's much larger circulation, which was centered southeast of Okinawa, Japan. Initially, the synoptic situation and, as a result, the meteorlogical reasoning appeared to be similar to that for Odessa and contrary to guidance provided by the best forecast aid, the One-way Tropical Cyclone Model (OTCM). OTCM moved Ruby northward into the subtropical ridge and towards Honshu, Japan, but at a slower speed than it had previously with Odessa. OTCM apparently was responding to the approach of a mid-latitude short wave trough. Figure 3-14-3 compares

Figure 3-14-2. Nighttime moonlight satellite imagery of Ruby. The close proximity of Odessa to Ruby appears to have hampered Ruby's further development. Ruby is near maximum intensity of 55 kt (28 m/s) (281248Z August DMSP visual imagery).

OTCM guidance with the forecasts for warnings 04 through 08. By following the forecast philosophy that OTCM still could not resolve the narrow subtropical ridge (due to its larger internal grid spacing), the warnings failed to reflect Ruby's gradual recurvature and subsequent landfall until approximately six hours before the event.

Over a thirty-six hour period, between 281200Z and 300000Z, the Tropical Storm maintained a maximum intensity of 55 kt (28 m/s). Ruby packed 55 kt (28 m/s) winds as it moved south of Tokyo, Japan, but began to weaken just prior to moving into Tokyo Bay and the Kanto Plain. Satellite imagery showed Ruby lost most of its central convection before making landfall due to interaction with the mid-latitude westerlies. Yokosuka received maximum sustained winds of 33 kt (17 m/s) with gusts to 47 kt (24 m/s) at 301420Z, as Ruby passed 5-10 nm (9-19 km) to the east. During this period Tokyo received three inches (76 mm) of rain and minor damage - trees down, windows broken and power outages for thousands of homes. After twelve hours over land, Ruby moved back into the Pacific and completed extratropical transition at 311000Z.

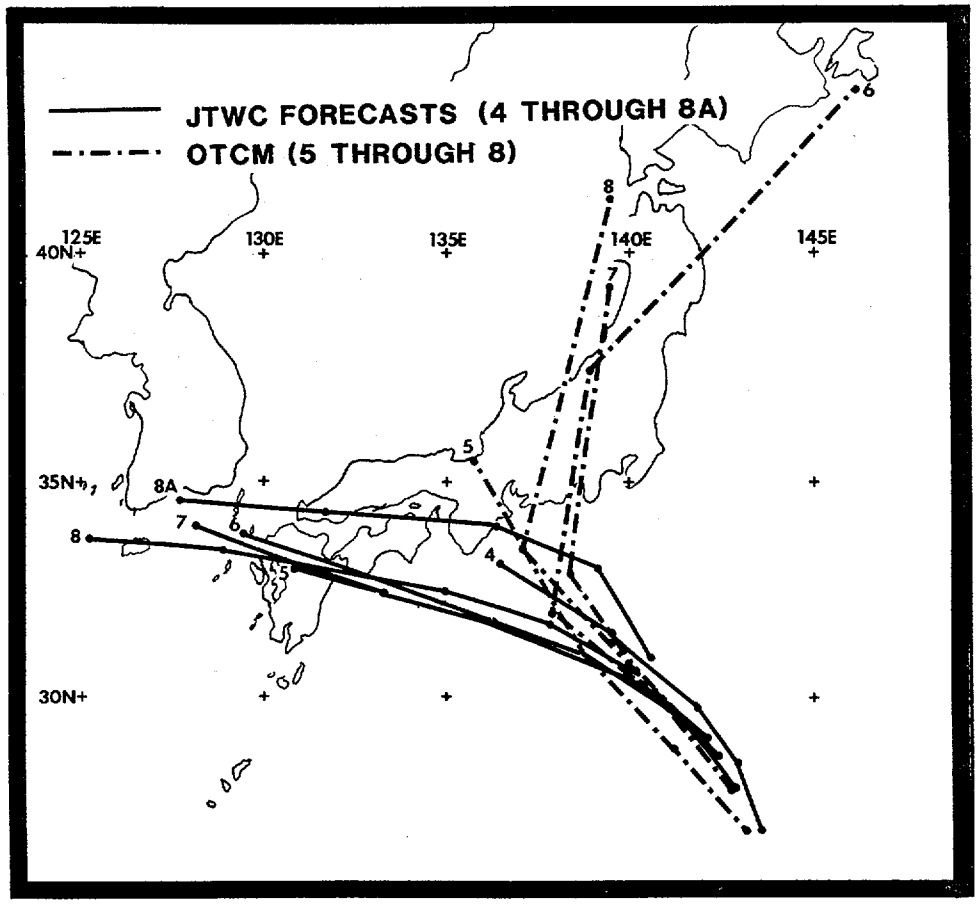
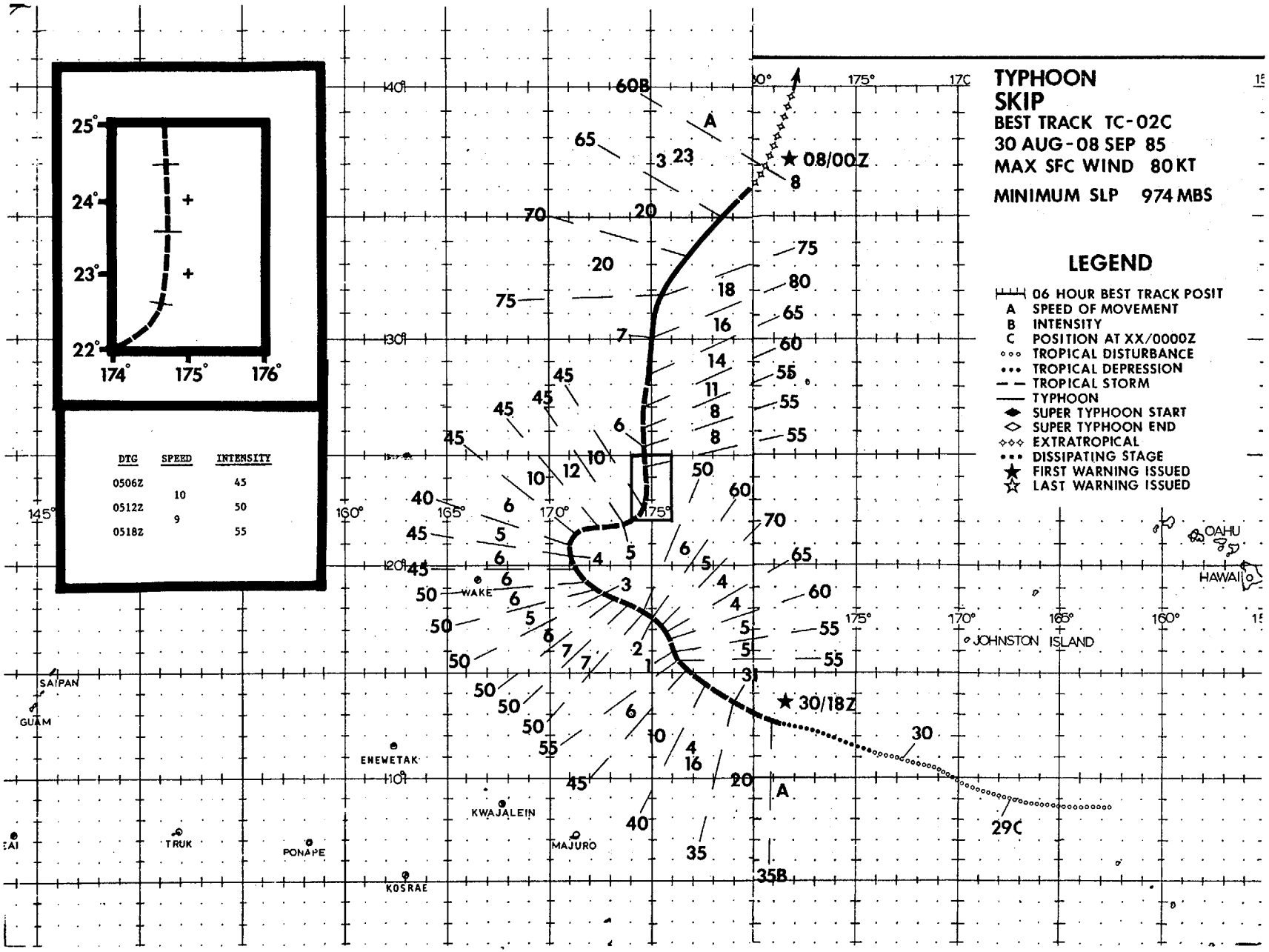


Figure 3-14-3. A comparison of OTCM guidance and the forecasts for five warnings (04 through 08).


TYPHOON
SKIP
BEST TRACK TC-02C
30 AUG-08 SEP 85
MAX SFC WIND 80 KT
MINIMUM SLP 974 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
DTG SPEED INTENSITY
0506Z 45
10
0512Z 50
9
0518Z 55
08/00Z
30/18Z
29C
35B
SAIPAN
GUAM
WAKE
ENEWETAK
KWAJALEIN
MAJURO
TRUK
PONAPE
KOSRAE
JOHNSTON ISLAND
OAHU
HAWAII

Typhoon Skip was the first system in the North Pacific to be warned on by both the Naval Western Oceanography Center (NWOC), Pearl Harbor, Hawaii and the Joint Typhoon Warning Center (JTWC), since Tropical Storm Carmen (02) in early April, 1980. (Note: Tropical cyclones east of the dateline are the responsibility of the Central Pacific Hurricane Center (CPHC), Honolulu, Hawaii, but all warnings and alerts are issued in coordination with NWOC.) Skip developed in the central North Pacific and transited the dateline twice. Additionally, the system achieved typhoon intensity twice: once east-southeast, and then later northeast, of Wake Island.

Satellite imagery detected an area of organized convection along the near-equatorial trough on the 28th of August. This disturbance raced west-northwestward for the next forty-eight hours under pressure from the strong mid-Pacific subtropical ridge. On 30 August, despite the 20 kt (10 m/s) plus movement, satellite images showed the cloud system's organization had increased significantly. This prompted the issuance of a Tropical Cyclone Formation Alert (TCFA) at 301730Z by NWOC. Almost immediately the TCFA was followed by the first warning at 301800Z on Tropical Depression 02C. As Skip transited the dateline from east to west, it became the fourth of what would be a five tropical cyclone scenario in the same ocean basin. The other systems that were part of this unusual event were Odessa, Pat, Ruby near Japan and Tess southwest of Guam.

Responsibility was transferred at the dateline from NWOC to JTWC for the second warning. The following warning upgraded Skip to a tropical storm at 310600Z based on satellite intensity estimates (post analysis later showed that Skip had reached tropical storm intensity six hours earlier, at 310000Z). Coincident with intensification Skip also began to slow its forward motion. The system obtained typhoon intensity at 011200Z. A weakening trend set in on 02 September as a mid-level trough approached from the northwest, but Wake Island was still threatened by Skip's approach. Finally, late on the 3rd, Skip turned away from Wake Island and moved towards the north. The Tropical Cyclone then executed an abrupt turn to the east and moved eastward for eighteen hours. During this period the central convection was displaced, by stronger winds aloft, to the east and northeast of the low-level circulation center.

On 05 September, after the passage of a mid-level trough, Skip resumed a northward track through the subtropical ridge and began to intensify and accelerate. A distinct eye developed (see Figure 3-02C-1) as the peak intensity of 80 kt (41 m/s) was reached on 07 September. But this peak was short lived, as increased wind shear aloft from mid-latitude westerlies and interaction with a trailing cold front came into play. Extratropical transition was rapidly completed near the dateline at 072100Z. The warning responsibility was transferred from JTWC to NWOC once again as Skip transited the dateline, this time from west to east, and the last warning followed at 080000Z.

In retrospect, Skip provided its share of forecasting difficulties due to its location in the data sparse central North Pacific and the complex interaction between mid-latitude troughing and the subtropical ridge. Skip also proved to be a challenge for the 54th Weather Reconnaissance Squadron to fly primarily for two reasons: its remote location, which required staging at the islands of Kwajalein and Wake; and the simultaneous occurrance of the multiple tropical cyclone outbreak in the western North Pacific, that stretched aircraft reconnaissance assets to their limit. Once it became apparent that Wake Island was no longer threatened by Skip, aircraft reconnaissance tasking was cancelled.

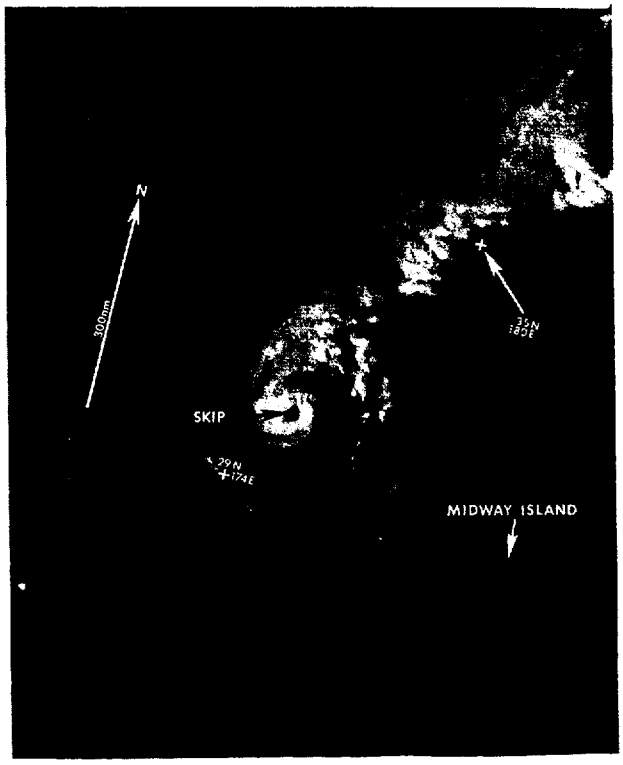
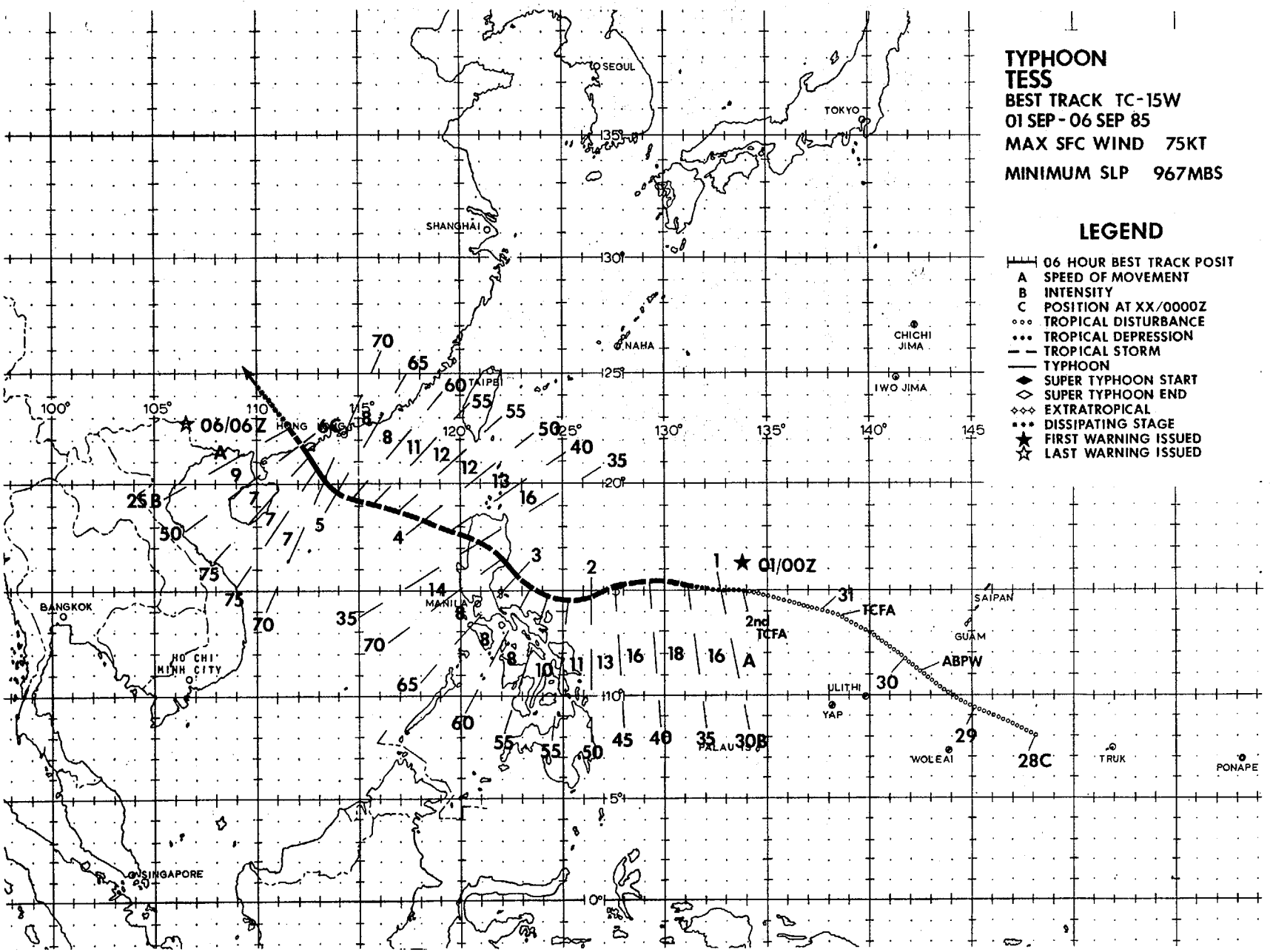


Figure 3-02C-1. Typhoon Skip at maximum intensity with a well defined eye. Skip trails at the end of a cold frontal cloud band that extends to the northeast (0702292 September NOAA imagery).


TYPHOON
TESS
BEST TRACK TC-15W
01 SEP - 06 SEP 85
MAX SFC WIND 75KT
MINIMUM SLP 967MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
06/06Z
01/00Z
TCFA
2nd TCFA
ABPW
SEOUL
TOKYO
SHANGHAI
NAHA
CHICHI JIMA
IWO JIMA
TAIPEI
HONG KONG
BANGKOK
HO CHI MINH CITY
MANILA
SINGAPORE
SAIPAN
GUAM
ULITHI
YAP
WOLEAI
PALAU
TRUK
PONAPE
100°
105°
110°
115°
120°
125°
130°
135°
140°
145
35°
30°
25°
20°
15°
10°
5°
0°

Typhoon Tess, the first of five significant tropical cyclones to develop in September, originated as a low latitude disturbance southeast of Guam (WMO 91217). Although bringing needed rain to the Philippines during a spell of drier than normal weather, Tess also brought unwanted death and destruction. Four people perished, several were missing and at least 300 were left homeless as this tropical cyclone crossed northern Luzon and disrupted air, ground and sea transportation. In addition, a tornado spawned by Tess, ravaged the coastal town of Lemery, 50 nm (93 km) south of Manila (WMO 98425).

During the last days of August, the monsoon trough was displaced poleward and extended from the northern South China Sea eastward encompassing Typhoons Pat and Odessa, and Tropical Storm Ruby. This left a broad zone of low-level southwesterly flow across the Philippine Sea. The surface/gradient level streamline analysis for 280000Z (Figure 3-15-1) indicated anticyclonic flow over Guam and a cyclonic circulation to the southeast. This cyclonic circulation center, which was moving northwestward, remained at the western end of a band of maximum cloudiness that showed no organization. Initial conditions for development of this low latitude disturbance were unfavorable because of the strong vertical shear from the equatorward outflow channel of the multiple tropical cyclones to the north.

At 1200Z on 30 August satellite data indicated that the area of cloudiness, then located 300 nm (556 km) west of Guam, had shown a marked increase in organization and amount of convection over the previous 12-hours. Synoptic data at that time confirmed the existence of a low-level circulation, a gradual decrease in sea-level pressure and winds estimated at 10 to 20 kt (5 to 10 m/s). These data prompted issuance of the first of two TCFA's at 301930Z. Aircraft reconnaissance was requested for the next day.

On 010126Z September, the first aircraft reconnaissance flight into the system verified the location of the surface circulation, and found surface winds of 30 to 35 kt (15 to 18 m/s) and a MSLP of 1003 mb. The first warning on Tropical Depression 15W followed at 010400Z. The center of the depression was located 600 nm (1111 km) east of Manila. The tropical cyclone was moving rapidly westward under the steering influence of the subtropical ridge which lay to the north. As the system matured, satellite imagery detected the formation of a ragged Central Dense Overcast (CDO). Based on the persistent CDO and associated intensification trend, Tropical Depression 15W was upgraded to Tropical Storm Tess at 011200Z (Post analyses showed that Tess actually had reached tropical storm intensity six hours earlier). Aircraft reconnaissance 36 hours later at 022351Z found 65 kt (33 m/s) maximum surface winds and a MSLP of 983 mb. As a result, Tess was further upgraded to typhoon status. At that time, Typhoon Tess was located by a combination of aircraft, satellite and radar information approximately 130 nm (241 km) east-northeast of Manila. Tess was destined to make landfall over Luzon within six hours. As Tess neared Luzon, it took a jog to the northwest sparing the Manila area from the strongest effects of the typhoon.

Landfall over northern Luzon resulted in the temporary downgrading of Tess to a tropical storm at 031200Z. However, within eleven hours Tess had cleared Luzon and was again over water in the South China Sea. Redevelopment to typhoon intensity was forecast and did occur at 050000Z when the Typhoon was located 170 nm (315 km) south of Hong Kong (WMO 45005) (Figure 3-15-2). Tess continued northwestward under the influence of the subtropical ridge and within 24 hours moved inland over the southern coast of mainland China near Yangjiang (WMO 59663), 120 nm (222 km) west-southwest of Hong Kong. The final warning was issued at 060600Z.

Despite passing well south of Hong Kong, Tess generated a peak gust to 60 kt (31 m/s) at the Royal Observatory, and 65 kt (33 m/s) at the Hong Kong International Airport (WMO 45007). Although considerable flooding and crop damage occurred over southern China as Tess moved inland, there were no reports of death or injuries.

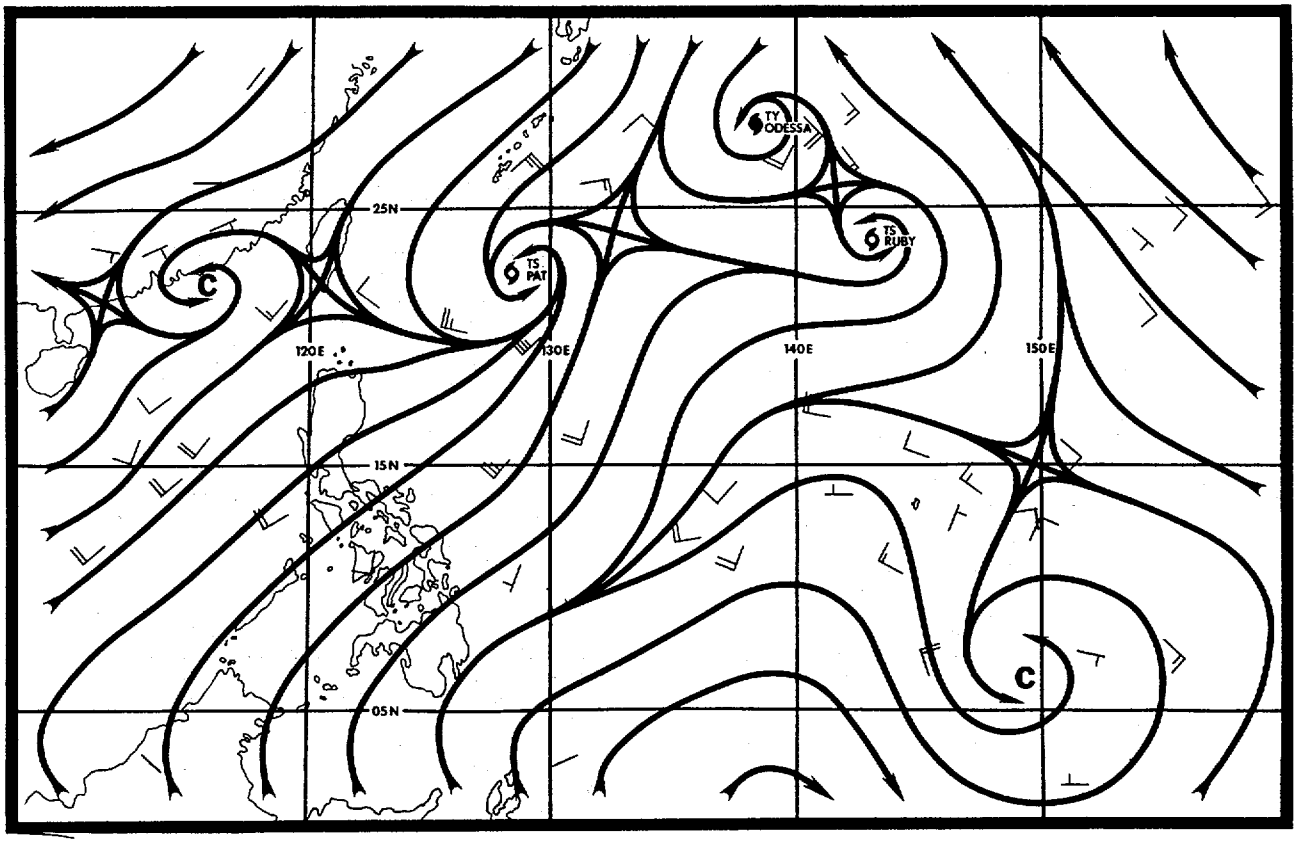


Figure 3-15-1. The 280000Z August surface/gradient level streamline analysis of the southwest monsoonal flow across the Philippine Sea. The low-latitude disturbance southeast of Guam was the precursor of Tess.

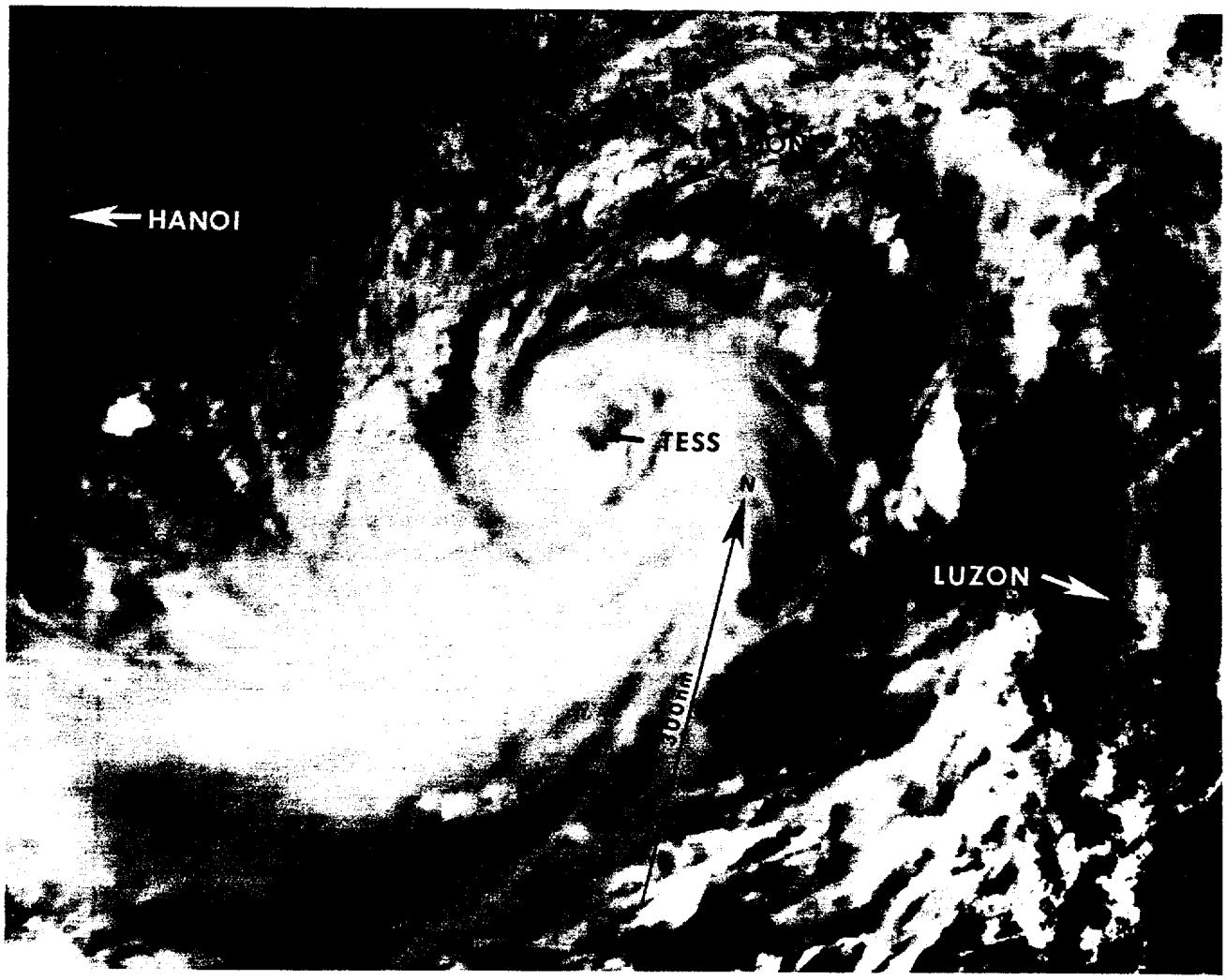
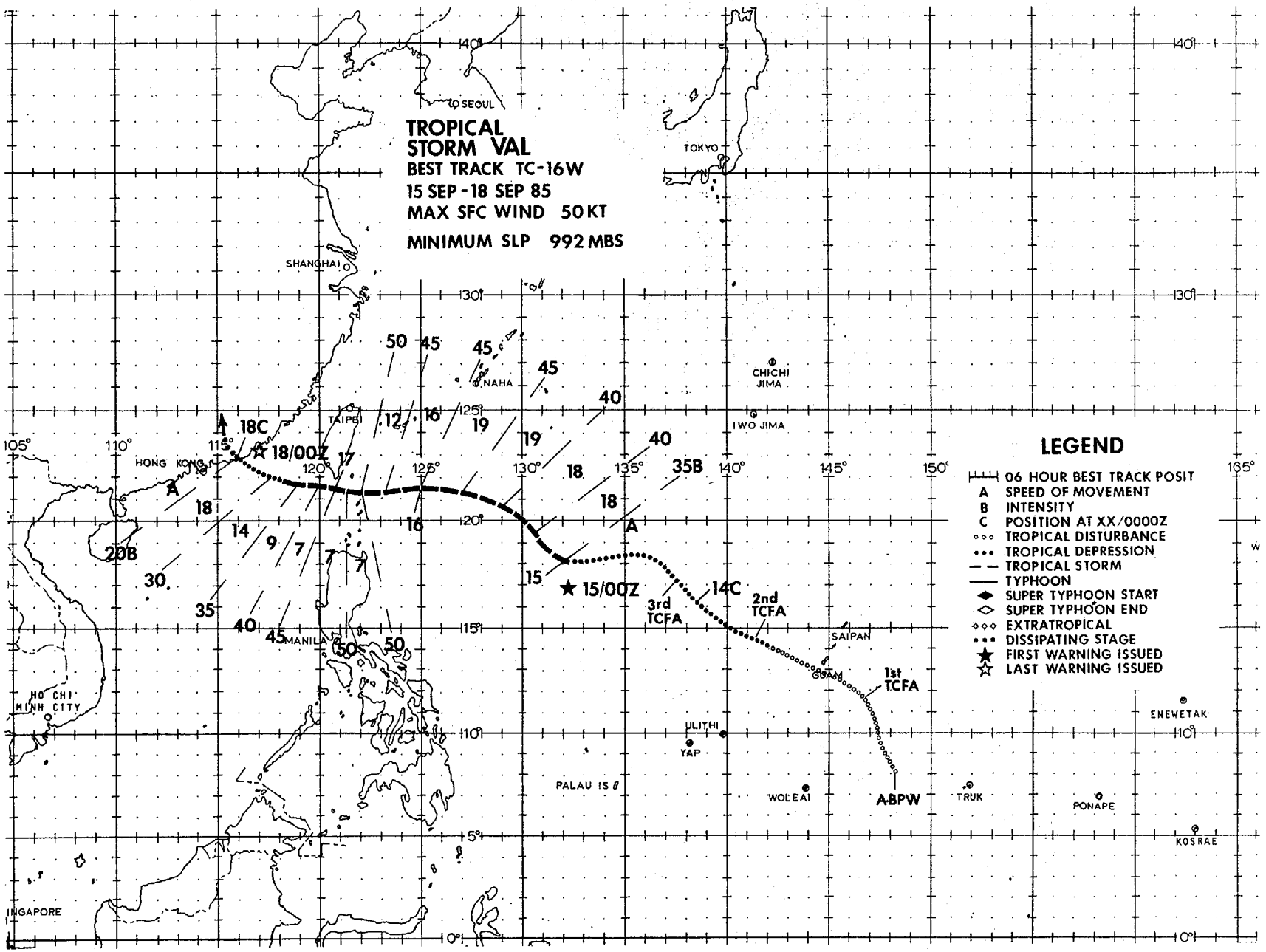


Figure 3-15-2. Typhoon Tess, with a ragged eye, near peak intensity. The coastline along the northern Gulf of Tonkin is to the west of Tess' cirrus outflow (0502Z 29 September DMSP visual imagery).


TROPICAL
STORM VAL
BEST TRACK TC-16W
15 SEP - 18 SEP 85
MAX SFC WIND 50 KT
MINIMUM SLP 992 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
SEOUL
TOKYO
SHANGHAI
NAHA
CHICHI JIMA
IWO JIMA
TAIPEI
HONG KONG
18C
18/00Z
15/00Z
14C
35B
20B
1st TCFA
2nd TCFA
3rd TCFA
SAIPAN
GUAM
MANILA
HO CHI MINH CITY
ULITHI
YAP
PALAU IS
WOLEAI
ABPW
TRUK
PONAPE
KOSRAE
ENEWETAK
INGAPORE

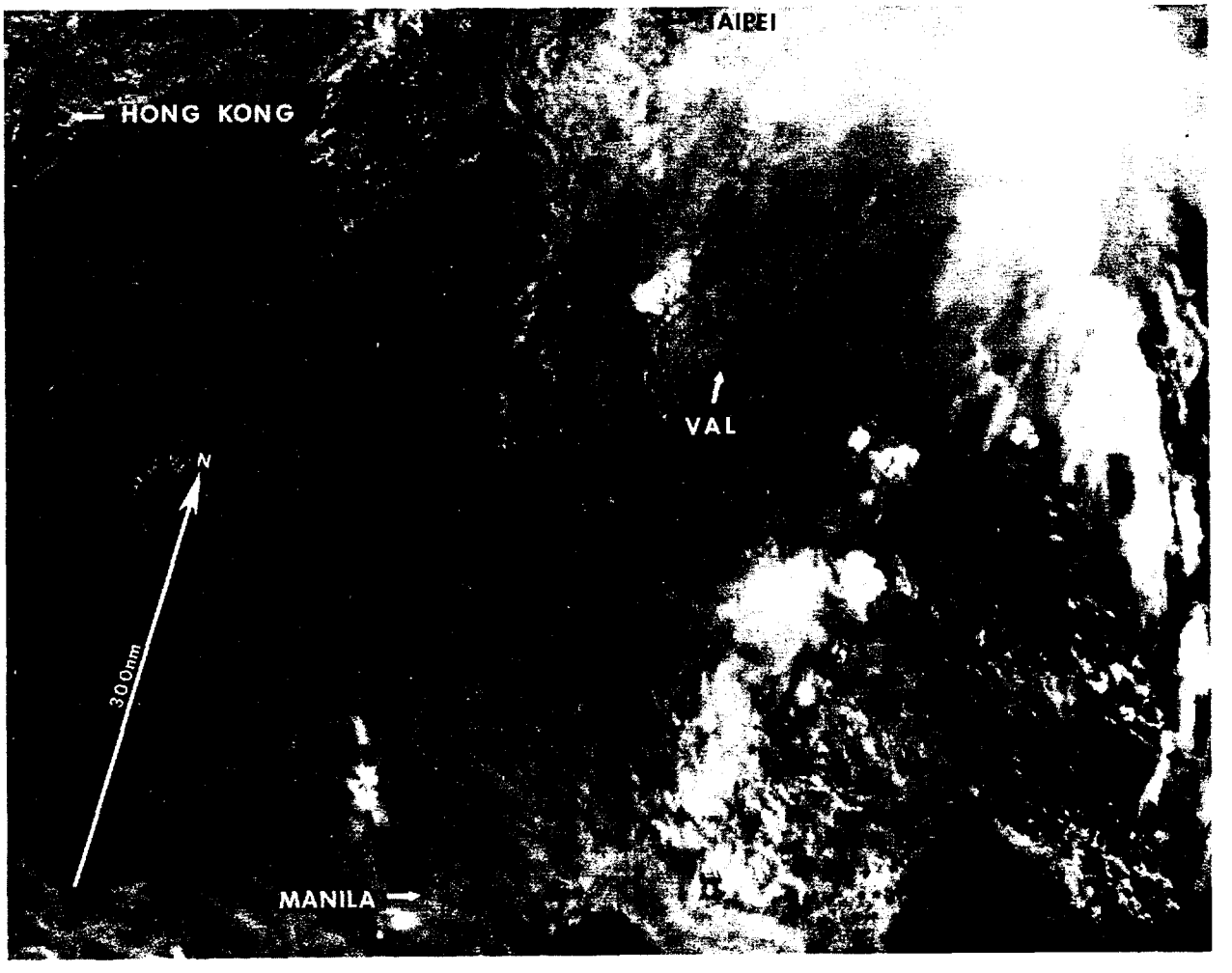
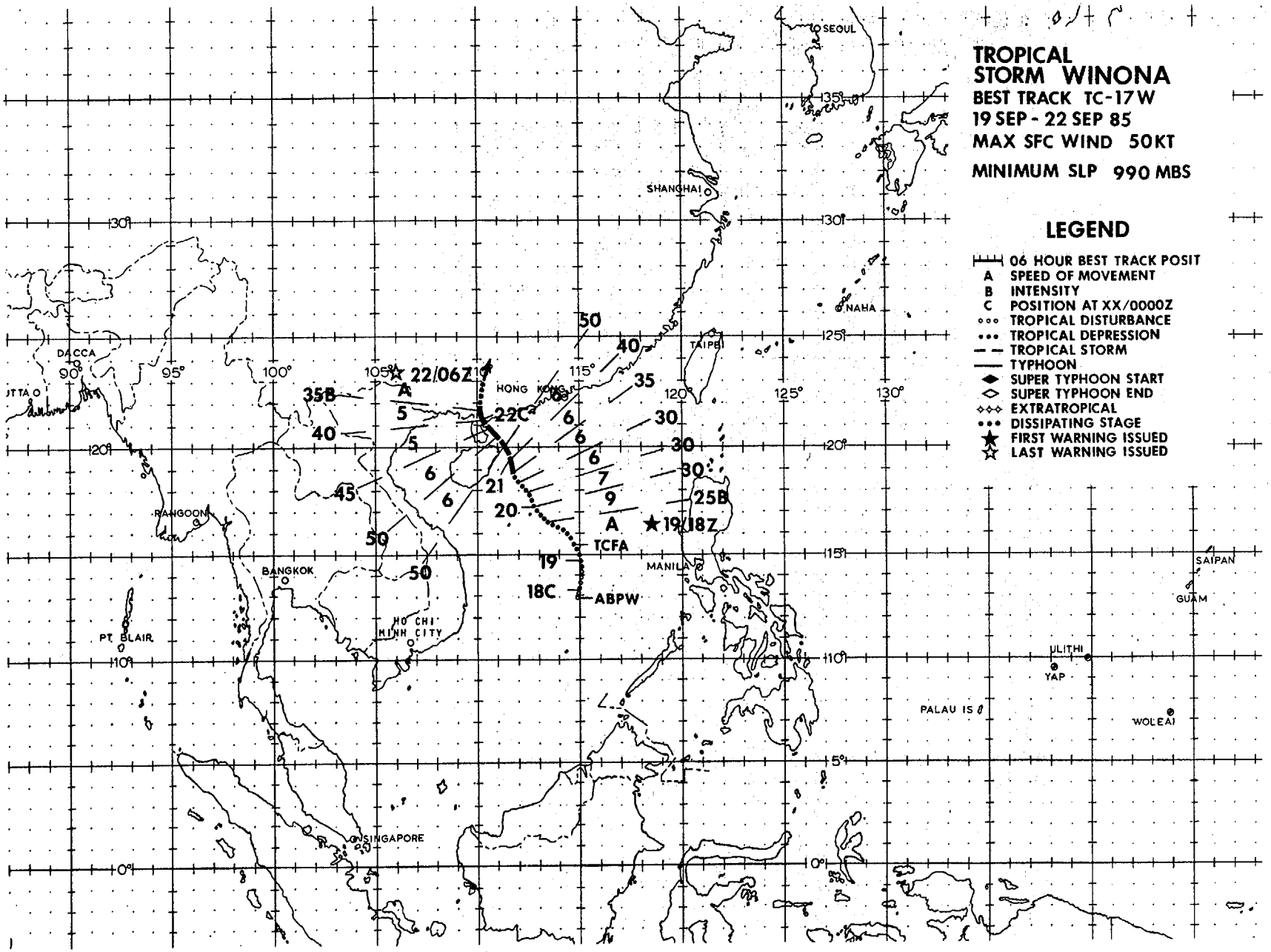


Figure 3-16-1. Tropical Storm Val was the first of two successive storms to reach a peak intensity of 50 kt (26 m/s). Originating in the monsoon trough southeast of Guam, it slowly developed as it moved northwest out of the trough. After moving into the central Philippine Sea. Val took a more westerly heading, paralleling the subtropical ridge axis to the north. Val remained poorly organized much of its lifetime, with the low-level center often difficult to locate from both satellite imagery and aircraft reconnaissance data. The above imagery shows one of the few times the low-level center could be identified. As Val approached Taiwan, its circulation became further disrupted. The low-level circulation center tracked west while most of the convection became displaced to the northwest and enhanced by Taiwan's mountainous terrain. The convection attempted to redevelop over the low-level wind center as Val transited the Luzon Straits, but without success. As a result, Val weakened prior to making landfall on mainland China and was not identifiable as a tropical cyclone after 180000Z. Due to the threat posed by Val, Hong Kong (WMO 45005) did go to Condition of Readiness II at 161500Z. However, Val dissipated earlier than anticipated and no significant weather was reported (160558Z September NOAA visual imagery).


TROPICAL
STORM WINONA
BEST TRACK TC-17W
19 SEP - 22 SEP 85
MAX SFC WIND 50KT
MINIMUM SLP 990 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
SEOUL
SHANGHAI
NAHA
TAIPEI
HONG KONG
DACCA
RANGOON
BANGKOK
HO CHI MINH CITY
PT BLAIR
SINGAPORE
MANILA
SAIPAN
GUAM
ULITHI
YAP
PALAU IS
WOLEAI
22/06Z
19/18Z
TCFA
ABPW
22C
18C
25B
35B
105°
100°
95°
90°
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30°
25°
20°
15°
10°
5°
0°

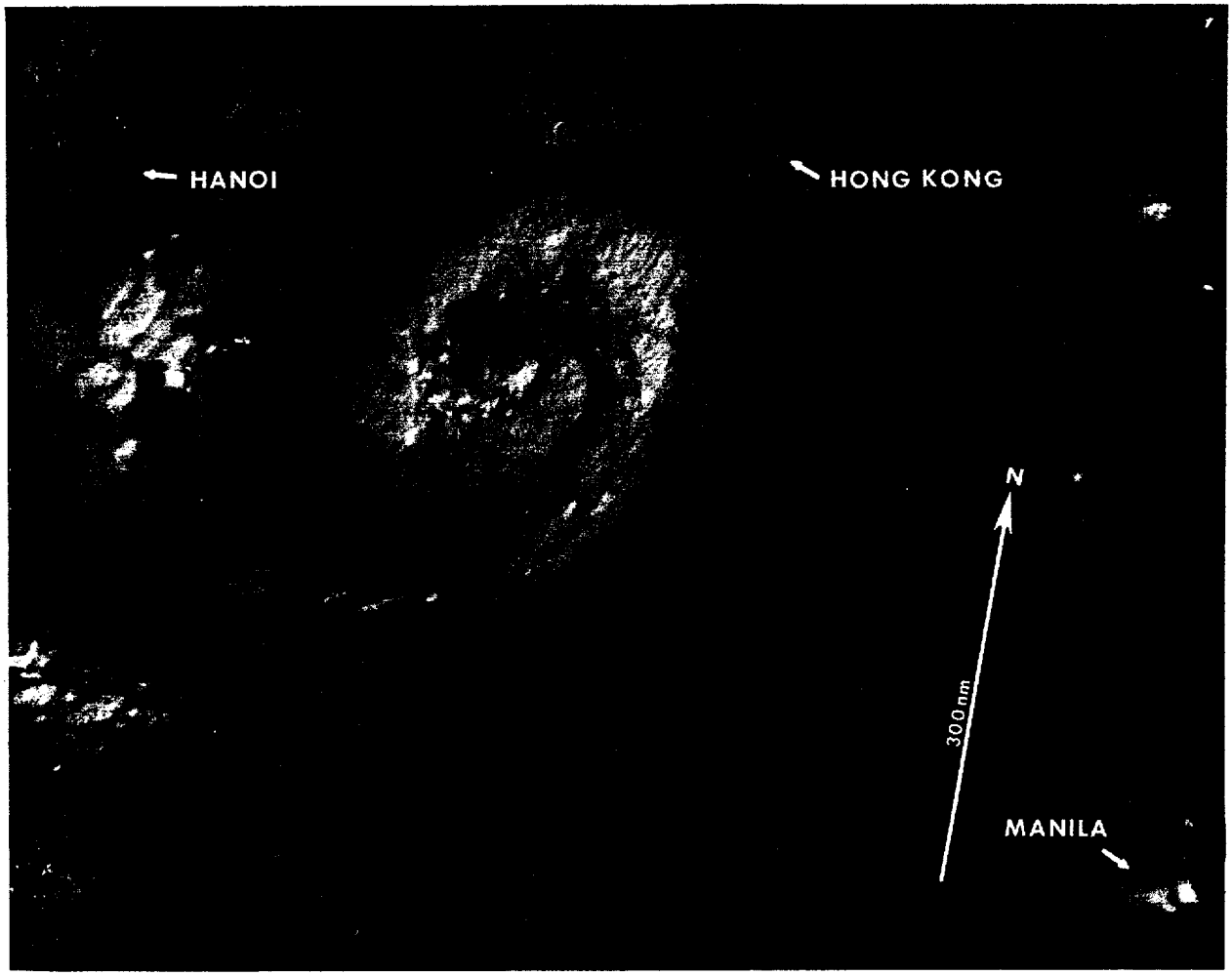
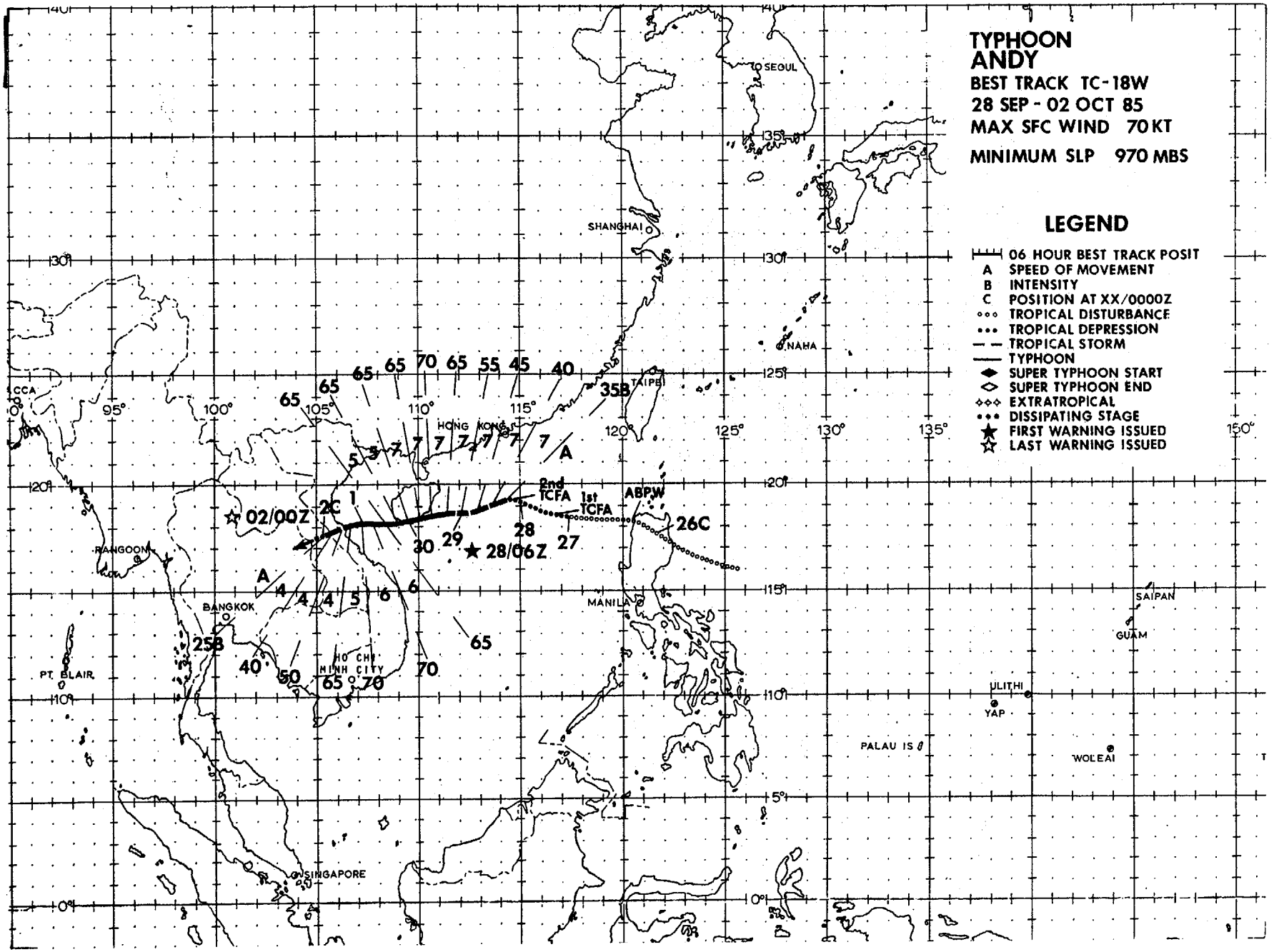


Figure 3-17-1. After the remnants of Tropical Storm Val dissipated over eastern China, excess vorticity at the base of the monsoon trough formed a surface circulation in the central South China Sea. Two days later this circulation intensified into Tropical Storm Winona. Winona tracked to the north-northwest as it intensified, moving around the western periphery of the subtropical ridge which was extending westward across the Philippine Sea. Winona made landfall as a 50 kt (26 m/s) tropical storm just west of Zhanjiang, China (WMO 59658) at about 212000Z. There were no reports of damage as it moved inland and dissipated. The satellite imagery above shows Winona just prior to reaching maximum intensity. Note the well-defined convective banding surrounding the center of the storm (210208Z September DMSP visual imagery).


TYPHOON
ANDY
BEST TRACK TC-18W
28 SEP - 02 OCT 85
MAX SFC WIND 70 KT
MINIMUM SLP 970 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
SEOUL
SHANGHAI
NAHA
TAIPEI
HONG KONG
RANGOON
BANGKOK
MANILA
SAIPAN
GUAM
ULITHI
YAP
WOLEAI
PALAU IS
PT BLAIR
HO CHI MINH CITY
SINGAPORE
02/00Z
28/06Z
End TCFA
1st TCFA
ABPW
25B
35B
26C
2C

Typhoon Andy was a relatively short-lived tropical cyclone. Developing in the South China Sea, Andy transited uneventfully to the west-southwest. Although the cyclone made landfall twice at or near typhoon strength, there were no reports of serious damage or injuries.

The disturbance that eventually developed into Typhoon Andy was first detected late on 25 September as a small area of intense convection in the monsoon trough east of the Philippines. This compact CDO feature was part of a larger area of disturbed weather which had persisted east of Mindanao for several days. The southern portion of this large area had been the subject of a TCFA on the 24th and 25th. When the area of convection moved northwest across northern Luzon early on the 26th and entered the South China Sea, development of Andy began in earnest.

Between 260000Z and 270000Z the tropical disturbance moved to the west-northwest and slowly consolidated. Coincidently, an early season surge in the northeast monsoon was underway generating 25 to 40 kt (13 to 21 m/s) winds across the Taiwan Straits and the northern South China Sea. This surge most probably contributed to the excess low-level cyclonic vorticity needed to produce a lee-side circulation off the northwest coast of Luzon. The development of this low-level vortex is thought to have aided the development of Andy. At 270000Z, Dvorak intensity analysis of the cloud system estimated 30 kt (15 m/s) surface winds were present. Sparse supporting synoptic data at that time showed only 20 to 25 kt (10 to 13 m/s) surface winds near the disturbance's center. However, due to the improved organization and the expectation for further development, a TCFA was issued at 270300Z. Less than three hours later, satellite imagery revealed the presence of a partially exposed low-level circulation center.

Over the next 24 hours, the system continued to move to the west-northwest in the monsoon trough. Despite the presence of the low-level circulation center on satellite imagery on the 27th, aircraft reconnaissance early on the 28th was unable to find a surface circulation. But, because winds of 25 to 30 kt (13 to 15 m/s) and a 1001 mb MSLP were observed, the TCFA was reissued at 280300Z.

The first warning on Andy, as Tropical Depression 18W, followed several hours later at 280600Z. By that time it had become apparent the system was more than just a benign circulation in the monsoon trough. Dvorak intensity analyses by two different tactical DMSP sites estimated the intensity at 30 and 45 kt (15 m/s and 23 m/s). As Tropical Depression 18W matured, it came under the influence of low- to mid-level ridging to the north. The Tropical Cyclone responded by turning to the west-southwest. It moved in this direction for the remainder of its lifetime.

Continuing to intensify, Andy attained typhoon strength about 24 hours after the first warning, at 290600Z. At that time, the Dvorak intensity analysis was a T4.0, supporting 65 kt (33 m/s) surface winds. Andy's intensification to a typhoon coincided with the formation of a small ragged eye. Typhoon Andy first made landfall on the southern tip of Hainan Island just east of Yai-Xian (WMO 59948) at 291800Z with maximum sustained winds of 65 kt (33 m/s), gusts to 80 kt (41 m/s). After a glancing blow to Hainan (Figure 3-18-1), Andy continued west-southwestward across the southern Gulf of Tonkin and reached its maximum intensity of 70 kt (36 m/s) at 301800Z. Typhoon Andy made landfall as a minimal strength typhoon approximately 30 nm (56 km) north of Dong Hoi, Vietnam (WMO 48848) at 011000Z. The tropical cyclone rapidly weakened as it moved inland. The last warning, issued at 020000Z, downgraded Andy to a 25 kt (13 m/s) tropical depression as it dissipated over central Laos.

Although a tropical cyclone of this magnitude would normally be expected to cause widespread damage, none was reported. Extensive preparations made prior to the cyclone's arrival probably lessened the impact of Andy's passage.

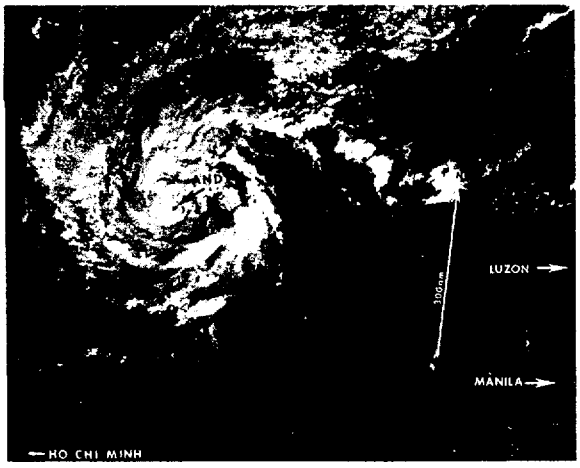
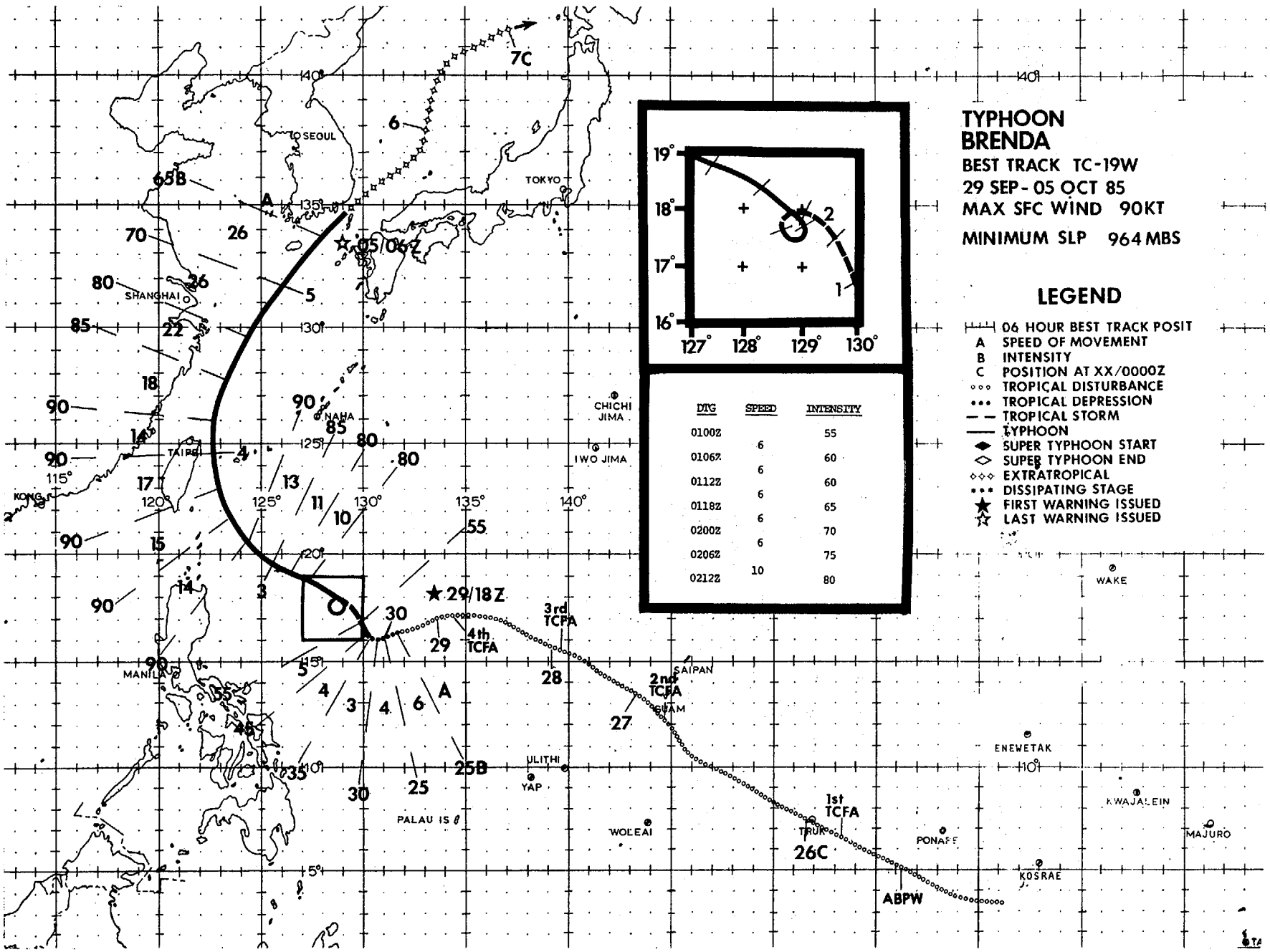


Figure 3-18-1. Typhoon Andy, with a small eye, as it entered the Gulf of Tonkin (300228Z September DMSP visual imagery).


TYPHOON
BRENDA
BEST TRACK TC-19W
29 SEP - 05 OCT 85
MAX SFC WIND 90KT
MINIMUM SLP 964 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
DTG SPEED INTENSITY
0100Z 55
6
0106Z 60
6
0112Z 60
6
0118Z 65
6
0200Z 70
6
0206Z 75
10
0212Z 80
05/06Z
29/18Z
1st TCFA
2nd TCFA
3rd TCFA
4th TCFA
26C
ABPW
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
HONG KONG
MANILA
PALAU IS
YAP
ULITHI
WOLEAI
GUAM
SAIPAN
CHICHI JIMA
IWO JIMA
WAKE
ENEWETAK
KWAJALEIN
MAJURO
PONAPE
KOSRAE
TRUK

Typhoon Brenda developed from a broad, persistent area of convection in the monsoon trough. Its life was influenced by two mid-latitude troughs. The first caused erratic early movement. The second caused Brenda to recurve into the mid-latitude westerlies, a track which was well-forecast by the Joint Typhoon Warning Center.

The disturbance that would become Brenda was first noticed on 25 September as a large area of persistent convection southeast of Truk (WMO 91334). (Further west, the early signs of Typhoon Andy were evident in the western Philippine Sea). Although the system was disorganized, good upper-level outflow was evident. The proximity of the tropical disturbance to Guam and its impressive satellite signature resulted in the issuance of the first of four TCFAs at 252230Z. Aircraft reconnaissance early on the 26th was unable to locate a surface circulation, but did find a broad area of troughing. The area tracked northwest through the 26th, with the convection covering a broad area and upper-level outflow remaining favorable. This prompted the reissuance of the TCFA, at 262230Z, but once again aircraft reconnaissance early on the 27th was unable to locate a circulation. This scenario repeated itself the next day. Finally, late on 28 September, the deep convection began to show an increase in amount and organization. A few hours later, after the fourth TCFA was issued, aircraft reconnaissance found a closed 15 kt (8 m/s) circulation at 290329Z. The slow development of the disturbance was surprising, since it appeared that all the necessary ingredients for development were present. It is thought that the extemely broad size of the disturbance may have prevented a faster development, which is more typical of WESTPAC tropical cyclones (Figure 3-19-1).

The first warning on Brenda was issued at 292347Z, valid at 291800Z, based upon aircraft reconnaissance which located a 20 kt (10 m/s) circulation and a MSLP of 1000 mb - a drop of three

Figure 3-19-1. Visual imagery of the Tropical Disturbance at the time aircraft reconnaissance first located a surface circulation center. This extremely broad area of convection showed little change from the 25th through the 28th. Most of the curvature due to an upper-level anticyclone. The abnormally large size of the disturbance may have slowed development (290107Z September DMSP visual imagery).

millibars in less than 24-hours. Initial forecasts called for the system to gradually increase in intensity, move west-northwest and cross northern Luzon. This was based on the expectation that the subtropical ridge would maintain itself north of Brenda. But, Brenda moved west-southwest followed by a brief turn to the northwest before apparently completing a small cyclonic loop on 1 October. These movements were related to the passage of a mid-latitude trough to the north. Although the trough did not completely weaken the ridge, it eroded the ridge enough to affect the steering flow. As a result, Brenda moved slowly and erratically. By the 2nd, the trough had passed to the northeast and the subtropical ridge began to rebuild. Brenda responded by turning back to the west-northwest while continuing to intensify, eventually reaching typhoon force at 011800Z. At that point it appeared that Brenda would miss northern Luzon and track just south of the island of Taiwan.

On 2 October, aircraft reconnaissance determined that the Typhoon had increased in strength and was more circular. With another mid-latitude trough approaching from mainland China, it appeared that Brenda's track would again be affected in 24- to 36-hours. Using this information and the belief that the subtropical ridge was not going to build far enough west to drive Brenda through the Luzon Straits, the forecast track was revised to recurve Brenda around the end of the ridge just east of Taiwan. Figure 3-19-2 shows the forecast aids

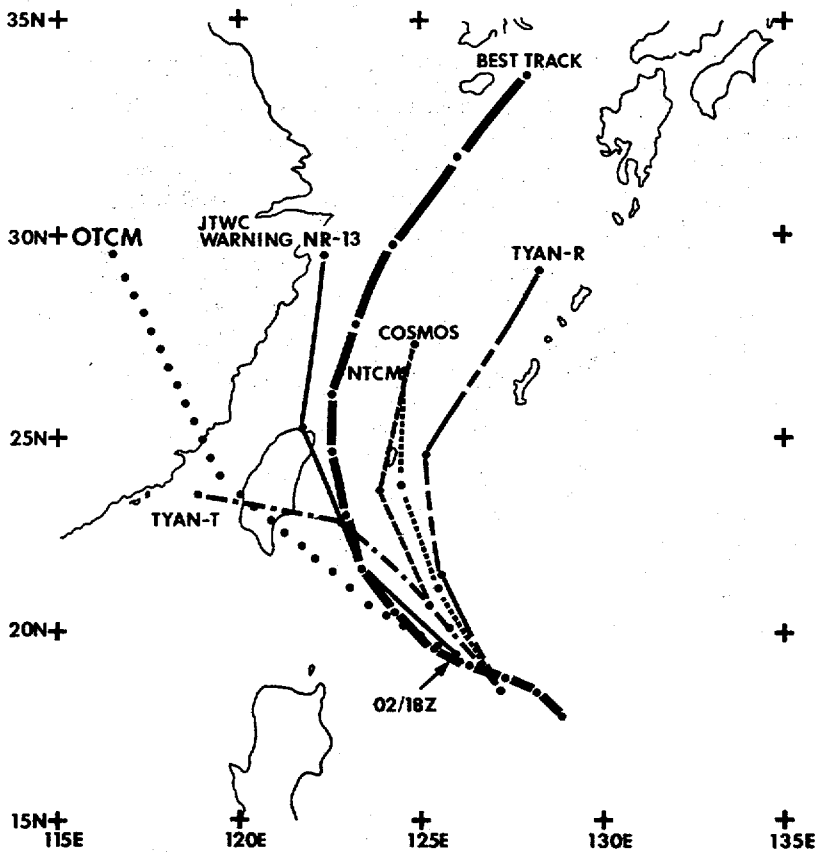


Figure 3-19-2. Forecast aids at 24-hour intervals, when the first recurvature forecast was issued, are compared to the warning and Brenda's best track. While some aids (NTCM, COSMOS and TYAN RECURVER) forecast recurvature; OTCM, JTWC's best aid during the past few years fails to indicate recurvature. All aids are slow in forecasting the speeds of movement during recurvature.

available to the TDO when the first recurvature forecast was issued. This forecast differed considerably from those of other warning agencies, but proved to be quite accurate, although the speed of movement was slow.

Brenda had a unique signature on satellite imagery because of its extremely large eye. Aircraft reconnaissance confirmed the existence of a large banding eye on 3 October. Satellite imagery showed a ragged eye, often larger than 60 nm (111 km) in diameter (Figure 3-19-3). The large eye lasted from 030000Z until Brenda moved around the ridge and began to accelerate into the westerlies on 4 October.

During recurvature, Brenda performed as forecast. It reached a maximum intensity of 90 kt (46 m/s) at 030600Z, and maintained that intensity for 24-hours, as it turned to the north and passed east of Taiwan. Under the influence of the mid-latitude westerlies north of the ridge axis, Brenda turned to the northeast and accelerated, passing just south of Korea on the 5th. Extratropical transition was underway by 050000Z and the final warning was issued at 050600Z. The extratropical remains of Brenda passed through the Korea (Tsushima) Strait and entered the Sea of Japan at 051200Z before slowing down and weakening.

Known damage from Brenda was limited to the southern Korean Peninsula and adjacent islands. Nearly 12 inches (30 cm) of rain was reported over a large area. The Korean National Disaster Relief Center reported 14 dead, 43 missing, and damage to 167 houses, 630 watercraft, and 34,600 acres (14,000 hectares) of rice paddies as a result of the storm's passage. Damage was greatest on the island province of Cheju and the two provinces near the coastal city of Pusan (WMO 47153) in the southeast corner of the peninsula.

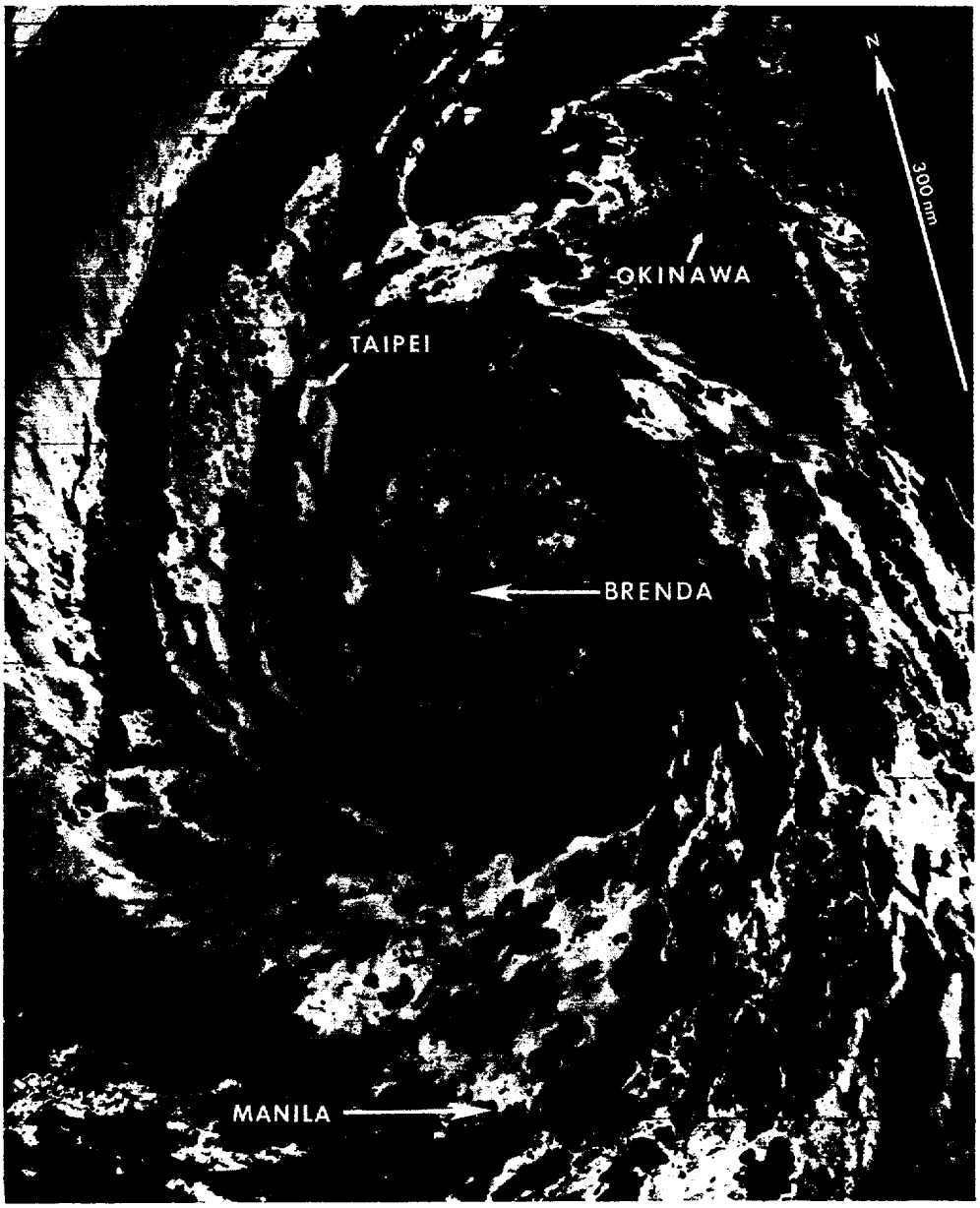
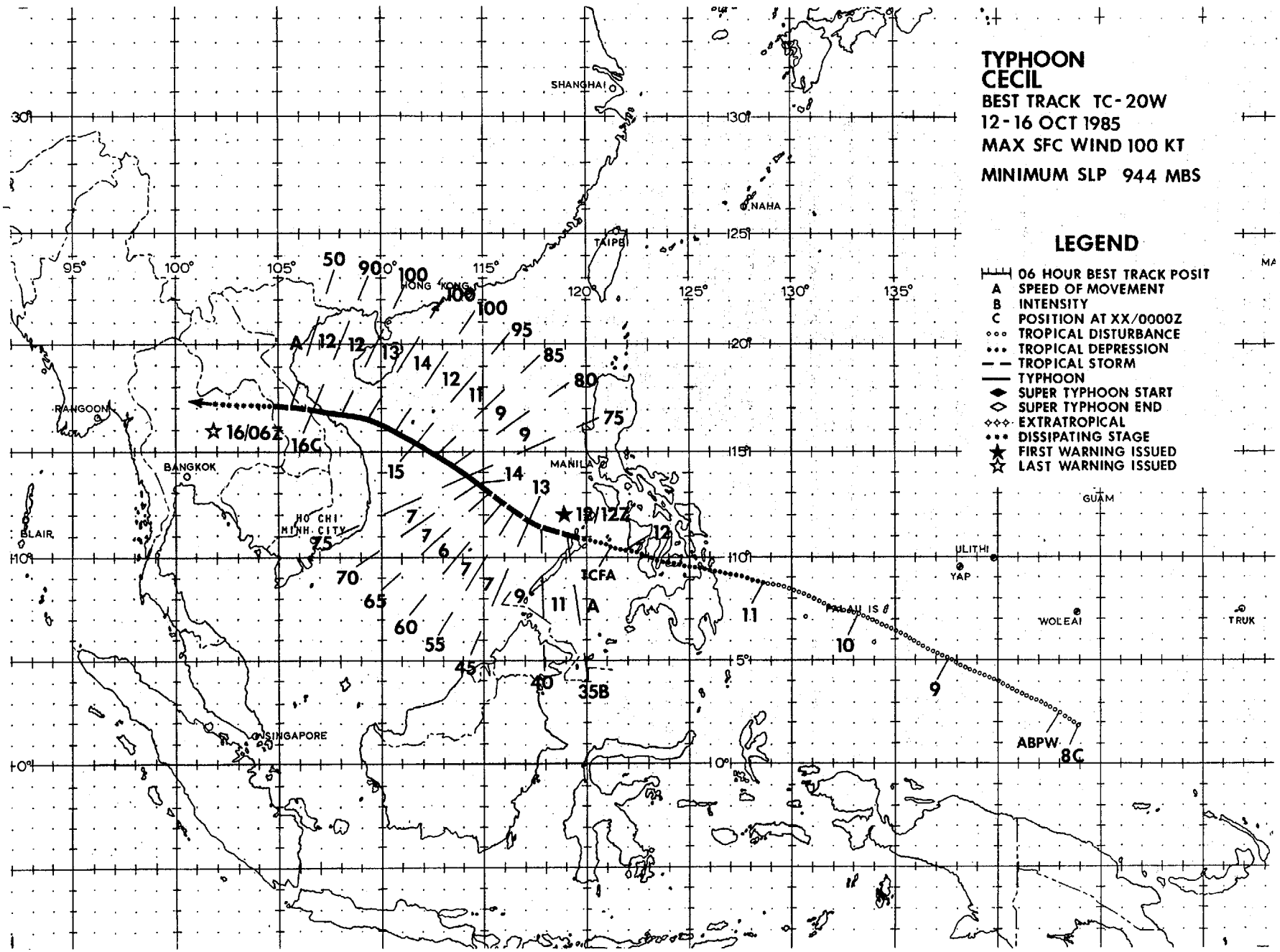


Figure 3-19-3. Nighttime enhanced infrared imagery of Brenda's large eye. The eye is 75 nm (139 km) in diameter (031407Z October DMSP enhanced infrared imagery).


TYPHOON
CECIL
BEST TRACK TC-20W
12-16 OCT 1985
MAX SFC WIND 100 KT
MINIMUM SLP 944 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
SHANGHAI
NAHA
TAIPEI
HONG KONG
RANGOON
BANGKOK
MANILA
HO CHI MINH CITY
SINGAPORE
GUAM
ULITHI
YAP
WOLEAI
TRUK
ABPW
ICFA
16/06Z
19/12Z
16C
35B
8C

Typhoon Cecil was one of several tropical cyclones to hit Vietnam during the autumn of 1985. In its wake, more than 700 were left dead and half-a-million homeless. The dollar value of the damage caused by Cecil has been estimated to be in excess of 65 million dollars.

Typhoon Cecil began innocently enough as an area of increased convective activity south of the Caroline Islands on the 8th of October. Satellite imagery at 080600Z showed a large area of strong, slightly curved convection extending along 04N from 136E to 145E. Supporting synoptic data showed convergent cross-equatorial flow. Over the next 72-hours, the tropical disturbance tracked to the west-northwest towards northern Mindanao, passing just south of the Belau (Palau) Islands late on the 9th. It maintained good upper-level outflow, enhanced by upper-level troughing to the north, and became more organized at the lower levels. Aircraft reconnaissance first located a surface circulation east of Mindanao at 110222Z. Maximum sustained winds at that time were 15 to 20 kt (8 to 10 m/s) and the MSLP was estimated to be 1006 mb.

Further organization of the low-level center was slowed as the disturbance passed through the islands of the southern Philippines. With continued development considered likely once the disturbance crossed the Philippines, a TCFA was issued at 120330Z for the northern Sulu Sea westward into the South China Sea. By 121200Z the disturbance had moved west of Palawan Island into the South China Sea. Little damage was sustained in the southern Philippines due to its passage. By then, satellite imagery indicated that the system had begun to consolidate over water, prompting JTWC to issue the first warning on Tropical Depression 20W at 121200Z. Initially, Cecil was expected to consolidate rapidly and traverse the South China Sea making landfall within 72-hours of the first warning over southern Vietnam.

Post-analysis indicated that Cecil was already at tropical storm intensity upon emerging into the South China Sea. It then turned to a more northwesterly heading and tracked along the southern edge of a ridge over eastern China and the East China Sea. Cecil steadily intensified as it moved northwest, reaching typhoon intensity by 131800Z. By that time satellite imagery showed that Cecil was slowing to 7 kt (13 km/hr) and developing an eye. The slower movement and a slightly more northward track meant that Cecil would not make landfall as early as previously expected. Aircraft reconnaissance at 130824Z confirmed the presence of a 20 nm (37 km) diameter eye and a minimum sea-level pressure of 984 mb.

Cecil took three days to cross the South China Sea. During the latter half of this transit, Cecil maintained an eye and continued to intensify at a steady rate. The low- to mid-level ridge was not as strong as forecast, so Cecil maintained a track to the northwest. As Cecil passed south of Hainan Island on the 15th (Figure 3-20-1), it was at its maximum intensity of 100 kt (51 m/s). By 151200Z, interaction with the topography of Vietnam and Hainan was preventing further intensification by hampering low-level inflow. The mid-level subtropical ridge remained across the island of Taiwan and mainland China. This turned Cecil on a more westerly track, resulting in landfall about 40 nm (74 km) north of Hue (WMO 48852) at 152200Z. Cecil continued to move west and weaken, dissipating over the Laos/Thailand border on the 16th. The final warning was issued at 160600Z.

Officials in Binh Tri Thien Province in central Vietnam described Typhoon Cecil as "the worst natural disaster yet in central Vietnam ...causing... damage worth more than 65 million dollars". At least 702 people were confirmed dead with 128 still missing and 560,000 left homeless. In addition to destroying or damaging 200,000 or more homes, Cecil also destroyed about 850 fishing boats and other small vessels. Winds of up to 90 kt (46 m/s) combined with flooding to ruin 70,000 hectares (172,900 acres) of rice and other crops. A 200 bed hospital was destroyed, five other hospitals damaged, and 250 dispensaries swept away, along with almost 9,000 classrooms with accompanying school equipment and textbooks. Dikes, canals, and pumping stations sustained almost one million dollars in damage. Telephone lines, electricity service, and roadways were cut, bringing business to a halt and hampering relief efforts. It will be many years before this province, one of Vietnam's poorest, recovers from the accumulated affects of this and the other tropical cyclones which affected Vietnam in 1985.

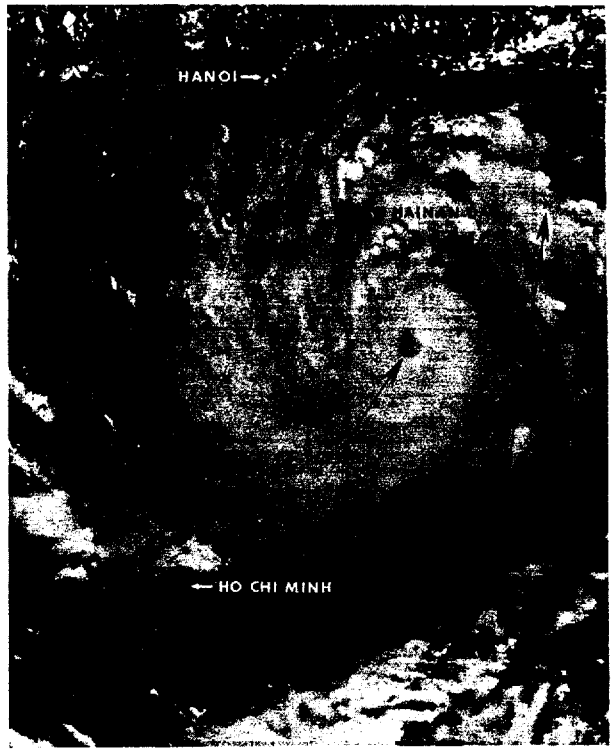
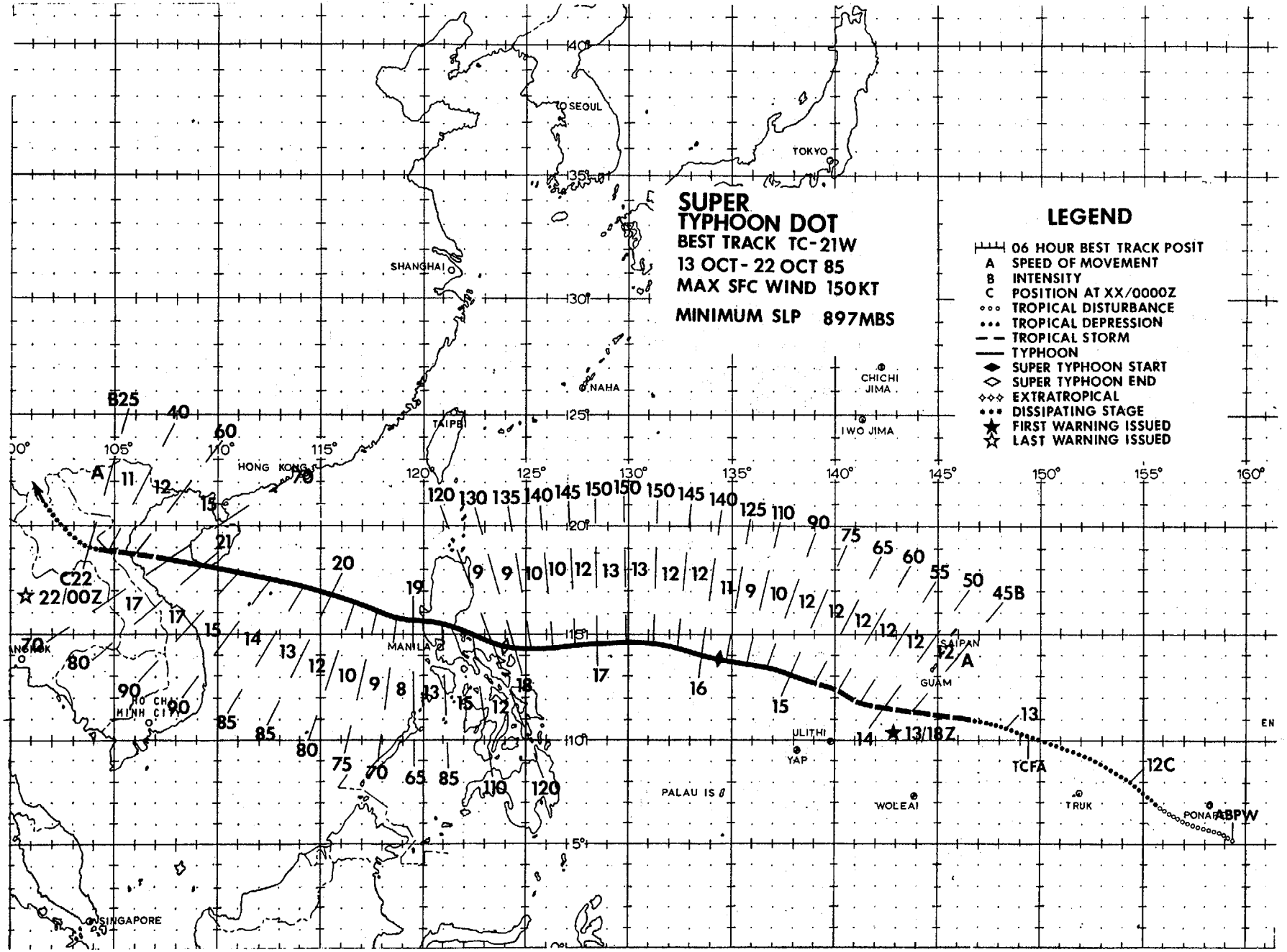


Figure 3-20-1. Typhoon Cecil at maximum intensity passing south of Hainan Island (150733Z October NOAA visual imagery).


SUPER
TYPHOON DOT
BEST TRACK TC-21W
13 OCT - 22 OCT 85
MAX SFC WIND 150KT
MINIMUM SLP 897MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
SEOUL
TOKYO
SHANGHAI
NAHA
CHICHI JIMA
IWO JIMA
TAIPEI
HONG KONG
MANILA
SAIPAN
GUAM
ULITHI
YAP
PALAU IS
WOLEAI
TRUK
PONAPE
SINGAPORE
C22
☆ 22/00Z
☆ 13/18Z
TCFA
12C
PBPW

After Typhoon Brenda, which had developed in the low-level southwest monsoon trough, completed extra-tropical transition on the 5th of October, the mid-level subtropical ridge became well-established over the Northwest Pacific. This synoptic feature would confine the development of tropical cyclones to low latitudes near 10N in the near-equatorial trough. Also coincident with Brenda's movement to the north was the replacement of the low-level southwest monsoon flow over the South China Sea with north-to-northeasterly flow off of the Asian continent.

Typhoon Dot was the only super typhoon (intensity equal to or greater than 130 kt (67 m/s)) of the 1985 WESTPAC season. It intensified (deepened) explosively causing intensity forecast difficulties. Other distinguishing characteristics were the small size of the area of intense convection, the small radius of maximum wind, and the absence of low-level southwest monsoon inflow. Also of interest was the large wind radius in the northwest semicircle (when it was located southeast of Luzon) where surface winds were enhanced by a strong pressure gradient between the tropical cyclone and a polar high pressure cell located near 40N 110E.

Dot was first detected as a tropical disturbance in the near-equatorial trough, 150 nm (278 km) southeast of Ponape (WMO 91348) on the 11th of October. Figure 3-21-1 shows the disturbance on the 12th of October exhibiting signs of organization in its upper-level outflow. The system moved west-northwest and reached tropical storm intensity on the 13th south of Guam.

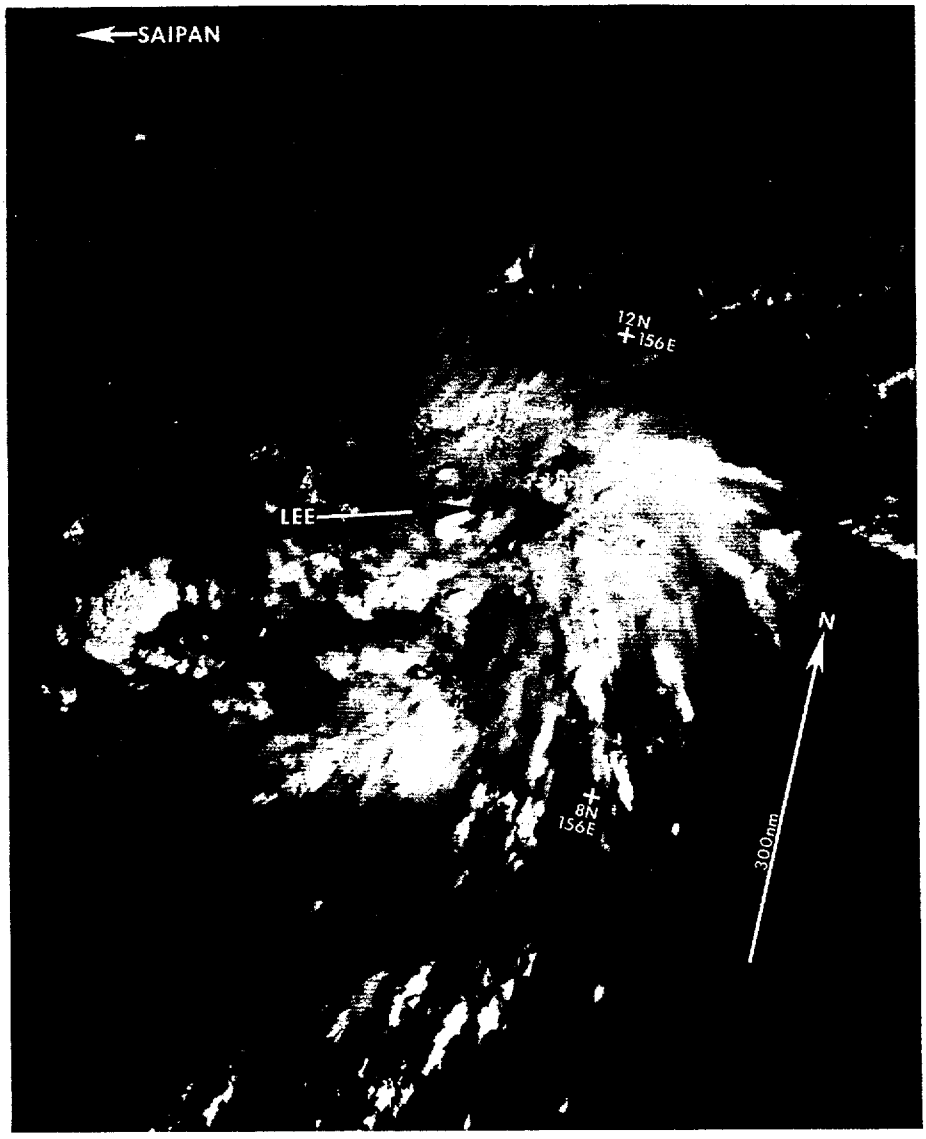


Figure 3-21-1. Super Typhoon Dot as a disturbance in the near-equatorial trough with signs of organized upper-level outflow [1200062 October DMSP visual imagery].

The track forecasts for Typhoon Dot did not present any significant difficulty for the forecasters at JTWC. Figure 3-21-2 shows that the mid-level easterlies dominate the Trust Territories westward through the Philippine Islands and into Southeast Asia at 120000Z. With no change expected in the orientation or strength of the ridge, a west-northwest track at 10 to 20 kt (19 to 37 km/hr) under this ridge was considered to be the best forecast. This was in agreement with climatological and analog forecast guidance. The two numerical models, OTCM (One-way interactive Tropical Cyclone Model) and NTCM (Nested Tropical Cyclone Model), were of little help during the crucial first four days of forecasts (when Dot was approaching the Philippines). Due to computer problems at Fleet Numerical Oceanography Center (FNOC) the older Primitive Equation (PE) model was run in place of the Navy Operational Global Atmospheric Prediction System (NOGAPS). Later, it was determined that OTCM, when running with data from the PE model, didn't have access to the necessary data fields. Subsequently, OTCM was modified to accept the needed data.

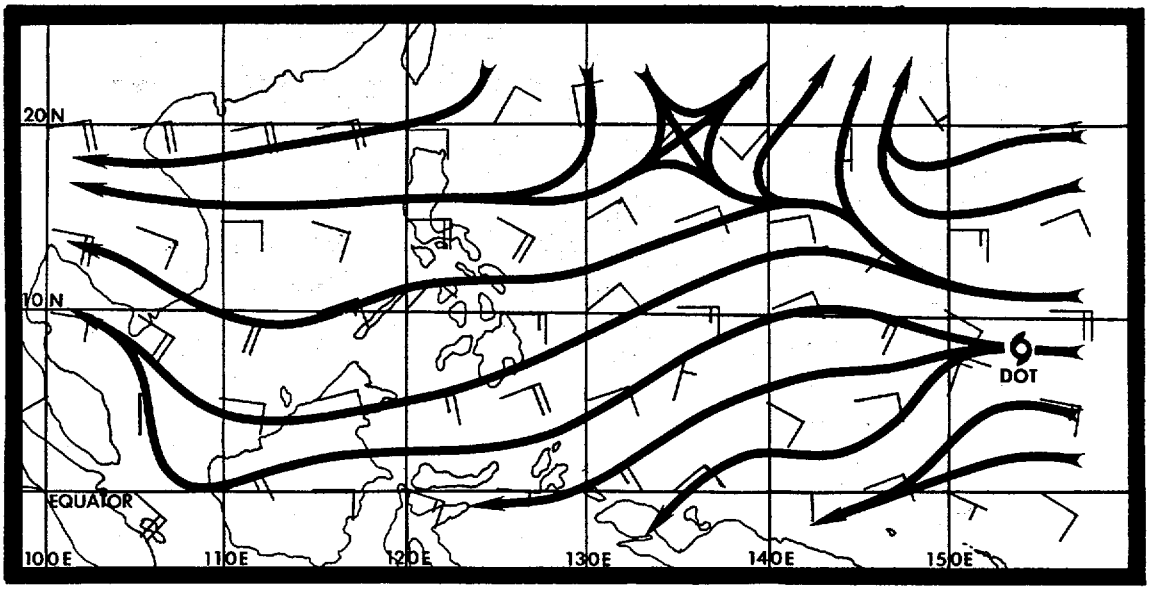


Figure 3-21-2. 400 mb Numerical Variational Analysis (NVA) at 120000Z October showing easterlies over Dot's future track to the west-northwest.

The one aspect of Typhoon Dot that did present considerable forecast difficulty was intensity. In the twenty-three hour period between 150022Z and 152342Z Dot's central sea-level pressure dropped from 969 mb to 903 mb (a decrease of 66 mb). This translates to a drop of approximately 2.8 mb/hour. This meets and exceeds the rate of 2.5 mb/hr (sustained for at least 12 hours) that Holliday and Thompson (1979) used to define explosive intensification (deepening). JTWC uses a technique (Dunnavan, 1981), in which the 700 mb equivalent potential temperature (Theta-E, a measure of the tropical cyclone's thermodynamic energy based on the central 700 mb temperature and dewpoint) and the central sea-level are compared pressure to forecast explosive intensification. The technique calls for intensification to below 925 mb (how far below can be estimated from the technique also) whenever the plots of central sea-level pressure and Theta-E intersect near the critical values of 950 mb and 360 degrees Kelvin (both values being statistical means derived from past intense storms). Figure 3-21-3 is a plot of Dot's central sea-level pressure and Theta-E during the period 140530Z to 180828Z. At Point A (142130Z), the two lines show a tendency to intersect (notice extrapolation to Point A'). However, Point B (150022Z) reflects a decrease in Theta-E. Then, at Point C (150615Z), this trend reverses and again extrapolation to Point C' would indicate intersection. Point D (150853Z) shows a slight

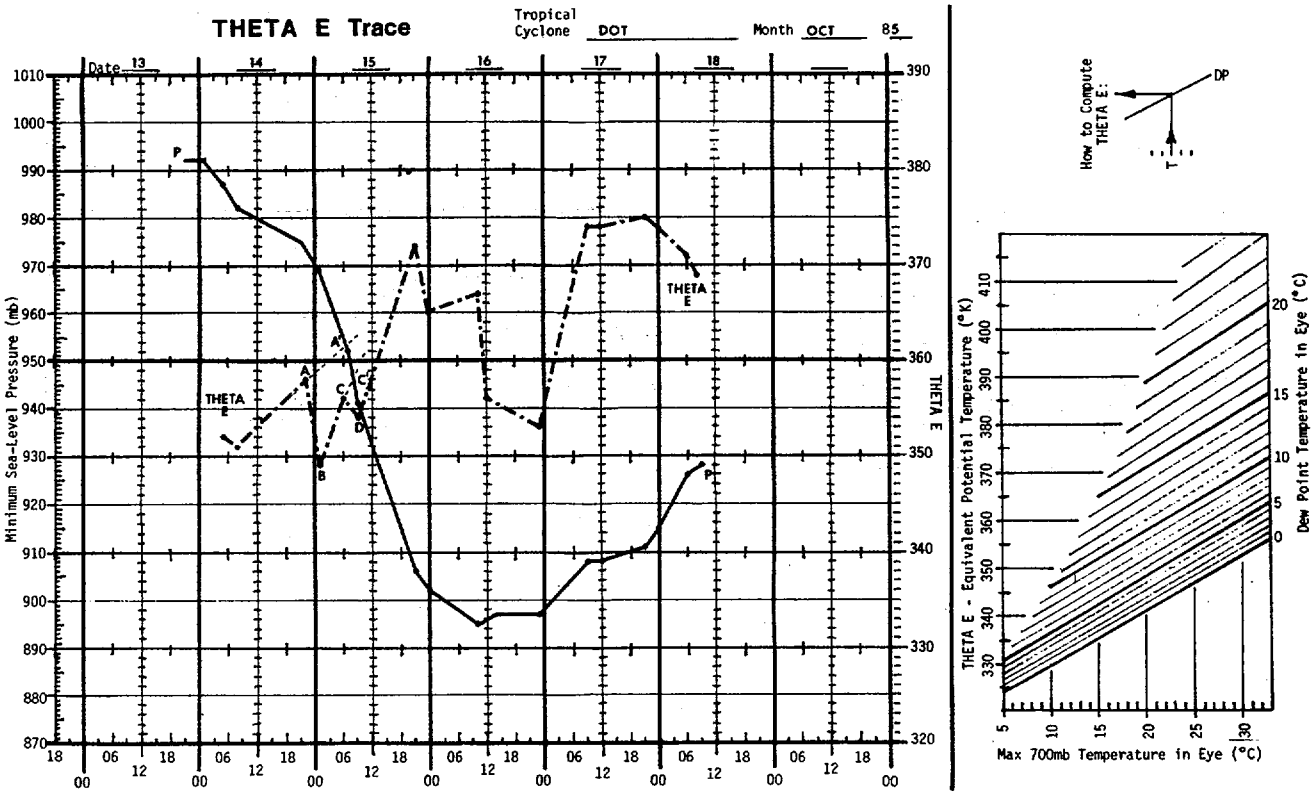


Figure 3-21-3. Plot of Dot's central sea-level pressure and central 700 MB equivalent potential temperature during the period 140530Z to 180828Z October.

decrease in Theta-E and no intersection. The next available aircraft reconnaissance data was not received until 152102Z, and by that time Dot's central sea-level pressure had plummeted to 906 mb and the central 700 mb temperature had soared from 20 Celsius to 30 Celsius (yielding a Theta-E of 372 K when paired with the dewpoint temperature of 11 Celsius). This forecast method is a reliable one in most instances. However, Typhoon Dot demonstrates a situation when the lack of timely aircraft data prevented the effective use of the technique. In post-analysis, if pressure, temperature, and dewpoint data had been available around 151200Z it is a distinct possibility that the intersection of the central sea-level pressure line and the Theta-E line would have been observed.

The reliability of this forecast technique was mentioned earlier. However, in addition to the timing problem already mentioned, a couple of factors should be pointed out. First, the computation of Theta-E is very sensitive to dewpoint temperature (and to a lesser degree ambient temperature). The dewpoint measurement is also sensitive to a sometimes non-homogeneous distribution of moisture in the storm's center. Second, a rarer but sometimes complicating factor is the complexity and delicacy of the dewpoint hygrometer which is an alternately cooled/heated mirror coupled with a thermistor. The dewpoint temperature is recorded when a thin film of dew forms on the mirror. Malfunctions of the instrument occasionally occur.

To give the reader an indication of what impact not knowing that Dot was going to explosively deepen had on the intensity forecasts can be seen in Figure 3-21-4. The graph depicts the best track intensities (at six hour intervals) for the period 131800Z to 181200Z compared to the corresponding 12-,24-,48-, and 72-hour intensity forecasts. Twelve-hour fore-

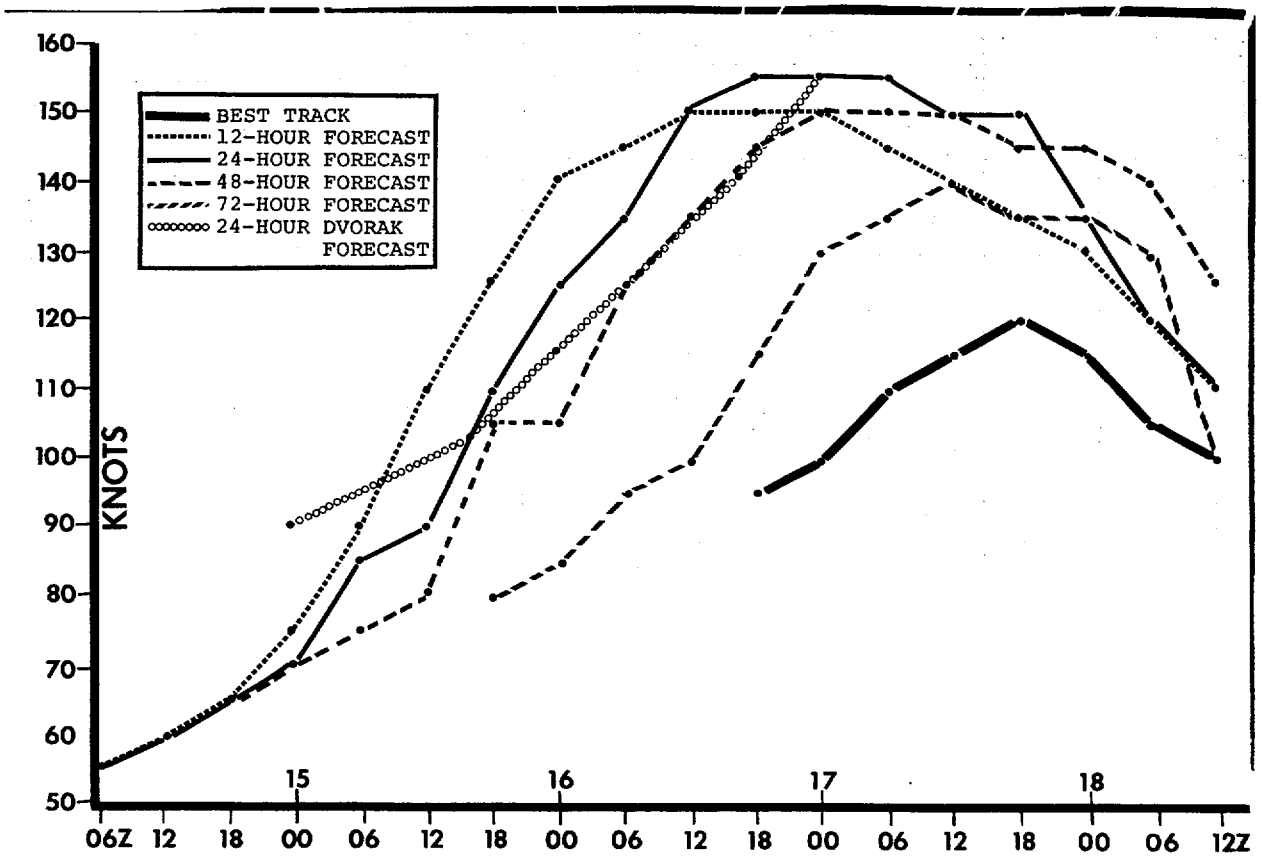


Figure 3-21-4. Plot of Dot's best track intensities at six-hour intervals and corresponding 12-,24-,48-, and 72-hour forecast intensities for the period 131800Z to 181200Z October 85.

casts for the period 151200Z through 160600Z were 20, 15, 15, and 10 kt (10, 8, 8, and 5 m/s) low. For the same period twenty-four hour forecasts were 30, 20, 35, and 20 kt (15, 10, 18, and 10 m/s) below the best track intensities. From the graph one can see that the 24-hour forecast intensity curve is very close to the Dvorak forecast intensity curve. This is usually the case since the Dvorak model is the main JTWC 24-hour intensity forecast tool. The problem with explosive intensification really starts showing up at the 48-hour forecast period. The 48-hour intensity forecasts during the period 151800Z through 161800Z October were 45, 55, 50, 50, and 35 kt (23, 28, 26, 26, and 18 m/s) too low. The three 72-hour forecasts that were effected by the explosive deepening were for the period 161800Z through 170600Z Oct and were 55, 50, and 35 kt (28, 26, and 18 m/s) too low. After Dot had explosively deepened, the intensity forecasts reflected the storm's high initial intensity and the forecast errors decreased significantly with the average 12-hour intensity forecast error for the period 140600Z through 181200Z (18 cases) being 5 kt (3 m/s), the average 24-hour error for the period 141800Z through 181200Z (16 cases) being 14 kt (7 m/s), the average 48-hour error for the period 151800Z through 181200Z (12 cases) being 24 kt (12 m/s), and the average 72-hour error for the period 161800Z through 181200Z (8 cases) being 28 kt (14 m/s). The point being made is that a forecaster doesn't necessarily have to know 72 hours ahead of time that a system is going to explosively deepen, but if he knows 12 or 24 hours ahead of time then the longer range forecasts made during that period will reflect the higher storm intensity and be more accurate.

Figure 3-21-5 shows Super Typhoon Dot at maximum intensity with a well-defined eye and intense convection confined to a small area around the system. Aircraft reconnaissance on the 16th and 17th of

Figure 3-21-5. Super Typhoon Dot at maximum intensity with a well-defined eye and small surrounding ring of intense convection (170147Z October DMSP visual imagery).

October consistently located the maximum surface winds 5 to 10 nm (3 to 5 km) from the center and radar eye diameters of 10 to 15 nm (5 to 8 km).

Figure 3-21-6 shows the surface wind circulation pattern around Dot (while it was southeast of Luzon) at 181200Z October. Strong winds extended out much further in the northwest semicircle where the surface winds were from the north to northeast. This increased flow resulted from a strong pressure gradient that existed between Dot and a polar high-pressure cell located near 40N 110E. The figure also shows the absence of any enhanced low-level southwest monsoon flow over the South China Sea.

The threat posed by Super Typhoon Dot caused all U.S. military installations in the Philippines to be placed in Tropical Cyclone Condition of Readiness I and resulted in the evacuation of aircraft from Cubi Point NAS and Clark AB, and the movement of several ships from Subic Bay. Seventy-four peoples were reported killed, more than 50,000 left homeless, and damage to buildings and crops estimated at 1.3 million dollars. NAVOCEANCOMFAC Cubi Point reported a peak gust of 19 kt (10 m/s) and Det 5, 20WS at Clark AB reported maximum sustained winds of 27 kt (14 m/s) with a peak gust of 44 knots (23 m/s). Dot was a very intense typhoon but the damage done in the Philippines was certainly limited by the storm's small diameter of maximum wind, its small area of intense convection, its path of approach to Luzon (this kept most of the low-level flow parallel to the mountainous terrain, reducing orographically-enhanced rainfall), and the absence of enhanced low-level southwest monsoon flow.

After entering the South China Sea late on the 18th of October with minimal typhoon intensity, Dot began regaining organization overwater and continued on a west-northwesterly track. By 201200Z, the Typhoon's intensity peaked at 90 kt (46 m/s) 300 nm (556 km) south-southwest of Hong Kong (WMO 45007). Dot weakened as it churned across the southern tip of Hainan Island, leaving at least two dead, 2300 houses collapsed, and flooding in its wake. Crossing the Gulf of Tonkin in less than a day, it slammed into the coast of North Vietnam 130 nm (241 km) south of Hanoi (WMO 48819). The final warning on Dot was issued at 220000Z as the system dissipated over the rugged mountains inland.

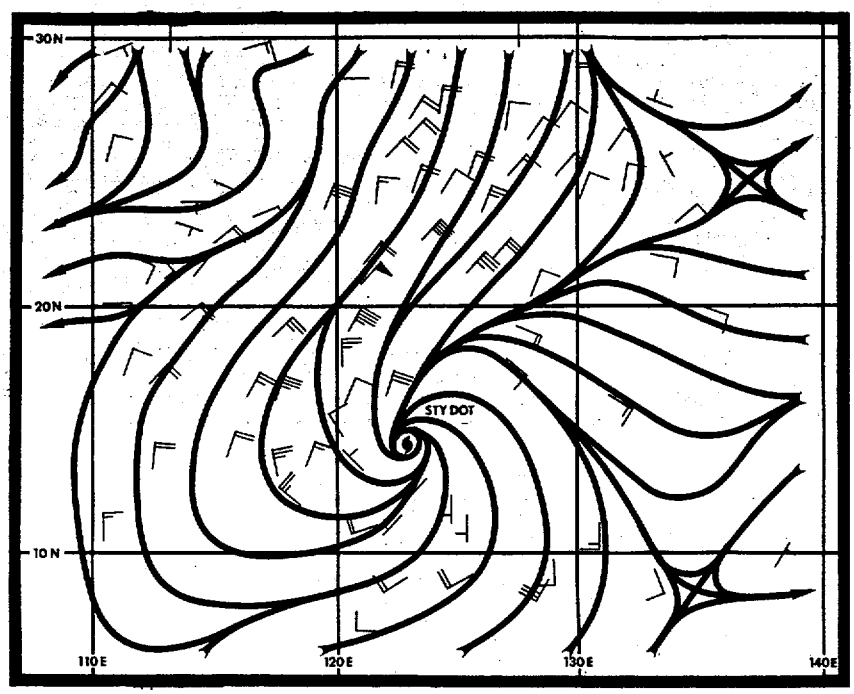


Figure 3-21-6. Surface analysis at 181200Z October showing strong winds extending out a great distance in the northwest semicircle and the absence of (convection-enhanced) low-level southwest monsoon flow.

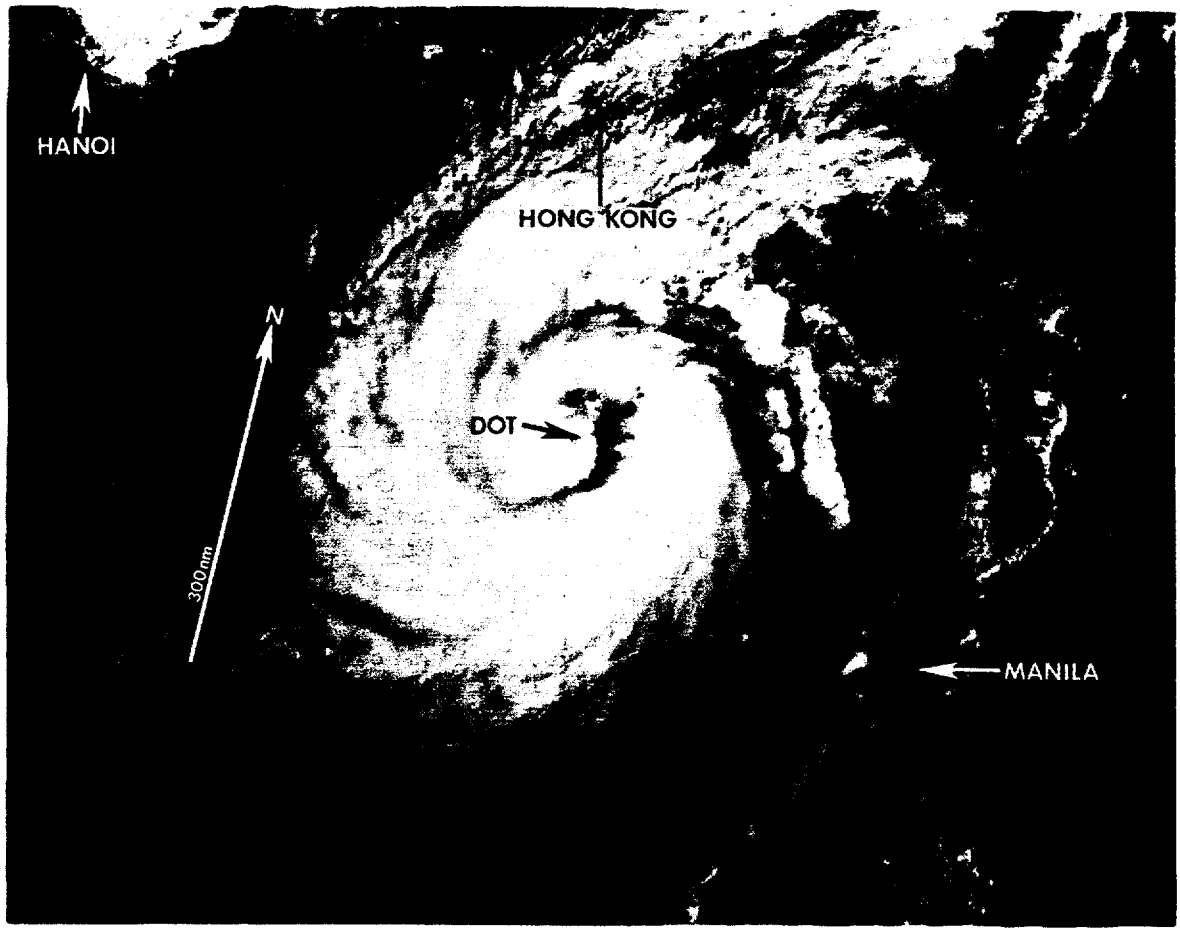
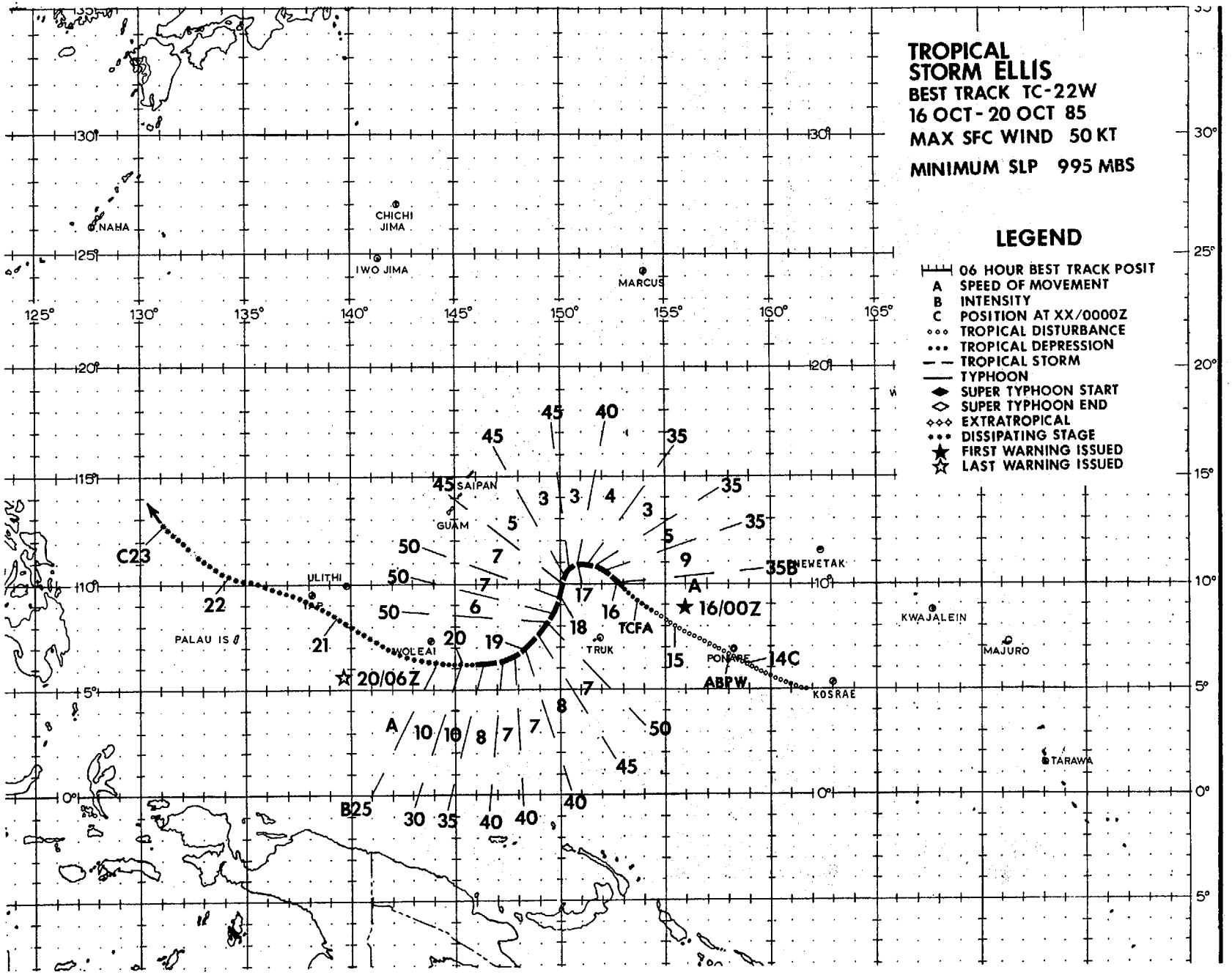


Figure 3-21-7. Super Typhoon Dot with 85 knots (44 m/s) after crossing Luzon and re-intensifying in the South China Sea (2002277 October DMSP visual imagery).


TROPICAL
STORM ELLIS
BEST TRACK TC-22W
16 OCT - 20 OCT 85
MAX SFC WIND 50 KT
MINIMUM SLP 995 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
NAHA
CHICHI JIMA
IWO JIMA
MARCUS
SAIPAN
GUAM
ULITHI
PALAU IS
WOLEAI
TRUK
PONAPE
KOSRAE
NEWETAK
KWAJALEIN
MAJURO
TARAWA
C23
22
21
20/06Z
16/00Z
TCFA
ABPW
14C
35B
B25

Tropical Storm Ellis, which formed in the wake of Super Typhoon Dot, proved to be a relatively short-lived system. Although it did not pass close enough to any populated areas to cause significant damage, Ellis was noteworthy since it presented a unique forecasting problem. Originally forecast to move west-northwest under the subtropical ridge and pass relatively close to Guam, it actually slowed just after reaching tropical storm intensity and proceeded to move southwest for almost three days before dissipating over water.

The disturbance which eventually developed into Tropical Storm Ellis was first observed as a curved band of convection near the island of Ponape (WMO 91348) on 14 October. The area was subsequently included on the Significant Tropical Weather Advisory (ABPW PGTW) at 140600Z. The system moved west-northwest and increased in organization during the next 36-hours. At 151730Z, a Tropical Cyclone Formation Alert (TCFA) was issued and aircraft reconnaissance requested for the following day.

Interpretation of the 160000Z visual satellite imagery, using the Dvorak intensity technique, yielded a surface wind estimate of 35 kt (18 m/s). This, in combination with aircraft reconnaissance which located a surface circulation with 35 kt (18 m/s) at the 1500 ft (457 m) level at 160458Z, prompted the first warning on Tropical Storm Ellis at 160500Z. Ellis was forecast to move west-northwest under the subtropical ridge which was apparently well established to the north of the system. At 170000Z Ellis slowed to 3 kt (6 km/hr) as the steering flow south of the subtropical ridge axis weakened in response to the passage of a mid-latitude trough to the north. The forecast philosophy of continuing the west-northwest track was not changed at this point, as a resumption of that movement was expected when the mid-latitude trough moved northeastward. In addition, the synoptic guidance appeared to be in agreement with this reasoning. Figure 3-22-1 is Fleet Numerical Oceanography Center's (FNOC) 700 mb Numerical Variational Analysis (NVA) field for 170000Z, which indicates the weak easterly flow around the subtropical ridge and the mid-latitude trough north of Ellis. The 400 mb analysis for the same time (Figure 3-22-2) indicates similar features, except the north-south extent of the subtropical ridge is much smaller. Note that the flow near Ellis is generally weak and southerly, with weak easterlies to the north.

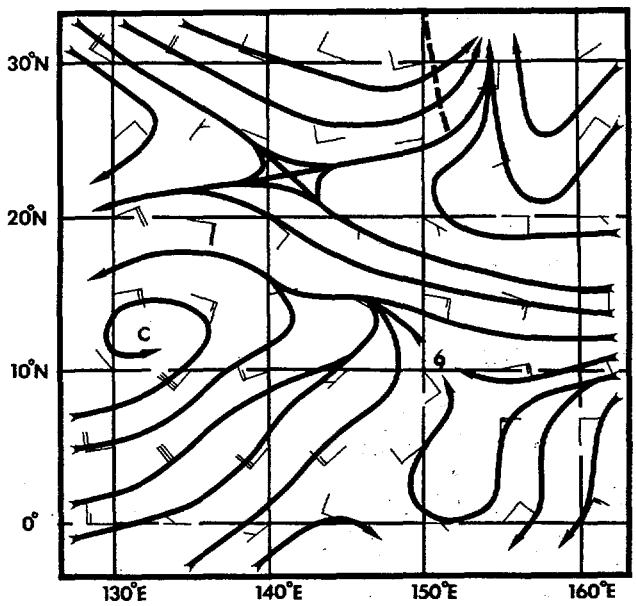


Figure 3-22-1. 170000Z 700 mb Numerical Variational Analyses (NVA) showing weak troughing and 15 kt (8 m/s) easterlies to the north of Ellis.

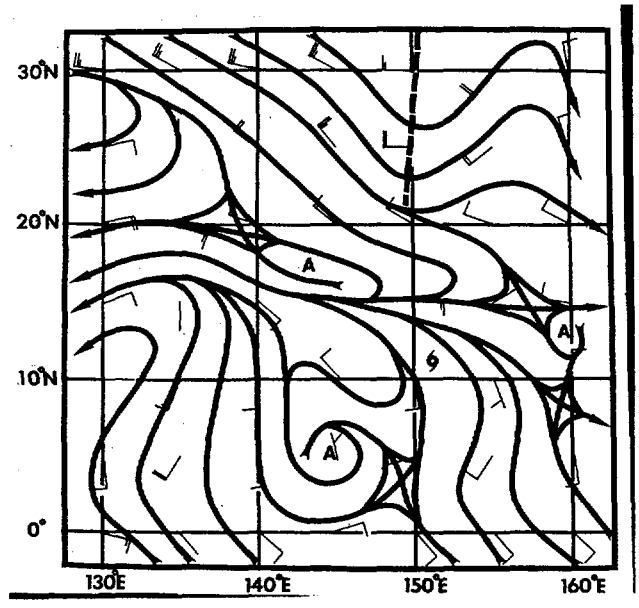


Figure 3-22-2. 170000Z 400 mb NVA depicting weak ridging north of Ellis.

Due to the uncertainity of these mid-tropospheric analyses, synoptic track aircraft missions were requested. The one flown between 0300Z and 0700Z on 17 October provided 400 mb winds in the vicinity of Ellis' forecast track. Figure 3-22-3 shows these observations. In contrast to the NVA analysis (Figure 3-22-2) for that time, the flow is generally northerly to the north and west of Ellis. The lack of data over water in the western North Pacific was probably responsible for the disagreement between the aircraft observations and the NVA analysis at 400 mb. However, the NVA from the following day (180000Z) represented a significant change; the observations from the synoptic track were in good agreement with the new analysis at 400 mb (see Figure 3-22-4).

In the meantime aircraft reconnaissance at

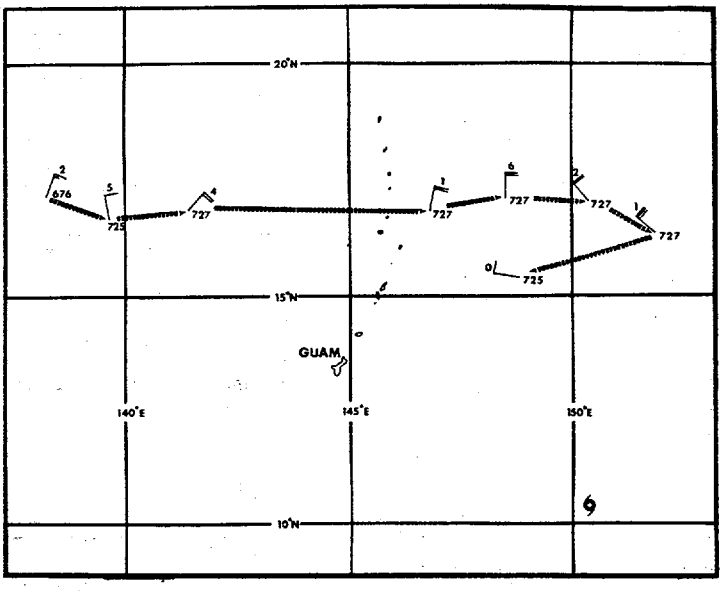


Figure 3-22-3. Observations from the aircraft reconnaissance mission synoptic track at 400 mb, indicating northerly flow vice easterly flow ahead of Ellis.

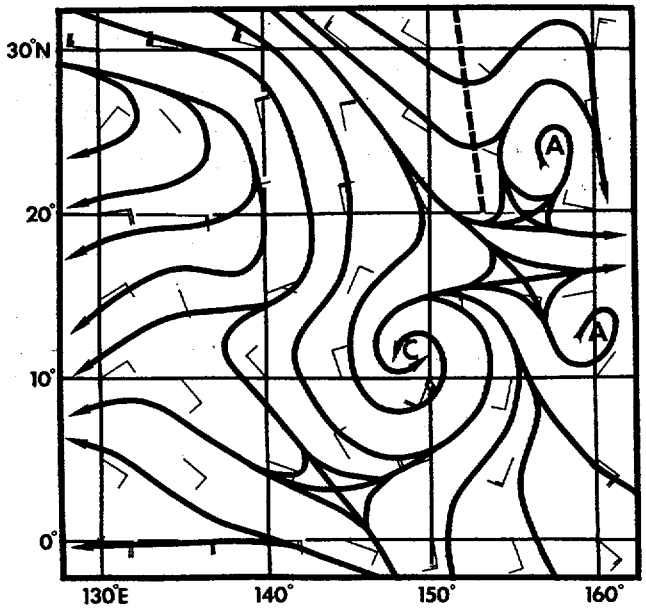


Figure 3-22-4. 180000Z October 400 mb analysis, showing northerly flow ahead of Ellis, which agrees with earlier observations from the synoptic track.

172200Z and 172345Z found the low-level circulation center well south of the forecast track, indicating Ellis had moved south-southwest during the period. At that time Ellis also reached its maximum intensity of 50 kt (26 m/s). The feature that helped to drive the low- to mid-level ridging to the west and moved Ellis to the south-southwest, was most probably an upper cold low, or cell, in the tropical upper-tropospheric trough (TUTT). The 200 mb analysis for 190000Z (see Figure 5-22-5) indicated that the TUTT cell was in close proximity to Ellis. Satellite imagery at that time indicated that upper-level outflow was suppressed in the west semicircle (see Figure 3-22-7). The low- to mid-level flow remained northerly, and Ellis continued its southwestward track.

At 191200Z, Ellis began to weaken as it attempted to move under the TUTT cell and experienced increased vertical shear. By 200000Z the intensity had decreased to 30 kt (15 m/s) and the low-level cloud lines had lost most of their curvature. The last warning was issued at 200600Z.

In retrospect the One-way Tropical Cyclone Model (OTCM) presented a puzzle during the initial forecasts on Ellis, because of its previous performance on Super Typhoon Dot several days before. With Dot, which also formed in low latitudes, OTCM guidance repeatedly, and erroneously, drove the system equa-

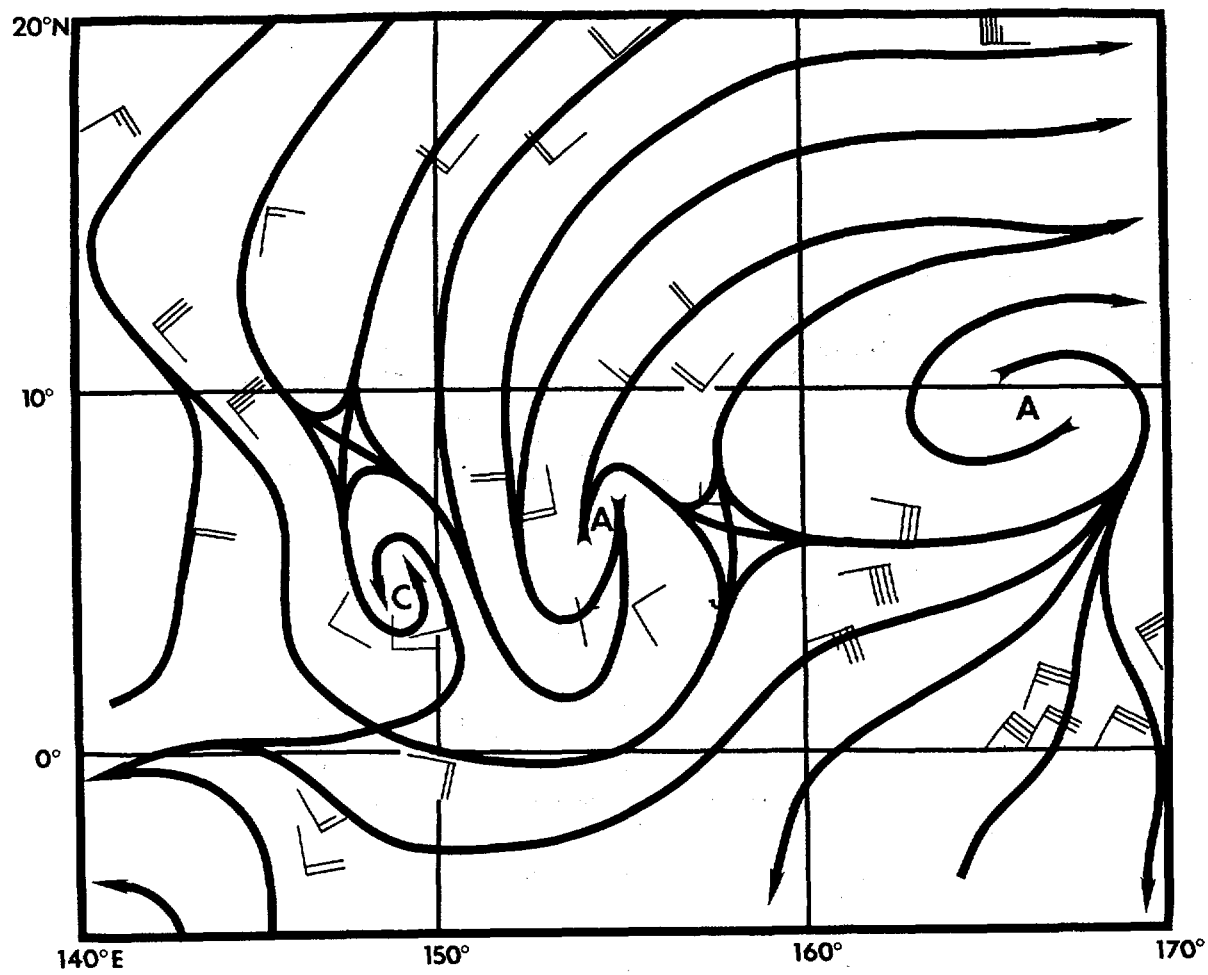


Figure 3-22-5. 190000Z October 200 mb analysis depicting the location of the TUTT and the upper-level cold low.

torward. As a consequence, the OTCM (Figure 3-22-6), which indicated southwest movement for Ellis, was highly suspect. Persistence and climatology favored a west to northwest track through the southern Mariana Islands. As it turned out, Ellis moved southwest, passing well south of the island of Guam. In this case the OTCM guidance was "right" for the "wrong" reasons. After-the-fact it was determined by the software managers at Fleet Numerical Oceanography Center that during this time the Primitive Equation (PE) model was run instead of the Navy Operational Global Atmospheric Prediction System (NOGAPS). Since the PE model was hemispheric - not global - OTCM, when it received the data fields, only found the northern hemisphere with a boundary at the equator. Thus, for a low latitude systems like Ellis and Dot, OTCM generated a spurious vortex due to the lack of southern hemisphere fields. This caused the forecast guidance to fluctuate wildly and drive the system towards the equator. OTCM, subsequently, was modified to incorporate the latest southern hemisphere fields before running.

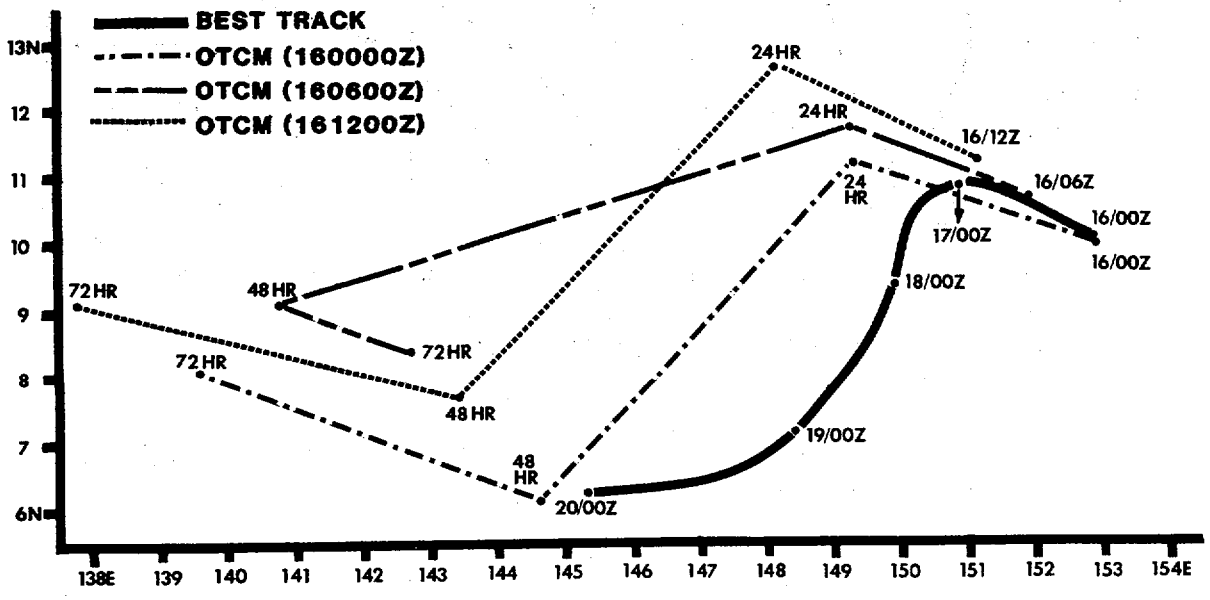


Figure 3-22-6. Comparison of the best track for Ellis with OTCM guidance for the period 160000Z through 161200Z October.

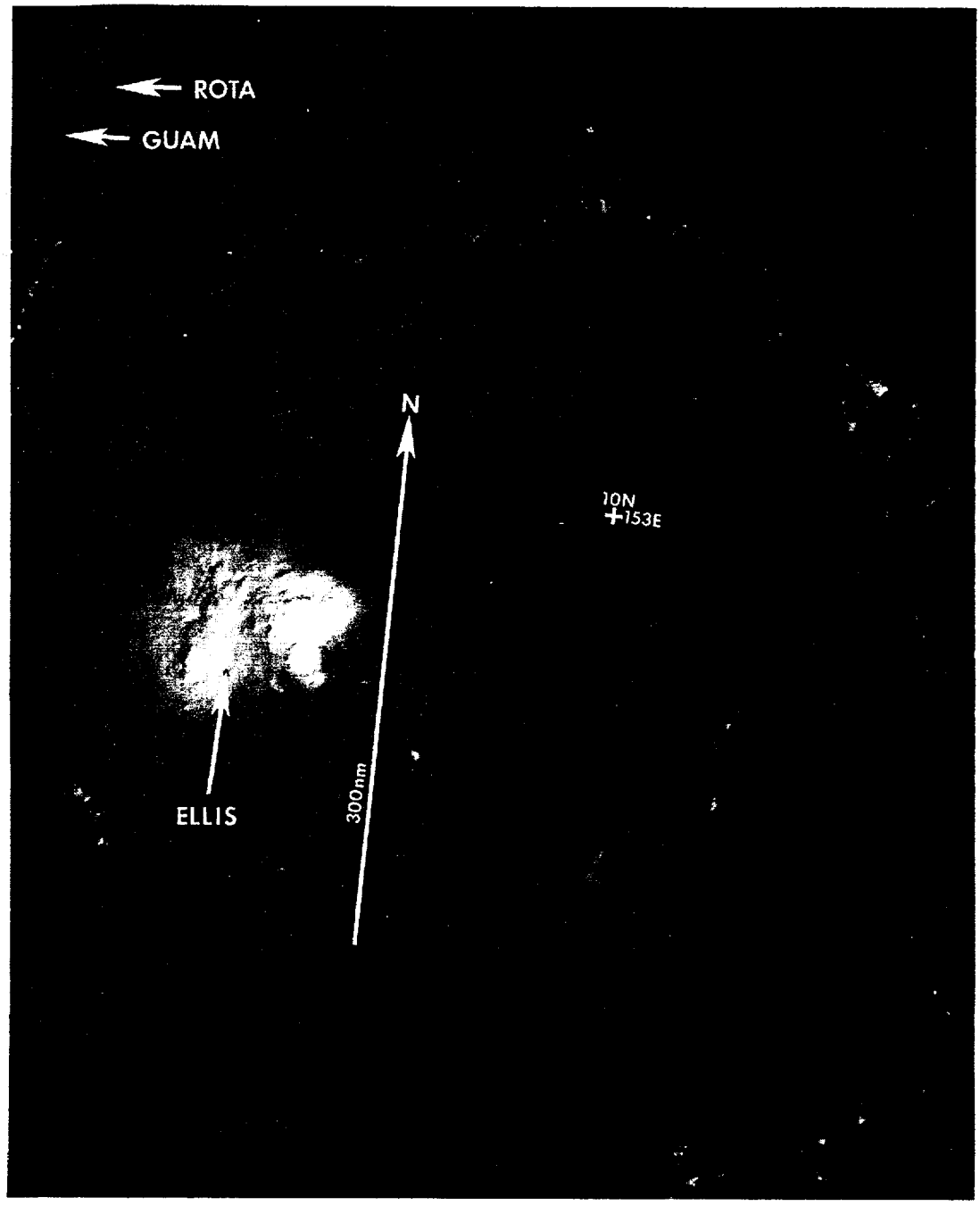
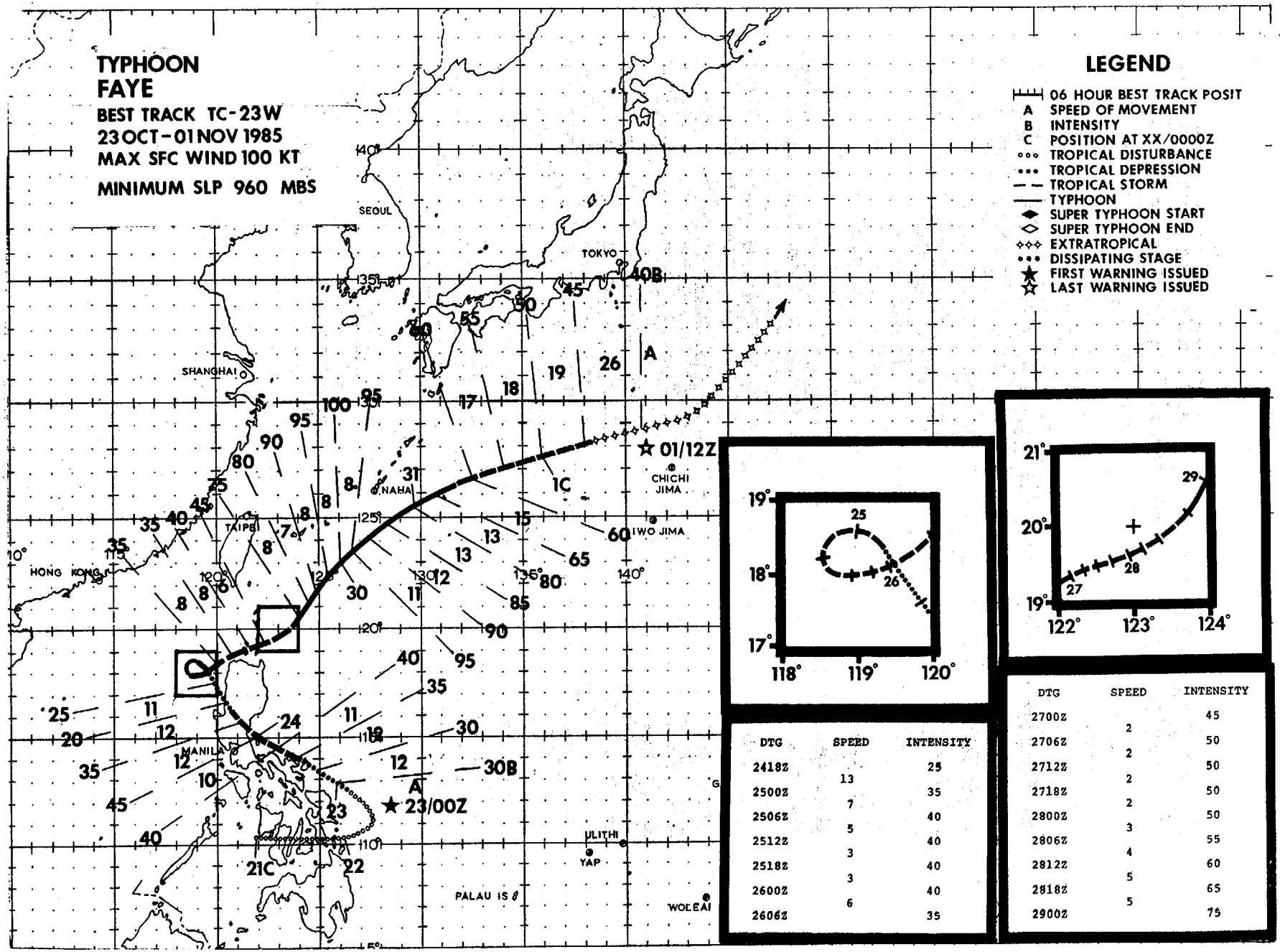


Figure 3-22-7. Tropical Storm Ellis 440 nm (815 km) south-southeast of Guam. Cirrus clouds define the outflow boundary in the eastern semicircle. Although Ellis is near the edge of the satellite imagery, the absence of cirrus in the western semicircle hints at the restricted outflow aloft due to the close proximity of the upper cold low further to the west (182325Z October DMSP visual imagery).


TYPHOON
FAYE
BEST TRACK TC-23W
23 OCT - 01 NOV 1985
MAX SFC WIND 100 KT
MINIMUM SLP 960 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
HONG KONG
MANILA
CHICHI JIMA
IWO JIMA
ULITHI
YAP
PALAU IS
WOLEAI
01/12Z
23/00Z
40B
30B
21C
1C
31
A
DTG SPEED INTENSITY
2418Z 13 25
2500Z 7 35
2506Z 5 40
2512Z 3 40
2518Z 3 40
2600Z 6 40
2606Z 35
DTG SPEED INTENSITY
2700Z 2 45
2706Z 2 50
2712Z 2 50
2718Z 2 50
2800Z 3 50
2806Z 4 55
2812Z 5 60
2818Z 5 65
2900Z 75

Faye was the last of four tropical cyclones to form in October, a month that normally accounts for five. Its formation was unusual because it was masked by two other tropical cyclones already in progress.

To set the stage, on 21 October Super Typhoon Dot was moving from the South China Sea into North Vietnam. The low-level southwesterly flow, that had been feeding into Dot, extended across the South China Sea into the Philippine Islands. A day later - with Dot over land and dissipating - a fresh outbreak of polar air from the northeast moved across the northern South China Sea and Philippines. The low-level convergence and cloudiness associated with the southwesterly monsoon flow persisted in the southern Philippine Islands - (this was the start of Faye). To the east in the Philippine Sea the remnants of Ellis were embedded in the western end of the near-equatorial trough. Ellis had been finalled at (200600Z). Although devoid of central cloudiness, it still retained some cyclonic vorticity. As the remnants of Ellis drifted west-northwestward, satellite imagery at 221200Z revealed a resurgence of its central convection. This renewed activity resulted in the issuance of two Tropical Cyclone Formation Alerts (TCFA) at 211200Z and 220300Z. The remains of Ellis, however, did not regenerate.

In conjunction with the continued interest in Ellis, an aircraft reconnaissance investigation mission was scheduled for the daylight hours on the 23rd of October. It located east-southeasterly winds at 10 kt (5 m/s) and a MSLP of 1009 mb associated with the TCFA area; however, as the flight continued to the west, it discovered 35 kt (18 m/s) winds and a MSLP of 1004 mb associated with another circulation. This prompted the first warning on Tropical Depression 23W at 230000Z. Up to this time there had been no mention of this new system in either the Significant Tropical Weather Advisory (ABPW PGTW) or the TCFA associated with Ellis. The tropical depression, once identified, moved northwestward under the subtropical ridge and slowly intensified. It reached tropical storm intensity at 231200Z. Later (240300Z), Tropical Storm Faye made landfall over central Luzon 60 nm (111 km) northeast of Manila (WMO 98429) with an intensity of 40 kt (21 m/s). Faye tracked to the northwest across Luzon in 9 hours and entered the South China Sea as a 20 kt (10 m/s) tropical depression some 130 nm (241 km) north-northwest of Manila. During the next 12-hours, Faye re-intensified over open water and moved on to the northwest. As a consequence of this northwesterly movement, Hong Kong (WMO 45005) went to Tropical Cyclone Condition of Readiness III at 250303Z.

Although, the system was forecast to move slowly to the northwest and intensify, the presence of a mid-latitude trough over mainland China changed that scenario. Faye was upgraded to tropical storm intensity late on the 24th and slowed further. Actually, satellite, radar and two aircraft reconnaissance fixes confirmed that the system completed a small cyclonic loop between 241800Z and 251800Z. Then Faye turned northeastward and accelerated through the Luzon Straits. Aircraft reconnaissance peripheral data between 262100Z and 270000Z showed the maximum surface winds to be in the northeastern semicircle. This was due to the increased pressure gradient between the low central pressure of Faye and the ridge to the northeast over Japan. For the next two days, after moving from the Straits, Faye slowed again, covering only 140 nm (259 km). The slowing trend was accompanied by intensification. Faye became a typhoon at 281800Z.

With Typhoon Faye approaching, Kadena AB on the island of Okinawa set Tropical Cyclone Condition of Readiness III (at 290900Z), and Condition II at 300310Z. During this period Typhoon Faye was at its maximum intensity of 100 kt (51 m/s) and beginning to accelerate to the northeast (see Figure 3-23-1). The closest point of approach to Kadena AB was 90 nm (167 km) to the southeast at 301900Z. Even though Faye's intensity at this time was 85 kt (44 m/s), the maximum observed winds at Kadena AB were only 18 kt (9 m/s).

After passing south of the island of Okinawa, Typhoon Faye continued to decrease in intensity due to the increased strength of the upper-level westerlies and the associated vertical wind shear. At 311200Z, 17 hours after its closest point of approach to Okinawa, Typhoon Faye was downgraded to a tropical storm. Faye continued accelerating to the east-northeast and transitioned to an extratropical low with an intensity of 45 kt (23 m/s) six hours before the final warning at 011200Z.

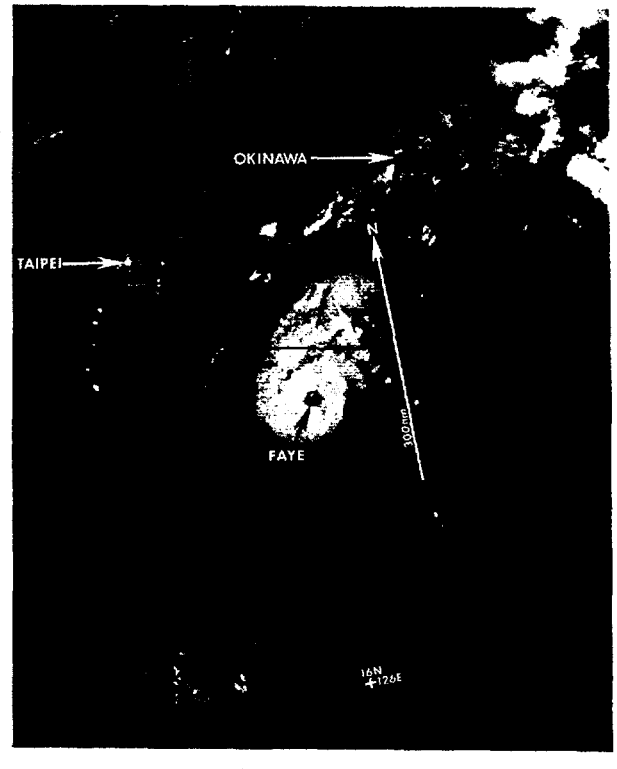
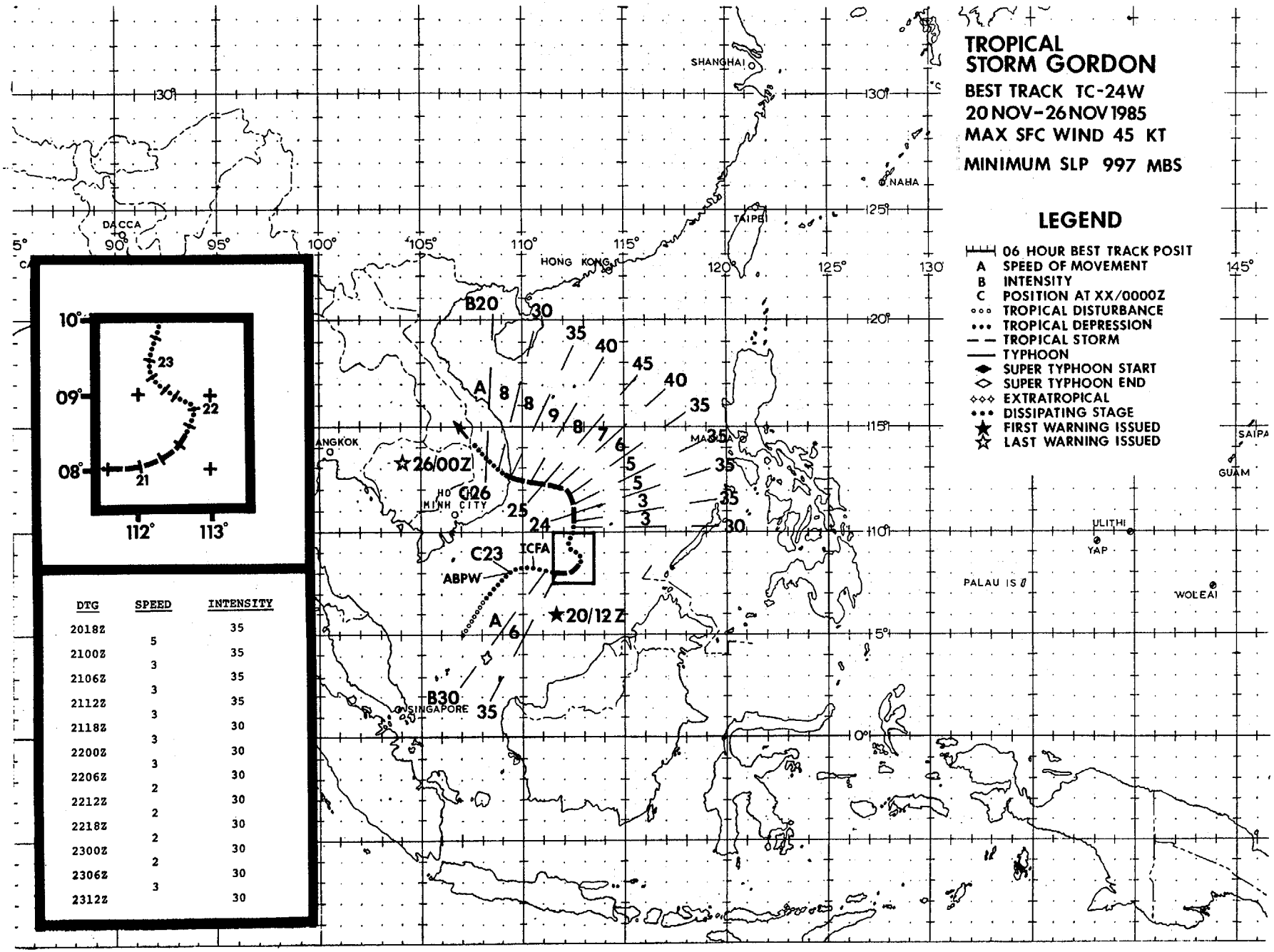


Figure 3-23-1. Nighttime moonlight imagery of Typhoon Faye one day after reaching typhoon intensity. Because this is a low-light-level image, the bright city lights along the west coast of the island of Taiwan can be seen to the west of the Tropical Cyclone [2913462 October DMSP visual imagery].


TROPICAL
STORM GORDON
BEST TRACK TC-24W
20 NOV-26 NOV 1985
MAX SFC WIND 45 KT
MINIMUM SLP 997 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
SHANGHAI
NAHA
TAIPEI
HONG KONG
DACCA
BANGKOK
HO CHI MINH CITY
SINGAPORE
MANILA
PALAU IS
YAP
ULITHI
WOLEAI
GUAM
SAIPAN
B20
30
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40
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A 8 8 9 8 7 6 5 5 3 3
☆26/00Z
C26
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24
35
35
30
C23
ICFA
ABPW
★20/12Z
A 6
B30
35
10°
09°
08°
112°
113°
23
22
21
DTG SPEED INTENSITY
2018Z 5 35
2100Z 3 35
2106Z 3 35
2112Z 3 35
2118Z 3 30
2200Z 3 30
2206Z 2 30
2212Z 2 30
2218Z 2 30
2300Z 2 30
2306Z 3 30
2312Z 30

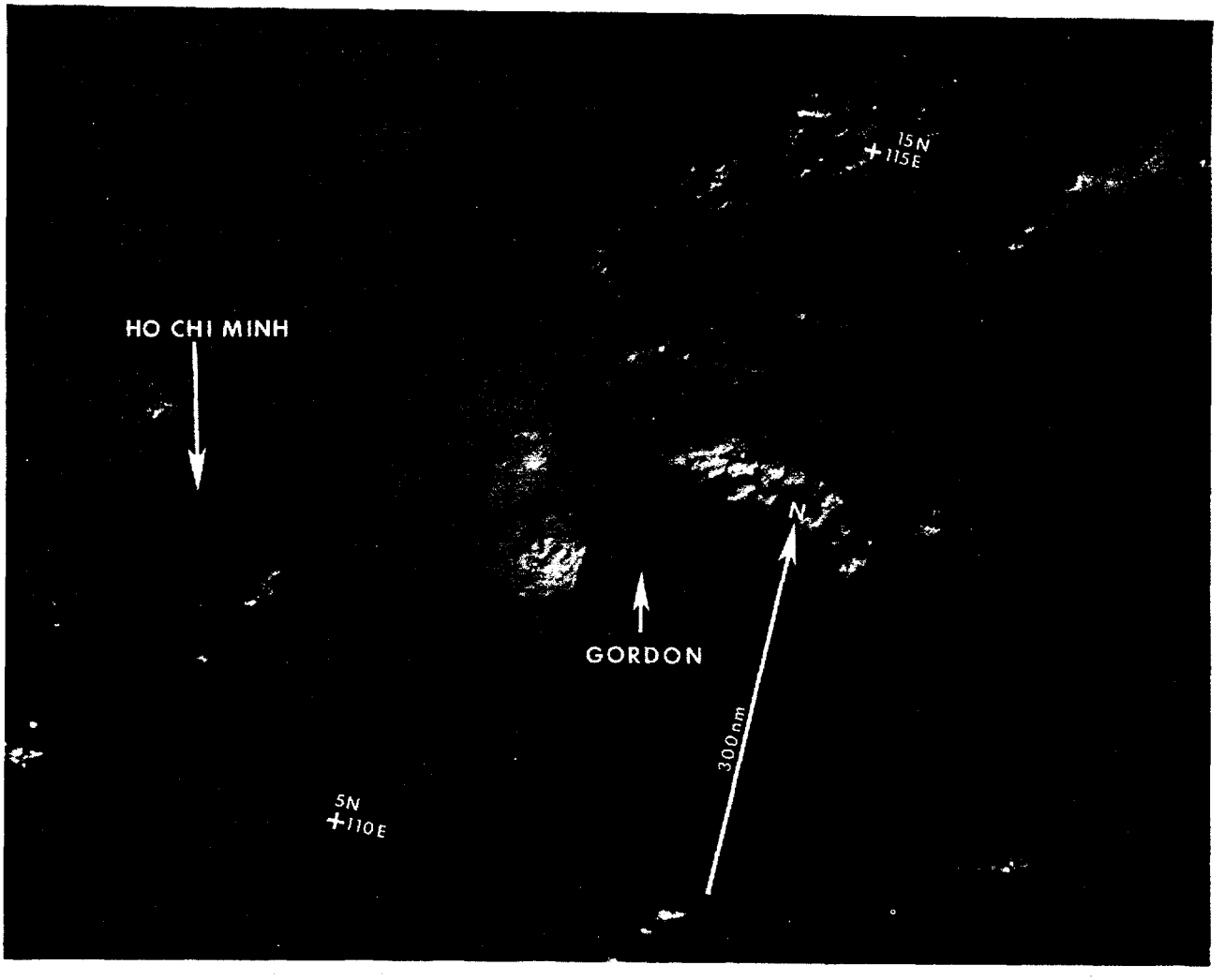
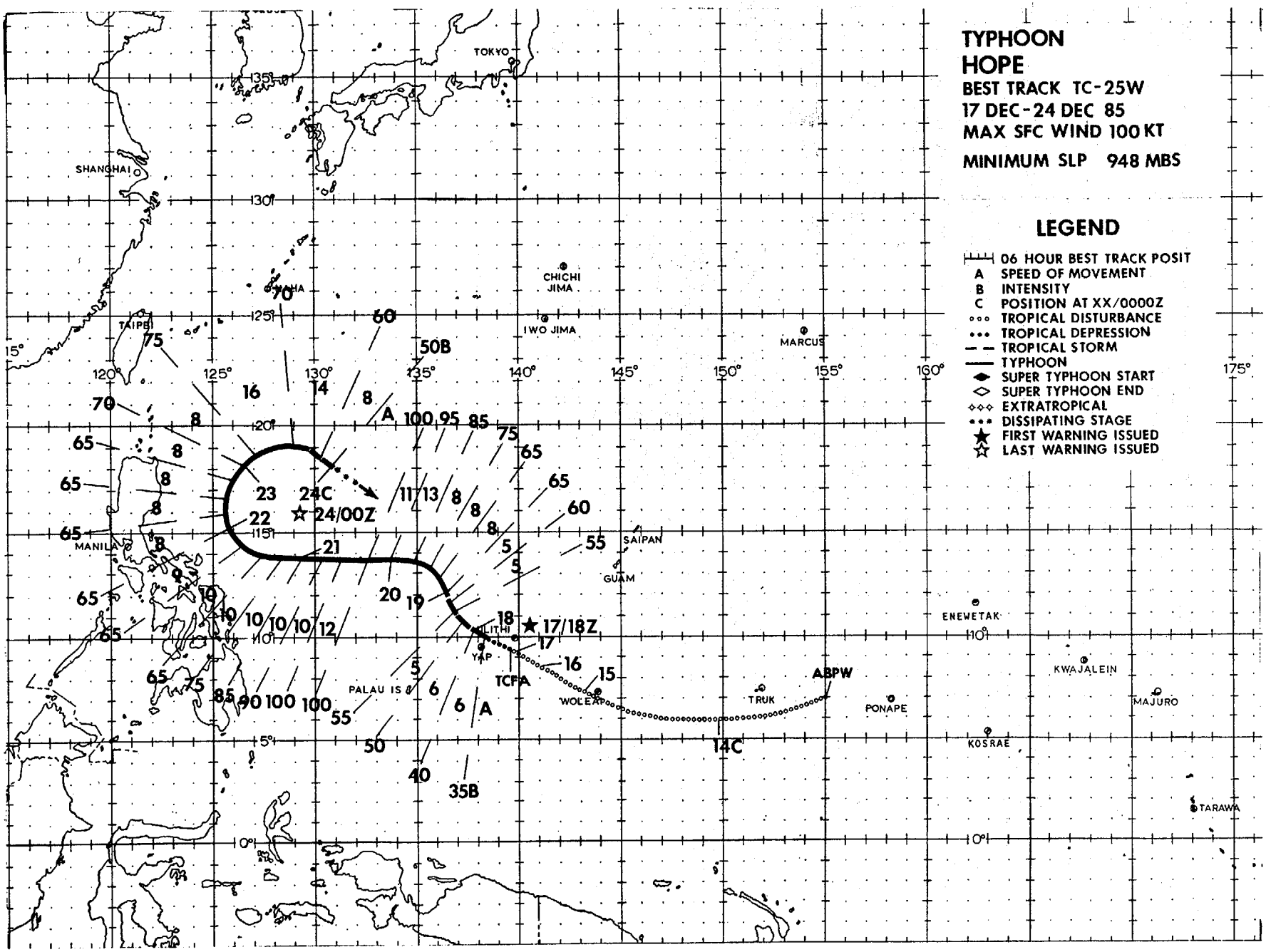


Figure 3-24-1. Tropical Storm Gordon, the only significant tropical cyclone to develop in WESTPAC during November, originated in the monsoon trough in the South China Sea. Gordon's initial intensification to a tropical storm on the 20th was coincident with a surge in the northeast monsoon which was present from late on the 19th until early on the 21st. However, by 220000Z the surge had weakened and so did Gordon. Subsequent redevelopment to tropical storm intensity on the 23rd and 24th appeared to be due to the system's development as a warm-core tropical cyclone. The USS Kitty Hawk (CV-63) Battle Group passed close to Gordon's center on the 23rd without sustaining any damage, and reported winds of 35-45 kt (18-23 m/s). Positioning the center of Tropical Storm Gordon was often difficult, particularly at night. The low-level circulation center was often several degrees away from the strongest convection, and although frequently exposed, consisted of only low-level cloudiness, which was difficult to resolve on infrared satellite imagery. The most intense convection was usually observed northwest of the low-level circulation center, as shown in the (above) imagery (230228Z November DMSP visual imagery).


TYPHOON
HOPE
BEST TRACK TC-25W
17 DEC-24 DEC 85
MAX SFC WIND 100 KT
MINIMUM SLP 948 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
TOKYO
SHANGHAI
CHICHI JIMA
IWO JIMA
MARCUS
TAIPEI
MANILA
SAIPAN
GUAM
ENEWETAK
KWAJALEIN
MAJURO
YAP
ITHI
WOLEAI
TRUK
PONAPE
KOSRAE
TARAWA
PALAU IS
TCFA
ABPW
14C
24C
24/00Z
17/18Z
35B
50B
120°
125°
130°
135°
140°
145°
150°
155°
160°
175°
15°
20°
25°
30°
35°
10°
5°
0°

Hope was a late-season typhoon that originated at low-latitude in the near-equatorial trough. It was aided in its initial development by the presence of enhanced low-level northeast monsoon flow and an associated shear zone. Typhoon Hope presented forecast problems at two different times: first at the crucial turning point from a westward to a northward track; and after recurvature when extratropical transition was imminent.

After Tropical Storm Gordon dissipated over Vietnam on the 25th of November, a winter weather pattern dominated the northwest Pacific area. Convective activity was confined to low latitudes in the near-equatorial trough. The disturbance, that was to become Typhoon Hope, was detected on the 13th of December between Truk and Pohnpei. The disturbance moved in a general westerly direction for the next three days and showed signs of slow intensification. Figure 3-25-1 shows Hope as a tropical depression located approximately 90 nm (167 km) east of Yap. By 171800Z, satellite data indicated the disturbance had further intensified while moving west-northwestward aided by the effect of the shear zone to the north. As a result, the initial warning was issued. Between 171800Z and 191200Z December, Hope moved northwest before coming under the full steering influence of the mid-level subtropical ridge that caused the system to assume a westward track.

Tracking Hope during the period 191200Z-201200Z was facilitated by the availability of four aircraft fixes and several satellite eye fixes. Typhoon Hope reached its maximum intensity of 100 kt (52 m/s) at 200600Z (see Figure 3-25-2) just thirty hours after the initial warning. After that, Hope decreased slightly in intensity and maintained 65-75 kt (34-39 m/s) during the period 210600Z-231200Z.

After the 200300Z warning, the One-way Interactive Tropical Cyclone Model (OTCM) showed definite indications of a recurvature type track, whereas before it had indicated a generally northwestward track. The OTCM is the primary forecasting aid. The Nested Tropical Cyclone Model (NTCM) did not show signs of recurvature, but did indicate a

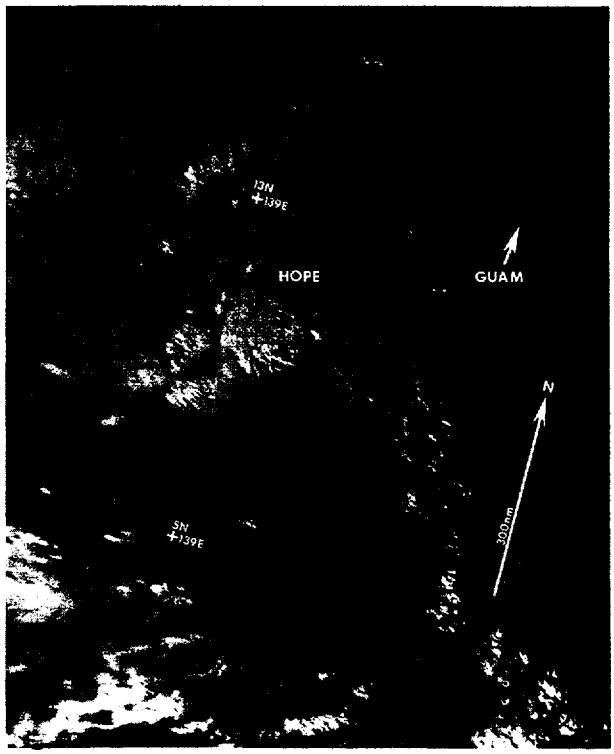


Figure 3-25-1. Hope as a tropical depression approximately 90 nm (167 km) east of Yap (WMO 91413). The shear zone to the north apparently aided Hope's development by enhancing the low-level northeast flow (170441Z December NOAA visual imagery).

Figure 3-25-2. Typhoon Hope with a large ragged eye near time of maximum intensity (200551Z December NOAA visual imagery).

northerly track. As indicated in Figure 3-25-3, the OTCM yielded good forecast guidance during the period 191800Z-201200Z and the NTCM (Figure 3-25-4) gave fairly good guidance during the period 191800Z-210000Z. OTCM indicated a northwestward track and recurvature to the north-northeast (Figure 3-25-3) after about 48 hours. NTCM indicated a track change from northwest to northward (Figure 3-25-4). This guidance was integrated into the 201500Z warning. The track made good synoptic sense since it could be interpreted as Typhoon Hope moving around the western periphery of the mid-level subtropical ridge. The forecasts held with a curving track that started toward the west-northwest, turned north, and became northeast at about the 48 hour point.

After 201200Z December, a sequence of events started that caused major track forecast problems. As has been pointed out earlier, after 201200Z Typhoon Hope began to weaken slightly and the eye structure disappeared from satellite imagery. This resulted in doubts about the exact location of the surface center of the typhoon. At 210842Z, a 31 hour period began during which no aircraft fixes were made on Typhoon Hope due to aircraft non-availability and maintenance problems. Under normal conditions, four aircraft fixes would have been made during that time period. Aircraft positioning of typhoons is the most accurate method available and is especially important at major track changes.

After 210000Z, the OTCM guidance stopped the recurvature scenario and started showing just a general northwest movement (Figure 3-25-5). It indicated a more westward direction with each run of the model. NTCM also indicated a northward track until 210000Z. After that time, it went to a straight westward track (Figure 3-25-6). This erroneous guidance (ie. the westward track) reflected OTCM and NTCM's inability to forecast in a winter synoptic situation. With specific refernce to the model, strong middle-to-upper level westerlies apparently caused an early termination of the model run, or (as in this case) misleading guidance.

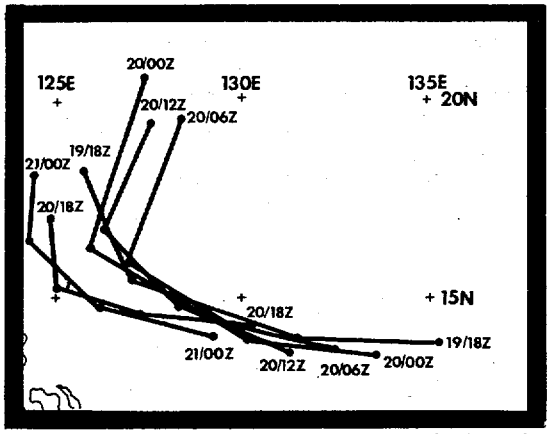


Figure 3-25-3. One-way interactive Tropical Cyclone Model (OTCM) forecast tracks for the period 191800Z-210000Z December showing a recurvature track.

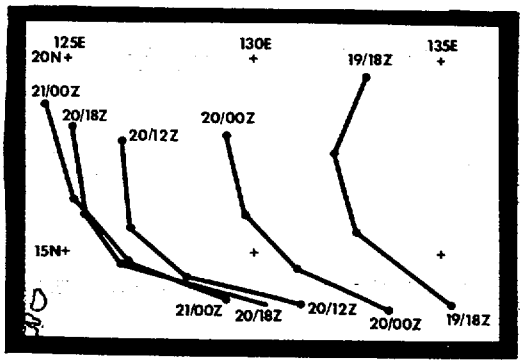


Figure 3-25-4. Nested Tropical Cyclone Model (NTCM) forecast tracks for the period 191800Z-210000Z December showing fairly good forecast track guidance in the form of tracks with northward movement.

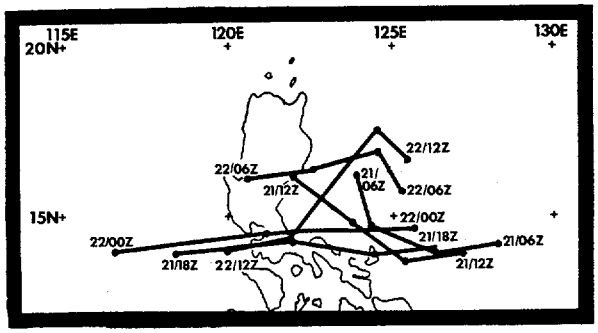
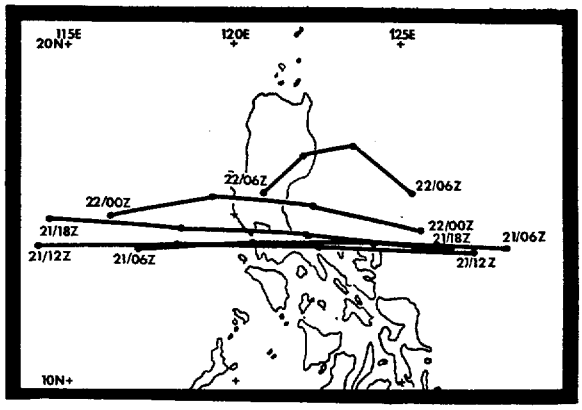


Figure 3-25-5. One-way interactive Tropical Cyclone Model (OTCM) forecast tracks for the period 210600Z-221200Z December. The forecast guidance indicates that the recurvature track is changed to westerly with time.

Figure 3-25-6. Nested Tropical Cyclone Model (NTCM) forecast guidance for the period 210600Z-220600Z December showing the swing to an almost straight westward track.



The final factor leading up to the forecast problem was Hope's continued west-northwestward movement and decreasing distance from Luzon. There was a definite need to warn of Hope's approach if there was a possibility that it was going to continue moving west-northwest and not recurve.

The combination of these events presented a dilemma for the typhoon forecaster, who had to issue the 220300Z warning. Hope was close to the critical track turning point. It was either going to continue moving west-northwest and make landfall on the east coast of Luzon, or start moving northward and recurve as had been forecast for the past 36 hours. The forecaster was presented with the following facts: (1) Hope's position was known within an estimated accuracy of 60 nm (111 km) based on poorly defined infrared satellite fixes (no satellite eye fixes or aircraft fixes being available); (2) Hope appeared to be continuing on a west-northwest track; (3) the numerical forecast models were indicating a straight westward track and had not indicated recurvature for about 24 hours; and (4) there was a definite need to warn Department of Defense interests on Luzon of Hope's approach. After carefully considering the combined effect of these factors, the forecaster decided to significantly change the forecast philosophy and forecast Typhoon Hope to track west-northwest across Luzon into the South China Sea.

During the next six hours; however, satellite fixes indicated that Typhoon Hope was moving toward the north. A quick recovery was made on the 220900Z warning when the forecast track was switched back to one reflecting northward movement, followed by recurvature to the northeast, and decreasing intensity as extratropical transition occurred. The warnings over the next two days were accurate with a general concept of eastward movement with extratropical transition. The forecast tracks had Hope accelerating in speed and moving as far east-northeast as 27N 149E before completing extratropical transition.

In retrospect, an extratropical transition where the tropical cyclone is sheared away by upper-level westerlies and then dissipates below 20N would have been a more representative forecast for the final two days. Climatologically, this is what one would expect to happen in late December. In the case of Typhoon Hope, the 400mb trough with moderate westerlies over southern China was super-imposed over moderate-to-strong anticyclonic flow and cold air advection at the 925 mb level. These features are depicted in Figures 3-25-7 and 3-25-8. Based on these patterns, a shearing type of extratropical transition (followed by a dramatic decrease in the system's associated wind speeds) with no significant eastward acceleration is to be expected. Shearing, decreased wind speeds, and no significant eastward acceleration is exactly what happened after 240000Z. Figure 3-25-9 shows the remnants of Hope. There were no reported deaths, injuries, or property damage attributed to this late-season typhoon.

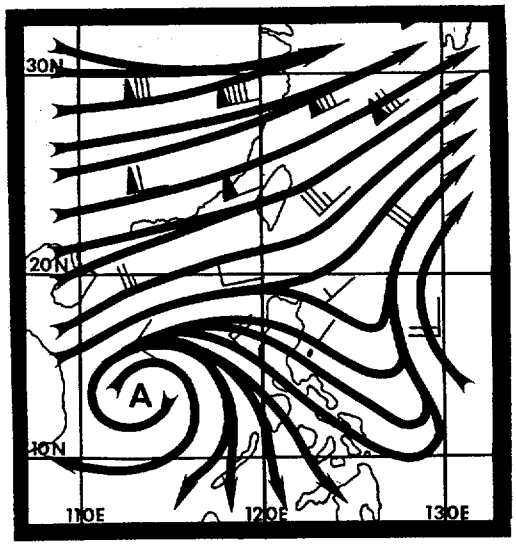


Figure 3-25-7. 400 mb Numerical Variational Analysis (NVA) at 220000Z December indicates a trough extends from near 60N 130E to 22N 107E with moderate westerlies north of Hope.

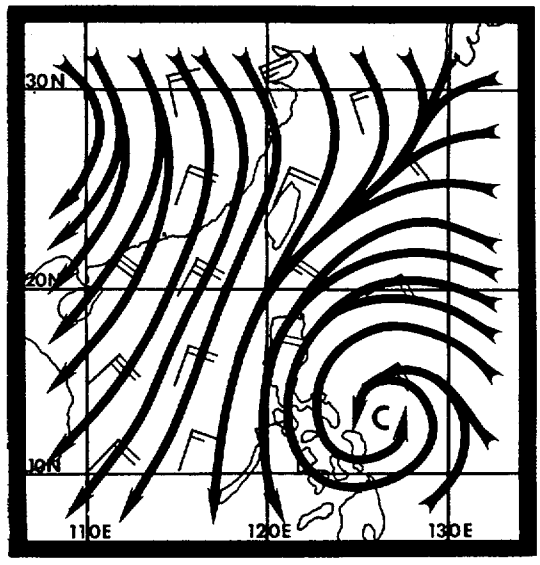


Figure 3-25-8. 925 mb NVA analysis at 220000Z showing moderate-to-strong anticyclonic flow and cold air advection over southern China.

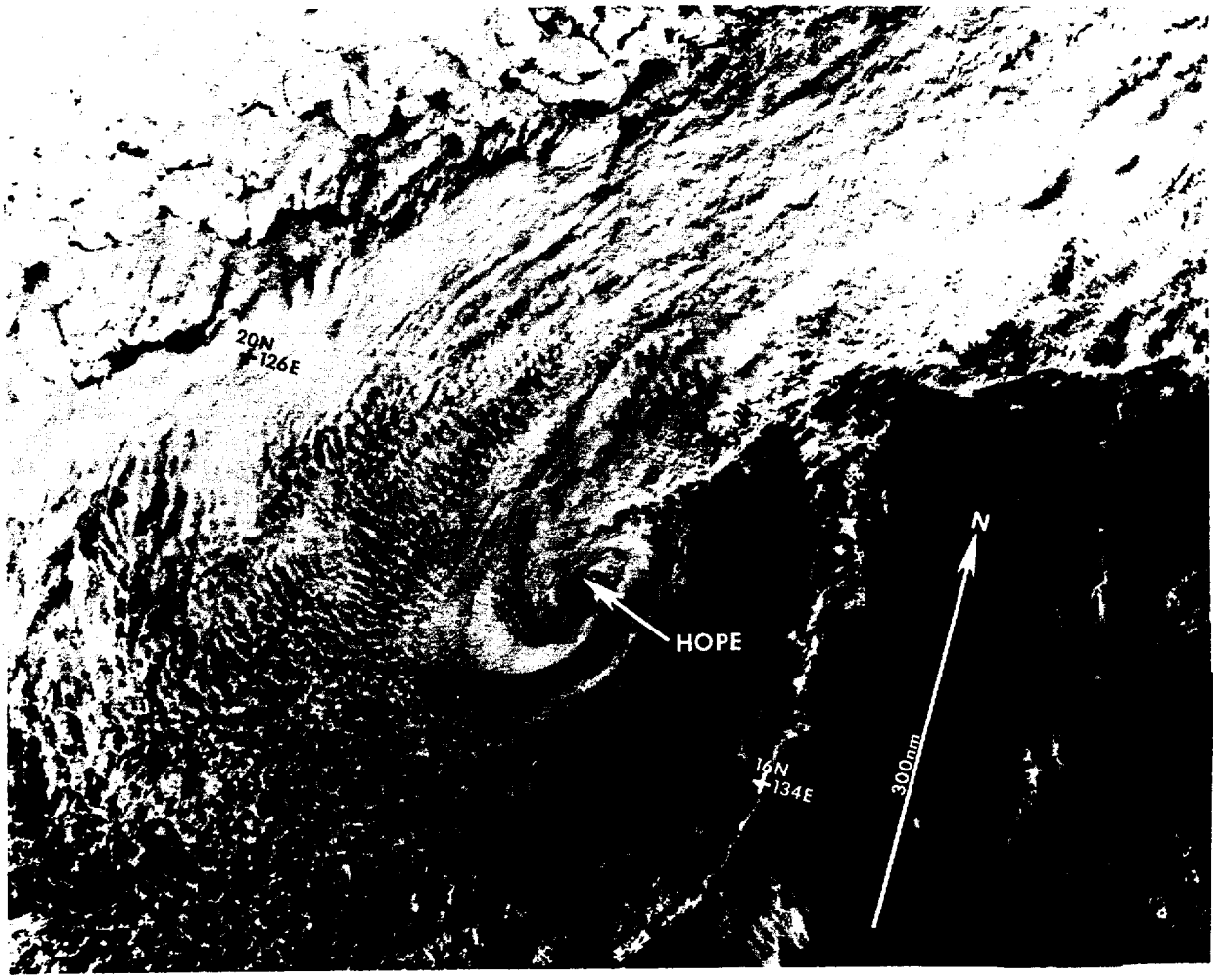
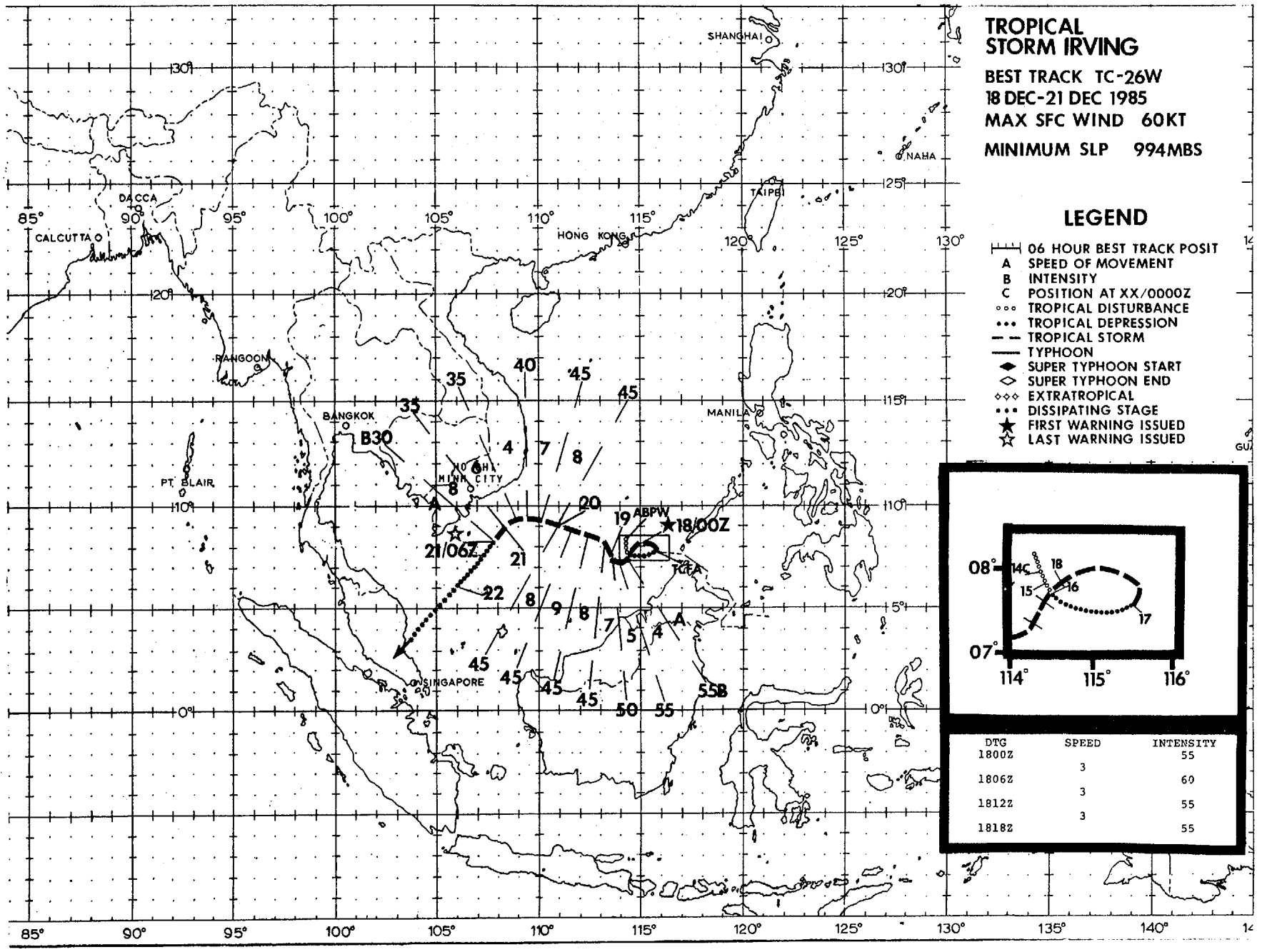


Figure 3-25-9. Typhoon Hope dissipating after having the central convection sheared away by mid- to-upper level westerlies (240042Z December DMSP visual imagery).


TROPICAL
STORM IRVING
BEST TRACK TC-26W
18 DEC-21 DEC 1985
MAX SFC WIND 60KT
MINIMUM SLP 994MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
SHANGHAI
NAHA
TAIPEI
HONG KONG
DACCA
CALCUTTA
RANGOON
BANGKOK
PT. BLAIR
MANILA
SINGAPORE
HO CHI MINH CITY
B30
21/06Z
18/00Z
ABPW
TCFA
DTG SPEED INTENSITY
1800Z 55
3
1806Z 60
3
1812Z 55
3
1818Z 55

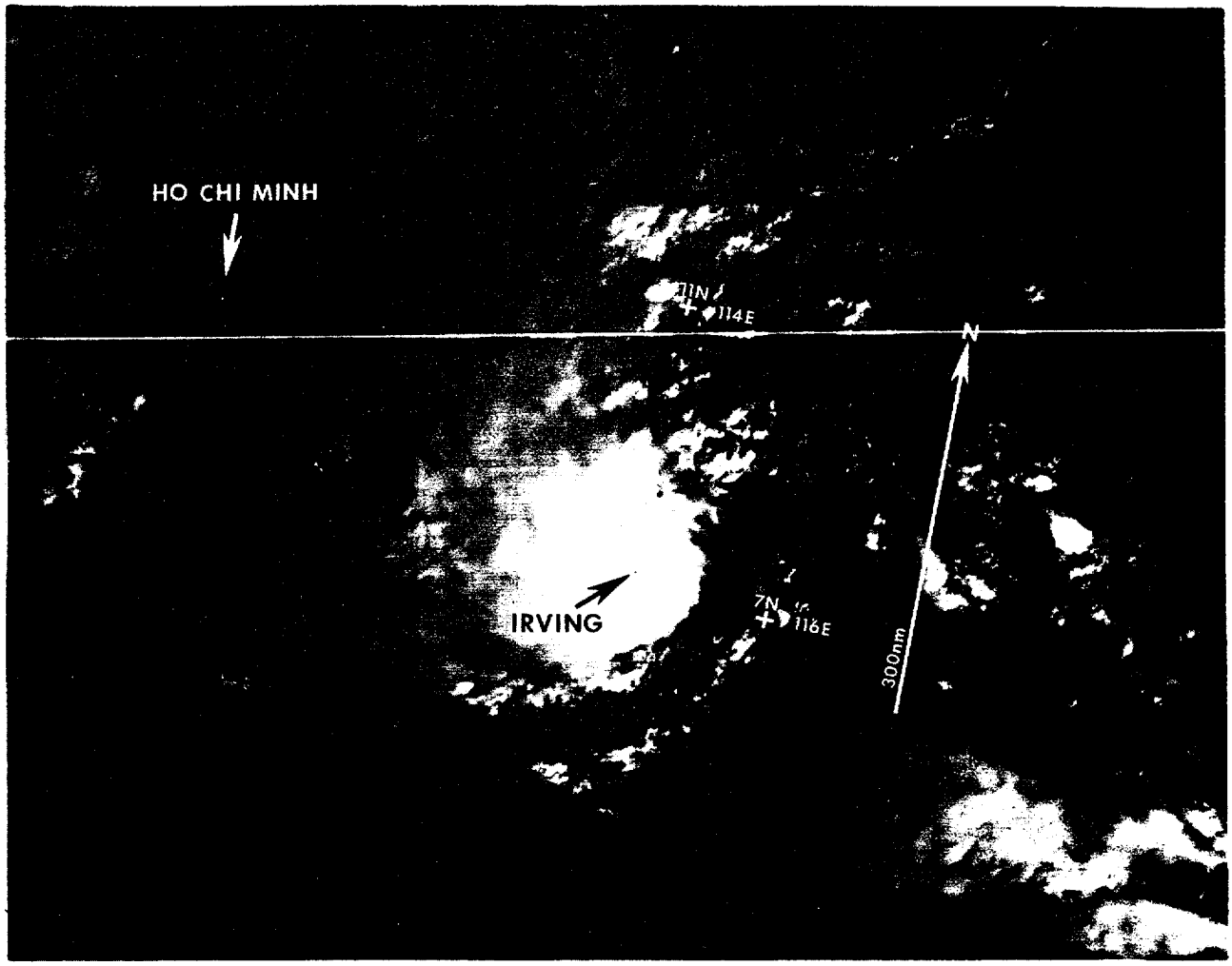


Figure 3-26-1. Tropical Storm Irving was one of two significant tropical cyclones to occur in the month of December. It formed at the western end of the low-latitude near-equatorial trough. The proximity of the low-level northeast monsoon and associated winter gales in the South China Sea masked Irving's initial development. Aircraft reconnaissance proved instrumental in locating the low-level circulation center and describing the wind field of this off-season tropical cyclone. Irving's central dense overcast and low-level cumulus spirals are visible in the (above) satellite imagery (1902242 December DMSP visual imagery).

3. NORTH INDIAN OCEAN TROPICAL CYCLONES

Tropical cyclone activity in the North Indian Ocean was above normal. Six significant tropical cyclones, all of tropical storm intensity, developed as compared to the climatological mean of four. These systems occurred in the spring and fall transition season, which normally encompasses the peak of the activity. Tables 3-6 through 3-8 provide a summary of information for 1985 and comparison with earlier years.

TABLE 3-6.

1985 SIGNIFICANT TROPICAL CYCLONES

TROPICAL CYCLONE	PERIOD OF WARNING	CALENDAR DAYS OF WARNING	NUMBER OF WARNINGS ISSUED	MAXIMUM SURFACE WIND KT - (M/S)	ESTIMATED MSLP MB	BEST TRACK DISTANCE TRAVELED NM - (KM)
TC 01B	23MAY - 25MAY	3	8	60 (31)	979	515 (954)
TC 02A	29MAY - 31MAY	3	12	50 (26)	987	609 (1128)
TC 03B	9OCT - 11OCT	3	7	50 (26)	988	667 (1235)
TC 04B	15OCT - 16OCT	2	4	50 (26)	987	296 (548)
TC 05B	15NOV - 18NOV	4	12	55 (28)	983	843 (1561)
TC 06B	11DEC - 14DEC	4	11	50 (26)	987	1025 (1898)
	1985 TOTALS:	19	54			

TABLE 3-7.

1985 SIGNIFICANT TROPICAL CYCLONES

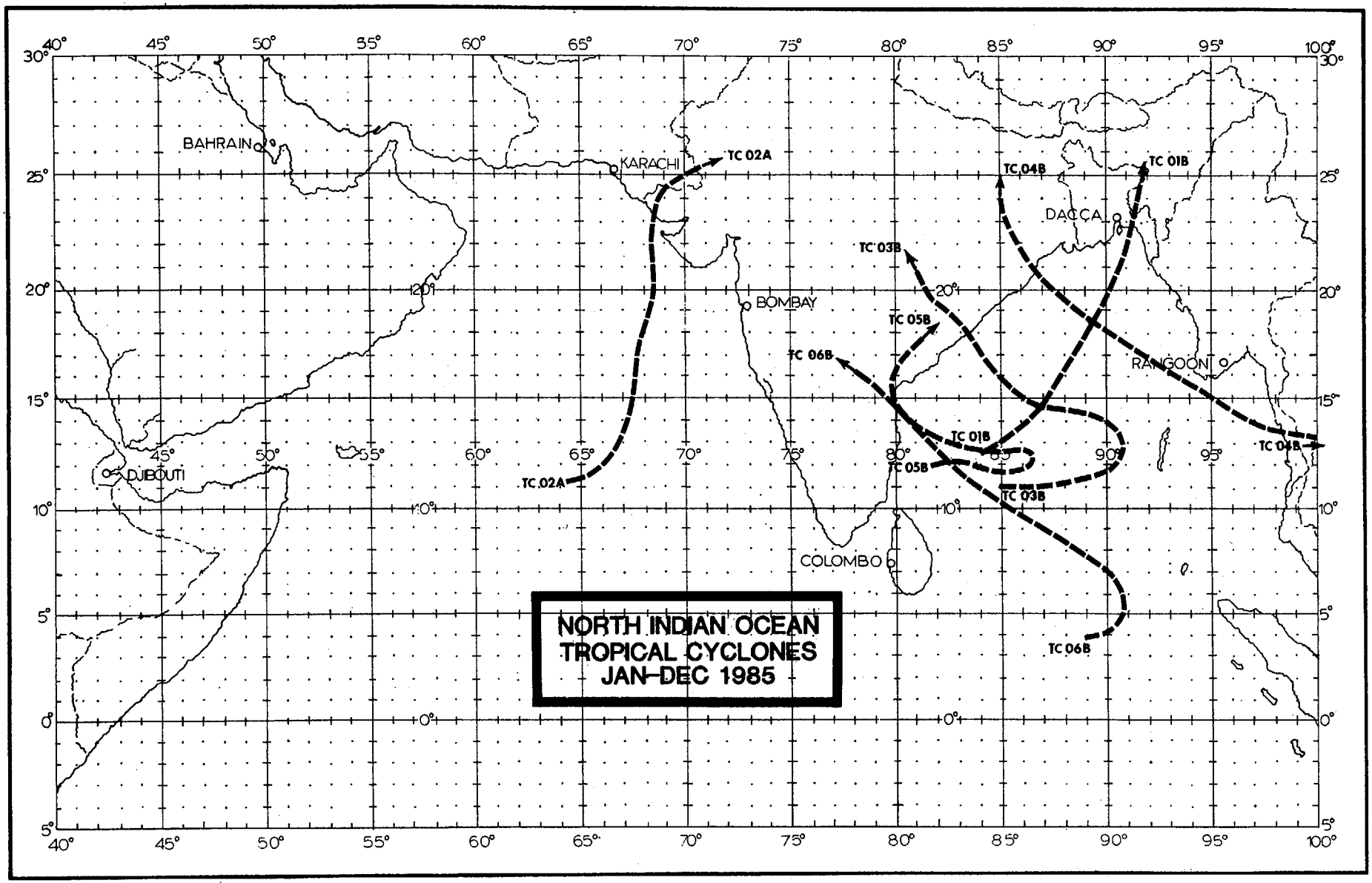
NORTH INDIAN OCEAN	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1985 TROPICAL CYCLONES	0	0	0	0	2	0	0	0	0	2	1	1	6
1975 - 1985 AVERAGE	.1	-	-	.1	.8	.4	-	.1	.3	1.1	1.4	.4	4.5
CASES	1	-	-	1	9	4	-	1	3	12	15	4	50

FORMATION ALERTS:	5 out of 8 Formation Alerts developed into significant tropical cyclones. Tropical Cyclone Formation Alerts were issued for all significant tropical cyclones, except one, that developed during 1985.	
WARNINGS	Number of warning days:	19
	Number of warning days with two tropical cyclones in region:	0
	Number of warning days with three or more tropical cyclones in region:	0

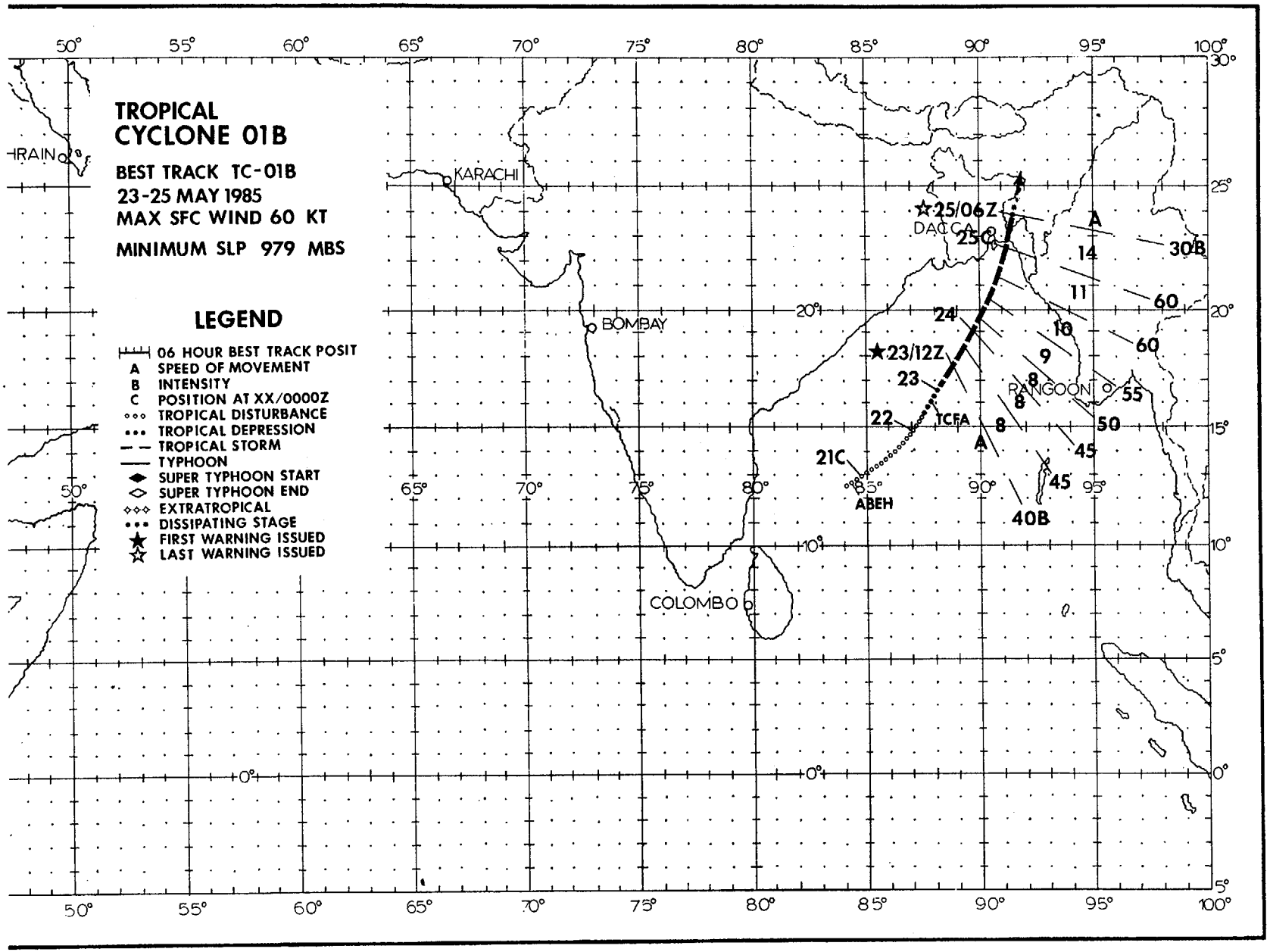
TABLE 3-8.

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1971*	-	-	-	-	-	0	0	0	0	1	1	0	2
1972*	0	0	0	1	0	0	0	0	2	0	1	0	4
1973*	0	0	0	0	0	0	0	0	0	1	2	1	4
1974*	0	0	0	0	0	0	0	0	0	0	1	0	1
1975	1	0	0	0	2	0	0	0	0	1	2	0	6
1976	0	0	0	1	0	1	0	0	1	1	0	1	5
1977	0	0	0	0	1	1	0	0	0	1	2	0	5
1978	0	0	0	0	1	0	0	0	0	1	2	0	4
1979	0	0	0	0	1	1	0	0	2	1	2	0	7
1980	0	0	0	0	0	0	0	0	0	0	1	1	2
1981	0	0	0	0	0	0	0	0	0	1	1	1	3
1982	0	0	0	0	1	1	0	0	0	2	1	0	5
1983	0	0	0	0	0	0	0	1	0	1	1	0	3
1984	0	0	0	0	1	0	0	0	0	1	2	0	4
1985	0	0	0	0	2	0	0	0	0	2	1	1	6
1975-1985 AVERAGE	.1	-	-	.1	.8	.4	-	.1	.3	1.1	1.4	.4	4.5
CASES	1	0	0	1	9	4	0	1	3	12	15	4	50

* JTWC warning responsibility began on 4 June 1971 for the Bay of Bengal, east of 90E. As directed by USCINCPAC, JTWC issued warnings only for those tropical cyclones that developed or tracked through that portion of the Bay of Bengal. Commencing with the 1975 tropical cyclone season JTWC's area of responsibility was extended westward to include the western portion of the Bay of Bengal and the entire Arabian Sea.



FWC/JTWC GUAM 3142/62 (NEW 2-76)


TROPICAL
CYCLONE 01B
BEST TRACK TC-01B
23-25 MAY 1985
MAX SFC WIND 60 KT
MINIMUM SLP 979 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
KARACHI
BOMBAY
COLOMBO
DACCA
RANGOON
ABEH
TCFA
☆25/06Z
★23/12Z
21C
40B
30B
50
45
55
60
50°
55°
60°
65°
70°
75°
80°
85°
90°
95°
100°
30°
25°
20°
15°
10°
5°
0°

-761)

Tropical Cyclone 01B was the first of two cyclones to form in the North Indian Ocean during the Spring transition season. Although only reaching an intensity of 60 kt (31 m/s), it was one of the most noteworthy storms of 1985 due to the tremendous loss of life the cyclone caused in Bangladesh. An estimated 6,000 people died from the storm, with an additional 300,000 people left homeless. Most of the deaths were due to the storm surge, estimated at 15 ft (5 m), which completely inundated many of the low-lying islands (DeAngelis, 1985).

By late May, the Spring transition season was well underway in the North Indian Ocean. The southwest monsoon had moved into the southern Bay of Bengal and was creating a large amount of convection across the region. Late on the 20th of May, an area of convection began to show some organization in the southwest Bay of Bengal. This prompted the Significant Tropical Weather Advisory (ABEH PGTW) to be reissued at 202030Z to include mention of this disturbance. During the following nine hours satellite imagery showed the disturbance continuing to improve in organization. As a result, the potential for significant tropical cyclone development was upgraded to "fair" on the 210600Z Significant Tropical Weather Advisory. Subsequent data continued to show slow development. An upper-level anticyclone was forming over the disturbance and a Dvorak analysis of satellite imagery estimated surface winds of 25 to 35 kt (13 to 18 m/s). This resulted in the issuance of a TCFA at 222100Z as the disturbance moved into the central Bay of Bengal.

Since the disturbance was developing in the monsoon trough (Figure 3-01B-1), there was some uncertainty as to whether a closed surface circu-

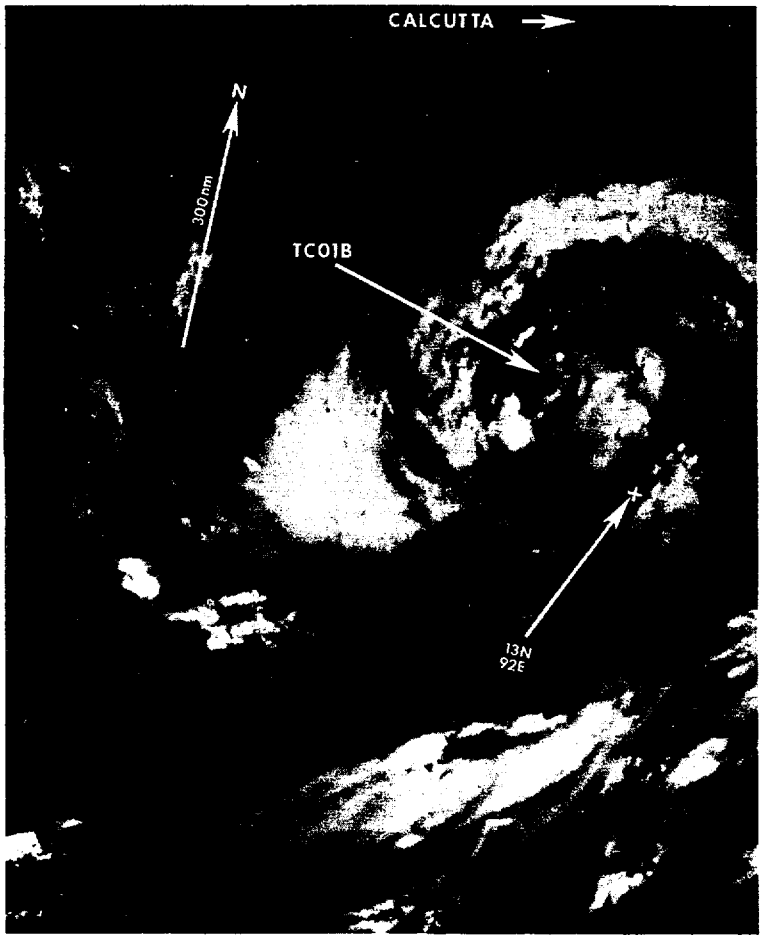


Figure 3-01B-1. The tropical disturbance, which became Tropical Cyclone 01B is consolidating in the Bay of Bengal. Estimated surface winds at this time are 25 kt (13 m/s) (2204327 May DMSP visual imagery).

lation existed or the disturbance was still a broad trough. Analysis performed by the Air Force Global Weather Center (AFGWC) on satellite imagery at 230442Z quickly settled the question by estimating surface winds of 45 kt (23 m/s), which supported a closed surface circulation. Based on this information, the first warning on Tropical Cyclone 01B was issued at 231200Z.

The forecast reasoning for Tropical Cyclone 01B centered on the presence of the monsoon trough. The initial forecast called for the storm to remain in the trough and move to the north-northeast. This forecast philosophy proved to be correct, and remained unchanged throughout the lifetime of Tropical Cyclone 01B. As a result, Bangladesh received nearly a 36 hour warning of the cyclones arrival. The only forecasting difficulty with Tropical Cyclone 01B was predicting its speed. Based on satellite fixes of the poorly defined circulation center from nighttime infrared imagery, the first three warnings indicated a slower forward speed than was actually taking place. This was corrected early on the 24th, when visual satellite imagery revealed the location of the low-level circulation center (Figure 3-01B-2).

Tropical Cyclone 01B continued to intensify, reaching a peak intensity of 60 kt (31 m/s) at 241800Z. This intensity was maintained until landfall at 250200Z just west of Chittagong, Bangladesh (WMO 41977). The cyclone lost organization fairly rapidly as it moved inland, but still brought torrential rains and extensive flooding to the higher elevations of Bangladesh and eastern India. The final warning was issued at 250600Z.

The fact that Bangladesh was given advance warning of the cyclones approach was responsible for the saving of thousands of lives. Tropical Cyclone 01B inflicted the greatest damage and death in the delta region of the Ganges. Several low-lying islands were completely submerged due to the 15 ft (5 m) storm surge which accompanied the storm at landfall. In several cases the only structures left standing were concrete multi-story shelters built after the 1970 cyclone (In November 1970, a tropical cyclone hit Bangladesh and killed an estimated 300,000 people). The islands of Sandwip, Urir Char and Bhola were among the most heavily damaged. Further inland, heavy rains caused severe flooding along Bangladesh's northeastern border with India. Overflowing rivers affected tens of thousands of people, with the Tripura and Manipur States of India being among the hardest hit regions.

Reference: DeAngelis, Dick, 1985: Under the Bangladesh Cyclone. Mariners Weather Log, Vol 29, No. 3, pp. 141-143.

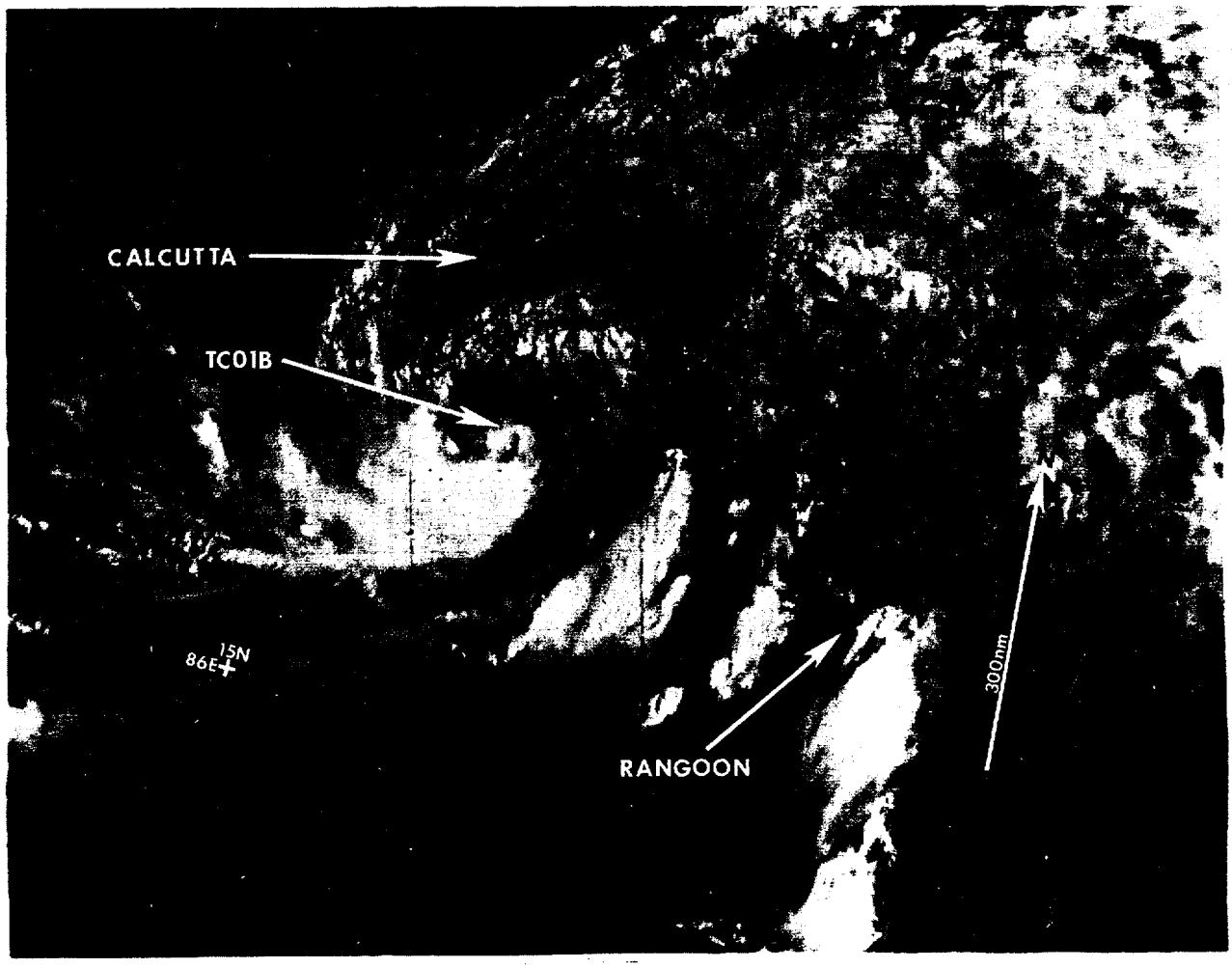
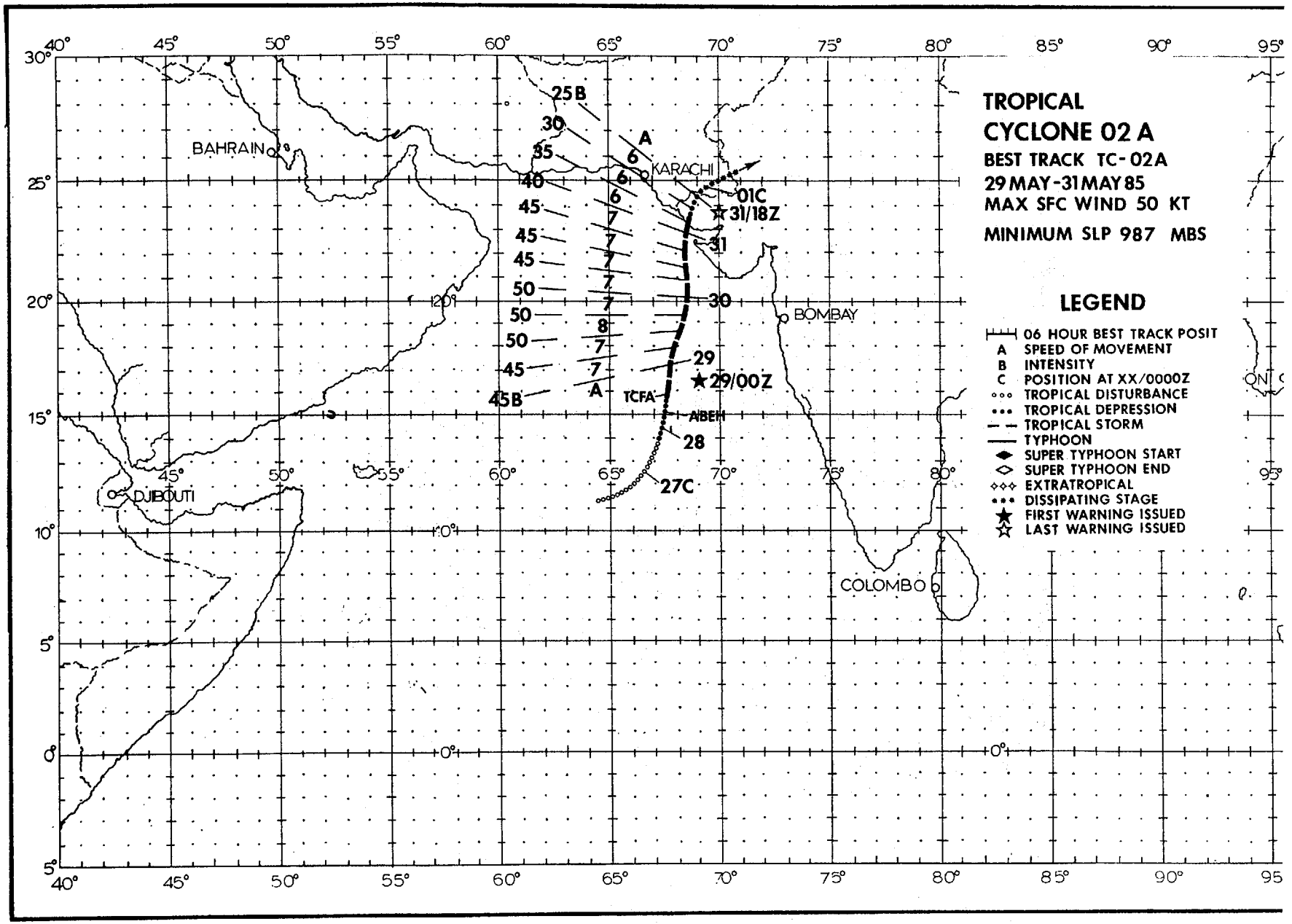


Figure 3-01B-2. Tropical Cyclone 01B less than one day prior to making landfall over Bangladesh (2403517 May DMSP Visual Imagery).



FWC/JTWC GUAM 3142/62. (NEW 2-76)

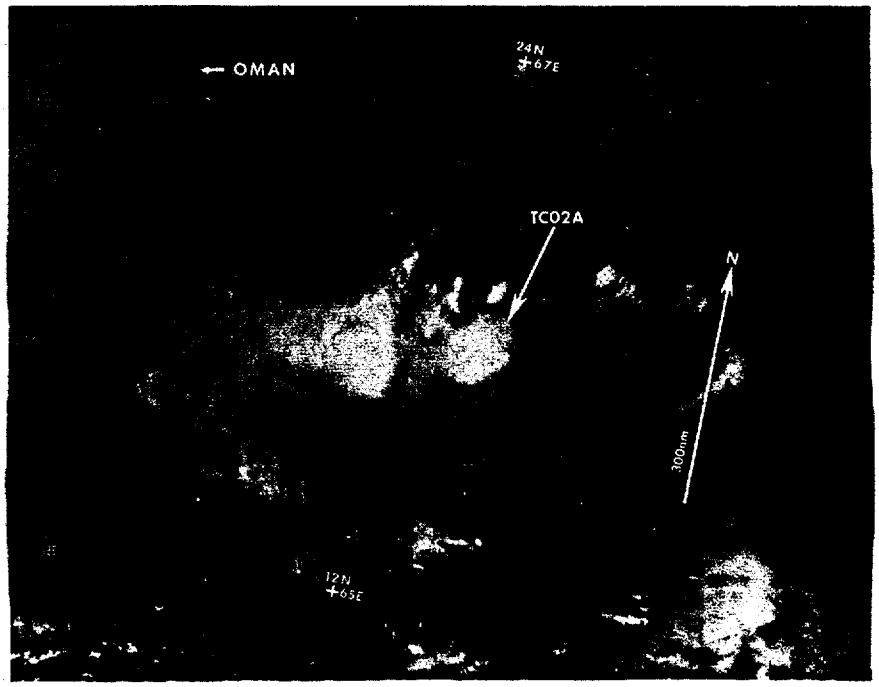


Figure 3-02A-1. Tropical Cyclone 02A near peak intensity. The low-level circulation center is just at the edge of the central cloud mass (290533Z May DMSP visual imagery).

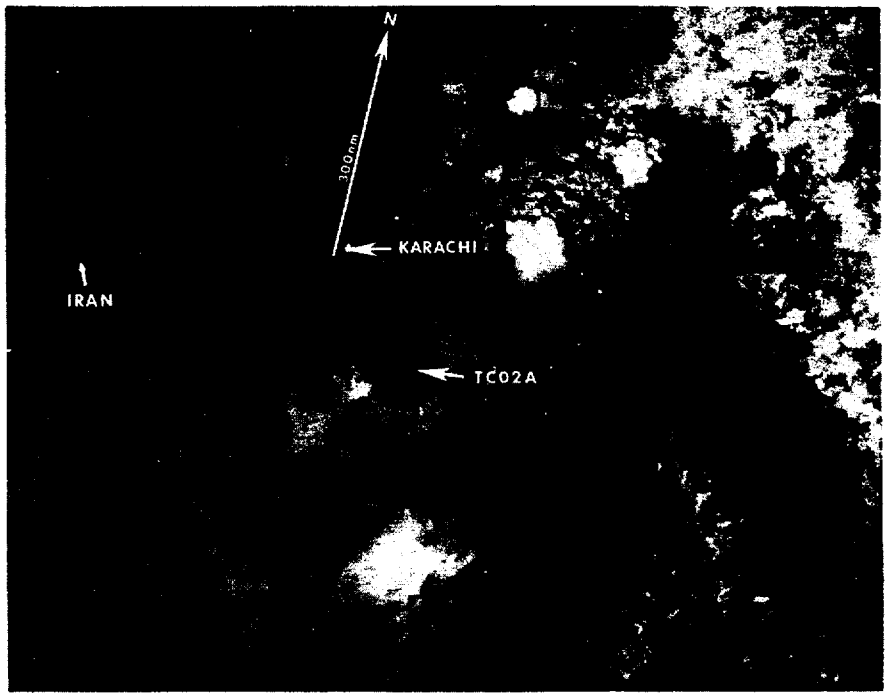
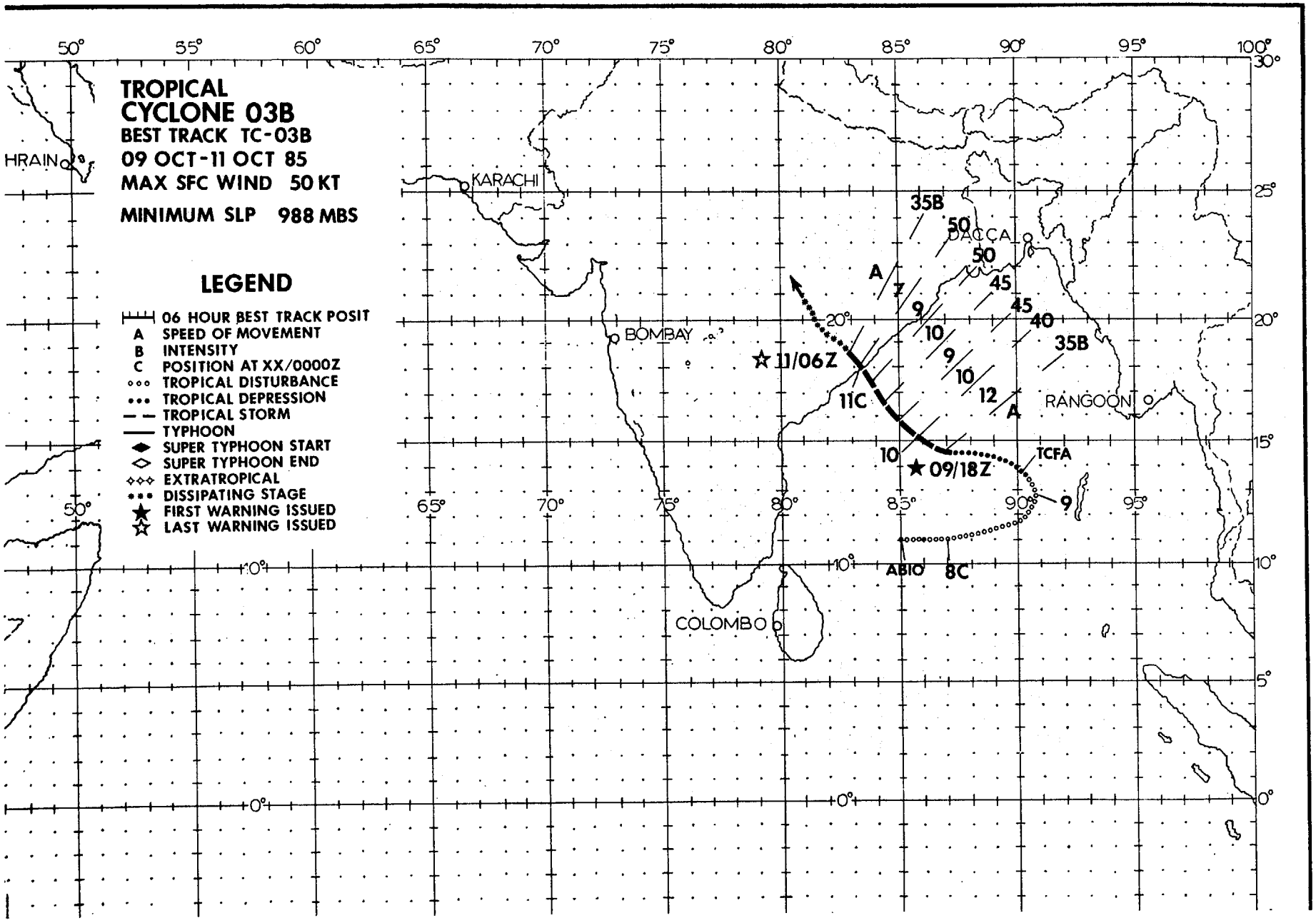


Figure 3-02A-2. Nighttime moonlight image of 02A weakening off the west coast of India. The low-level circulation center is completely exposed (301753Z May DMSP visual imagery).


TROPICAL
CYCLONE 03B
BEST TRACK TC-03B
09 OCT-11 OCT 85
MAX SFC WIND 50 KT
MINIMUM SLP 988 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
HRAIN
KARACHI
BOMBAY
DACCA
RANGOON
COLOMBO
11/06Z
09/18Z
TCFA
11C
8C
ABIO
35B
50
45
40
10
9
12
A
Z
50°
55°
60°
65°
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95°
100°
30°
25°
20°
15°
10°
5°
0°

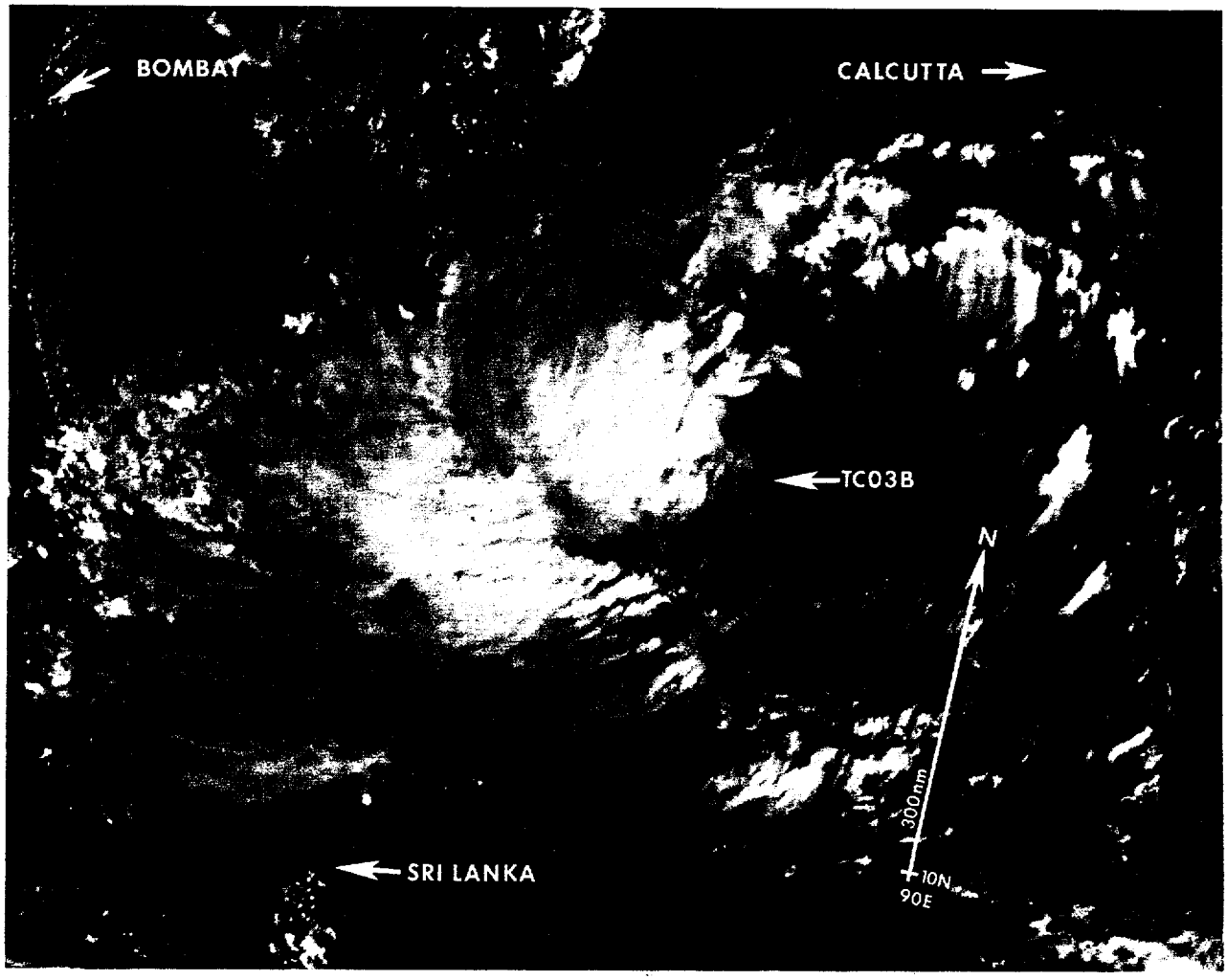
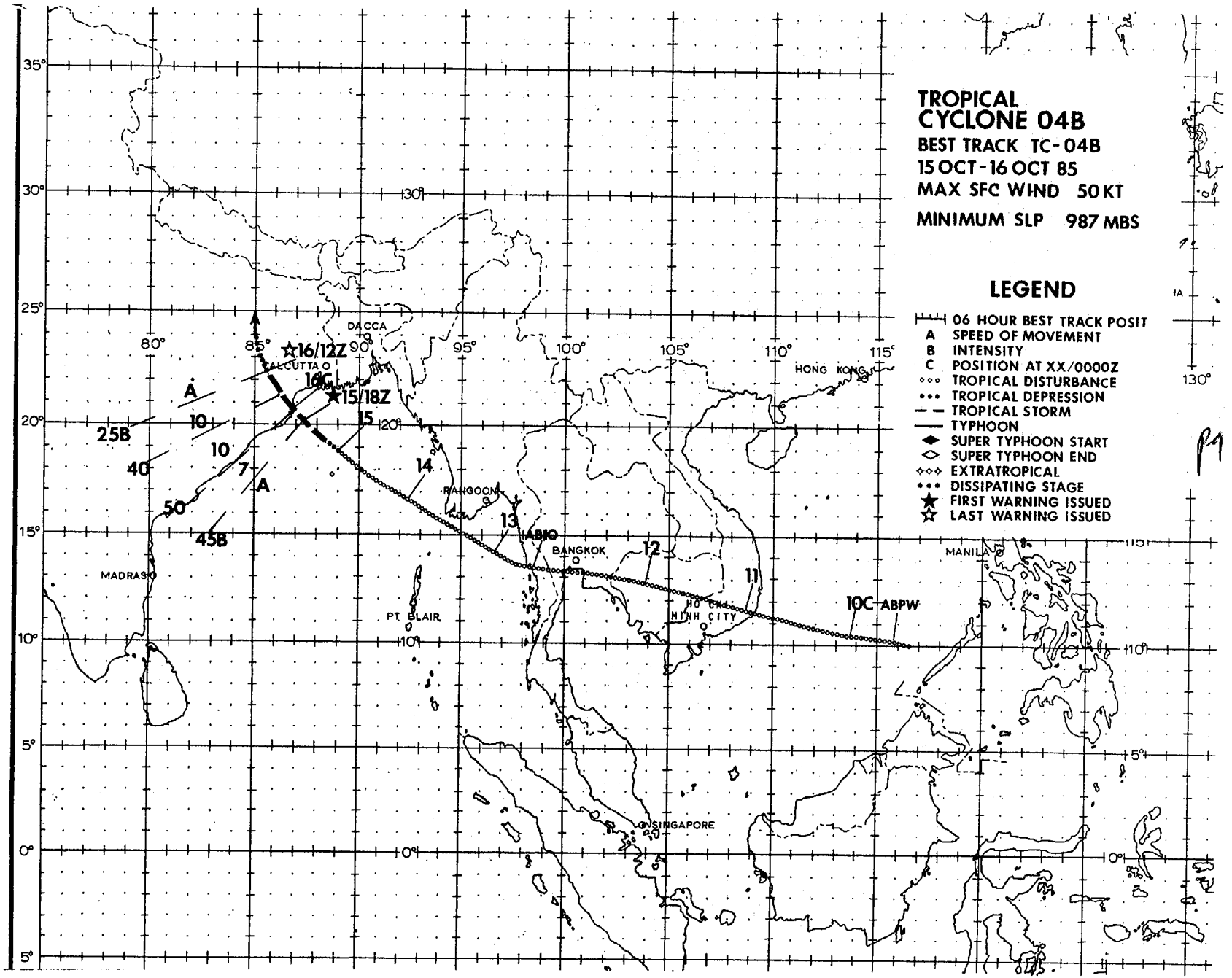


Figure 3-03B-1. Developing in early October, Tropical Cyclone 03B was the first of four tropical cyclones to develop during the Fall transition season. After an initial movement to the east during its formative stage, Tropical Cyclone 03B turned and followed a climatological track to the northwest. The Tropical Cyclone reached a maximum intensity of 50 kt (26 m/s) just prior to making landfall near Visakhapatnam, India (WMO 43149) at 102200Z. There were no reports of damage or injuries from this cyclone. The (above) imagery shows Tropical Cyclone 03B as it consolidated in the Bay of Bengal. At this time the intensity was 40 kt (21 m/s) (100409Z October DMSP visual imagery).


TROPICAL
CYCLONE 04B
BEST TRACK TC-04B
15 OCT-16 OCT 85
MAX SFC WIND 50 KT
MINIMUM SLP 987 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
16/12Z
15/18Z
CALCUTTA
DACCA
RANGOON
BANGKOK
HONG KONG
MANILA
MADRAS
PT. BLAIR
HO CHI MINH CITY
SINGAPORE
10C ABPW
ABIO
25B
45B
35°
30°
25°
20°
15°
10°
5°
0°
80°
85°
90°
95°
100°
105°
110°
115°
120°
130°

Despite being in warning status for only 18 hours, Tropical Cyclone 04B had a long life. It was first detected on 9 October, almost a week before the initial warning was issued, as an area of poorly organized convection in the South China Sea. The Tropical Disturbance was developing in the active monsoon trough, midway between Tropical Cyclone 03B in the Bay of Bengal, and a disturbance in the Philippine Sea that would soon develop into Typhoon Cecil.

Satellite fixes of an upper-level circulation center, based on the extrapolation of cirrus and convective curvature, followed the progress of the system as it moved closer to Vietnam. For the next two days, the system continued to move west-northwestward across the Southeast Asian Peninsula. It emerged in the Andaman Sea late on the 12th, still a poorly organized area of convection. The disturbances westward progress was also reflected at the surface, where a 10 to 15 kt (5 to 8 m/s), 1004 mb low pressure center was present.

During the 13th and 14th, the disturbance turned to the northwest, crossed the northern Andaman Sea and entered the Bay of Bengal. Upper-level support remained relatively weak and diffuse. Positioning by satellite imagery, hampered by mid- to high-level cloudiness, was accomplished on these two days mostly by analysis of spiral band curvature and extrapolation of a poorly defined low-level circulation center. With conditions favorable for slow intensification, the minimum sea-level pressure dropped from 1004 mb on the 12th to an estimated 1000 mb late on the 14th. Surface winds showed a corresponding rise, increasing to 25 kt (13 m/s). Early forecasts on the 14th predicted the system would cross the North Orissa-West Bengal Coast late on the 15th.

Early on the 15th, available data showed little change. Synoptic data at 150000Z showed a 30 kt (15 m/s) surface circulation in the north central Bay of Bengal with an upper-level anticyclone located approximately 80 nm (148 km) to the northeast. Since earlier positions had indicated greater separation between the upper- and lower-level systems, this may have signaled the beginning of increased organization. Still, available synoptic data showed no further decrease in pressure nor significant increase in surface winds. On satellite imagery, the system remained broad and diffuse, showing little improvement in organization over the past 24- to 48-hours (Figure 3-31-1). Meanwhile, coastal Bangladesh, with fresh memories of Tropical Cyclone 01B, which killed over 6,000 people in May, braced for the current cyclone still expected to hit the coast late on the 15th. Port cities like Chittagong (WMO 41978), Khulna (WMO 41930) and others were advised to raise cautionary signals and fishing boats were advised to stay near the coast.

As 151200Z data became available, it was obvious that the system had, indeed, developed over the past 6- to 12-hours. Synoptic data from ships located a rapidly developing cyclone about 180 nm (333 km) south of Calcutta (WMO 42809). Minimum sea-level pressure was estimated to be near 990 mb and winds had increased to 45 kt (23 m/s). At 151555Z, an abbreviated Tropical Cyclone Warning Bulletin was issued by JTWC to reflect the latest data which indicated a cyclone had formed. By then, more port cities had hoisted warning signals, low-lying areas were preparing for a possible storm surge of 4 to 7 ft (1 to 2 m) above sea-level, and more fishing boats and trawlers had sought shelter.

At 151800Z, JTWC issued the first complete warning on Tropical Cyclone 04B. Subsequent ship reports had indicated a continued fall in the mean sea-level pressure and confirmed surface winds of 45 kt (23 m/s). Satellite imagery at 151649Z showed a dramatic increase in organization and convection over the past 12-hours. The strongest convection was already onshore, but the low-level circulation center remained offshore and was located on the northeast edge of the strong convection.

By 160000Z, Tropical Cyclone 04B had reached maximum intensity as it made landfall on the coast of India approximately 55 nm (102 km) south of Balasore (WMO 42895) and about 140 nm (259 km) southwest of Calcutta. A large area of strong convection remained associated with the system (Figure 3-04B-2). However, shearing conditions had already begun to disrupt vertical organization and, as the system continued to track inland, more and more convection and organization were lost. The final warning was issued at 161200Z.

At least 38 people were killed, with over 200 reported still missing as late as six days after the storm struck the coast. Most of the missing were from the east Indian state of Orissa where a village was completely washed away by flood waters. Heavy rain-induced flooding combined with storm-induced high tides to swamp offshore islands cutting-off access to more than 500 villages.

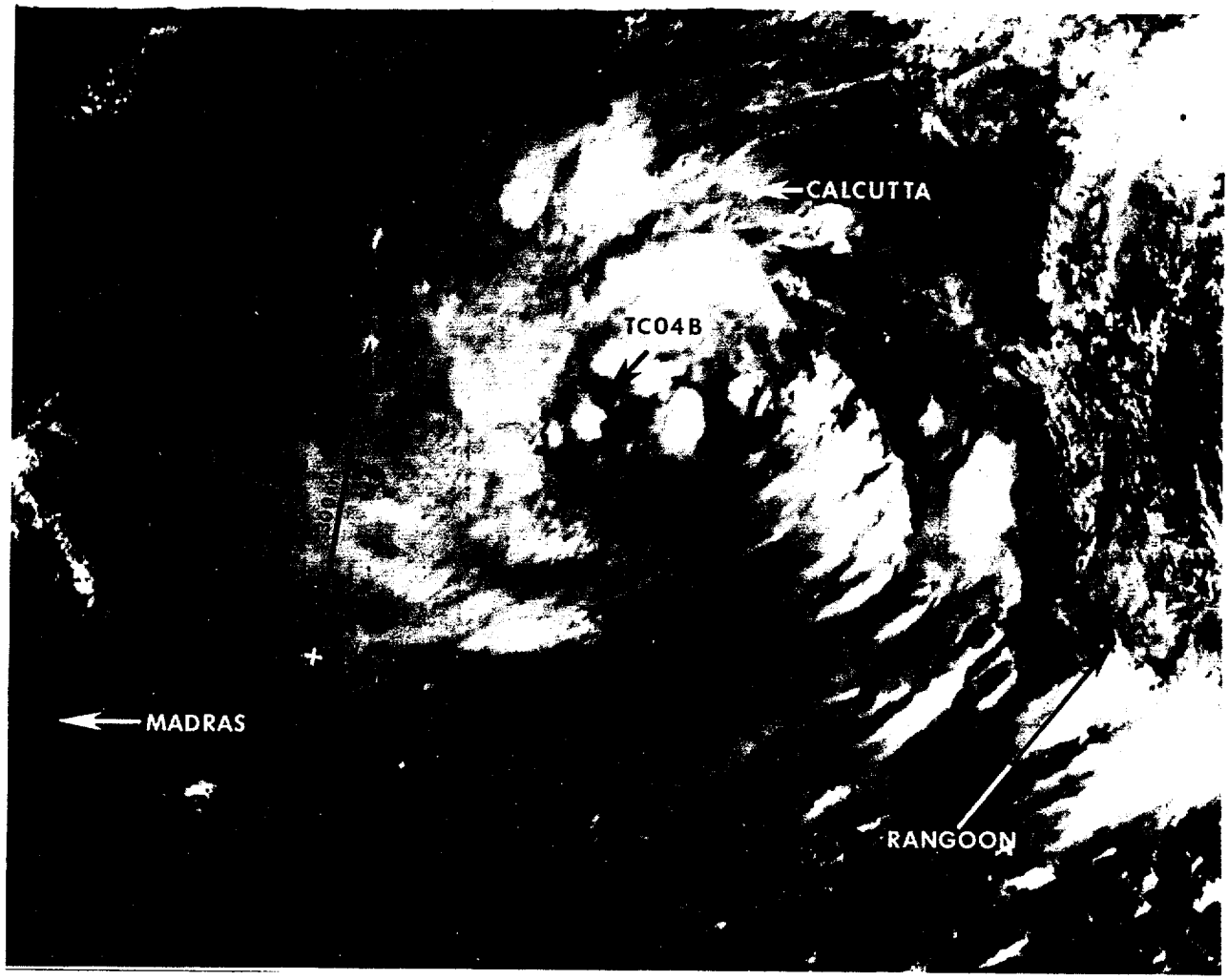


Figure 3-04B-1. The Tropical Disturbance in the Bay of Bengal just prior to undergoing rapid development. The Dvorak intensity estimate is 25 kt (13 m/s) (150408Z October DMSP visual imagery).

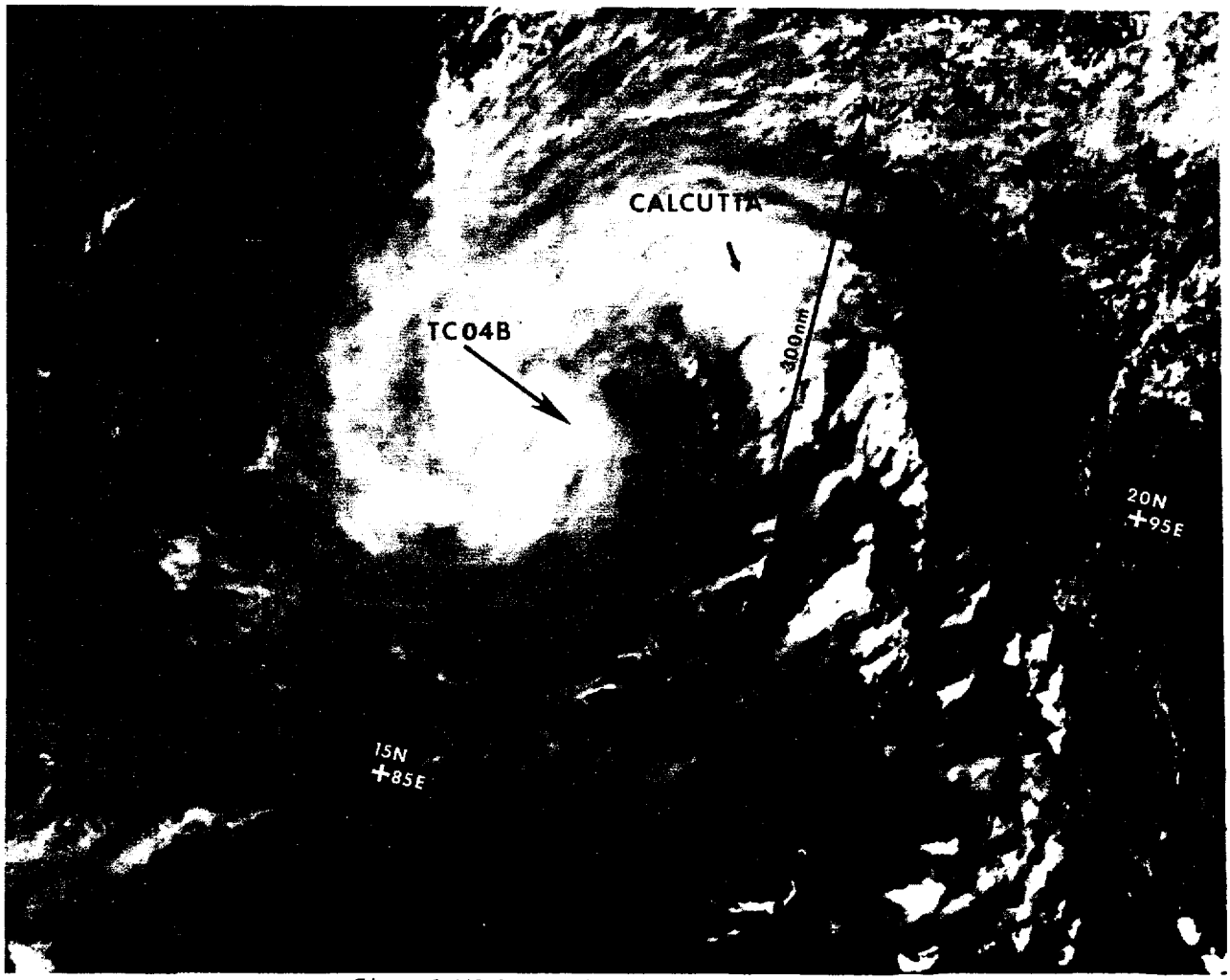
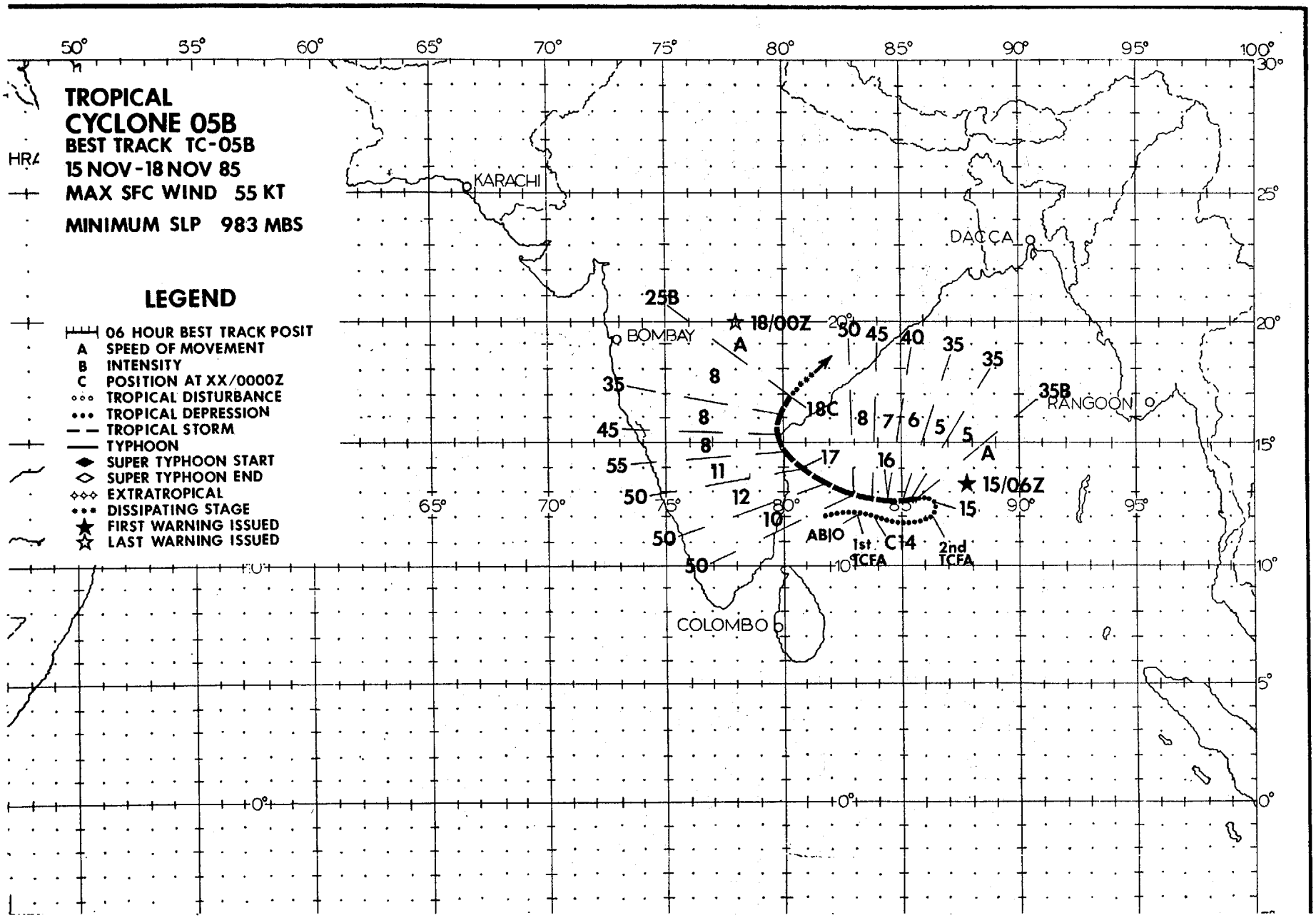


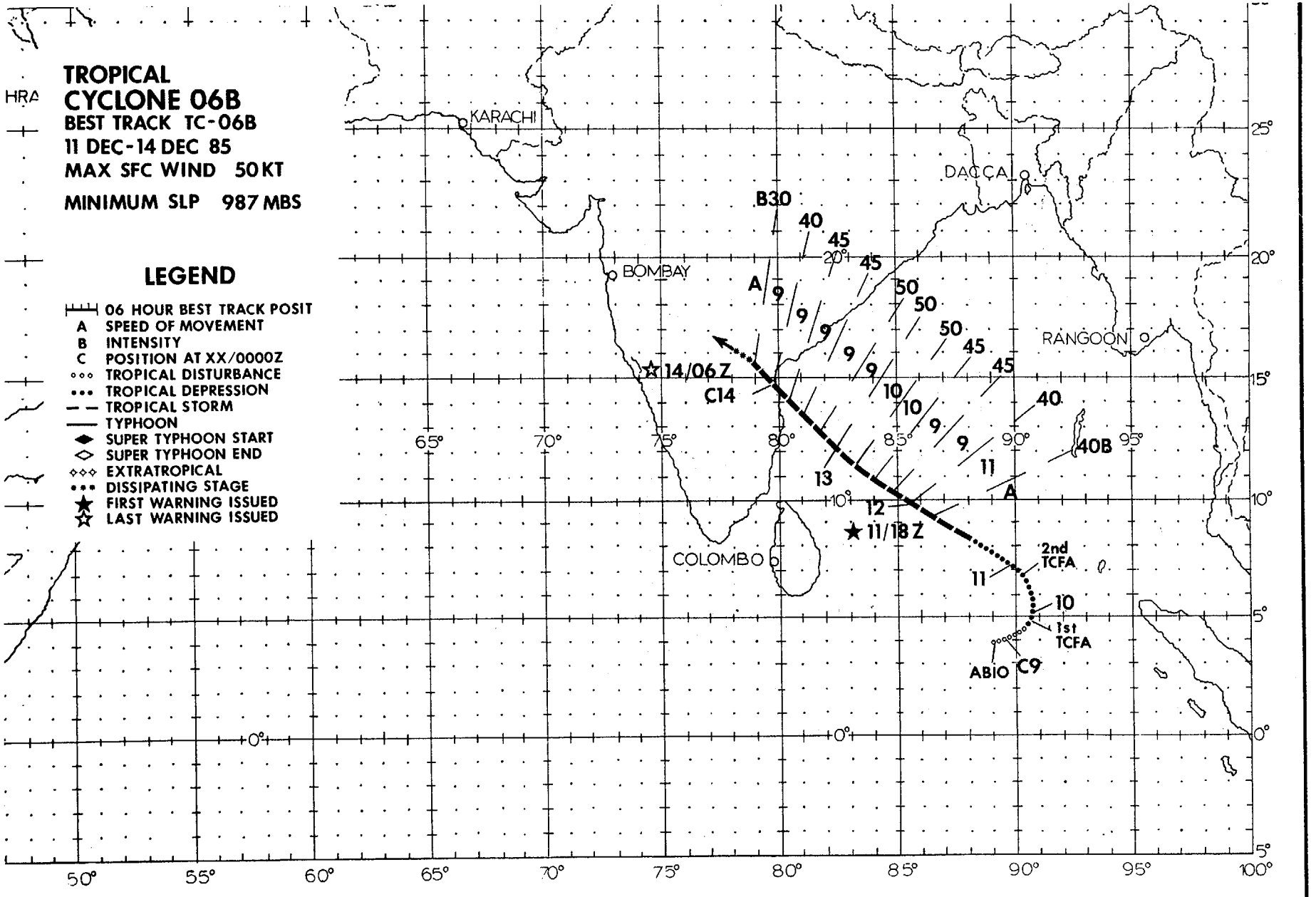
Figure 3-04B-2. Tropical Cyclone 04B just after it made landfall over eastern India. There is a dramatic increase in organization as compared to the imagery in Figure 3-31-1 (160348Z October DMSP visual imagery).


TROPICAL
CYCLONE 05B
BEST TRACK TC-05B
15 NOV-18 NOV 85
MAX SFC WIND 55 KT
MINIMUM SLP 983 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
KARACHI
BOMBAY
DACCA
RANGOON
COLOMBO
25B
18/00Z
15/06Z
35B
ABIO
1st TCFA
C14
2nd TCFA
50°
55°
60°
65°
70°
75°
80°
85°
90°
95°
100°
30°
25°
20°
15°
10°
5°
0°

TROPICAL CYCLONE 05B

Tropical Cyclone 05B formed as a monsoon depression on the southern periphery of the monsoon trough approximately 120 nm (222 km) east-southeast of Madras, India. The system was initially thought to be associated with a disturbance that formed on the east Indian coast near Madras. However, post-analysis of satellite fixes and imagery indicate that the first disturbance formed near the western extent of the monsoon trough on 111200Z, then went ashore on about 120600Z. Therefore, it was determined that the first system was not part of the disturbance that eventually became Tropical Cyclone 05B. At 130600Z, A small area of convection on the southern extent of the monsoon trough developed into a cyclone of about 25 kt (13 m/s). A TCFA was issued at 131800Z as the system remained at 25 kt (13 m/s) and moved east along the southern periphery of the monsoon trough. A second TCFA was issued at 141800Z as the cyclone remained at the same intensity and continued to move east at about 9 kt (5 m/s). Tropical Cyclone 05B finally began to intensify slightly when it reached the eastern extent of the monsoon trough at about 150000Z. Subsequently, the system slowed to about 6 kt (3 m/s), began to move north, and intensified to 35 kts (18 m/s), prompting the issuance of the first warning at 150600Z.

At 151200Z, it was apparent that Tropical Cyclone 05B had begun to move west toward India under the influence of low- to mid-level easterlies to the north of the monsoon trough. At this point, The system continued to intensify slowly and began to accelerate, turning to the west-northwest. Tropical Cyclone 05B reached a maximum intensity of 55 kt (28 m/s) just prior to landfall at 170600Z, 90 nm (167 km) north of Madras. No reports of damage or loss of life due to Tropical Cyclone 05B were received.


TROPICAL
CYCLONE 06B
BEST TRACK TC-06B
11 DEC-14 DEC 85
MAX SFC WIND 50 KT
MINIMUM SLP 987 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
KARACHI
BOMBAY
DACCA
RANGOON
COLOMBO
ABIO
B30
40
45
45
A
9
9
9
9
50
50
50
45
45
40
10
10
9
9
11
A
40B
13
12
11
10
14/06Z
C14
11/18Z
2nd TCFA
1st TCFA
C9
HRA
136
65°
70°
75°
80°
85°
90°
95°
50°
55°
60°
65°
70°
75°
80°
85°
90°
95°
100°
25°
20°
15°
10°
5°
0°

2-76)

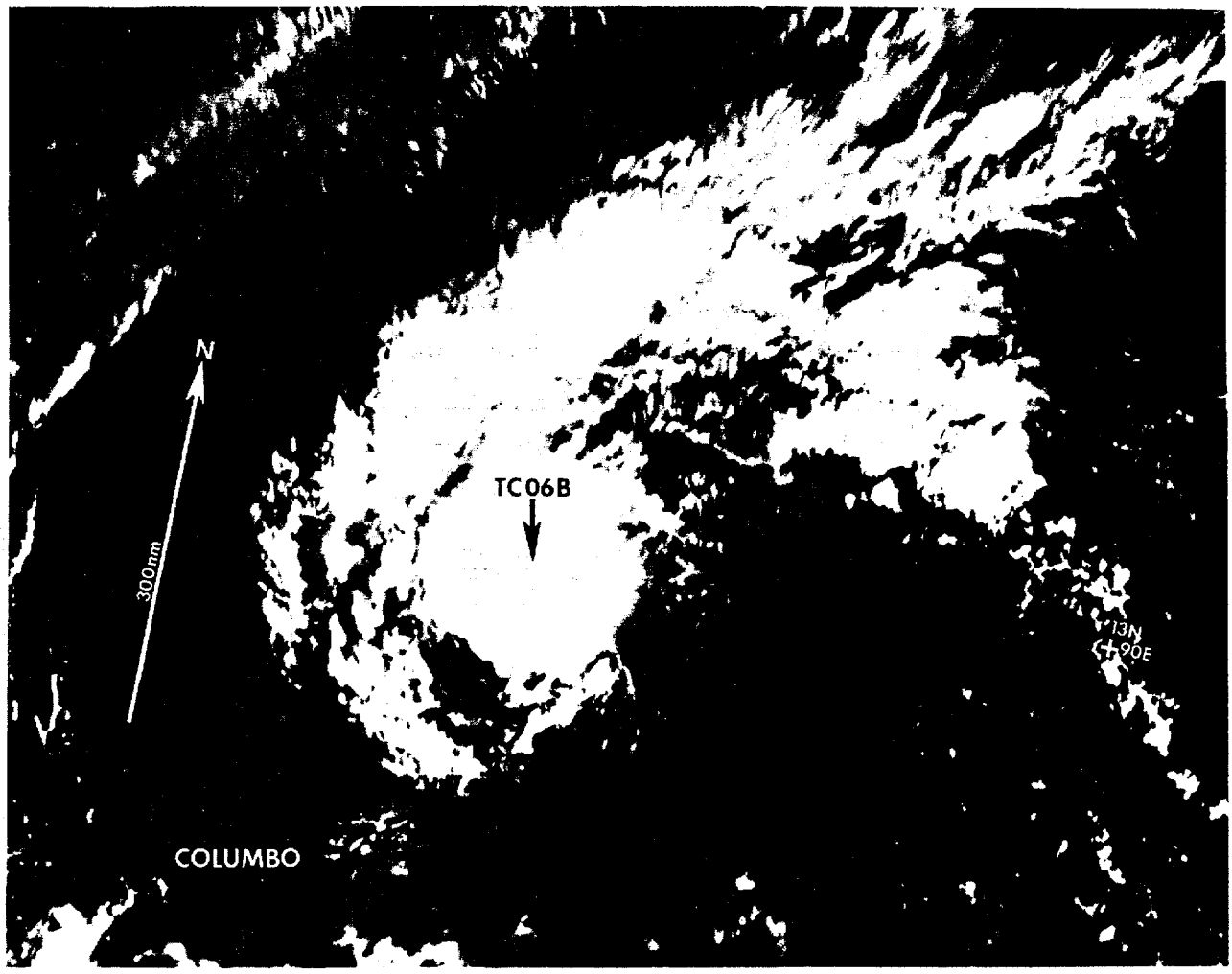


Figure 3-06B-1. Tropical Cyclone 06B formed in the monsoon trough, intensified, and moved northwestward across the Bay of Bengal. In the satellite image, the low-level cumulus lines that are spiralling into the circulation center can be seen along the southern edge of the central dense overcast (130426Z December DMSP visual imagery).

CHAPTER IV - Summary of South Pacific and South Indian Ocean Tropical Cyclones

1. GENERAL

This is the first year that Southern Hemisphere tropical cyclones are included in the Annual Tropical Cyclone Report. In retrospect, the JTWC area of responsibility (AOR) was expanded on 1 October 1980 to include the Southern Hemisphere from 180 degrees longitude westward to the east coast of Africa. Details on tropical cyclones in this region for the July 1980 to June 1982 are contained in Diercks et al, (1982). For the July 1982 through June 1984 period, reference the NOCC/JTWC TECH NOTE 86-1. As in earlier reports, data on tropical cylones forming in, or moving into, the South Pacific Ocean east of 180 degrees, which is the Naval Western Oceanography Center (NAVWESTOCEANCEN) AOR, are included for completeness.

JTWC provides the sequential numbering for all South Pacific and South Indian Ocean significant tropical cyclones. The current convention (as stated in USCINCPACINST 3140.1 (series)) for labelling tropical cyclones that develop in the South Indian Ocean (west of 135 degrees east longitude) is to add the suffix "S" to the assigned tropical cyclone number, while those originating in the South Pacific Ocean (east of 135 degrees east longitude) receive a "P" suffix. The "P" suffix also applies to significant tropical cyclones which form east of the 180 degrees in the South Pacific Ocean. Also, it should be noted that to encompass the Southern Hemisphere tropical cyclone season, which occurs from January through April, the limits of each tropical cyclone year are defined as 1 July to 30 June. Thus, the 1985 Southern Hemisphere tropical cyclone year is from 1 July 1984 to 30 June 1985. (This is in contrast to the convention for labelling Northern Hemisphere tropical cyclones which is based on the calendar year - 1 January to 31 December - to include the seasonal activity from May through December.)

TABLE 4-1. SOUTH PACIFIC AND SOUTH INDIAN OCEAN

1985 SIGNIFICANT TROPICAL CYCLONES

TROPICAL CYCLONE	PERIOD OF WARNING	CALENDAR DAYS OF WARNING	NUMBER OF WARNINGS ISSUED	MAXIMUM SURFACE WINDS - KT(M/S)	ESTIMATED MSLP - MB	BEST TRACK DISTANCE TRAVELED - NM(KM)
01S ----------	11 NOV - 14 NOV	4	9	50 (26)	987	2026 (3752)
02S BOBALAHY	03 DEC - 07 DEC	5	10	55 (28)	983	1208 (2237)
03S EMMA	10 DEC - 12 DEC	3	6	45 (23)	990	1375 (2547)
04P ----------	12 DEC - 13 DEC	2	4	35 (18)	996	845 (1565)
05S FRANK	23 DEC - 27 DEC	5	10	75 (39)	968	569 (1054)
06P ----------	26 DEC - 27 DEC	2	2	45 (23)	990	464 (859)
07P MONICA	27 DEC - 29 DEC	3	5	65 (33)	971	1322 (2448)
08P ----------	29 DEC - 31 DEC	3	5	45 (23)	990	948 (1756)
09P DRENA	11 JAN - 13 JAN	3	6	50 (26)	988	612 (1133)
10S CELESTINA	12 JAN - 21 JAN	10	20	65 (33)	975	1692 (3134)
11P ERIC	14 JAN - 18 JAN	5	8	100 (51)	950	3030 (5612)
12S ----------	15 JAN - 17 JAN	3	4	35 (18)	996	874 (1619)
13P NIGEL	16 JAN - 19 JAN	4	8	105 (54)	937	2414 (4471)
14P ODETTE	17 JAN - 22 JAN	6	11	100 (51)	942	1701 (3150)
15S DITRA	27 JAN - 31 JAN	5	9	70 (36)	971	1154 (2137)
16P FREDA	28 JAN - 30 JAN	3	6	75 (39)	966	2035 (3769)
17S GERTIE	30 JAN - 31 JAN	2	4	55 (28)	985	432 (800)
18P ----------	02 FEB - 06 FEB	5	9	35 (18)	996	941 (1743)
19S ESITERA	05 FEB - 10 FEB	6	11	50 (26)	987	1612 (2985)
20S HUBERT	12 FEB - 17 FEB	6	11	55 (28)	983	2408 (4460)
21S FELISKA	14 FEB - 19 FEB	6	11	50 (26)	987	511 (946)
22S ISOBEL	14 FEB - 21 FEB	8	15	50 (26)	987	1416 (2622)
23S GERIMENA	14 FEB - 25 FEB	12	23	65 (33)	981	1298 (2404)
24S ----------	19 FEB - 20 FEB	2	4	35 (18)	996	756 (1400)
25S JACOB	19 FEB - 26 FEB	8	15	75 (39)	966	2422 (4486)
26P PIERRE	20 FEB - 22 FEB	3	6	45 (23)	990	978 (1811)
27P GAVIN	05 MAR - 07 MAR	3	5	55 (28)	983	1539 (2850)
28S KIRSTY	07 MAR - 14 MAR	8	17	115 (59)	930	1389 (2572)
29S LINDSAY	08 MAR - 10 MAR	3	5	55 (28)	970	579 (1072)
30P HINA	13 MAR - 17 MAR	5	10	135 (69)	920	2469 (4573)
31P SANDY	20 MAR - 25 MAR	6	12	120 (62)	920	2391 (4428)
32P TANYA	29 MAR - 01 APR	4	10	60 (31)	979	935 (1732)
33S HELISAONINA	11 APR - 16 APR	6	12	110 (57)	932	1769 (3276)
34S GRETEL	11 APR - 14 APR	4	6	45 (23)	988	483 (895)
35S MARGOT	12 APR - 17 APR	6	11	70 (36)	970	1111 (2058)
1985 TOTALS:		98*	320			

*OVERLAPING DAYS INCLUDED ONLY ONCE IN SUM.

NOTE: NAMES OF CYCLONES GIVEN BY REGIONAL WARNING CENTERS (NANDI, BRISBANE, DARWIN, PERTH AND MAURITIUS) AND APPENDED TO JTWC WARNINGS, WHEN AVAILABLE.

2. SOUTH PACIFIC AND SOUTH INDIAN OCEAN TROPICAL CYCLONES

The 1985 year (1 July 1984 through 30 June 1985) was unusually active, with 35 tropical cyclones (see Table 4-1 and pages 142 through 146) reaching warning status. This exceeded the total of 30 tropical cyclones for 1984 (1 July 1983 - 30 June 1984) and proved to be the busiest year to date for JTWC. Six tropical cyclones occurred in the South Pacific east of 165 degrees east longitude, which matched the long term mean. The Australian area (105 to 165 degrees east longitude) accounted for 15 tropical cyclones as compared to the climatological mean of 10.3 - five more than normal. Fourteen tropical cyclones developed in the South Indian Ocean, which is almost twice the long term mean of 8.4 cyclones (See Tables 4-2 and 4-3). This represents the highest total for this area since at least the 1958-1959 season (Gray, 1979). In this regard, meteorological satellite surveillance of tropical cyclones has been updating climatologies since the early 1960s. (This meteorological watch from space detects tropical cyclones that might have previously gone undetected over the conventional data sparse oceanic areas.) Thus, tropical cyclone climatologies should benefit from increased surveillance from space in some areas, for example, the South Indian Ocean.

Caveat: Intensity estimates for southern hemisphere tropical cyclones are derived primarily from satellite imagery evaluation (Dvorak, 1984) and from intensity estimates reported by other regional warning centers. Only, in very rare instances are the intensity estimates based on surface observational data. Estimates of the minimum sea-level pressure are usually derived from the Atkinson and Holliday (1977) relationship between the maximum sustained one-minute surface wind and the minimum sea-level pressure (Table 4-4). This relationship has been shown to be representative for tropical cyclones in the western North Pacific and is also used by the Australian regional warning centers to provide intensity estimates. However, since these pressure estimates are usually based on wind intensities that were derived from interpretation of satellite imagery, considerable caution should be exercised when using these resultant pressure values in future tropical cyclone work.

TABLE 4-2. FREQUENCY OF TROPICAL CYCLONES BY MONTH AND YEAR FOR SOUTH PACIFIC AND INDIAN OCEAN

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
(1959 - 1978) AVERAGE*	---	---	---	0.4	1.5	3.6	6.1	5.8	4.7	2.1	0.5	---	24.7
1981	0	0	0	1	3	2	6	5	3	3	1	0	24
1982	1	0	0	1	1	3	9	4	2	3	1	0	25
1983	1	0	0	1	1	3	5	6	3	5	0	0	25
1984	1	0	0	1	2	5	5	10	4	2	0	0	30
1985	0	0	0	0	1	7	9	9	6	3	0	0	35
(1981 - 1985) AVERAGE	0.6	0	0	0.8	1.6	4.0	6.8	6.8	3.6	3.2	0.4	0	27.8
CASES	3	0	0	4	8	20	34	34	18	16	2	0	139

* (GRAY, 1979)

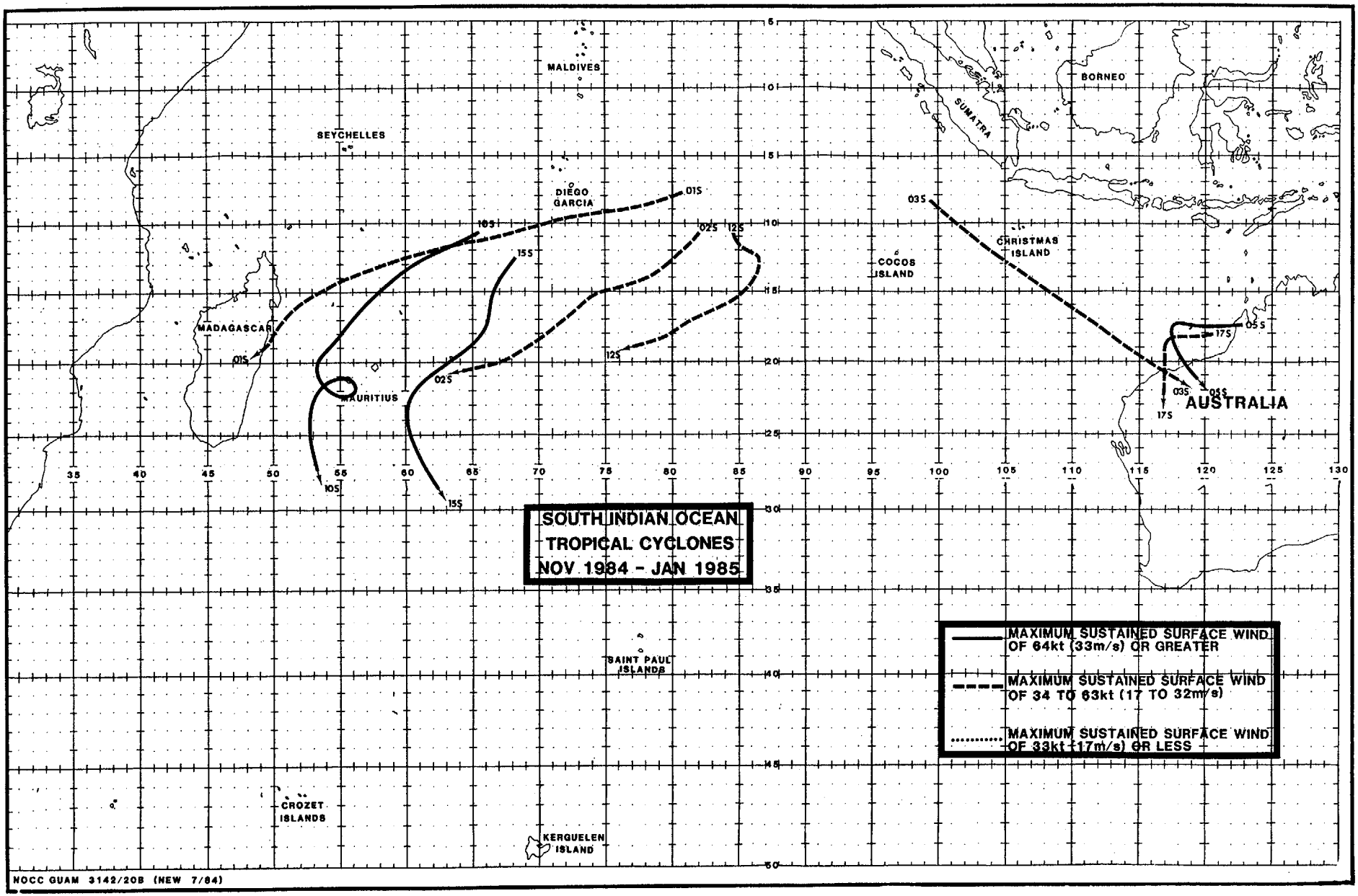
TABLE 4-3. YEARLY VARIATION OF TROPICAL CYCLONES BY OCEAN BASIN

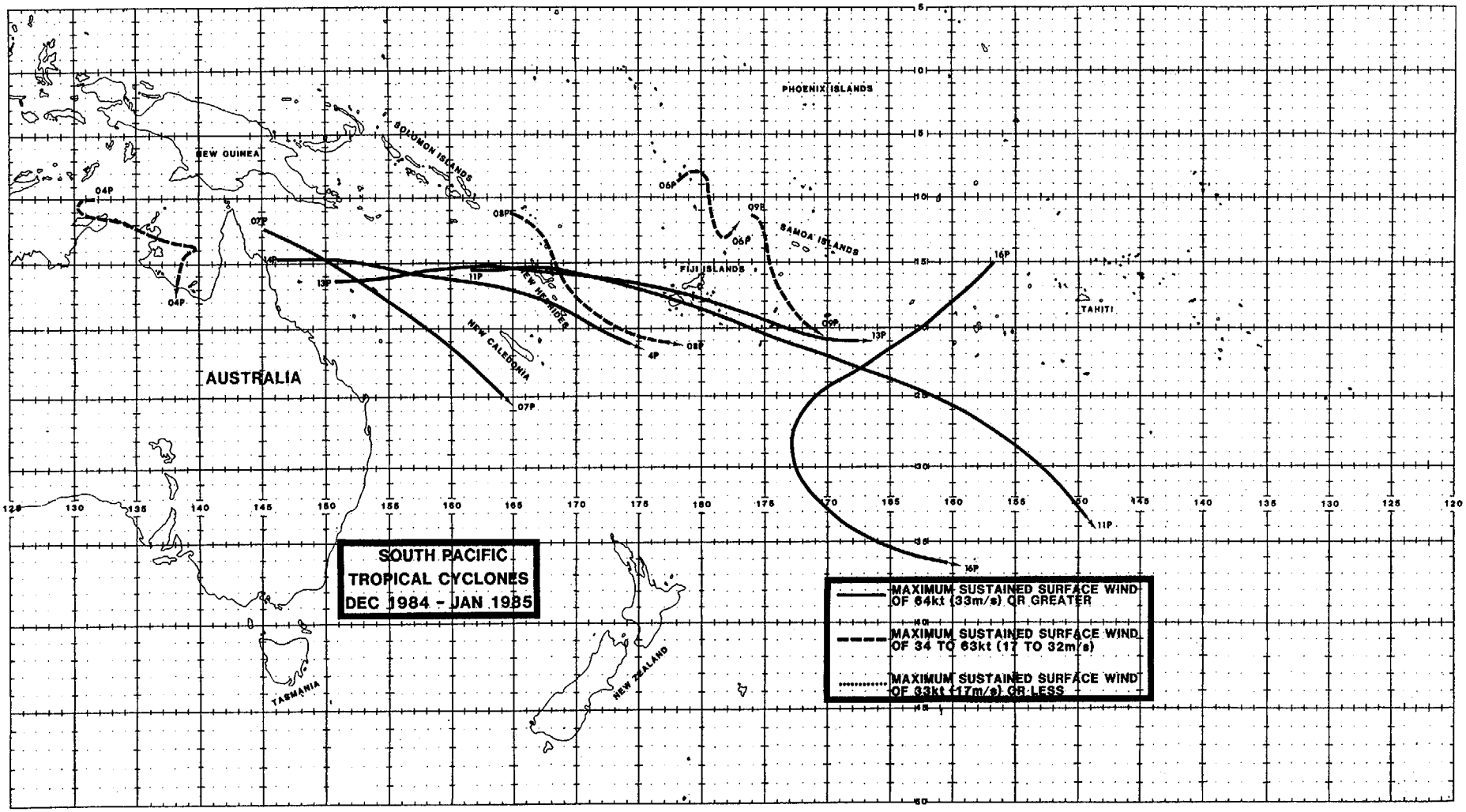
YEAR	(105E WESTWARD) SOUTH INDIAN	(105E-165E) AUSTRALIAN	(165E EASTWARD) SOUTH PACIFIC	TOTAL
(1959 - 1978) AVERAGE*	8.4	10.3	5.9	24.6
1981	13	8	3	24
1982	12	11	2	25
1983	7	6	12	25
1984	14	14	2	30
1985	14	15	6	35
(1981 - 1985) AVERAGE	12.0	10.8	5.0	27.8
CASES	60	54	25	139

* (GRAY, 1979)

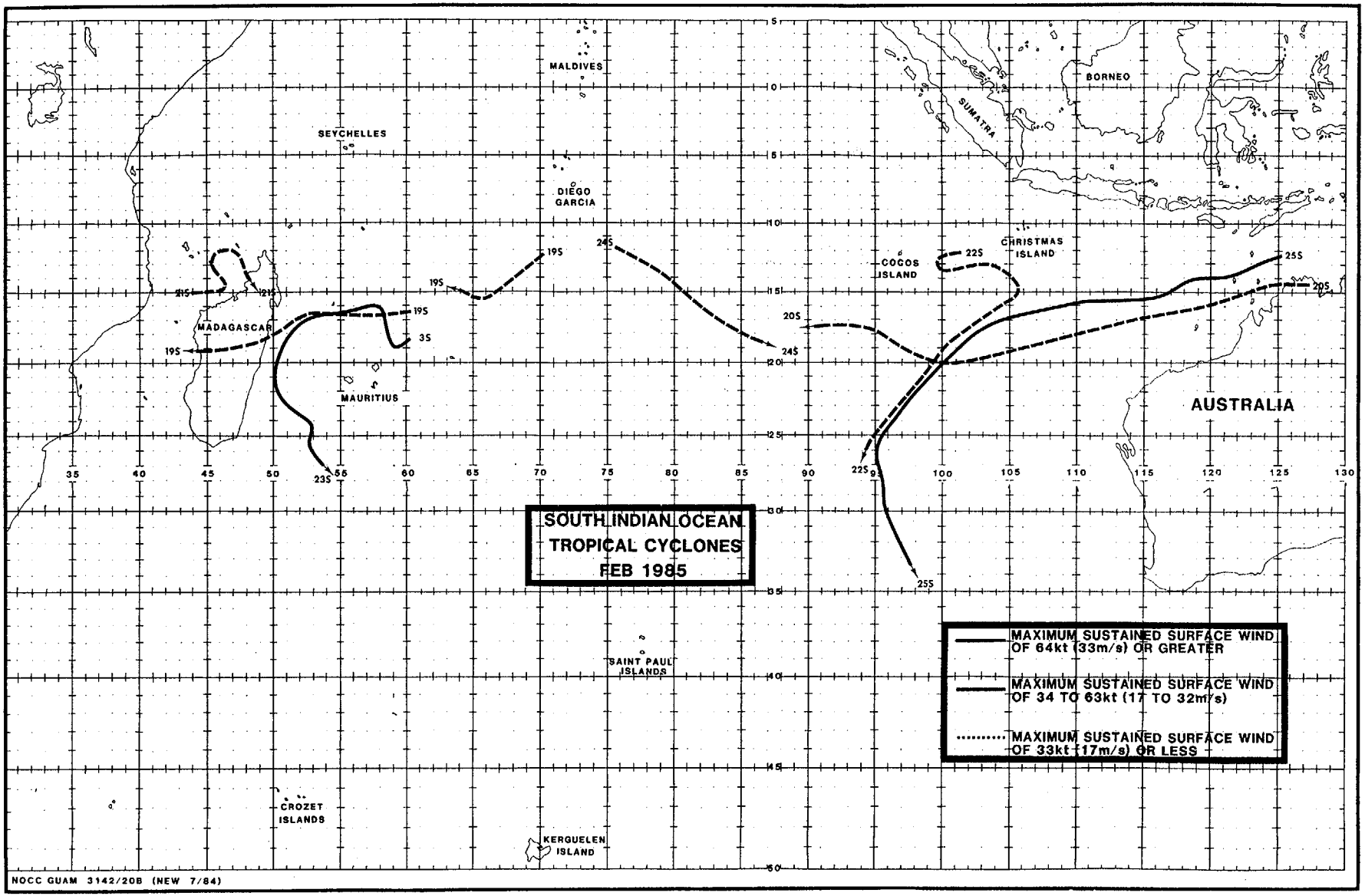
TABLE 4-4. MAXIMUM SUSTAINED SURFACE WIND VERSUS MINIMUM SEA-LEVEL PRESSURE (ATKINSON AND HOLLIDAY, 1977).

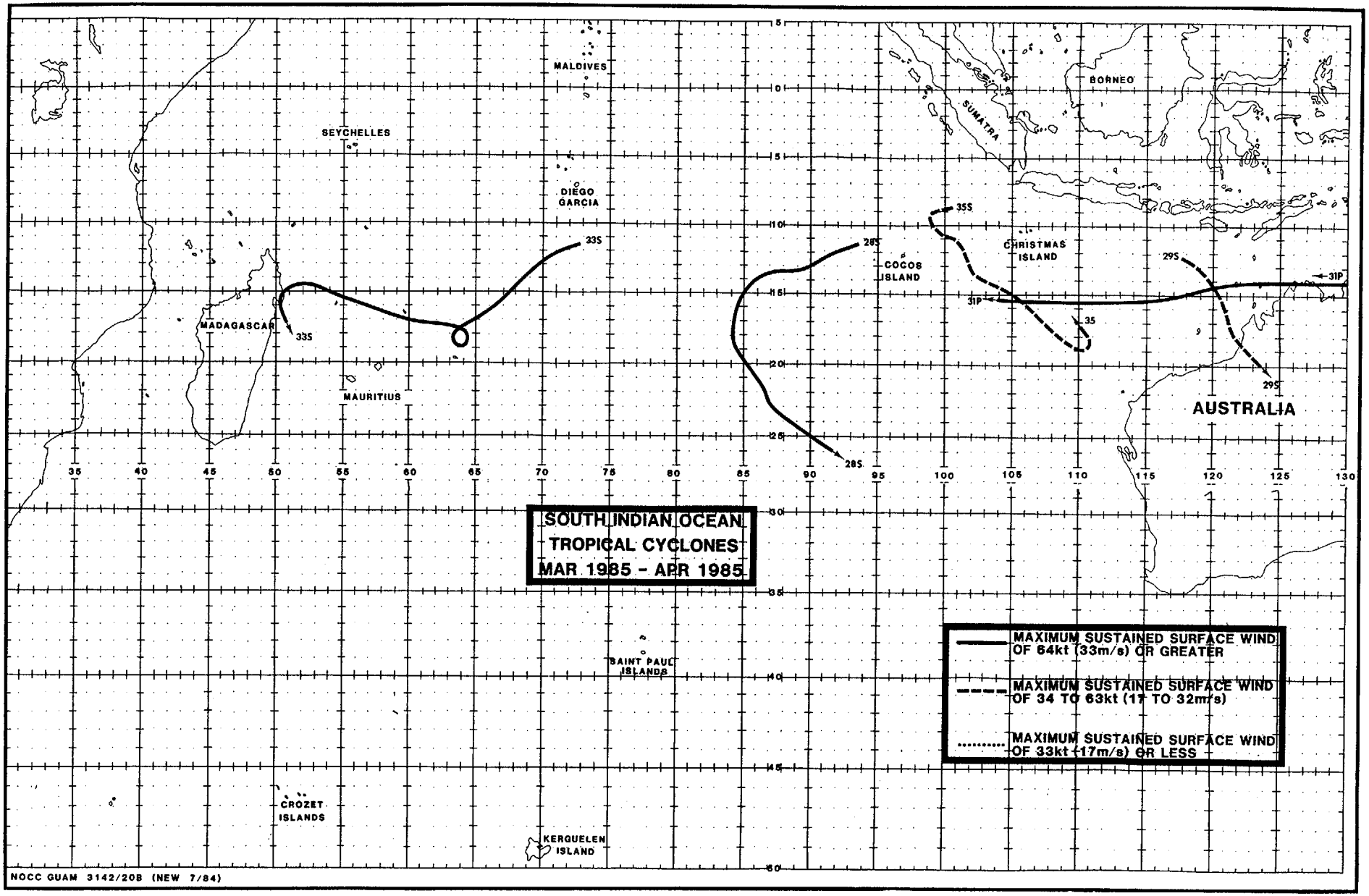
MAXIMUM SUSTAINED SURFACE WIND (KT)	EQUIVALENT MINIMUM SEA-LEVEL PRESSURE (MB)
30	1000
35	997
40	994
45	991
50	987
55	984
60	980
65	976
70	972
75	967
80	963
85	958
90	953
95	948
100	943
105	938
110	933
115	927
120	922
125	916
130	910
135	904
140	898
145	892
150	885
155	879
160	872
165	865
170	858

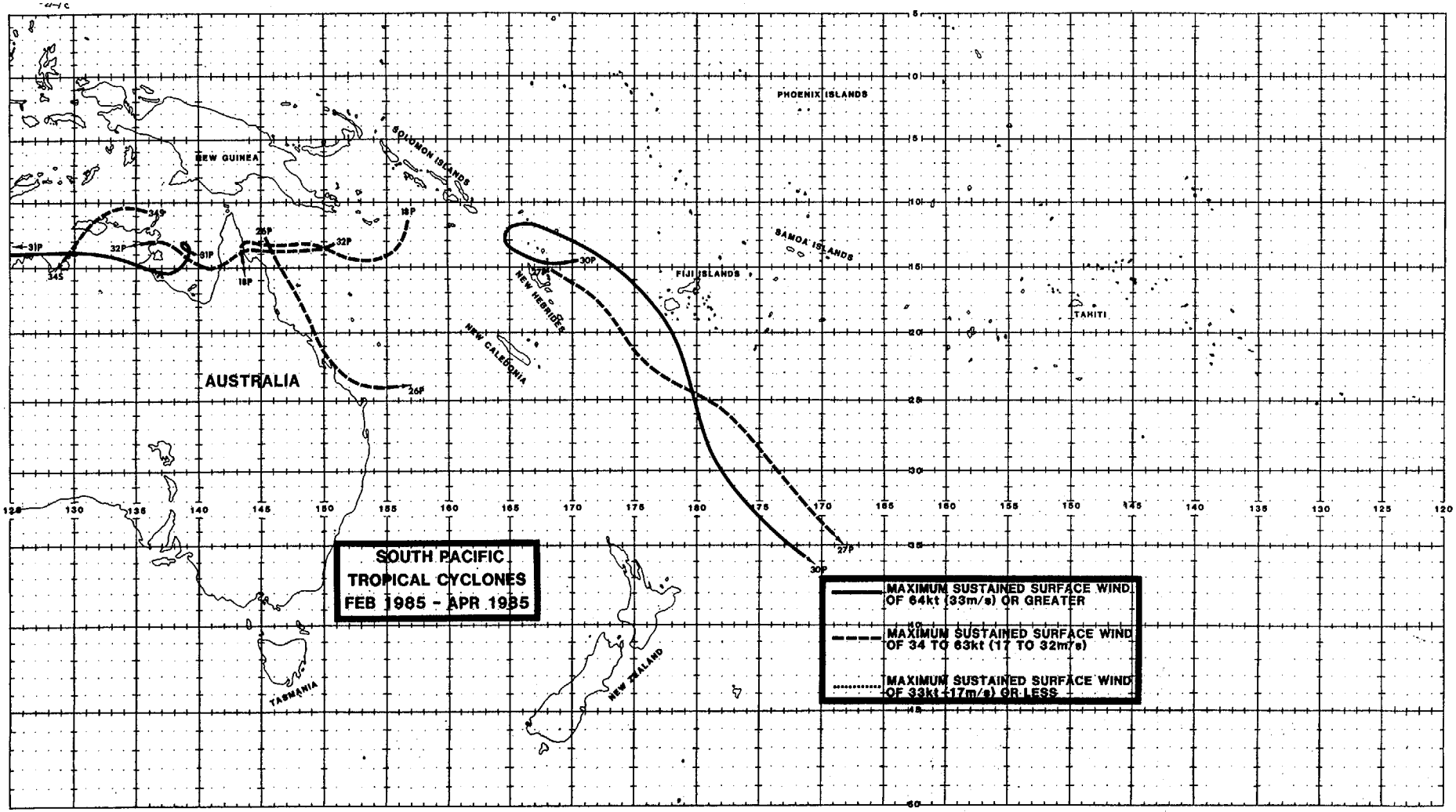

MALDIVES
SEYCHELLES
DIEGO GARCIA
MADAGASCAR
MAURITIUS
SUMATRA
BORNEO
CHRISTMAS ISLAND
COCOS ISLAND
AUSTRALIA
SAINT PAUL ISLANDS
CROZET ISLANDS
KERGUELEN ISLAND
SOUTH INDIAN OCEAN
TROPICAL CYCLONES
NOV 1984 - JAN 1985
MAXIMUM SUSTAINED SURFACE WIND OF 64kt (33m/s) OR GREATER
MAXIMUM SUSTAINED SURFACE WIND OF 34 TO 63kt (17 TO 32m/s)
MAXIMUM SUSTAINED SURFACE WIND OF 33kt (17m/s) OR LESS
NOCC GUAM 3142/208 (NEW 7/84)



NOCC GUAM 3142/20A (NEW 7/84)


MALDIVES
SEYCHELLES
DIEGO GARCIA
BORNEO
SUMATRA
CHRISTMAS ISLAND
COCOS ISLAND
MADAGASCAR
MAURITIUS
AUSTRALIA
SAINT PAUL ISLANDS
CROZET ISLANDS
KERGUELEN ISLAND
SOUTH INDIAN OCEAN
TROPICAL CYCLONES
FEB 1985
MAXIMUM SUSTAINED SURFACE WIND OF 64kt (33m/s) OR GREATER
MAXIMUM SUSTAINED SURFACE WIND OF 34 TO 63kt (17 TO 32m/s)
MAXIMUM SUSTAINED SURFACE WIND OF 33kt (17m/s) OR LESS
NOCC GUAM 3142/20B (NEW 7/84)


MALDIVES
SEYCHELLES
DIEGO GARCIA
MADAGASCAR
MAURITIUS
BORNEO
SUMATRA
CHRISTMAS ISLAND
COCOS ISLAND
AUSTRALIA
SAINT PAUL ISLANDS
CROZET ISLANDS
KERGUELEN ISLAND
33S
28S
35S
31P
29S
SOUTH INDIAN OCEAN
TROPICAL CYCLONES
MAR 1985 - APR 1985
MAXIMUM SUSTAINED SURFACE WIND OF 64kt (33m/s) OR GREATER
MAXIMUM SUSTAINED SURFACE WIND OF 34 TO 63kt (17 TO 32m/s)
MAXIMUM SUSTAINED SURFACE WIND OF 33kt (17m/s) OR LESS
NOCC GUAM 3142/20B (NEW 7/84)



NOCC GUAM 3142/20A (NEW 7/84)

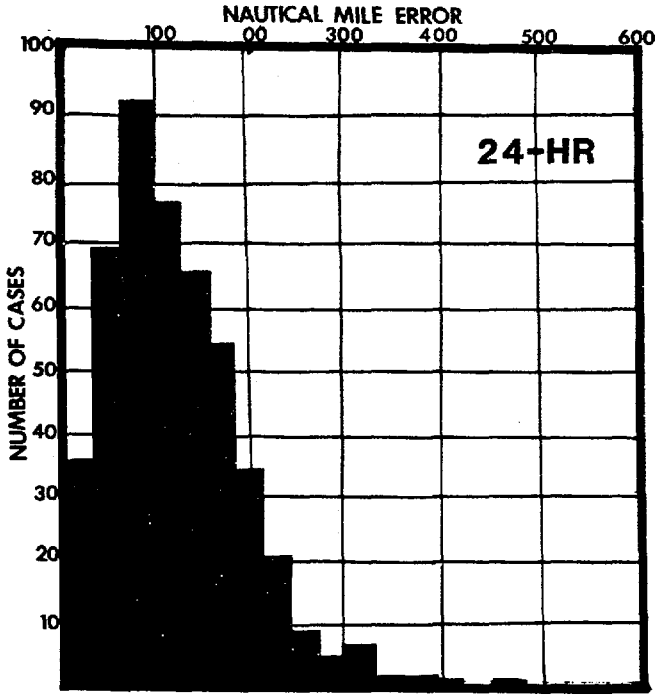
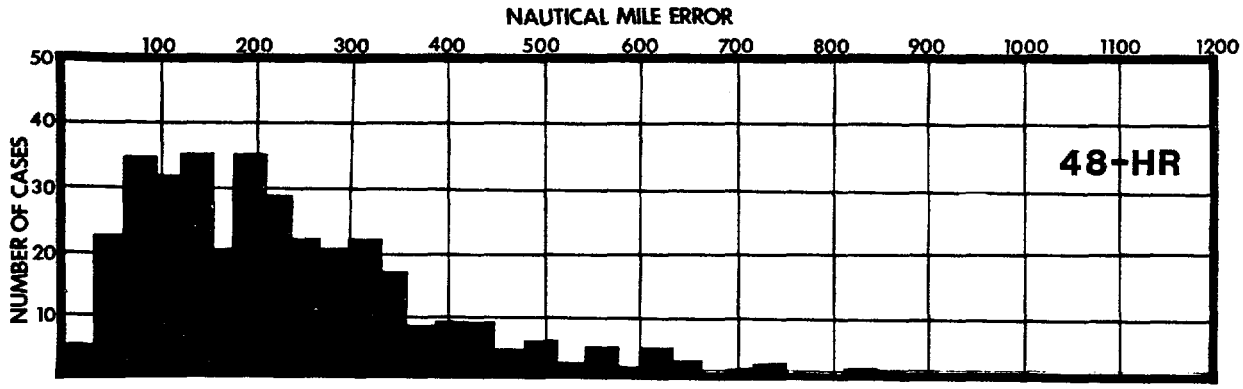
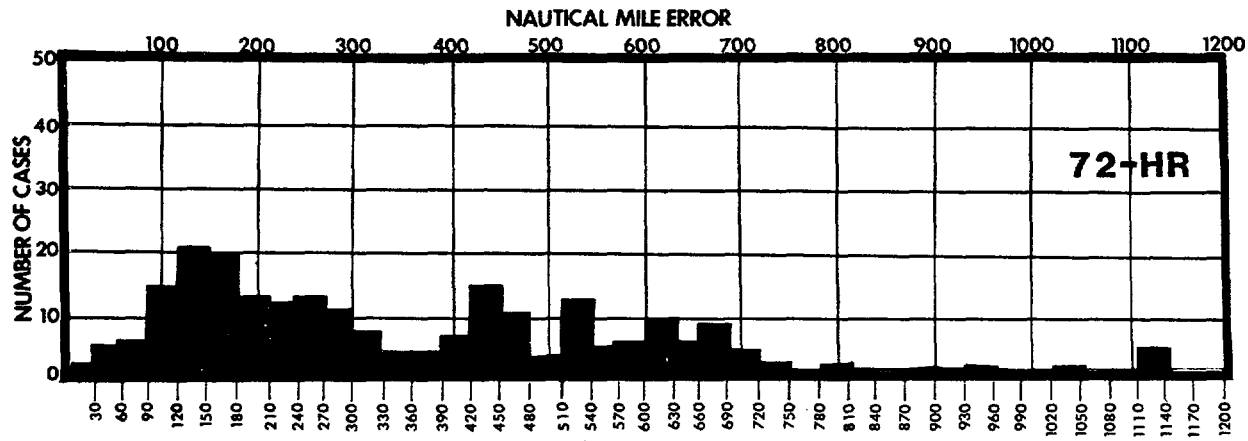


Figure 5-2. Frequency distribution of the 24-, 48-, and 72-hour forecast errors in 30 nm increments for all significant tropical cyclones in the western North Pacific during 1985.

FORECAST ERRORS (nm)

	24-HR	48-HR	72-HR
MEAN:	117	231	367
MEDIAN:	107	202	296
STANDARD DEVIATION:	72.6	153.3	254.5
CASES:	477	356	241





CHAPTER V - SUMMARY OF FORECAST VERIFICATION

1. ANNUAL FORECAST VERIFICATION

a. Western North Pacific Ocean

The positions given for warning times and those at the 24-, 48-, and 72-hour forecast times were verified against the final best track positions at the same valid times. The resultant vector and right angle (track) errors (illustrated in Figure 5-1) were then calculated for each tropical cyclone and are presented in Table 5-1. Figure 5-2 provides the frequency distributions of vector errors in 30 nm increments for 24-, 48-, and 72-hour forecasts of all 1985 tropical cyclones in the western North Pacific. A summation of the mean vector and right angle errors, as calculated for all tropical cyclones in each year, is shown in Table 5-2. A comparison of the annual mean vector errors for all tropical cyclones as compared to those tropical cyclones that reached typhoon intensity can be seen directly in Table 5-3. The annual mean vector errors for 1985 as compared to the ten previous years are graphed in Figure 5-3.

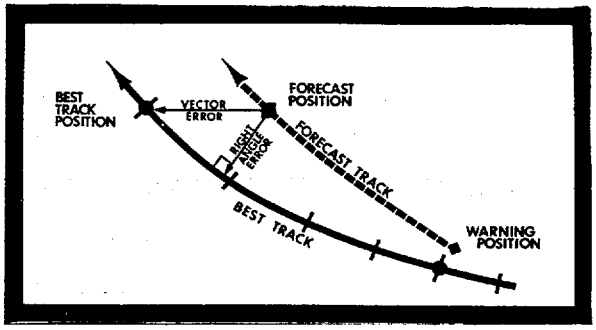


Figure 5-1. Illustration of the method to determine vector error and right angle error.

TABLE 5-1.

FORECAST ERROR SUMMARY FOR THE WESTERN NORTH PACIFIC SIGNIFICANT TROPICAL CYCLONES OF 1985. (ERRORS IN NM)

	WARNING			24-HOUR			48-HOUR			72-HOUR		
	VECTOR ERROR	RT ANGLE ERROR	NR OF WRNGS	VECTOR ERROR	RT ANGLE ERROR	NR OF WRNGS	VECTOR ERROR	RT ANGLE ERROR	NR OF WRNGS	VECTOR ERROR	RT ANGLE ERROR	NR OF WRNGS
01W. TS ELSIE	29	12	9	201	58	5	484	155	1	-	-	-
02W. TS FABIAN	35	7	16	87	30	12	158	51	8	191	25	4
03W. TY GAY	17	9	22	112	55	17	259	79	14	371	65	8
04W. TD 04W	48	27	10	177	110	6	213	-	2	-	-	-
05W. TY HAL	15	12	22	137	109	19	380	347	13	630	591	11
06W. TY IRMA	15	11	26	120	71	22	216	173	18	416	273	14
07W. TY JEFF	18	13	40	132	80	30	342	170	21	639	345	13
08W. TY KIT	14	9	33	113	56	28	305	156	22	523	259	15
09W. TS LEE	18	12	14	129	51	10	293	77	6	657	17	2
10W. TY MAMIE	26	14	17	120	70	13	229	147	9	266	122	4
11W. TY NELSON	10	9	26	64	47	22	132	88	17	182	148	14
12W. TY OLIVIA	15	8	37	146	66	33	238	111	26	272	128	21
13W. TY PAT	16	8	20	155	44	16	331	122	12	514	259	8
14W. TS RUBY	13	12	15	166	110	10	318	137	6	377	27	2
02C. TY SKIP	16	12	33	129	85	29	311	248	25	605	473	20
15W. TY TESS	19	15	22	122	70	18	97	56	14	141	115	10
16W. TS VAL	31	10	13	160	84	9	129	104	5	249	-	1
17W. TS WINONA	18	14	11	87	69	7	140	136	3	-	-	-
18W. TY ANDY	9	6	16	44	30	12	87	63	8	120	84	4
19W. TY BRENDA	17	12	23	93	43	19	245	106	15	436	230	11
20W. TY CECIL	14	11	16	104	93	13	179	159	9	196	139	2
21W. STY DOT	10	8	33	63	32	29	80	31	25	131	68	21
22W. TS ELLIS	16	10	17	149	117	13	363	311	9	583	430	5
23W. TY FAYE	15	7	38	104	58	34	242	136	30	414	231	26
24W. TS GORDON	37	16	23	114	51	17	159	58	11	238	80	6
25W. TY HOPE	19	15	26	123	83	22	201	124	18	159	102	14
26W. TS IRVING	35	18	14	132	73	12	163	41	9	170	51	5
ALL FORECASTS	18	11	592	117	66	477	231	134	356	367	214	241

TABLE 5-2

ANNUAL MEAN FORECAST ERRORS (NM) FOR THE WESTERN NORTH PACIFIC

YEAR	24-HOUR VECTOR	24-HOUR RIGHT ANGLE	48-HOUR VECTOR	48-HOUR RIGHT ANGLE	72-HOUR VECTOR	72-HOUR RIGHT ANGLE
1971	111	64	212	118	317	117
1972	117	72	245	146	381	210
1973	108	74	197	134	253	162
1974	120	78	226	157	348	245
1975	138	84	288	181	450	290
1976	117	71	230	132	338	202
1977	148	83	283	157	407	228
1978	127	75	271	179	410	297
1979	124	77	226	151	316	223
1980	126	79	243	164	389	287
1981*	123	75	220	119	334	168
1982*	113	67	237	139	341	206
1983*	117	72	259	152	405	237
1984*	117	66	233	137	363	231
1985*	117	66	231	134	367	214

* The technique for calculating right angle error was revised in 1981; therefore, a direct correlation in right angle statistics cannot be made for the errors computed before 1981 and the errors computed since 1981.

TABLE 5-3. ANNUAL MEAN FORECAST ERRORS (NM) FOR WESTERN NORTH PACIFIC

YEAR	24-HOUR ALL	24-HOUR TYPHOON*	48-HOUR ALL	48-HOUR TYPHOON*	72-HOUR ALL	72-HOUR TYPHOON*
1950-58		170				
1959		117**		267**		
1960		177**		354**		
1961		136		274		
1962		144		287		476
1963		127		246		374
1964		133		284		429
1965		151		303		418
1966		136		280		432
1967		125		276		414
1968		105		229		337
1969		111		237		349
1970	104	98	190	181	279	272
1971	111	99	212	203	317	308
1972	117	116	245	245	381	382
1973	108	102	197	193	253	245
1974	120	114	226	218	348	351
1975	138	129	288	279	450	442
1976	117	117	230	232	338	336
1977	148	140	283	266	407	390
1978	127	120	271	241	410	459
1979	124	113	226	219	316	319
1980	126	116	243	221	389	362
1981	123	117	220	215	334	342
1982	113	114	237	229	341	337
1983	117	110	259	247	405	384
1984	117	110	233	228	363	361
1985	117	112	231	228	367	355

* For Typhoons only while winds were over 35 kt (18 m/sec).

** Forecast positions north of 35 N were not verified.

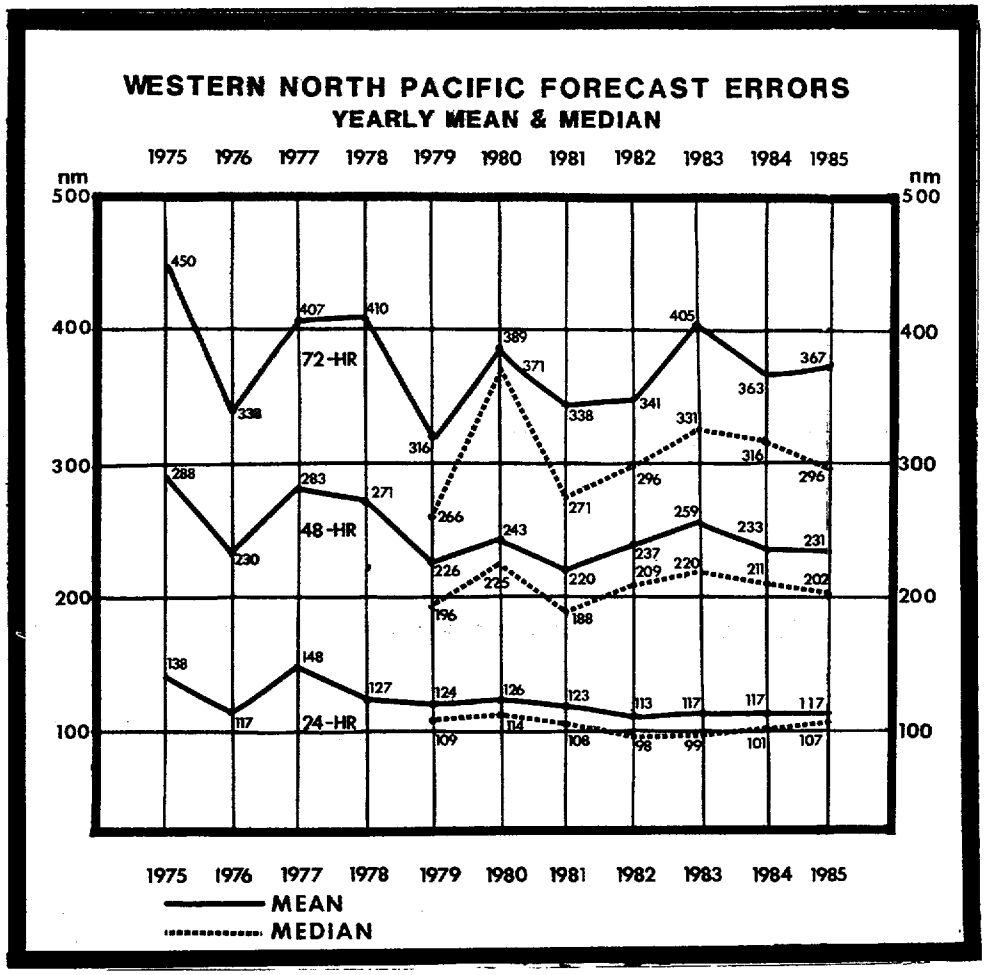


Figure 5-3. Annual mean and median vector errors (nm) for all tropical cyclones in the western North Pacific.

b. North Indian Ocean

The positions given for warning times and those at the 24-, 48-, and 72-hour valid times were verified for tropical cyclones in the North Indian Ocean by the same methods used for the western North Pacific. It should be noted that due to the low number of North Indian Ocean tropical cyclones, these error statistics should not be taken as representative of any trend.

Table 5-4 is the forecast error summary for the North Indian Ocean. Table 5-5 contains the annual average of forecast errors for each year through 1974. Vector errors are plotted in Figure 5-4 (Seventy-two hour forecast errors were evaluated for the first time in 1979). There were no verifying 72-hour forecasts in 1983 and 1985.

TABLE 5-4.

FORECAST ERROR SUMMARY FOT THE NORTH INDIAN OCEAN
SIGNIFICANT TROPICAL CYCLONES FOR 1985. (ERROR IN NM)

	WARNING			24-HOUR			48-HOUR			72-HOUR		
	POSIT ERROR	RT ANGLE ERROR	NR OF WRNGS	POSIT ERROR	RT ANGLE ERROR	NR OF WRNGS	POSIT ERROR	RT ANGLE ERROR	NR OF WRNGS	POSIT ERROR	RT ANGLE ERROR	NR OF WRNGS
1. TC 01B	33	14	8	134	29	4						
2. TC 02A	24	14	12	61	38	9	115	--	4			
3. TC 03B	26	20	7	141	42	3						
4. TC 04B	18	8	4									
5. TC 05B	47	16	12	188	71	8	369	109	4			
6. TC 06B	21	16	11	113	57	6						
ALL FORECAST:	24	14	12	61	38	9	115	--	4			

TABLE 5-5

ANNUAL MEAN FORECAST ERRORS FOR THE NORTH INDIAN OCEAN

YEAR	24-HOUR VECTOR	24-HOUR RIGHT ANGLE	48-HOUR VECTOR	48-HOUR RIGHT ANGLE	72-HOUR VECTOR	72-HOUR RIGHT ANGLE
1971*	232	-	410	-	-	-
1972*	224	101	292	112	-	-
1973*	182	99	299	160	-	-
1974*	137	81	238	146	-	-
1975	145	99	228	144	-	-
1976	138	108	204	159	-	-
1977	122	94	292	214	-	-
1978	133	86	202	128	-	-
1979	151	99	270	202	437	371
1980	115	73	93	87	167	126
1981**	109	65	176	103	197	73
1982**	138	66	368	175	762	404
1983**	117	46	153	67	-	-
1984**	154	71	274	127	388	159
1985**	123	51	242	109	-	-

* The western Bay of Bengal and the Arabian Sea were not included in the JTWC area of responsibility until the 1975 tropical cyclone season.

** The technique for calculating right angle error was revised in 1981; therefore, a direct correlation in right angle statistics cannot be made for the errors computed before 1981 and the errors computed since 1981.

c. South Pacific and Indian Oceans

The positions given for warning times and those at the 24- and 48-hour valid times were verified for tropical cyclones in the South Pacific and South Indian Oceans by the same methods used for the western North Pacific.

Table 5-6 is the forecast error summary for the South Pacific and Indian Oceans and Table 5-7 contains the annual average of forecast errors for each year since 1981. Vector errors are plotted in Figures 5-5 (Seventy-two hours forecasts are not issued in the southern hemisphere).

TABLE 5-6

FORECAST ERROR SUMMARY FOR THE SOUTH PACIFIC AND SOUTH INDIAN OCEAN SIGNIFICANT TROPICAL CYCLONES FOR 1985. (ERRORS IN NM)

	WARNING			24-HOUR			48-HOUR		
	POSIT ERROR	RT ANGLE ERROR	NR OF WRNGS	POSIT ERROR	RT ANGLE ERROR	NR OF WRNGS	POSIT ERROR	RT ANGLE ERROR	NR OF WRNGS
TC 01S ----	53	18	8	105	38	6	180	78	5
TC 02S BOBALAHY	29	22	10	105	76	9	181	121	7
TC 03S EMMA	32	19	6	148	46	4	428	67	2
TC 04P ----	35	19	4	209	152	2	-	-	-
TC 05S FRANK	22	19	10	94	66	8	241	180	6
TC 06P ----	54	29	1	107	77	1	214	116	1
	45	26	5	135	90	3	235	206	1
TC 07P MONICA	43	22	5	176	48	5	259	57	1
TC 08P ----	21	21	1	91	55	1	-	-	-
	23	23	4	195	167	2	-	-	-
TC 09P DRENA	54	37	6	99	62	5	106	57	3
TC 10S CELESTINA	42	27	20	142	85	18	228	110	13
TC 11P ERIC	31	22	11	239	58	9	510	145	7
	67	67	1	221	216	1	400	396	1
TC 12S ----	50	47	4	138	33	3	165	22	1
TC 13P NIGEL	21	17	11	105	43	9	193	58	7
TC 14P ODDETTE	28	14	10	98	42	8	120	55	6
TC 15S DITRA	28	16	9	122	59	8	145	90	6
TC 16P FREDA	42	23	6	187	71	4	359	305	2
TC 17S GERTIE	18	19	4	152	104	2	-	-	-
TC 18P ----	50	32	9	146	124	7	219	142	4
TC 19S ESITERA	64	37	10	152	67	8	201	91	5
TC 20S HUBERT	24	17	11	142	89	10	375	229	9
TC 21S FELIKSA	37	5	1	135	105	1	-	-	-
	33	19	10	145	65	8	220	129	5
TC 22S ISOBEL	54	26	15	179	94	13	242	130	11
TC 23S GERIMENA	46	31	23	94	53	22	119	58	20
TC 24S ----	110	76	4	407	239	3	1124	613	1
TC 25S JACOB	20	14	15	80	66	13	152	113	11
TC 26P PIERRE	31	16	6	157	86	5	173	110	3
TC 27P GAVIN	62	56	8	203	131	6	182	159	2
TC 28S KIRSTY	27	16	16	101	68	14	232	161	12
TC 29S LINDSAY	39	23	5	218	99	3	565	235	1
TC 30P BINA	29	18	13	160	94	11	410	184	9
TC 31P SANDY	20	9	12	109	68	10	194	132	9
TC 32P TANYA	30	16	10	60	34	9	82	58	9
TC 33S HELISAONINA	32	21	11	192	110	10	403	243	9
TC 34S GRETEL	30	18	6	102	94	4	231	-	2
TC 35S MARGOT	28	21	11	178	119	10	404	237	8
ALL FORECASTS:	36	23	332	138	78	273	242	133	199

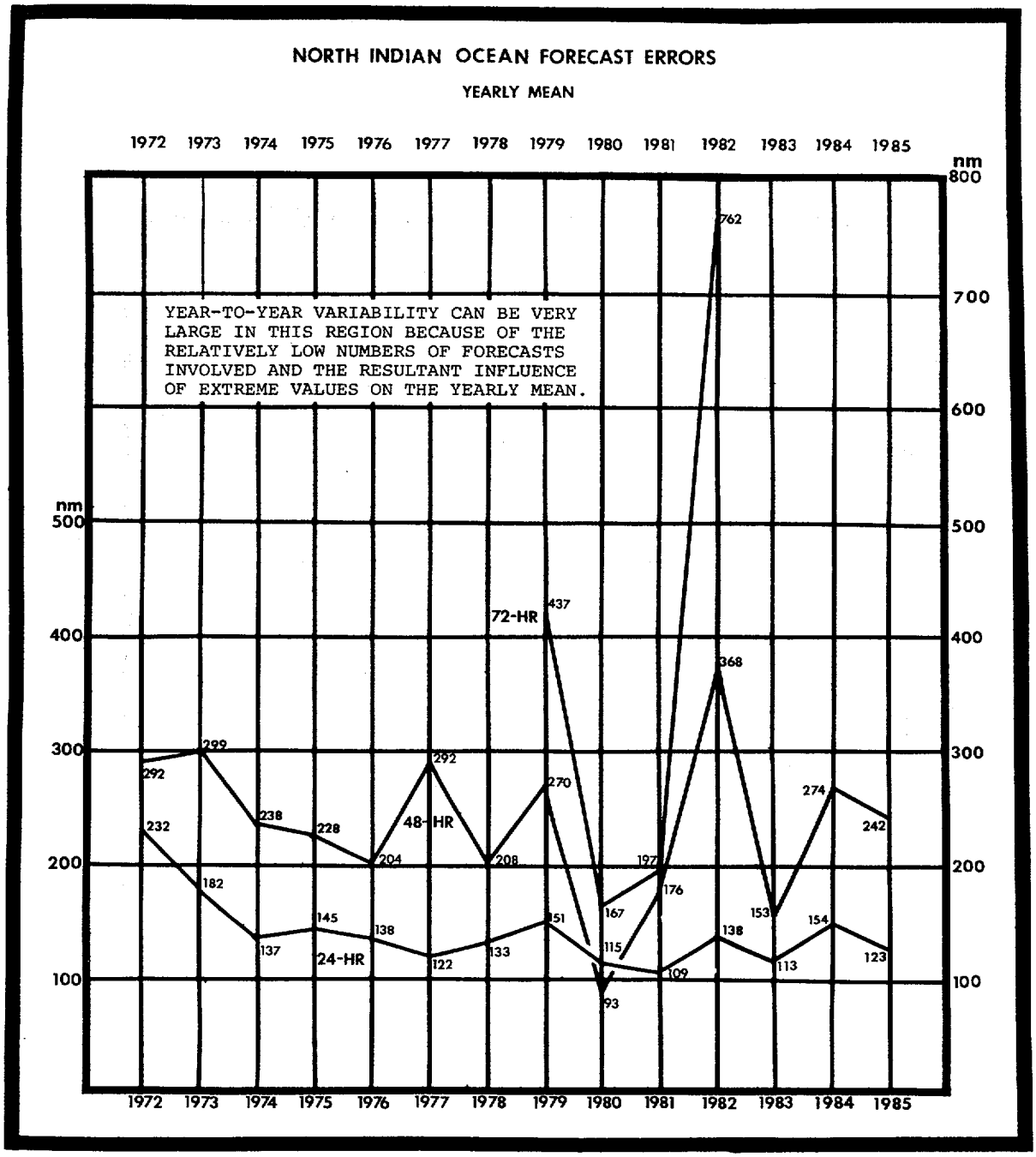


Figure 5-4. Annual mean vector errors (nm) for all tropical cyclones in the North Indian Ocean.

2. COMPARISON OF OBJECTIVE TECHNIQUES

a. General

Objective techniques used by JTWC are divided into five main categories:

(1) extrapolation;

(2) climatological and analog techniques;

(3) model output statistics;

(4) dynamic models; and

(5) empirical and analytical techniques;

In September 1981, JTWC began to initialize its array of objective forecast techniques (described below) on the six-hour-old preliminary best track position (an interpolative process) rather than the forecast (partially extrapolated) warning position, e.g. the 0600Z warning is now supported by objective techniques developed from the 0000Z preliminary best track position. This operational change has yielded several advantages:

*techniques can now be requested much earlier in the warning development time line, i.e. as soon as the track can be approximated by one or more fix positions after the valid time of the previous warning;

*receipt of these techniques is virtually assured prior to the development of the next warning; and

*improved (mean) forecast accuracy. This latter aspect arises because JTWC now has a more reliable approximation of the short-term tropical cyclone movement. Further, since most of the objective techniques are biased for persistence, this new procedure optimizes their performance and provides more consistent guidance on short-term movement, indirectly yielding a more accurate initial position estimate as well as lowering 24-hour forecast errors.

b. Description of Objective Techniques

(1) XTRP — Forecast positions for 24- and 48-hours are derived from the extension of a straight line which connects the most recent and 12-hour old preliminary best track positions.

(2) CLIM — A climatological aid providing 24-, 48-, and 72-hour tropical cyclone forecast positions (and intensity changes in the western North Pacific) based upon the position of the tropical cyclone. The output is based upon data records from 1945 to 1981 for the western North Pacific Ocean and 1900 to 1981 for the North Indian Ocean.

(3) TPAC — Forecast positions are generated from a blend of climatology and persistence. The 24- and 48-hour positions are equally weighted between climatology and persistence and the 72-hour position is one quarter persistence and three quarters climatology. Persistence is a straight line extension of a line connecting the current and 12-hour old positions. Climatology is based on data from 1945 to 1981 for the western North Pacfic Ocean and 1900 to 1981 for the North Indian Ocean.

(4) TYAN 78 — An updated analog program which combines the earlier versions TYFN 75 and INJAN 74. The program scans a 30-year climatology with a similar history (within a specified acceptance envelope) to the current tropical cyclone. For the western North Pacific Ocean, three forecasts of position and intensity are provided for 24-, 48-, and 72-hours: RECR - a weighted mean of all tropical cyclones which were categorized as "recurving" during their best track period; STRA - a weighted mean of all accepted tropical cyclones which were categorized as moving "straight" (westward) during their best track period; TOTL - a weighted mean of all accepted tropical cyclones, including those used in the RECR and STRA forecasts. For the North Indian Ocean, a single (total) forecast track is provided for the 12-hour intervals to 72 hours.

(5) COSMOS — A model output statistics (MOS) routine based on the geostrophic steering at the 850-, 700-, and 500-mb levels. The steering is derived from the HATTRACK point advection model run on Global prognostic fields from the FLENUMOCEANCEN NOGAPS prediction system. The MOS forecast is then blended with the 6-hour past movement to generate the forecast track.

(6) OTCM — (One-way Interactive Tropical Cyclone Model) A course-mesh, three-layer in the vertical, primative equation model with a 205 km grid spacing over a 6400 X 4700 km domain. The model's fields are computed around a bogused, digitized cyclone vortex using FLENUMOCEANCEN Numerical Variational Analysis (NVA) or NOGAPS prognostic fields for the specified valid time. The past motion of the tropical cyclone is compared to initial steering fields and a bias correction is computed and applied to the model. FLENUMOCEANCEN NOGAPS global prognostic fields are used at 12-hour intervals to update the model's boundaries. The resultant forecast positions are derived by locating the 850 mb vortex at six-hour intervals to 72-hours.

(7) NTCM — (Nested Tropical Cyclone Model) A primative equation model with properties similar to the OTCM. The NTCM differs by containing a finer scale "nested" grid, initializing on NVA analysis fields only, not containing a (persistence) bias correction, and being a channel model which runs independent of FLENUMOCEANCEN prognostic fields (not requiring updating of its boundaries). The "nested grid" covers a 1200 X 1200 km area with a 41 km grid spacing which moves within the course mesh domain to keep an 850 mb vortex at its center.

(8) TAPT — An empirical technique which utilizes upper-tropospheric wind fields to estimate acceleration associated with the tropical cyclones interaction with the mid-latitude westerlies. It includes guidelines for duration of acceleration, upper-limits, and probable path of the cyclone.

(9) CLIP — A statistical regression technique based on climatology, current intensity and position and past movement. This technique is used as a crude measure of real forecast skill when verifying forecast accuracy.

TABLE 5-7.

ANNUAL MEAN FORECAST ERRORS (NM) FOR SOUTH PACIFIC AND SOUTH INDIAN OCEANS

YEAR	24-HOUR VECTOR	24-HOUR RIGHT ANGLE	48-HOUR VECTOR	48-HOUR RIGHT ANGLE
1981	165	119	315	216
1982	144	91	274	174
1983	154	84	288	150
1984	133	73	231	124
1985	138	78	242	133

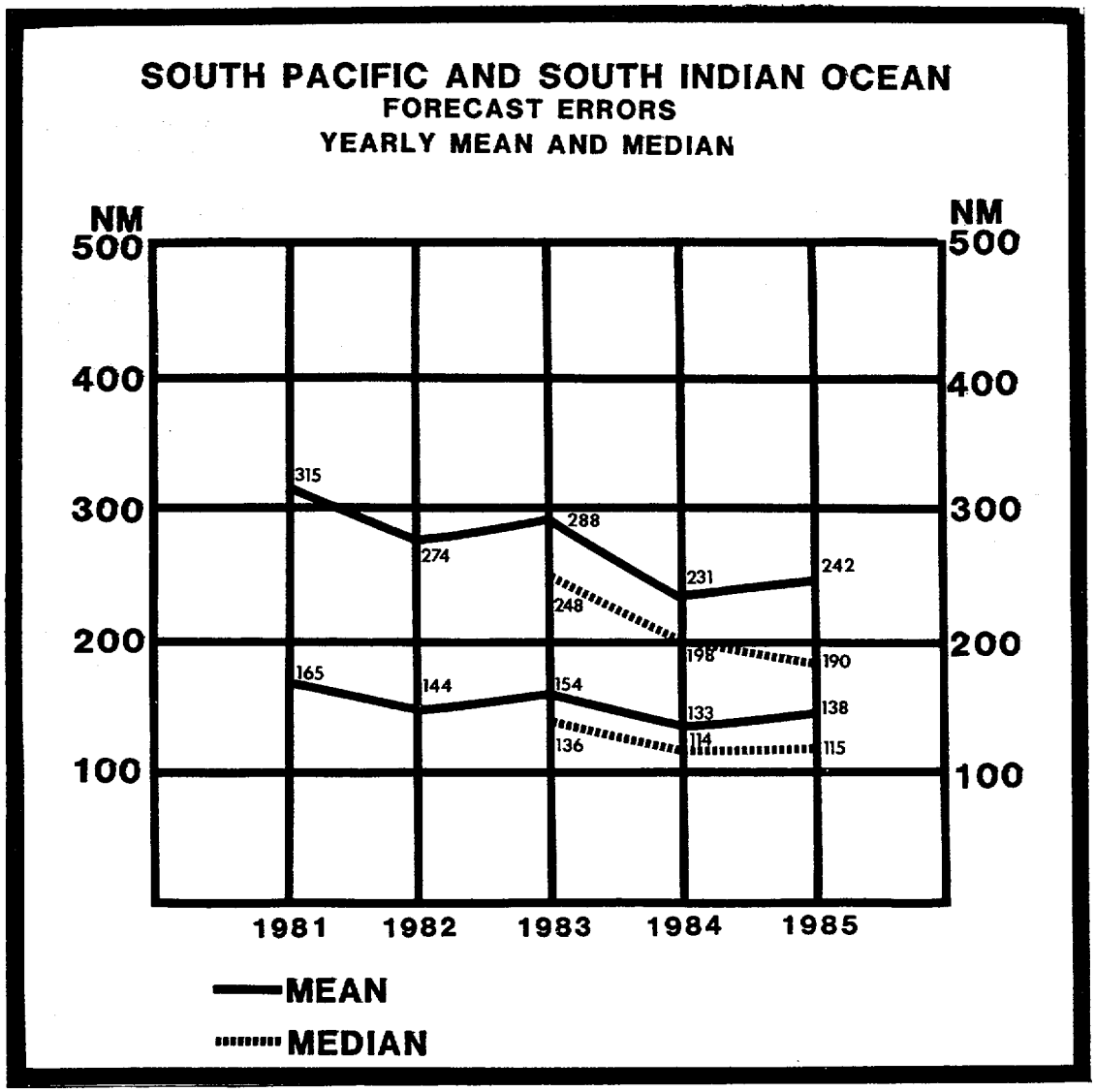


Figure 5-5. Annual mean and median vector errors (nm) for all tropical cyclones in the South Pacific and South Indian Oceans.

(10) THETA E — An empirically derived relationship between a tropical cyclone's minimum sea-level pressure (MSLP) and 700 mb equivalent potential temperature (Theta-E) was developed by Sikora (1976) and Dunnavan (1981). By monitoring MSLP and trends, the forecaster can evaluate the potential for sudden, rapid deepening of a tropical cyclone.

(11) WIND RADIUS — Following an analytic model of the radial profiles of sea-level pressures and winds in mature tropical cyclones (Holland, 1980), a set of radii for 30-, 50-, and 100-knot winds based on the tropical cyclone's maximum winds have been produced to aid the forecaster in determining forecast wind radii.

(12) DVORAK — An estimation of tropical cyclone's current and 24-hour forecast intensity is made from interpolation of satellite imagery (Dvorak, 1984) and provided to the forecaster. These intensity estimates are used in conjunction with other intensity-related data and trends to forecast tropical cyclone intensity.

JTWC currently uses TPAC, TAPT, TYAN78, COSMOS, OTCM and NTCM operationally to develop track forecasts.

c. Testing and Results

A comparison of selected techniques is included in Table 5-8 for all western North Pacific tropical cyclones, Table 5-9 for all North Indian Ocean tropical cyclones, and Table 5-10 for the South Pacific and South Indian Ocean tropical cyclones. In these tables, "X-axis" refers to techniques listed vertially. The example in the 449 cases available for a (homogeneous) comparison, the average vector error at 24 hours was 123 nm (228 km) for COSMOS and 117 nm (217 km) for OTCM. The difference of 5 nm (9 km) is shown in the lower right. (Differences are not always exact, due to computational round-off which occurs for each of the cases available for comparison).

TABLE 5-9. 1985 ERROR STATISTICS FOR SELECTED OBJECTIVE TECHNIQUES IN THE NORTH INDIAN OCEAN

24-HOUR FORECAST ERRORS (NM)

	JTWC		TOTL		CLIP		RECR		COSM		NTCM		OTCM		TPAC		CLIM		XTRP		HPAC	
JTWC	30	123																				
	123	0																				
TOTL	28	126	29	105																		
	107	-17	105	0																		
CLIP	0	0	0	0	0	0																
	0	0	0	0	0	0																
RECR	0	0	0	0	0	0	0	0														
	0	0	0	0	0	0	0	0														
COSM	0	0	0	0	0	0	0	0	0	0												
	0	0	0	0	0	0	0	0	0	0												
NTCM	20	120	21	104	0	0	0	0	0	0	21	105										
	103	-16	105	1	0	0	0	0	0	0	105	0										
OTCM	29	123	29	105	0	0	0	0	0	0	21	105	30	94								
	94	-28	92	-12	0	0	0	0	0	0	94	-10	94	0								
TPAC	29	123	29	105	0	0	0	0	0	0	21	105	30	94	30	101						
	102	-20	103	-1	0	0	0	0	0	0	103	-1	101	7	101	0						
CLIM	29	123	29	105	0	0	0	0	0	0	21	105	30	94	30	101	30	132				
	132	9	133	27	0	0	0	0	0	0	128	24	132	38	132	31	132	0				
XTRP	29	123	29	105	0	0	0	0	0	0	21	105	30	94	30	101	30	132	30	133		
	137	13	136	31	0	0	0	0	0	0	138	34	133	40	133	32	133	1	133	0		
HPAC	29	123	29	105	0	0	0	0	0	0	21	105	30	94	30	101	30	132	30	133	30	99
	100	-22	101	-3	0	0	0	0	0	0	100	-3	99	5	99	-1	99	-32	99	-33	99	0

NUMBER OF CASES	X-AXIS TECHNIQUE ERROR
Y-AXIS TECHNIQUE ERROR	ERROR DIFFERENCE Y - X

48-HOUR FORECAST ERRORS (NM)

	JTWC		TOTL		CLIP		RECR		COSM		NTCM		OTCM		TPAC		CLIM		XTRP		HPAC	
JTWC	8	242																				
	242	0																				
TOTL	8	242	12	181																		
	231	-10	181	0																		
CLIP	0	0	0	0	0	0																
	0	0	0	0	0	0																
RECR	0	0	0	0	0	0	0	0														
	0	0	0	0	0	0	0	0														
COSM	0	0	0	0	0	0	0	0	0	0												
	0	0	0	0	0	0	0	0	0	0												
NTCM	6	203	7	174	0	0	0	0	0	0	7	216										
	207	4	216	42	0	0	0	0	0	0	216	0										
OTCM	6	270	8	219	0	0	0	0	0	0	6	240	8	195								
	195	-74	195	-24	0	0	0	0	0	0	212	-27	195	0								
TPAC	8	242	12	181	0	0	0	0	0	0	7	216	8	195	12	189						
	258	16	189	8	0	0	0	0	0	0	208	-7	222	28	189	0						
CLIM	8	242	12	181	0	0	0	0	0	0	7	216	8	195	12	189	12	309				
	330	88	309	128	0	0	0	0	0	0	316	100	306	112	309	120	309	0				
XTRP	8	242	12	181	0	0	0	0	0	0	7	216	8	195	12	189	12	309	12	227		
	243	1	227	46	0	0	0	0	0	0	195	-20	280	85	227	38	227	-81	227	0		
HPAC	8	242	12	181	0	0	0	0	0	0	7	216	8	195	12	189	12	309	12	227	12	189
	257	15	189	8	0	0	0	0	0	0	208	-7	221	27	189	0	189	-119	189	-37	189	0

JTWC - OFFICIAL JTWC FORECAST
TOTL - ANALOG (TYAN 78)
NTCM - NESTED TROPICAL CYCLONE MODEL
OTCM - ONE-WAY TROPICAL CYCLONE MODEL
TPAC - CLIM AND PERSISTENCE BLEND
CLIM - CLIMATOLOGY
XTRP - 12-HOUR EXTRAPOLATION
HPAC - MEAN OF XTRP AND CLIM

72-HOUR FORECAST ERRORS (NM)

	JTWC		TOTL		CLIP		RECR		COSM		NTCM		OTCM		TPAC		CLIM	
JTWC	0	0																
	0	0																
TOTL	0	0	1	350														
	0	0	350	0														
CLIP	0	0	0	0	0	0												
	0	0	0	0	0	0												
RECR	0	0	0	0	0	0	0	0										
	0	0	0	0	0	0	0	0										
COSM	0	0	0	0	0	0	0	0	0	0								
	0	0	0	0	0	0	0	0	0	0								
NTCM	0	0	0	0	0	0	0	0	0	0	0	0						
	0	0	0	0	0	0	0	0	0	0	0	0						
OTCM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
TPAC	0	0	1	350	0	0	0	0	0	0	0	0	0	0	0	0	1	489
	0	0	489	138	0	0	0	0	0	0	0	0	0	0	0	0	489	0
CLIM	0	0	1	350	0	0	0	0	0	0	0	0	0	0	0	0	1	489
	0	0	639	288	0	0	0	0	0	0	0	0	0	0	0	0	639	150

																					1	639
																					639	0

TABLE 5-8. 1985 ERROR STATISTICS FOR SELECTED OBJECTIVE TECHNIQUES IN THE WESTERN NORTH PACIFIC OCEAN

24-HOUR FORECAST ERRORS (NM)

	JTWC		TOTL		CLIP		RECR		COSM		NTCM		OTCM		TPAC		CLIM		XTRP		HPAC	
JTWC	477	117																				
	117	0																				
TOTL	455	117	463	120																		
	120	3	120	0																		
CLIP	333	116	329	121	338	122																
	122	6	121	0	122	0																
RECR	429	117	434	119	308	122	436	132														
	132	14	132	13	132	9	132	0														
COSM	449	118	442	120	323	121	421	132	457	124												
	123	6	124	4	125	4	124	-7	124	0												
NTCM	368	116	359	121	337	121	338	133	359	123	373	123										
	122	6	123	2	124	3	124	-8	123	1	123	0										
OTCM	460	116	450	118	327	120	426	130	449	123	363	121	467	116								
	115	0	116	-1	117	-2	117	-12	117	-5	115	-5	116	0								
TPAC	465	117	456	119	330	121	430	131	448	123	365	123	457	116	472	122						
	122	5	121	2	121	0	122	-8	122	-1	123	0	121	5	122	0						
CLIM	468	117	458	119	331	121	431	131	450	123	366	123	459	116	472	122	475	159				
	160	43	160	40	161	39	160	29	159	36	163	40	159	43	160	38	159	0				
XTRP	465	117	456	119	330	121	429	131	447	123	363	123	456	115	470	121	472	159	472	128		
	128	12	128	9	128	7	128	-1	129	6	127	4	127	12	129	8	128	-30	128	0		
HPAC	465	117	456	119	330	121	429	131	447	123	363	123	456	115	470	121	472	159	472	128	472	120
	120	3	120	1	121	0	121	-9	120	-2	121	-1	119	3	120	0	120	-38	120	-7	120	0

NUMBER OF CASES	X-AXIS TECHNIQUE ERROR
Y-AXIS TECHNIQUE ERROR	ERROR DIFFERENCE Y - X

48-HOUR FORECAST ERRORS (NM)

	JTWC		TOTL		CLIP		RECR		COSM		NTCM		OTCM		TPAC		CLIM		XTRP		HPAC	
JTWC	356	231																				
	231	0																				
TOTL	342	231	365	249																		
	249	18	249	0																		
CLIP	250	232	263	251	268	253																
	255	23	253	2	253	0																
RECR	319	231	339	247	243	255	339	268														
	265	34	268	20	271	16	268	0														
COSM	333	236	346	252	254	254	327	267	355	238												
	236	0	240	-11	247	-6	240	-25	238	0												
NTCM	276	234	286	252	267	253	266	275	281	239	294	231										
	231	-2	231	-20	231	-20	235	-39	233	-5	231	0										
OTCM	338	232	348	248	253	248	326	265	345	235	280	227	360	234								
	234	2	234	-12	228	-19	239	-25	236	1	227	0	234	0								
TPAC	348	231	359	248	262	252	334	267	348	237	288	231	352	234	370	235						
	235	4	236	-11	235	-16	238	-28	236	0	237	6	233	0	235	0						
CLIM	349	231	361	248	263	252	335	268	350	237	289	231	354	234	370	235	372	299				
	296	65	301	52	301	48	304	37	298	61	308	76	299	65	299	64	299	0				
XTRP	347	231	359	248	262	252	333	267	348	237	287	231	352	234	369	234	370	298	370	268		
	271	40	268	21	266	14	268	1	273	35	267	35	265	32	269	34	268	-29	268	0		
HPAC	347	231	359	248	262	252	333	267	348	237	287	231	352	234	369	234	370	298	370	268	370	233
	234	3	235	-12	235	-16	236	-29	234	-2	236	4	231	-2	233	0	233	-64	233	-34	233	0

JTWC - OFFICIAL JTWC FORECAST
TOTL - TOTAL (TYAN 78)
CLIP - CLIPPER
RECR - RECURVER (TYAN 78)
COSM - COSMOS (MOS)
NTCM - NESTED TROPICAL CYCLONE MODEL
OTCM - ONE-WAY TROPICAL CYCLONE MODEL
TPAC - CLIM AND PERSISTENCE BLEND
CLIM - CLIMATOLOGY
XTRP - 12-HOUR EXTRAPOLATION
HPAC - MEAN OF XTRP AND CLIM

72-HOUR FORECAST ERRORS (NM)

	JTWC		TOTL		CLIP		RECR		COSM		NTCM		OTCM		TPAC		CLIM	
JTWC	241	367																
	367	0																
TOTL	228	363	266	374														
	373	11	374	0														
CLIP	168	357	190	370	195	368												
	357	0	367	-2	368	0												
RECR	217	371	249	375	181	373	250	414										
	408	37	413	38	417	44	414	0										
COSM	226	373	253	377	186	370	242	412	263	380								
	367	-5	386	8	406	36	395	-16	380	0								
NTCM	186	367	208	374	194	370	196	412	207	387	216	352						
	345	-21	353	-21	348	-20	357	-55	353	-33	352	0						
OTCM	188	358	212	364	147	349	198	407	213	370	168	329	222	399				
	397	40	398	34	389	40	400	-6	403	33	393	64	399	0				
TPAC	232	369	258	376	188	371	245	413	256	382	208	351	214	400	268	373		
	374	5	378	1	369	-1	372	-41	375	-7	379	28	380	-20	373	0		
CLIM	234	367	261	375	190	369	246	413	258	381	210	352	216	399	268	373	271	422
	421	54	426	51	415	46	418	5	421	40	427	75	434	35	423	51	422	0

TABLE 5-10. 1985 ERROR STATISTICS FOR SELECTED OBJECTIVE TECHNIQUES IN THE SOUTH INDIAN AND SOUTH PACIFIC OCEANS

24-HOUR FORECAST ERRORS (NM)

	JTWC		TOTL		CLIP		RECR		COSM		NTCM		OTCM		TPAC		CLIM		XTRP		HPAC	
JTWC	273	138																				
	138	0																				
TOTL	196	128	198	112																		
	112	-15	112	0																		
CLIP	0	0	0	0	0	0																
	0	0	0	0	0	0																
RECR	0	0	0	0	0	0	0	0														
	0	0	0	0	0	0	0	0														
COSM	0	0	0	0	0	0	0	0	0	0												
	0	0	0	0	0	0	0	0	0	0												
NTCM	213	140	167	114	0	0	0	0	0	0	215	144										
	144	4	133	20	0	0	0	0	0	0	144	0										
OTCM	213	135	175	110	0	0	0	0	0	0	184	137	214	138								
	139	4	135	25	0	0	0	0	0	0	140	2	138	0								
TPAC	235	135	197	112	0	0	0	0	0	0	199	140	212	137	237	132						
	132	-1	125	13	0	0	0	0	0	0	133	-6	131	-5	132	0						
CLIM	236	134	198	112	0	0	0	0	0	0	200	140	213	138	237	132	238	183				
	184	50	172	60	0	0	0	0	0	0	186	45	184	46	183	51	183	0				
XTRP	236	134	197	112	0	0	0	0	0	0	200	140	214	138	236	132	237	184	238	116		
	116	-17	111	0	0	0	0	0	0	0	115	-24	113	-24	116	-15	116	-67	116	0		
HPAC	235	134	197	112	0	0	0	0	0	0	199	140	213	138	236	132	237	184	237	116	237	131
	131	-2	124	12	0	0	0	0	0	0	133	-6	130	-7	131	0	131	-52	131	15	131	0

NUMBER OF CASES	X-AXIS TECHNIQUE ERROR
Y-AXIS TECHNIQUE ERROR	ERROR DIFFERENCE Y - X

48-HOUR FORECAST ERRORS (NM)

	JTWC		TOTL		CLIP		RECR		COSM		NTCM		OTCM		TPAC		CLIM		XTRP		HPAC	
JTWC	199	242																				
	242	0																				
TOTL	148	225	160	242																		
	232	7	242	0																		
CLIP	0	0	0	0	0	0																
	0	0	0	0	0	0																
RECR	0	0	0	0	0	0	0	0														
	0	0	0	0	0	0	0	0														
COSM	0	0	0	0	0	0	0	0	0	0												
	0	0	0	0	0	0	0	0	0	0												
NTCM	163	252	136	249	0	0	0	0	0	0	174	274										
	269	18	256	7	0	0	0	0	0	0	274	0										
OTCM	158	243	137	243	0	0	0	0	0	0	147	266	169	295								
	292	50	288	45	0	0	0	0	0	0	297	31	295	0								
TPAC	177	244	159	243	0	0	0	0	0	0	159	270	163	292	189	268						
	267	23	258	15	0	0	0	0	0	0	271	1	268	-24	268	0						
CLIM	178	244	160	242	0	0	0	0	0	0	160	268	164	292	189	268	190	351				
	351	108	347	104	0	0	0	0	0	0	353	85	351	60	352	84	351	0				
XTRP	181	244	159	243	0	0	0	0	0	0	165	269	169	295	188	269	189	352	195	259		
	251	7	234	-8	0	0	0	0	0	0	258	-10	251	-43	258	-10	257	-94	259	0		
HPAC	177	243	159	243	0	0	0	0	0	0	159	269	164	292	188	269	189	352	189	257	189	267
	266	23	257	14	0	0	0	0	0	0	270	1	265	-25	268	0	267	-84	267	10	267	0

JTWC - OFFICIAL JTWC FORECAST
TOTL - ANALOG (TYAN 78)
CLIP - CLIPPER
RECR - RECURVER (TYAN 78)
COSM - COSMOS (MOS)
NTCM - NESTED TROPICAL CYCLONE MODEL
OTCM - ONE-WAY TROPICAL CYCLONE MODEL
TPAC - CLIM AND PERSISTENCE BLEND
CLIM - CLIMATOLOGY
XTRP - 12-HOUR EXTRAPOLATION
HPAC - MEAN OF XTRP AND CLIM

72-HOUR FORECAST ERRORS (NM)

	JTWC		TOTL		CLIP		RECR		COSM		NTCM		OTCM		TPAC		CLIM	
JTWC	0	0																
	0	0																
TOTL	0	0	122	351														
	0	0	351	0														
CLIP	0	0	0	0	0	0												
	0	0	0	0	0	0												
RECR	0	0	0	0	0	0	0	0										
	0	0	0	0	0	0	0	0										
COSM	0	0	0	0	0	0	0	0	0	0								
	0	0	0	0	0	0	0	0	0	0								
NTCM	0	0	104	357	0	0	0	0	0	0	128	415						
	0	0	394	37	0	0	0	0	0	0	415	0						
OTCM	0	0	101	340	0	0	0	0	0	0	107	405	124	472				
	0	0	456	116	0	0	0	0	0	0	456	51	472	0				
TPAC	0	0	122	351	0	0	0	0	0	0	124	410	121	462	146	433		
	0	0	424	73	0	0	0	0	0	0	432	21	427	-33	433	0		
CLIM	0	0	122	351	0	0	0	0	0	0	124	410	121	462	146	433	146	506
	0	0	503	152	0	0	0	0	0	0	505	95	497	35	506	73	506	0

CHAPTER VI - APPLIED TROPICAL CYCLONE RESEARCH SUMMARY

The following articles delineate the extent of the research program at the Naval Environmental Prediction Research Facility (NAVENVPREDRSCHFAC) dedicated to supporting the operations at Joint Typhoon Warning Center (JTWC). There are three major research departments at NAVENVPREDRSCHFAC, each contributing to the overall program; research on current and future tropical cyclone models is performed in the Numerical Modeling Department, the Tactical Applications Department conducts statistical application studies, and the Satellite Processing and Display Department develops computer interactive techniques.

TROPICAL CYCLONE AIDS (TCAIDS) FOR SATELLITE-DATA PROCESSING AND DISPLAY SYSTEM (SPADS)

(Tsui, T. and A. Truschke, NAVENVPREDRSCHFAC)

TCAIDS is a system residing on SPADS composed of all existing tropical cyclone utility routines. Most of these routines use digital satellite data together with the environmental information to assist forecasters in making a low cost and timely tropical cyclone forecast. TCAIDS includes two tropical cyclone movement aids, one intensity forecasting aid, one satellite image rotation utility, and a 16-image looping display utility. The movement forecast aids are the satellite IR pattern regression routine -- ADAPT forecaster and the National Hurricane Center's Climatology-Persistence (CLIPER) routine. The intensity forecast aid uses the tropical cyclone spiral characteristics to predict the growth of the storm. This intensity forecasting program also provides various image enhancement routines.

NORTH PACIFIC TROPICAL CYCLONE CLIMATOLOGY

(Tsui, T. and R. Miller, NAVENVPREDRSCHFAC)

A tropical cyclone climatology for the North Pacific has been developed. Data used for the western basin were taken from the JTWC Tropical Cyclone Data Base and covered a period of 40 years, 1945-1984. Eastern basin data spanned the 34 year period 1949-1982 and were obtained from the Consolidated World-Wide Tropical Cyclone Data Base, National Climatic Data Center, Ashville, North Carolina. Storms for both basins were sorted according to month/day of the year into twenty-four 31-day overlapping periods. For each period, four charts are supplied: 1) actual storm paths; 2) mean storm paths; 3) average storm speed; and 4) storm constancy and frequency.

ADAPTION OF CSUM

(Tsui, T. and A. Truschke, NAVENVPREDRSCHFAC)

CSUM is a statistical tropical cyclone prediction model developed by Matsumoto and Gray (Colorado State University), and has been implemented into the JTWC combined ARQ procedure. CSUM incorporates climatology, persistence, and the Navy Operational Global Atmospheric Prediction System (NOGAPS) 500 mb height fields to forecast up to 72-hour tropical cyclone movement. In the operation, tropical cyclones are stratified on their position relative to the 500 mb subtropical ridge or their motions to better define the environmental influences on the cyclones. The 72-hour forecast track is segmented into three 24-hour time frames to permit the application of updated persistence and synoptic data relative to the new cyclone position. Testing of the optional version of the model is now underway.

ENVIRONMENTAL INFLUENCES ON TROPICAL CYCLONE INTENSIFICATION

(Merrill, R. and W. Gray, Colorado State University)

A study examining the observed upper-tropospheric environmental flow difference between intensifying and non-intensifying storms has been completed. Upper-tropospheric wind observations are composited for 28 tropical cyclones according to their intensity tendencies. A rotated coordinate system based on the outflow jet location is used so that the asymetric flow structure is preserved. Little difference is observed in total outflow on the synoptic scale. However, intensifying storms have a less constricted outflow with evidence of lateral connections with the surrounding flow.

EVALUATION OF JTWC OBJECTIVE AIDS

(Tsui, T. and R. Miller, NAVENVPREDRSCHFAC)

Evaluation of all JTWC objective aids is now underway. The complete evaluation of all aids will include 1978-1984 performances. Performances since 1967 will also be investigated; the study however will be limited to those aids existing in the JTWC data file. The evaluation will expand from the forecast error (mean vector error) to cross-track/-along-track errors, track/speed errors and timing errors. In addition, the evaluation will concentrate on the combined performance of the least forecast error distance and the most consistent heading forecast. Statistical tests on the significance of the results will be carried out to clarify the meaning of the performance differences.

NAVY TACTICAL APPLICATIONS GUIDE (NTAG) VOL. 6, PART I:
TROPICAL WEATHER ANALYSIS AND FORECAST APPLICATIONS

(Fett, R., NAVENVPREDRSCHFAC)

Studies were completed for this volume, based largely on Defense Meteorological Satellite Program (DMSP) data. The volume contains a number of new research results including a method of precisely locating the positions of equatorial troughs by satellite. Studies are presently being finalized in preparation for the printing process with anticipated distribution of Vol. 6, Part I, in the autumn of 1986. Additional studies currently under investigation in Vol. 6, Part II, relate exclusively to the tropical cyclone problem and will be published at a later date.

THE ADVANCED TROPICAL CYCLONE MODEL (ATCM)

(Hodur, R., NAVENVPREDRSCHFAC)

The Advanced Tropical Cyclone Model (ATCM) is being developed using the recommendations made at the tropical cyclone workshop held in Monterey, California (January, 1985). First, the Navy Operational Regional Atmospheric Prediction System

(NORAPS) is the framework for the ATCM. Second, the ATCM will have a uniform resolution of 80 km or less with at least 10 levels. Third, the domain of the model will cover the entire WESTPAC area. Using this approach, the ATCM will only need to be run once per watch, since all tropical systems can be included in the model domain. This also allows interactions to occur between storms during multiple storm situations.

The current work on the ATCM is geared toward defining the initial conditions of the large-scale flow and the circulation of the tropical cyclone. The large-scale flow will be defined by running the ATCM with an update cycle every watch. This approach has two advantages. First, all features forecast by ATCM are retained from one forecast to the next. Second, the first guess fields will be consistent with the ATCM model equations. Two approaches are being examined for the initial tropical cyclone circulation. The first is to allow the model to develop the storm structure in a no-flow environment, and then to add this circulation into the large-scale flow. The second is to let the model spin-up the tropical cyclone(s) with the large-scale flow using conventional data. Encouraging results were obtained using the latter technique in the western Atlantic, in the fall of 1985.

TROPICAL CYCLONE PREDICTION STUDIES

(Elsberry, R. L., Chan, J. C.-L., and J. E. Peak, NAVPGSCOL)

The performance of tropical cyclone forecast aids under different environmental conditions and for various cyclone characteristics has been studied. Based on a rating system for cross-track and along-track errors, the One-way Tropical Cyclone Model (OTCM) and the Nested Tropical Cyclone Model (NTCM) generally produce the most accurate forecasts at 72-hours. Empirical Orthogonal Function (EOF) analyses of the wind fields around western North Pacific tropical cyclones have been used to derive a statistical-synoptic track prediction scheme. The 72-hour errors are competitive with the JTWC official forecasts. Further improvement is obtained by stratifying the situations according to past storm motion. A similar improvement can be obtained if the wind-based EOF's are used to stratify the situation. An objective technique has been tested for estimating the warning position of the tropical cyclone from the fixes received during the previous 6-hours. Weighting factors for different observational platforms and for the time of the fix have been incorporated. The objective positions are generally superior to the JTWC operational positions during 1981 and 1982 and are nearly as good as the JTWC during 1983. The causes of the anomalous track guidance received during Super Typhoon Abby (1983) have also been examined. The intensity and enormous circulation of this super typhoon are suggested as the reasons for the failure of the objective aids during a period when Abby was moving almost normal to the steering flow.

THE NAVY TWO-WAY INTERACTIVE NESTED TROPICAL CYCLONE MODEL (NTCM)

(Fiorino, M., NAVENVRSCHPREDFAC)

A new version of the NTCM was tested in a research mode during the 1985 WESTPAC season. This version (NTCM3.0) has three features: 1) One-way influence boundary conditions on the course grid with forcing from the NOGAPS wind forecasts; 2) A vortex and heating specification procedure that insures a more realistic storm evolution; and 3) A pre-forecast modification of the steering flow that accounts for the observed current motion.

The operational version of the NTCM was changed in the early part of the season based on experience with NTCM3.0. The new operational version (NTCM2.2) differs from the 1984 version (NTCM2.1) in that the bias-corrector was activated and a serious program error was corrected, which affected the interaction between the fine and course meshes.

Although the time-dependent boundary version of NTCM3.0 was shown to be superior to its channel model equivalent and to NTCM2.1, the comparisons of NTCM2.2 and NTCM3.0 revealed little advantage to the new version of the model during the 1985 season.

ANNEX A
TROPICAL CYCLONE TRACK AND FIX DATA

1. WESTERN NORTH PACIFIC CYCLONE DATA

TROPICAL STORM ELSIE
BEST TRACK DATA

	BEST TRACK			WARNING		ERRORS			24 HOUR FORECAST		ERRORS			48 HOUR FORECAST		ERRORS			72 HOUR FORECAST		ERRORS		
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
010600Z	4.1	156.1	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
010606Z	4.5	155.6	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
010612Z	4.9	155.1	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
010618Z	5.4	154.6	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
010700Z	5.9	154.1	30	5.9	154.1	30.	0.	0.	7.4	150.8	45.	199.	15.	9.2	147.3	60.	484.	40.	0.0	0.0	0.	-0.	0.
010706Z	6.7	153.2	35	6.1	153.8	35.	51.	0.	7.5	151.3	50.	317.	25.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
010712Z	8.0	152.0	40	7.4	152.5	40.	47.	0.	9.2	149.8	55.	298.	30.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
010718Z	9.2	150.9	35	9.3	150.9	40.	6.	5.	14.7	147.5	55.	59.	35.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
010800Z	10.5	149.6	30	10.6	149.8	30.	13.	0.	15.8	146.6	40.	133.	20.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
010806Z	12.0	148.5	25	11.8	148.7	25.	17.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
010812Z	13.8	147.9	25	13.4	148.0	25.	25.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
010818Z	15.5	148.1	20	14.8	147.4	25.	58.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
010900Z	17.2	148.4	20	16.8	147.8	20.	42.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	29.	201.	484.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	12.	58.	155.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	1.	25.	40.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	1.	25.	40.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	9	5	1	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 976. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 14. KNOTS

TROPICAL STORM ELSIE
FIX POSITIONS FOR CYCLONE NO. 1

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	060000	3.8N 155.9E	PCN 6	T0.5/0.5	INIT OBS	PGTW
2	060300	4.4N 155.8E	PCN 6			PGTW
3	060600	3.9N 155.2E	PCN 6			PGTW
4	060900	4.6N 154.4E	PCN 6		ULCC FIX	PGTW
* 5	061200	5.0N 153.9E	PCN 6		ULCC FIX	PGTW
* 6	061600	5.6N 153.0E	PCN 6	T1.0/1.0	INIT OBS	PGTW
* 7	062100	6.0N 152.5E	PCN 6			PGTW
8	070000	5.8N 154.1E	PCN 6			PGTW
9	070300	6.0N 153.9E	PCN 6	T2.0/2.0 /D1.5/27HRS		PGTW
10	070600	6.3N 153.5E	PCN 6		ULCC FIX	PGTW
11	070900	6.6N 153.0E	PCN 6		ULCC FIX	PGTW
12	071200	8.5N 152.1E	PCN 6			PGTW
13	071600	9.9N 150.7E	PCN 6	T2.0/2.0 /D1.0/24HRS		PGTW
* 14	071800	10.4N 150.0E	PCN 6			PGTW
15	072041	10.8N 149.9E	PCN 6			PGTW
16	080000	10.1N 148.8E	PCN 6			PGTW
17	080047	10.2N 149.0E	PCN 5	T2.0/2.0 /S0.0/22HRS		PGTW
18	080300	11.0N 148.5E	PCN 6			PGTW
19	080600	12.1N 147.8E	PCN 6			PGTW
20	080900	12.9N 147.6E	PCN 6		ULCC FIX	PGTW
21	080921	13.0N 148.2E	PCN 6		ULCC FIX	PGTW
22	081200	13.9N 148.1E	PCN 6		ULCC FIX	PGTW
23	082020	16.2N 149.4E	PCN 6		ULCC FIX	PGTW

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN-TATION / DIAM	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	062238	5.8N 154.4E	1500FT		1002	25 330 70	050 33 330 70	10 5			+25 +25 +24 28	1
2	072128	10.3N 150.4E	1500FT		1003	30 170 94	230 29 170 94	6 10			+23 +25 +34 26	2
3	072355	10.2N 149.6E	1500FT		1003	30 050 90	120 32 060 95	10 10			+24 +24 +20 27	2

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
* 1	070600	6.0N 154.0E	035	045	91339 91334 91348

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL STORM FABIAN
BEST TRACK DATA

	BEST TRACK		WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
MO/DA/HR	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
0108062	12.4 134.0	35	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0108122	12.1 134.2	40	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0108182	11.8 134.4	45	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0109002	11.3 134.6	50	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0109062	10.5 135.2	55	10.7 135.0	50.	17.	-5.	10.7 135.0	50.	199.	5.	10.7 135.0	50.	224.	10.	10.7 135.0	50.	242.	20.
0109122	9.9 135.9	50	10.6 135.0	55.	68.	5.	10.6 135.0	55.	210.	15.	10.6 135.0	50.	242.	15.	10.6 135.0	45.	229.	20.
0109182	9.4 136.7	45	10.6 135.0	55.	124.	10.	10.6 135.0	55.	213.	15.	10.6 135.0	50.	251.	15.	10.6 135.0	45.	212.	20.
0110002	9.2 137.5	45	9.0 137.5	45.	12.	0.	9.4 138.7	40.	22.	0.	10.1 139.0	35.	54.	5.	10.1 139.0	35.	81.	15.
0110062	9.2 138.0	45	9.4 138.4	45.	27.	0.	10.6 139.6	40.	68.	0.	11.3 139.9	35.	142.	5.	0.0 0.0	0.	-0.	0.
0110122	9.3 138.3	40	9.6 138.6	45.	25.	5.	10.2 139.3	40.	35.	5.	11.0 139.6	35.	123.	10.	0.0 0.0	0.	-0.	0.
0110182	9.4 138.4	40	9.6 138.7	50.	21.	10.	10.0 139.4	45.	35.	10.	10.7 139.9	40.	131.	15.	0.0 0.0	0.	-0.	0.
0111002	9.7 138.5	40	9.5 138.5	45.	12.	5.	9.7 138.8	40.	32.	10.	10.4 139.1	40.	97.	20.	0.0 0.0	0.	-0.	0.
0111062	9.9 138.7	40	9.7 138.4	45.	21.	5.	10.5 138.1	45.	88.	15.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0111122	9.7 139.0	35	9.9 138.1	45.	55.	10.	10.4 137.4	50.	101.	85.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0111182	9.5 139.1	35	9.5 138.3	40.	47.	5.	9.5 138.3	40.	18.	15.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0112002	9.2 139.0	30	9.0 138.8	30.	17.	0.	9.6 138.0	25.	19.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0112062	9.2 138.8	30	9.1 138.9	30.	8.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0112122	9.2 138.6	25	9.1 138.9	30.	19.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0112182	9.2 138.3	25	9.1 138.9	25.	36.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0113002	9.3 137.9	20	9.2 138.8	20.	54.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	35.	87.	158.	191.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	7.	30.	51.	25.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	4.	10.	12.	19.	0.	0.	0.	0.
AVG INTENSITY BIAS	3.	10.	12.	19.	0.	0.	0.	0.
NUMBER OF FORECASTS	16	12	8	4	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 507. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 4. KNOTS

TROPICAL STORM FABIAN
FIX POSITIONS FOR CYCLONE NO. 2

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	040000	4.2N 131.2E	PCN 6	T1.0/1.0	INIT OBS	PGTW
2	040300	4.7N 130.8E	PCN 6			PGTW
3	040600	4.9N 130.1E	PCN 6			PGTW
4	040900	4.8N 129.8E	PCN 6			PGTW
* 5	041200	8.0N 131.1E	PCN 6		ULCC FIX	PGTW
* 6	041600	8.9N 129.4E	PCN 6	T2.5/2.5	INIT OBS	PGTW
* 7	041800	9.4N 128.9E	PCN 6			PGTW
* 8	042230	8.5N 127.4E	PCN 5		ULCC FIX	PGTW
9	042230	9.8N 128.2E	PCN 5	T3.0/3.0	INIT OBS ULCC FIX	RODN
* 10	050000	10.4N 127.7E	PCN 6	T2.0/2.0 /D1.0/24HRS		PGTW
* 11	050300	10.8N 128.3E	PCN 6			PGTW
* 12	050600	11.7N 128.3E	PCN 6			PGTW
13	050734	7.8N 130.0E	PCN 6		EXP LLCC ULCC 12.5N 127.2E	PGTW
14	050900	7.9N 129.9E	PCN 6		ULCC 11.9N 128.5E	PGTW
15	051025	8.0N 129.7E	PCN 6			PGTW
* 16	051109	12.1N 128.1E	PCN 6		ULCC FIX	RODN
17	051200	8.3N 129.8E	PCN 6			PGTW
* 18	051428	12.9N 129.9E	PCN 6		ULCC FIX	RODN
* 19	051600	13.9N 132.9E	PCN 6	T1.5/2.5 /W1.0/24HRS	ULCC FIX	PGTW
* 20	051800	14.4N 133.3E	PCN 6			PGTW
* 21	052206	12.8N 132.1E	PCN 5		SCNDRY CIRCLTN 15.0N 134.8E	PGTW
* 22	060000	14.8N 132.9E	PCN 6	T3.0/3.0-/D1.0/24HRS		PGTW
* 23	060128	14.9N 133.5E	PCN 5			PGTW
* 24	060300	14.6N 133.2E	PCN 6			PGTW
* 25	060600	12.8N 132.8E	PCN 6		ULCC FIX	PGTW
* 26	061003	12.9N 133.7E	PCN 5		ULCC FIX	PGTW
* 27	061200	13.6N 134.1E	PCN 6		ULCC FIX	PGTW
* 28	061408	14.4N 134.7E	PCN 6			PGTW
29	061600	11.2N 135.0E	PCN 6	T2.5/2.5 /D1.0/24HRS	ULCC 15.4N 135.6E	PGTW
30	070000	12.1N 135.3E	PCN 6	T2.5/2.5+/W0.5/24HRS		PGTW
31	070107	9.8N 133.6E	PCN 5	T2.5/2.5	INIT OBS	RODN
32	070300	11.2N 134.9E	PCN 6			PGTW
33	070600	10.4N 135.1E	PCN 6		ULCC FIX	PGTW
* 34	071020	9.8N 132.5E	PCN 6		ULCC FIX	RODN
35	071600	10.0N 136.5E	PCN 6	T1.5/2.0 /W1.0/24HRS	ULCC 12.9N 136.3E	PGTW
36	071800	10.0N 136.3E	PCN 6		ULAC 14.0N 136.3E	PGTW
37	072258	14.1N 134.7E	PCN 5	T3.0/3.0 /D0.5/22HRS		RODN
38	080047	12.4N 133.8E	PCN 5	T2.5/2.5 /S0.0/25HRS		PGTW
39	080300	12.6N 133.9E	PCN 6			PGTW
40	080600	12.3N 134.1E	PCN 6			PGTW
41	080956	11.7N 134.4E	PCN 6		ULCC FIX	PGTW
42	082234	11.7N 134.2E	PCN 6			PGTW
43	090027	11.1N 134.4E	PCN 5			PGTW
44	090300	10.6N 134.9E	PCN 4		EXP LLCC	PGTW
45	090600	10.4N 135.0E	PCN 4			PGTW
46	090643	10.3N 134.9E	PCN 3			PGTW
* 47	090900	10.9N 134.8E	PCN 3			PGTW
* 48	091200	10.4N 133.5E	PCN 6		ULCC FIX	PGTW
* 49	091307	10.7N 137.8E	PCN 5			PGTW
* 50	091600	10.6N 134.3E	PCN 6	T3.0/3.0	INIT OBS ULCC FIX	PGTW
* 51	091800	16.4N 134.4E	PCN 6		ULCC FIX	PGTW
52	100007	9.0N 137.6E	PCN 5	T3.0/3.0 /D0.5/24HRS	EXP LLCC	PGTW
53	100300	9.3N 137.8E	PCN 4		EXP LLCC	PGTW
54	100600	9.4N 138.2E	PCN 4		EXP LLCC	PGTW
55	100631	9.5N 138.3E	PCN 3		EXP LLCC	PGTW
56	100900	9.5N 138.0E	PCN 6			PGTW
57	101200	9.7N 138.6E	PCN 4			PGTW
58	101247	9.5N 138.8E	PCN 3			PGTW
59	101800	9.5N 138.7E	PCN 6	T3.5/3.5 /D0.5/26HRS		PGTW
60	102118	9.5N 139.1E	PCN 6		ULCC 09.2N 136.4E	PGTW
61	110000	9.4N 138.6E	PCN 6	T3.0/3.0 /S0.0/24HRS	ULCC 09.4N 136.0E	PGTW
62	110128	9.4N 138.5E	PCN 5			PGTW
63	110442	9.6N 138.4E	PCN 5			PGTW
64	110600	9.7N 138.6E	PCN 6			PGTW
65	110618	9.5N 138.7E	PCN 5			PGTW
66	110959	9.7N 137.9E	PCN 5			PGTW

* 67	111200	9.6N 137.0E	PCN 6				PGTW
* 68	111227	9.2N 137.4E	PCN 5				PGTW
* 69	111600	9.2N 137.3E	PCN 6	T3.0/3.5 /W0.5/22HRS			PGTW
* 70	111727	9.3N 137.6E	PCN 6		ULCC FIX		PGTW
* 71	111800	9.3N 137.7E	PCN 6		ULCC FIX		PGTW
72	112057	9.1N 138.8E	PCN 4				PGTW
73	120107	8.9N 139.3E	PCN 3	T1.5/2.0 /W1.5/25HRS	EXP LLCC		PGTW
74	120300	9.0N 139.4E	PCN 4		EXP LLCC		PGTW
75	120431	9.2N 139.2E	PCN 3		EXP LLCC		PGTW
76	120605	9.1N 138.8E	PCN 3				PGTW
77	121717	9.1N 138.9E	PCN 6		ULCC FIX		PGTW
78	121717	9.7N 138.8E	PCN 5				RODN
79	122036	9.2N 138.6E	PCN 5				PGTW
80	130047	9.2N 138.3E	PCN 3	T1.5/1.5 /S0.0/24HRS	EXP LLCC		PGTW
81	130300	9.2N 137.7E	PCN 4		EXP LLCC		PGTW
82	130420	9.3N 137.8E	PCN 3		EXP LLCC		PGTW

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN-DIAM/TATION	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	070142	11.2N 134.9E	1500FT		1000	35 300 45	010 38 240 45	3 10			+29 +27 +24	3
2	090423	10.4N 135.0E	1500FT		989	60 240 25	310 60 240 25	10 5			+24 +28 +25 27	6
3	092355	9.0N 137.4E	1500FT		992	25 320 55	050 25 320 55	8 3			+24 +25 +25 28	7
4	100247	9.3N 137.8E	1500FT		990	45 220 90	280 47 230 115	3 2			+24 +25 +25	7
5	102217	9.3N 138.6E	1500FT		992	45 220 50	270 50 220 50	10 2			+25 +25	8
6	102344	9.4N 138.5E	1500FT		992	35 110 30	340 25 220 95	10 2			+25 +25 28	8
7	112312	9.0N 138.8E	1500FT		1000	20 140 120	250 31 140 120	8 4			+26	10

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	101200	9.9N 138.7E	045	045	91413 91203
2	110000	9.9N 138.7E	045	045	91413 91203
3	110600	9.7N 138.4E	045	035	91413
4	110900	10.0N 138.0E	045	035	91413
5	111000	10.0N 138.2E	045	040	91413
6	111200	9.9N 138.8E	045	045	91413 91203
7	111500	9.6N 139.0E	040	055	91413
8	121200	9.0N 138.7E	030	050	91413

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TYPHOON GAY
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST ERRORS				48 HOUR FORECAST ERRORS				72 HOUR FORECAST ERRORS			
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
052000Z	11.5	131.9	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
052006Z	11.9	132.0	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
052012Z	12.3	132.0	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
052018Z	12.7	132.1	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
052100Z	13.1	132.1	35	13.0	131.8	35.	19.	0.	14.5	131.1	45.	63.	0.	16.2	129.9	45.	98.	-20.	17.8	128.7	40.	174.	-50.
052106Z	13.6	132.1	35	13.3	131.7	40.	29.	5.	14.9	130.8	50.	72.	0.	16.6	129.6	50.	120.	-15.	18.3	128.3	45.	199.	-55.
052112Z	14.1	132.1	35	14.2	132.0	45.	8.	10.	16.2	131.1	55.	18.	5.	18.0	129.4	50.	60.	-20.	19.6	128.2	45.	196.	-55.
052118Z	14.5	132.1	40	14.6	132.0	45.	8.	5.	16.6	130.9	55.	36.	0.	18.4	129.3	50.	75.	-30.	20.1	128.2	45.	245.	-50.
052200Z	14.9	132.1	45	14.6	132.1	45.	18.	0.	15.5	131.3	50.	152.	-15.	16.7	130.0	50.	249.	-40.	18.4	128.4	50.	433.	-40.
052206Z	15.6	131.8	50	15.2	132.1	45.	30.	-5.	16.6	131.5	45.	162.	-20.	18.5	129.9	45.	184.	-55.	20.0	128.1	45.	464.	-35.
052212Z	16.3	131.4	50	16.1	131.7	45.	21.	-5.	17.8	130.4	45.	95.	-25.	19.2	128.9	40.	202.	-60.	20.3	127.6	40.	600.	-35.
052218Z	17.2	130.8	55	17.1	130.8	45.	6.	-10.	19.1	129.0	55.	31.	-25.	20.6	126.9	50.	274.	-45.	22.5	127.0	45.	657.	-20.
052300Z	17.8	130.2	65	17.8	130.3	55.	6.	-10.	20.1	127.8	65.	67.	-25.	22.2	126.8	65.	326.	-25.	0.0	0.0	0.	-0.	0.
052306Z	18.6	129.6	65	18.7	129.8	55.	13.	-10.	21.5	126.8	65.	134.	-35.	23.9	127.5	65.	345.	-15.	0.0	0.0	0.	-0.	0.
052312Z	19.0	129.3	70	19.2	129.3	65.	12.	-5.	21.8	127.2	80.	160.	-20.	24.3	128.2	70.	422.	-5.	0.0	0.0	0.	-0.	0.
052318Z	19.6	128.9	80	19.8	128.8	70.	13.	-10.	22.5	127.2	80.	206.	-15.	25.5	129.4	65.	447.	0.	0.0	0.0	0.	-0.	0.
052400Z	20.7	128.8	90	20.6	128.6	85.	13.	-5.	23.5	128.2	85.	222.	-5.	25.9	131.2	65.	463.	5.	0.0	0.0	0.	-0.	0.
052406Z	21.5	129.2	100	21.5	129.0	100.	11.	0.	24.5	130.5	90.	181.	10.	27.7	133.8	65.	362.	10.	0.0	0.0	0.	-0.	0.
052412Z	22.4	130.0	100	22.4	130.1	100.	6.	0.	25.9	134.4	85.	189.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
052418Z	23.4	130.8	95	23.2	130.9	95.	13.	0.	26.6	135.4	75.	162.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
052500Z	24.8	132.0	90	24.7	132.0	85.	6.	-5.	31.0	138.4	55.	42.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
052506Z	26.0	133.4	80	25.8	133.0	75.	25.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
052512Z	27.6	135.1	75	27.4	134.8	70.	20.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
052518Z	29.0	136.8	65	28.9	137.1	65.	17.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
052600Z	30.3	138.4	60	30.6	138.7	60.	20.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
052606Z	30.7	139.8	55	31.6	140.1	60.	56.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	17.	112.	259.	371.	17.	112.	259.	371.
AVG RIGHT ANGLE ERROR	9.	55.	79.	65.	9.	55.	79.	65.
AVG INTENSITY MAGNITUDE ERROR	5.	13.	25.	43.	5.	13.	25.	43.
AVG INTENSITY BIAS	-2.	-9.	-23.	-43.	-2.	-9.	-23.	-43.
NUMBER OF FORECASTS	22	17	14	8	22	17	14	8

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1464. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS. 10. KNOTS

TYPHOON GAY
FIX POSITIONS FOR CYCLONE NO. 3

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	161800	8.3N 136.4E	PCN 6	T1.0/1.0	INIT OBS ULCC FIX	PGTW
	2	170000	8.6N 135.3E	PCN 6	T1.0/1.0	INIT OBS ULCC 8.7N 134.9E	PGTW
	3	181200	9.3N 131.9E	PCN 6		ULCC FIX	PGTW
	4	181600	9.1N 131.7E	PCN 6		ULCC FIX	PGTW
	5	181800	9.1N 131.8E	PCN 6	T1.0/1.0	INIT OBS ULCC FIX	PGTW
	6	182100	9.1N 132.1E	PCN 6		ULCC FIX	PGTW
	7	190000	8.8N 131.0E	PCN 6		ULCC 8.8N 1324E	PGTW
	8	190300	9.8N 131.0E	PCN 6	T2.0/2.0	INIT OBS ULCC 9.0N 133.1E	PGTW
	9	190529	8.5N 131.4E	PCN 5	T2.0/2.0	INIT OBS	RPMK
	10	190600	9.3N 132.3E	PCN 6			PGTW
	11	190900	9.2N 132.5E	PCN 6			PGTW
	12	191052	8.8N 131.4E	PCN 5			RPMK
	13	191200	9.0N 132.8E	PCN 6			PGTW
	14	191309	8.9N 131.7E	PCN 6			RODN
	15	191600	9.2N 131.2E	PCN 6	T1.0/1.0+/S0.0/22HRS	ULCC 9.1N 132.1E	PGTW
	16	191800	9.1N 132.2E	PCN 6			PGTW
	17	192111	8.9N 132.8E	PCN 6			RODN
*	18	200000	10.3N 132.3E	PCN 6		ULCC FIX	PGTW
*	19	200150	12.3N 132.8E	PCN 5			RODN
	20	200150	11.5N 132.2E	PCN 3	T2.0/2.0 /S0.0/20HRS		RPMK
*	21	200300	13.1N 132.9E	PCN 6	T2.0/2.0 /S0.0/24HRS	ULCC 10.5N 132.2E	PGTW
	22	200518	12.7N 131.7E	PCN 5			PGTW
	23	200518	12.5N 131.9E	PCN 4	T2.0/2.0 /S0.0/24HRS	EXP LLCC	RPMK
*	24	200600	13.0N 131.7E	PCN 6		ULCC 10.9N 132.6E	PGTW
*	25	200900	13.4N 131.8E	PCN 6		ULCC 10.9N 131.9E	PGTW
	26	200951	12.3N 131.6E	PCN 3		EXP LLCC	RPMK
	27	201200	12.0N 132.6E	PCN 6			PGTW
	28	201600	12.5N 132.2E	PCN 6	T2.0/2.0-/D1.0/24HRS		PGTW
*	29	201804	13.1N 133.1E	PCN 5			RODN
	30	201804	12.8N 132.5E	PCN 6			PGTW
*	31	202049	12.5N 130.3E	PCN 6			RPMK
	32	202306	13.4N 131.8E	PCN 5			PGTW
	33	202306	12.9N 131.8E	PCN 3			RPMK
	34	210000	12.8N 131.9E	PCN 6	T2.5/2.5 /D0.5/21HRS		PGTW
	35	210130	13.1N 131.6E	PCN 3	T2.5/2.5 /D0.5/24HRS		RPMK
	36	210300	13.0N 131.9E	PCN 6			PGTW
	37	210507	13.3N 131.8E	PCN 5			RPMK
	38	210600	13.5N 132.5E	PCN 6			PGTW
	39	210900	13.4N 132.5E	PCN 6			PGTW
	40	210929	14.7N 132.0E	PCN 6			RPMK
	41	211003	13.8N 132.2E	PCN 6			PGTW
	42	211003	14.2N 131.7E	PCN 5			RPMK
	43	211200	14.1N 132.3E	PCN 6			PGTW
	44	211600	14.5N 132.5E	PCN 6		ULCC FIX	PGTW
	45	211753	14.8N 131.9E	PCN 4			RODN
	46	211800	14.5N 132.2E	PCN 6	T2.5/2.5 /D0.5/26HRS	ULCC FIX	PGTW
	47	212242	14.7N 131.1E	PCN 5	T4.0/4.0 /D1.0/21HRS		RODN
	48	212242	14.1N 131.9E	PCN 5			PGTW
	49	220000	14.4N 132.1E	PCN 6	T3.0/3.0 /D0.5/24HRS	ULCC FIX	PGTW
	50	220109	15.5N 132.0E	PCN 3			RODN
	51	220110	14.8N 132.2E	PCN 5	T2.5/2.5 /S0.0/24HRS		RPMK
	52	220300	14.8N 132.2E	PCN 6		EXP LLCC	PGTW
	53	220456	15.1N 132.1E	PCN 6		ULCC FIX	PGTW
	54	220600	15.6N 131.8E	PCN 6		ULCC FIX	PGTW
	55	220900	15.9N 131.7E	PCN 6		ULCC FIX	PGTW
*	56	220908	14.9N 131.8E	PCN 6			RPMK
	57	220939	15.8N 131.9E	PCN 6		ULCC FIX	PGTW
	58	221200	16.1N 131.6E	PCN 6		ULCC FIX	PGTW
*	59	221350	15.7N 132.2E	PCN 5			RPMK

60	221600	16.7N	131.5E	PCN 6	T3.0/3.0 /D0.5/22HRS	ULCC FIX		PGTW
61	221742	17.5N	130.5E	PCN 6		ULCC FIX		PGTW
62	221742	16.7N	130.7E	PCN 5				RPMK
63	222100	17.5N	130.6E	PCN 6		ULCC FIX		PGTW
64	222148	17.8N	131.0E	PCN 3	T4.0/4.0 /S0.0/23HRS			RODN
65	222217	17.4N	130.5E	PCN 5				PGTW
66	230000	18.0N	130.2E	PCN 6	T4.0/4.0-/D1.0/24HRS	ULCC FIX		PGTW
67	230049	18.1N	130.9E	PCN 3	T3.5/3.5-/D1.0/24HRS			RPMK
68	230300	18.5N	130.0E	PCN 6		ULCC FIX		PGTW
69	230446	18.5N	129.8E	PCN 2				PGTW
70	230600	18.5N	129.8E	PCN 4		ULCC FIX		PGTW
71	230900	18.7N	129.8E	PCN 4		RGD EYE		PGTW
72	230915	18.7N	129.5E	PCN 2		WELL DEFINED EYE		PGTW
73	231028	18.9N	129.6E	PCN 4				RODN
74	231200	19.2N	129.4E	PCN 4				PGTW
75	231330	19.3N	129.3E	PCN 4		ULCC FIX		RSKO
76	231600	19.2N	129.2E	PCN 6	T4.0/4.0 /D1.0/24HRS	ULCC FIX		PGTW
77	231731	19.9N	128.9E	PCN 2				RSKO
78	231800	19.5N	129.7E	PCN 6		ULCC FIX		PGTW
79	232100	19.8N	128.9E	PCN 6		ULCC FIX		PGTW
80	232127	20.2N	128.7E	PCN 1	T4.0/4.0 /D0.5/21HRS			RPMK
81	232153	20.2N	129.2E	PCN 2				PGTW
82	240000	20.4N	129.0E	PCN 2	T5.0/5.0-/D1.0/24HRS	60 PCT EYEWALL		PGTW
83	240029	20.4N	128.7E	PCN 2	T5.0/5.0-/D1.0/27HRS	EYE FIX		RODN
84	240300	21.0N	129.0E	PCN 2		EYE FIX		PGTW
85	240600	21.5N	129.2E	PCN 2		EYE FIX		PGTW
86	240617	21.6N	128.8E	PCN 1	T4.5/4.5-/D1.0/29HRS	EYE FIX		RPMK
87	240900	21.8N	129.8E	PCN 2		EYE FIX		PGTW
* 88	241032	22.1N	130.5E	PCN 4		EYE FIX		PGTW
89	241200	22.4N	130.1E	PCN 4				PGTW
90	241309	22.6N	129.9E	PCN 2		EYE FIX		RSKO
91	241600	22.7N	130.6E	PCN 4	T5.0/5.0-/D1.0/24HRS	ULCC FIX		PGTW
92	241720	23.0N	130.7E	PCN 4		ULCC FIX		PGTW
93	241720	23.3N	130.8E	PCN 4		ULCC FIX		RSKO
94	242100	23.4N	131.4E	PCN 6		ULCC FIX		PGTW
95	242105	24.5N	132.1E	PCN 3	T4.0/5.0 /W1.0/24HRS			RODN
96	242310	24.5N	132.3E	PCN 5				RODN
97	250000	24.7N	132.1E	PCN 6	T3.5/4.5 /W1.5/24HRS			PGTW
98	250150	25.2N	133.0E	PCN 5	T3.5/4.5 /W1.0/24HRS			RPMK
99	250300	25.2N	132.6E	PCN 6				PGTW
100	250424	25.4N	132.6E	PCN 5		ULCC 25.8N 133.1E		PGTW
101	250600	25.6N	132.8E	PCN 6				PGTW
102	250900	27.1N	134.1E	PCN 6				PGTW
103	250945	27.3N	134.8E	PCN 2		EYEWALL OPN SE-S-SW		RSKO
104	251007	27.4N	134.2E	PCN 6				PGTW
105	251200	27.8N	135.3E	PCN 6		ULCC FIX		PGTW
106	251249	27.9N	135.1E	PCN 3				RSKO
107	251600	29.0N	137.0E	PCN 6	T4.0/5.0 /W1.0/24HRS	ULCC FIX		PGTW
*108	251710	29.4N	137.7E	PCN 6		ULCC FIX		PGTW
109	251710	30.0N	138.1E	PCN 4		ULCC FIX		RSKO
*110	251800	29.7N	137.9E	PCN 6		ULCC FIX LLCC 28.6N 136.6E		PGTW
111	252044	29.4N	137.9E	PCN 3				RODN
112	252100	29.3N	138.1E	PCN 6				PGTW
113	252246	30.0N	138.1E	PCN 3				PGTW
114	260000	30.5N	139.0E	PCN 6				PGTW
115	260413	30.8N	139.1E	PCN 3		EXP LLCC		PGTW
116	260600	30.8N	139.5E	PCN 6				PGTW
117	260900	30.9N	140.9E	PCN 6				PGTW
118	260924	30.7N	140.3E	PCN 5				RODN
119	260943	30.9N	140.6E	PCN 6				PGTW
120	261200	31.1N	141.7E	PCN 6				PGTW
121	261600	30.3N	140.9E	PCN 4				PGTW
122	261800	30.6N	141.5E	PCN 4				PGTW
123	262221	29.9N	143.2E	PCN 4				PGTW
124	270000	30.0N	143.6E	PCN 6				PGTW
125	270300	30.0N	144.5E	PCN 6				PGTW
126	270600	30.0N	144.9E	PCN 6				PGTW
127	280300	29.2N	147.4E	PCN 4		EXP LLCC		PGTW

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN- DIAM/TATION	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	230830	18.8N 129.6E	700MB	2832	971	65 030 10	120 72 030 15	4 2	CIRCULAR	15	+11 +16 + 9	1
2	232103	20.1N 128.8E	700MB	2729		50 030 8	330 86 120 12	4 3	CIRCULAR	15	+11 +18 +12	2
3	232311	20.5N 128.7E	700MB	2706	957	90 280 7	110 90 030 15	4 3	CIRCULAR	18	+13 +18 +12	2
4	240548	21.5N 129.2E	700MB	2656		100 250 10	330 101 250 10	5 5	CIRCULAR	13	+17 +19 +12	3
5	240818	21.9N 129.7E	700MB	2661	952	100 330 10	360 79 330 10	5 5	ELLIPTICAL	20 10 360	+18 +15 +13	3
6	242059	24.1N 131.2E	700MB	2833		90 220 7	300 80 190 28	3 2			+11 +22 +12	4
7	242334	24.7N 131.9E	700MB	2844		80 300 30	310 80 230 22	3 2			+12 +20 + 7	4
8	250901	27.1N 133.9E	700MB	2855	974	100 270 40	190 74 110 30	10 5			+11 +16 + 9	5
9	251139	27.0N 135.0E	700MB	2873	979		170 65 040 45	10 5			+ 9 +14 +12	5
10	252327	30.6N 138.4E	700MB	2900	983	50 250 70	320 55 250 72	5 10			+10 +12 +10	6

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL DEPRESSION 04
BEST TRACK DATA

	BEST TRACK			WARNING		ERRORS			24 HOUR FORECAST			ERRORS			48 HOUR FORECAST			ERRORS			72 HOUR FORECAST			ERRORS		
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND	
061700Z	16.6	112.6	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
061706Z	16.3	112.3	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
061712Z	16.0	111.5	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
061718Z	16.0	110.9	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
061800Z	16.0	110.5	30	16.7	110.2	30.	45.	0.	17.6	108.1	40.	161.	10.	18.7	106.3	40.	228.	10.	0.0	0.0	0.	-0.	0.			
061806Z	16.2	110.2	30	16.5	109.9	30.	25.	0.	17.1	107.9	40.	184.	10.	18.1	106.1	30.	198.	5.	0.0	0.0	0.	-0.	0.			
061812Z	16.4	110.1	30	16.5	109.3	30.	46.	0.	17.2	106.9	30.	247.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
061818Z	16.6	110.4	30	16.5	109.1	30.	75.	0.	16.5	108.4	30.	183.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
061900Z	16.6	110.7	30	16.5	110.0	30.	41.	0.	16.5	109.4	30.	164.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
061906Z	16.9	111.1	30	17.2	110.6	30.	34.	0.	17.5	110.0	30.	121.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
061912Z	17.6	111.2	30	17.3	110.8	30.	29.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
061918Z	18.4	110.9	30	17.5	110.8	30.	54.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
062000Z	19.1	110.3	30	18.0	110.5	30.	67.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
062006Z	19.4	109.3	25	19.4	110.4	25.	62.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	48.	177.	213.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	27.	110.	0.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	0.	4.	8.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	0.	4.	8.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	10	6	2	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 441. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 6. KNOTS

TROPICAL DEPRESSION TD04W
FIX POSITIONS FOR CYCLONE NO. 4

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	170000	16.8N 112.5E	PCN 4	T1.5/1.5	INIT OBS	PGTW
	2	170231	15.9N 112.4E	PCN 3	T1.5/1.5	INIT OBS EXP LLCC	RPMK
	3	170300	16.0N 112.4E	PCN 4		EXP LLCC	PGTW
	4	170600	16.6N 112.3E	PCN 6			PGTW
	5	171055	16.1N 112.6E	PCN 5			RPMK
*	6	171055	15.4N 108.1E	PCN 6			RODN
*	7	171511	15.8N 110.0E	PCN 5	T1.5/1.5	INIT OBS	RPMK
	8	171600	15.4N 110.2E	PCN 6	T1.5/1.5	INIT OBS ULCC FIX	PGTW
	9	171800	16.6N 111.1E	PCN 6			PGTW
	10	172243	16.8N 110.3E	PCN 6	T2.0/2.0 /D0.5/20HRS		RPMK
	11	180000	16.5N 110.8E	PCN 6	T2.5/2.5-/D1.0/24HRS		PGTW
	12	180210	16.4N 110.4E	PCN 3		EXP LLCC	RPMK
	13	180210	16.4N 110.4E	PCN 3	T2.5/2.5	INIT OBS	RODN
	14	180300	16.2N 110.2E	PCN 6			PGTW
	15	180600	16.4N 109.9E	PCN 6			PGTW
	16	180900	16.8N 109.7E	PCN 6			PGTW
*	17	181122	15.9N 108.2E	PCN 6		ULCC FIX	RODN
*	18	181200	16.7N 108.6E	PCN 6		ULCC FIX	PGTW
*	19	181451	16.8N 107.8E	PCN 5			RPMK
	20	181800	16.2N 110.4E	PCN 6			PGTW
	21	181939	16.5N 110.5E	PCN 3		EXP LLCC	RPMK
	22	182100	16.8N 110.6E	PCN 4			PGTW
	23	182221	16.6N 110.4E	PCN 3	T2.0/2.0 /S0.0/20HRS	EXP LLCC	RPMK
	24	182309	16.8N 110.5E	PCN 3	T1.0/1.0	INIT OBS	RKSO
	25	190000	17.0N 110.9E	PCN 6		EXP LLCC	PGTW
	26	190150	17.2N 110.5E	PCN 5			RKSO
	27	190300	17.1N 110.7E	PCN 6	T2.0/2.5 /W0.5/27HRS	EXP LLCC	PGTW
	28	190600	17.6N 111.0E	PCN 6			PGTW
	29	190642	16.6N 111.5E	PCN 5	T2.5/2.5 /S0.0/28HRS		RODN
	30	190900	17.7N 111.3E	PCN 6			PGTW
	31	191101	17.2N 111.5E	PCN 4		EXP LLCC	RPMK
	32	191101	18.1N 111.1E	PCN 5			RODN
	33	191148	17.0N 111.6E	PCN 3			RPMK
*	34	191928	19.4N 109.1E	PCN 4		EXP LLCC	RPMK
*	35	192200	17.1N 111.6E	PCN 6			RKSO
	36	200000	19.2N 110.6E	PCN 6		EXP LLCC	PGTW
	37	200026	19.2N 110.3E	PCN 3	T1.5/2.0 /W0.5/26HRS	EXP LLCC	RPMK
	38	200300	18.9N 110.2E	PCN 6			PGTW
	39	200600	19.2N 110.2E	PCN 6			PGTW
*	40	200631	19.2N 111.4E	PCN 6			RKSO

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	170600	16.0N 112.0E	020	030	59985 59981
2	170900	16.2N 111.8E	020	015	59985 59981
3	171200	16.3N 111.3E	020	015	59986 59981
4	171800	16.5N 111.0E	020	045	59985 59981

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TYPHOON HAL
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST ERRORS				48 HOUR FORECAST ERRORS				72 HOUR FORECAST ERRORS			
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
061906Z	14.2	133.5	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
061912Z	14.3	132.5	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
061918Z	14.5	131.5	35	14.5	132.5	30.	58.	-5.	16.2	129.1	55.	68.	-20.	19.2	125.3	65.	145.	-30.	22.1	123.7	80.	289.	-10.
062000Z	14.8	130.6	45	15.1	130.8	45.	21.	0.	18.5	126.7	65.	138.	-20.	23.1	124.0	85.	287.	0.	27.0	124.6	100.	518.	0.
062006Z	15.1	129.8	65	15.4	129.8	55.	18.	-10.	18.6	126.2	90.	121.	0.	22.9	124.1	110.	300.	30.	26.9	124.7	115.	535.	20.
062012Z	15.4	129.0	65	15.6	129.1	65.	13.	0.	18.0	126.1	90.	92.	-5.	21.5	123.9	110.	262.	30.	25.4	123.0	115.	441.	25.
062018Z	15.8	128.0	75	16.2	128.3	70.	30.	-5.	18.6	125.2	90.	137.	-5.	22.2	123.9	105.	271.	15.	26.2	122.7	110.	470.	25.
062100Z	16.2	126.7	85	16.3	126.9	85.	13.	0.	19.2	123.1	105.	108.	20.	22.8	121.2	105.	216.	5.	27.1	120.9	65.	420.	-15.
062106Z	16.7	125.5	90	16.9	125.7	90.	17.	0.	20.3	122.0	105.	107.	25.	24.2	119.9	85.	232.	-10.	29.0	122.0	60.	519.	-15.
062112Z	17.8	124.5	95	17.7	124.5	95.	6.	0.	21.2	121.3	105.	132.	25.	25.6	120.9	80.	357.	-10.	29.7	124.3	65.	621.	15.
062118Z	18.7	122.8	95	18.8	122.7	95.	8.	0.	23.7	119.9	90.	211.	0.	28.8	123.5	70.	600.	-15.	33.2	129.3	60.	940.	20.
062200Z	19.1	121.2	85	19.3	121.2	90.	12.	5.	23.4	118.3	90.	152.	-10.	28.6	123.2	70.	571.	-10.	33.3	131.3	50.	1030.	20.
062206Z	19.8	120.5	80	19.4	120.1	95.	26.	15.	24.1	118.7	90.	187.	-5.	29.3	124.1	75.	614.	0.	34.0	133.3	45.	1145.	20.
062212Z	19.6	119.7	80	19.7	119.7	85.	6.	5.	22.9	118.3	90.	144.	0.	28.7	123.3	75.	544.	25.	0.0	0.0	0.	-0.	0.
062218Z	20.3	118.9	90	20.5	119.0	90.	13.	0.	24.1	118.8	90.	224.	5.	28.9	123.5	75.	549.	35.	0.0	0.0	0.	-0.	0.
062300Z	20.9	117.9	100	21.1	117.9	100.	12.	0.	25.1	115.5	40.	174.	-40.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
062306Z	21.4	117.0	95	21.4	116.9	100.	6.	5.	24.5	113.7	35.	135.	-40.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
062312Z	21.5	116.2	90	21.7	116.1	90.	13.	0.	24.5	113.1	35.	136.	-15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
062318Z	21.8	115.6	85	21.9	115.1	80.	28.	-5.	24.2	112.5	25.	146.	-15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
062400Z	22.2	115.4	80	22.1	115.2	80.	13.	0.	22.9	113.6	35.	93.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
062406Z	22.8	115.3	75	22.8	115.3	50.	0.	-25.	24.9	116.1	25.	97.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
062412Z	23.3	115.2	50	23.3	115.2	50.	0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
062418Z	23.7	115.1	40	23.8	115.1	40.	6.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
062500Z	24.0	114.8	30	23.9	115.1	30.	18.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
062506Z	24.2	114.5	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	15.	137.	380.	630.	15.	142.	380.	528.
AVG RIGHT ANGLE ERROR	11.	109.	347.	591.	11.	112.	347.	490.
AVG INTENSITY MAGNITUDE ERROR	4.	13.	17.	17.	4.	15.	17.	16.
AVG INTENSITY BIAS	-1.	-5.	5.	10.	-1.	-6.	5.	7.
NUMBER OF FORECASTS	22	19	13	11	21	17	13	9

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1305. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 9. KNOTS

TYPHOON HAL
FIX POSITIONS FOR CYCLONE NO. 5

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	131800	5.5N 151.5E	PCN 6	T0.0/0.0	INIT OBS	PGTW
	2	132100	5.3N 151.1E	PCN 6			PGTW
	3	140000	4.5N 151.7E	PCN 6			PGTW
	4	140300	4.8N 151.4E	PCN 6			PGTW
	5	140600	5.2N 150.8E	PCN 6	T1.0/1.0	INIT OBS	PGTW
	6	140900	5.1N 151.0E	PCN 6			PGTW
	7	141200	4.4N 147.4E	PCN 6			PGTW
	8	141600	3.3N 147.4E	PCN 6		ULCC FIX	PGTW
*	9	150000	5.8N 140.8E	PCN 6		ULCC FIX	PGTW
**	10	150130	17.3N 137.5E	PCN 5	T1.0/1.0	INIT OBS	RPMK
*	11	150543	5.1N 140.4E	PCN 5			RPMK
	12	160000	6.3N 146.9E	PCN 6	T1.0/1.0 /S0.0/24HRS		PGTW
	13	160900	8.1N 144.3E	PCN 6		ULCC FIX	PGTW
	14	161200	7.1N 144.2E	PCN 6			PGTW
	15	170900	11.0N 139.7E	PCN 6			PGTW
	16	171200	10.3N 139.7E	PCN 6	T1.0/1.0	INIT OBS ULCC FIX	PGTW
	17	171600	10.6N 139.4E	PCN 6		ULCC FIX	PGTW
	18	171800	11.0N 139.0E	PCN 6		ULCC FIX	PGTW
	19	172100	11.4N 139.1E	PCN 6		ULCC FIX	PGTW
	20	180028	12.4N 139.1E	PCN 5	T1.5/1.5	INIT OBS	RODN
	21	180600	12.6N 138.4E	PCN 6	T1.0/1.0	INIT OBS	PGTW
	22	180941	13.7N 139.1E	PCN 5			RODN
	23	181309	12.8N 138.3E	PCN 5			RPMK
	24	181600	13.4N 136.1E	PCN 6	T2.0/2.0 /D1.0/28HRS	ULCC FIX	PGTW
	25	182040	12.6N 137.0E	PCN 6			RPMK
	26	182100	15.9N 135.9E	PCN 6		ULCC FIX	PGTW
	27	182128	15.8N 136.1E	PCN 6			PGTW
	28	190000	15.2N 134.9E	PCN 6			PGTW
	29	190008	16.3N 134.4E	PCN 5	T2.0/2.0 /D0.5/24HRS		RODN
	30	190600	13.4N 133.5E	PCN 6	T2.0/2.0 /D1.0/24HRS		PGTW
*	31	190900	13.6N 132.0E	PCN 6			PGTW
	32	190920	14.0N 133.2E	PCN 5			RODN
	33	191007	14.0N 132.6E	PCN 6		ULCC FIX	PGTW
	34	191200	13.9N 132.3E	PCN 6			PGTW
	35	191600	13.7N 132.3E	PCN 6	T2.5/2.5+/D0.5/24HRS	PSBL SCNDRY 14.3N 132.8E	PGTW
	36	191746	14.0N 132.3E	PCN 5		ULCC FIX	PGTW
*	37	192100	15.1N 132.6E	PCN 6			PGTW
	38	192245	15.0N 131.1E	PCN 5			PGTW
	39	200000	14.5N 130.9E	PCN 6			PGTW
	40	200129	15.1N 130.0E	PCN 3	T3.0/3.0 /D1.0/25HRS		RODN
*	41	200300	15.9N 130.2E	PCN 4	T3.0/3.0 /D1.0/21HRS	EXP LLCC	PGTW
	42	200449	14.9N 130.5E	PCN 5			PGTW
	43	200600	15.5N 129.9E	PCN 6			PGTW
	44	200900	15.7N 129.9E	PCN 6			PGTW
	45	201200	15.7N 129.2E	PCN 6			PGTW
	46	201410	15.7N 129.5E	PCN 4			RODN
	47	201735	16.2N 128.2E	PCN 5			RPMK
	48	201800	16.2N 128.3E	PCN 4	T3.5/3.5 /D1.0/26HRS		PGTW
	49	202100	16.2N 127.4E	PCN 6		ULCC FIX	PGTW
	50	202221	16.3N 127.3E	PCN 4			PGTW
	51	210100	16.6N 126.6E	PCN 4			PGTW
*	52	210109	16.8N 126.0E	PCN 1	T4.5/4.5 /D1.5/24HRS		RODN
	53	210300	16.6N 126.2E	PCN 4	T4.0/4.0 /D1.0/24HRS		PGTW
	54	210600	16.5N 125.7E	PCN 4			PGTW
	55	210621	16.7N 125.9E	PCN 3	T5.0/5.0	INIT OBS	RPMK
*	56	210621	17.4N 125.3E	PCN 1	T4.5/4.5	INIT OBS	RSKO
	57	211019	18.0N 125.0E	PCN 1	T4.5/4.5 /D1.5/28HRS		RODN
	58	211059	18.1N 124.8E	PCN 3			RKSO
*	59	211100	16.8N 124.8E	PCN 3			RPMK
	60	211200	17.8N 124.2E	PCN 4	T4.5/4.5 /D1.0/18HRS		PGTW
	61	211600	18.1N 123.7E	PCN 6			PGTW

62	211906	19.4N 122.0E	PCN 3				RODN
63	212100	19.6N 122.1E	PCN 6			ULCC FIX	PGTW
64	212118	19.0N 121.9E	PCN 1	T5.0/5.0 /D0.5/15HRS			RKSO
65	212350	18.4N 123.8E	PCN 3				RKSO
66	220000	19.4N 121.1E	PCN 4				PGTW
67	220230	19.0N 121.0E	PCN 1	T5.0/5.0 /D0.5/25HRS		LLCC WITHIN EYE	RODN
68	220230	19.1N 120.9E	PCN 3	T5.0/5.0 /S0.0/20HRS		OPN EYE	RPMK
69	220300	19.0N 120.8E	PCN 2	T5.5/5.5 /D1.5/24HRS		RGD EYE	PGTW
* 70	220610	19.2N 120.2E	PCN 3			RGD EYE	PGTW
71	220610	19.7N 119.4E	PCN 3			LLCC WITHIN EYE	RPMK
72	220900	19.3N 120.3E	PCN 4				PGTW
73	220957	19.1N 120.5E	PCN 4				PGTW
74	220957	19.3N 120.0E	PCN 3				RKSO
75	221200	19.6N 119.7E	PCN 6				PGTW
76	221511	19.9N 119.5E	PCN 1				RODN
77	221600	20.1N 119.7E	PCN 6	T5.0/5.0-/D0.5/28HRS			PGTW
78	221800	20.7N 119.0E	PCN 6				PGTW
79	221855	20.4N 118.6E	PCN 3			RGD EYE	RPMK
80	222233	20.5N 117.7E	PCN 5	T4.5/5.0 /W0.5/25HRS			RKSO
81	222313	21.0N 118.1E	PCN 2	T5.0/5.5 /W0.5/20HRS		EYE FIX	PGTW
82	222313	21.0N 117.8E	PCN 1	T5.5/5.5 /D0.5/21HRS			RODN
83	222313	20.9N 117.8E	PCN 1	T5.0/5.0-/S0.0/21HRS			RPMK
84	230300	21.2N 117.5E	PCN 4				PGTW
85	230559	21.2N 116.7E	PCN 1				RPMK
86	230559	21.5N 116.8E	PCN 1	T5.0/5.0 /D0.5/07HRS		LLCC WITHIN EYE	RKSO
87	230600	21.4N 116.9E	PCN 2				PGTW
88	230900	21.5N 116.3E	PCN 2			EYE FIX	PGTW
89	231010	21.2N 115.7E	PCN 3				RPMK
* 90	231117	21.5N 115.2E	PCN 1			LLCC WITHIN EYE	RODN
91	231117	21.7N 116.1E	PCN 2			LLCC WITHIN EYE	RKSO
92	231200	21.5N 116.0E	PCN 4			RGD EYE	PGTW
93	231451	21.7N 116.0E	PCN 2			LLCC WITHIN EYE	RKSO
94	231600	21.7N 115.7E	PCN 4	T4.5/5.0 /W0.5/24HRS			PGTW
95	231800	21.8N 115.4E	PCN 4				PGTW
96	231845	21.9N 115.6E	PCN 3				RPMK
97	232100	21.8N 115.2E	PCN 4				PGTW
98	232216	22.0N 115.4E	PCN 1	T4.0/5.0-/W1.0/23HRS			RODN
99	232249	21.9N 115.4E	PCN 2				PGTW
100	232249	21.9N 114.7E	PCN 5	T4.5/5.0-/W0.5/17HRS			RKSO
101	240000	22.0N 115.3E	PCN 2				PGTW
*102	240149	22.5N 114.0E	PCN 3				RODN
103	240300	22.4N 115.1E	PCN 4	T3.0/4.0-/W2.0/28HRS			PGTW
104	240548	22.9N 115.4E	PCN 5				PGTW
105	240548	23.0N 115.5E	PCN 3	T3.5/4.5 /W1.5/31HRS			RPMK
106	240900	22.7N 115.3E	PCN 4				PGTW
107	241056	22.5N 115.4E	PCN 4				RODN
108	241127	23.3N 115.1E	PCN 5				RKSO
109	241200	23.1N 115.3E	PCN 4				PGTW
110	241430	23.7N 115.1E	PCN 5				RKSO
111	241600	23.6N 115.1E	PCN 6	T3.0/4.0-/W1.5/24HRS			PGTW
112	241800	23.8N 115.2E	PCN 6				PGTW
*113	241833	25.2N 115.2E	PCN 5			ULCC FIX	RPMK
114	242100	23.7N 115.0E	PCN 6				PGTW
115	250000	24.2N 115.0E	PCN 6				PGTW
116	250006	23.9N 115.6E	PCN 5				RODN
117	250006	23.9N 115.6E	PCN 5				RPMK
118	250130	23.9N 114.6E	PCN 5				RKSO
119	250600	23.8N 113.7E	PCN 6				PGTW

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE DIAM/TATION	EYE ORIEN-	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	192313	15.0N 130.7E	1500FT		984	55 100 160	180 50 100 160	5 4				+25 +25 +24 28	4
2	200615	15.2N 129.8E	1500FT		979	65 080 90	160 68 080 120	8 3				+25 +25 +25	5
3	200851	15.0N 129.8E	1500FT		976	65 280 105	320 65 280 105	8 4				+26 +26 +25	6
4	202137	16.0N 127.3E	700MB	2817		65 120 120	180 84 100 84	8 2				+15 +16 + 9	7
5	202344	16.2N 126.8E	700MB	2824	969	65 330 70	050 56 310 64	10 2				+15 +16 +15	7
6	210900	17.0N 125.2E	700MB	2767	964	90 030 130	150 105 040 75	5 2				+13 +20 +12	8
7	211132	17.8N 124.3E	700MB	2774			060 95 320 34	10 7	CIRCULAR	80		+12 +17 +10	8
8	212056	19.0N 121.6E	700MB	2732		65 040 40	140 76 040 54	5 15				+12 +19 +10	9
9	212333	19.1N 121.4E	700MB	2738	961	65 280 15	040 80 320 95	2 3				+12 +18 +12	9
10	220841	19.0N 120.2E	700MB	2766		75 180 12	270 77 180 38	10 8				+12 +17 +12	10
11	221128	19.7N 119.8E	700MB	2768	961	80 030 25	040 62 310 37	10 8				+16 +19 +13	10
12	221931	20.4N 118.8E	700MB	2809			230 80 150 69	6 15	CONCENTRIC	10 80		+15 +18 +14	11

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR TDDFF	COMMENTS	RADAR POSITION	SITE WMO NO.
1	220700	19.5N 120.4E	LAND				4//// 50000		16.3N 120.6E	98321
2	220800	19.5N 120.3E	LAND				4//// 42805		16.3N 120.6E	98321
3	220800	19.5N 120.5E	LAND				60/2/ 5////		22.6N 120.3E	46744
4	220900	19.6N 120.4E	LAND				65/2/ 53006		22.6N 120.3E	46744
5	221000	19.5N 120.1E	LAND				4//// 53012		16.3N 120.6E	98321
* 6	221000	19.5N 121.0E	LAND				5//// 53515		18.4N 121.6E	98231
7	221000	19.6N 120.3E	LAND				65/// 53006		22.6N 120.3E	46744
8	221100	19.6N 119.7E	LAND				4////		16.3N 120.6E	98321
9	221100	19.6N 120.1E	LAND				///// 35315		18.4N 121.6E	98231
10	221100	20.1N 119.2E	LAND				6////4 72914		23.4N 116.7E	59316
11	221100	19.6N 120.2E	LAND				65/// 53006		22.6N 120.3E	46744
12	221300	19.8N 119.9E	LAND				65/// 53208		22.6N 120.3E	46744
13	221400	19.9N 119.8E	LAND				65/// 53209		22.6N 120.3E	46744
14	221500	19.9N 119.5E	LAND				65/// 53209		22.6N 120.3E	46744
15	221600	19.9N 119.5E	LAND				65/// 53202		22.6N 120.3E	46744
16	221700	20.4N 118.8E	LAND				5///3 72920		23.4N 116.7E	59316
17	221700	20.1N 119.4E	LAND				65/// 53202		22.6N 120.3E	46744
18	221800	20.2N 119.3E	LAND				6//// 53409		22.6N 120.3E	46744
19	222000	20.7N 118.5E	LAND				24843 52913		23.4N 116.7E	59316
20	222100	20.7N 118.4E	LAND				21873 52906		23.4N 116.7E	59316
21	222200	20.7N 118.4E	LAND				24934 50000		23.4N 116.7E	59316
22	222200	20.9N 118.6E	LAND				6//// 53009		22.6N 120.3E	46744
23	222300	20.9N 118.1E	LAND				20973 53313		23.4N 116.7E	59316
24	222300	21.0N 118.4E	LAND				6//// 53013		22.6N 120.3E	46744
25	230000	21.0N 118.0E	LAND				20913 53313		23.4N 116.7E	59316
26	230000	21.2N 118.1E	LAND				6//// 53219		22.6N 120.3E	46744
27	230100	21.1N 117.9E	LAND				20913 52906		23.4N 116.7E	59316
28	230100	20.9N 117.9E	LAND				6//// 52916		22.6N 120.3E	46744
29	230200	21.2N 117.7E	LAND				10983 52913		23.4N 116.7E	59316
* 30	230200	22.1N 117.7E	LAND				6//// 53017		22.6N 120.3E	46744
31	230300	21.2N 117.4E	LAND				6//// 53017		22.6N 120.3E	46744
32	230500	21.0N 117.3E	LAND				30802 /////		22.3N 114.2E	45005
33	230600	21.6N 117.0E	LAND				10924 53011		23.4N 116.7E	59316
34	230600	21.2N 117.0E	LAND				30912 /////		22.3N 114.2E	45005
35	230600	21.5N 116.9E	LAND				5//// 53112		22.6N 120.3E	46744
36	230700	21.4N 116.8E	LAND				31972 62111		22.3N 114.2E	45005
* 37	230700	21.6N 118.0E	LAND				07714 53011		23.4N 116.7E	59316
38	230800	21.4N 116.7E	LAND				21972 63110		22.3N 114.2E	45005
39	230900	21.4N 116.6E	LAND				21913 73009		22.3N 114.2E	45005
40	230900	21.5N 116.5E	LAND				10913 52709		23.4N 116.7E	59316
41	231000	21.5N 116.5E	LAND				21912 73008		22.3N 114.2E	45005

42	231100	21.5N 116.3E	LAND	31942	73008	22.3N	114.2E	45005
43	231200	21.5N 116.2E	LAND	31914	/////	22.3N	114.2E	45005
44	231300	21.3N 116.1E	LAND	30914	72808	22.3N	114.2E	45005
45	231300	21.6N 116.1E	LAND	10912	52706	23.4N	116.7E	59316
46	231400	21.4N 116.0E	LAND	30914	72607	22.3N	114.2E	45005
47	231400	21.7N 116.0E	LAND	10973	53006	23.4N	116.7E	59316
48	231500	21.6N 115.8E	LAND	31974	72807	22.3N	114.2E	45005
49	231600	21.6N 115.6E	LAND	30974	72910	22.3N	114.2E	45005
50	231600	21.8N 115.9E	LAND	10913	53006	23.4N	116.7E	59316
51	231700	21.7N 115.6E	LAND	30974	43010	22.3N	114.2E	45005
52	231700	21.8N 115.8E	LAND	10923	53006	23.4N	116.7E	59316
53	231800	21.7N 115.5E	LAND	30944	73007	22.3N	114.2E	45005
54	231800	21.9N 115.7E	LAND	10913	53007	23.4N	116.7E	59316
55	231900	21.8N 115.5E	LAND	30972	73506	22.3N	114.2E	45005
56	231900	21.9N 115.7E	LAND	10913	53007	23.4N	116.7E	59316
57	232000	21.9N 115.5E	LAND	30912	73606	22.3N	114.2E	45005
58	232000	22.0N 115.4E	LAND	10914	53006	23.4N	116.7E	59316
59	232100	22.0N 115.4E	LAND	30912	73408	22.3N	114.2E	45005
60	232200	21.9N 115.3E	LAND	30912	73007	22.3N	114.2E	45005
61	232200	22.2N 115.4E	LAND	10914	53005	23.4N	116.7E	59316
62	232300	22.1N 115.3E	LAND	20912	73105	22.3N	114.2E	45005
63	240000	22.1N 115.3E	LAND	20912	73104	22.3N	114.2E	45005
64	240000	22.2N 115.5E	LAND	10914	59000	23.4N	116.7E	59316
65	240100	22.3N 115.4E	LAND	20912	73605	22.3N	114.2E	45005
66	240200	22.4N 115.4E	LAND	20912	73606	22.3N	114.2E	45005
67	240300	22.5N 115.4E	LAND	20914	73608	22.3N	114.2E	45005
68	240400	22.7N 115.4E	LAND	20914	73607	22.3N	114.2E	45005
69	240500	22.7N 115.3E	LAND	20914	73407	22.3N	114.2E	45005
70	240600	22.8N 115.4E	LAND	24854	73405	22.3N	114.2E	45005
71	240700	22.8N 115.4E	LAND	24154	83505	22.3N	114.2E	45005
72	240800	22.9N 115.4E	LAND	25114	83605	22.3N	114.2E	45005
73	240900	23.1N 115.4E	LAND	21114	83606	22.3N	114.2E	45005
74	241000	23.3N 115.3E	LAND	3////	83506	22.3N	114.2E	45005
75	241100	23.2N 115.1E	LAND	2////	83405	22.3N	114.2E	45005
76	241300	23.2N 115.0E	LAND	5////	83206	22.3N	114.2E	45005
77	241500	23.3N 114.9E	LAND	6////	82905	22.3N	114.2E	45005
78	241800	23.6N 114.9E	LAND	5////	83405	22.3N	114.2E	45005
79	242100	23.6N 114.8E	LAND	5////	83405	22.3N	114.2E	45005

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	240900	23.0N 115.2E	040	018	59501 59293 59117 45005
2	241200	23.2N 115.1E	030	030	59501 59293 59117 45005
3	241500	23.8N 115.2E	030	045	59501 59293 59117 45005
4	241800	23.9N 114.7E	060	040	59501 59293 59117 45005

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TYPHOON IRMA
BEST TRACK DATA

	BEST TRACK			WARNING		24 HOUR FORECAST ERRORS					48 HOUR FORECAST ERRORS					72 HOUR FORECAST ERRORS				
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
062412Z	8.1	135.9	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
062418Z	8.8	134.9	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
062500Z	9.4	134.0	40	9.8	133.9	35.	25.	-5.	12.0	130.5	55.	66.	-5.	15.0	126.0	75.	244.	15.	19.0	122.0	90.	437.	15.
062506Z	9.9	133.2	45	10.0	133.0	50.	13.	5.	12.4	129.0	70.	117.	10.	15.9	124.1	90.	341.	25.	19.2	120.6	90.	522.	10.
062512Z	10.4	132.5	50	10.6	132.0	55.	32.	5.	13.0	127.7	75.	170.	15.	16.8	122.9	95.	391.	20.	19.9	119.6	85.	584.	5.
062518Z	11.0	132.0	55	11.3	130.7	60.	79.	5.	14.2	126.1	80.	245.	20.	18.2	121.3	95.	475.	10.	21.3	118.5	90.	646.	5.
062600Z	11.5	131.5	60	11.5	131.3	60.	12.	0.	13.8	128.7	70.	109.	10.	17.0	126.2	70.	227.	-5.	20.3	122.8	60.	474.	-30.
062606Z	12.3	131.0	60	12.4	130.9	60.	2.	0.	15.7	128.9	60.	64.	-5.	19.4	126.5	50.	190.	-30.	23.5	124.7	50.	328.	-40.
062612Z	13.1	130.6	60	13.2	130.4	55.	13.	-5.	16.5	128.5	50.	70.	-25.	20.5	126.7	45.	186.	-35.	25.2	125.0	45.	315.	-40.
062618Z	13.9	130.3	60	14.3	130.2	60.	25.	0.	18.2	128.5	75.	70.	0.	22.9	126.3	65.	205.	-20.	28.2	125.5	55.	291.	-25.
062700Z	14.9	130.2	60	14.8	130.1	60.	8.	0.	18.4	129.3	75.	33.	0.	23.3	129.0	70.	89.	-20.	28.3	129.7	65.	133.	-10.
062706Z	15.8	130.0	65	15.7	129.9	60.	8.	-5.	19.4	129.2	75.	49.	-5.	24.3	129.1	70.	103.	-20.	29.3	130.3	65.	187.	-10.
062712Z	16.7	129.7	75	16.7	129.5	75.	11.	0.	20.5	128.9	90.	74.	10.	25.5	129.2	75.	114.	-10.	30.4	130.6	65.	278.	-10.
062718Z	17.7	129.6	75	17.8	129.3	75.	18.	0.	21.8	128.8	90.	90.	5.	26.5	129.1	75.	144.	-5.	31.4	131.0	65.	437.	0.
062800Z	18.8	129.7	75	18.7	129.6	75.	8.	0.	22.9	129.3	90.	100.	0.	27.6	130.3	75.	137.	0.	31.5	135.2	55.	518.	-5.
062806Z	20.0	129.8	80	19.8	129.5	80.	21.	0.	24.3	129.4	95.	95.	5.	28.8	131.2	80.	170.	5.	32.2	136.8	60.	667.	5.
062812Z	21.3	129.9	80	21.4	129.9	80.	6.	0.	26.4	131.0	90.	45.	5.	31.2	137.0	75.	105.	0.	0.0	0.0	0.	-0.	0.
062818Z	22.8	130.0	85	22.8	130.0	85.	9.	0.	28.1	132.3	80.	69.	0.	32.3	139.3	70.	153.	5.	0.0	0.0	0.	-0.	0.
062900Z	24.4	130.1	90	24.3	130.2	90.	8.	0.	29.6	134.4	80.	131.	5.	33.6	143.1	65.	248.	5.	0.0	0.0	0.	-0.	0.
062906Z	25.7	130.2	90	25.8	130.3	90.	8.	0.	30.9	135.3	80.	98.	5.	34.2	144.8	60.	363.	5.	0.0	0.0	0.	-0.	0.
062912Z	27.0	130.5	85	27.0	130.6	85.	5.	0.	31.7	135.0	75.	49.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
062918Z	28.2	131.0	80	28.3	131.0	80.	6.	0.	32.4	136.2	70.	191.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
063000Z	29.4	131.9	75	29.5	131.9	75.	6.	0.	33.3	138.7	60.	323.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
063006Z	30.9	133.4	75	30.9	133.3	75.	5.	0.	34.7	141.9	60.	391.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
063012Z	32.4	135.5	75	32.3	135.5	75.	6.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
063018Z	34.8	138.7	65	34.9	138.8	65.	8.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
070100Z	37.7	142.5	60	37.7	142.8	60.	14.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
070106Z	40.1	146.5	55	39.9	145.8	55.	34.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	15.	120.	216.	416.	15.	120.	216.	416.
AVG RIGHT ANGLE ERROR	11.	71.	173.	273.	11.	71.	173.	273.
AVG INTENSITY MAGNITUDE ERROR	1.	6.	13.	15.	1.	6.	13.	15.
AVG INTENSITY BIAS	0.	3.	-3.	-9.	0.	3.	-3.	-9.
NUMBER OF FORECASTS	26	22	18	14	26	22	18	14

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 2413. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 15. KNOTS

TYPHOON IRMA
FIX POSITIONS FOR CYCLONE NO. 6

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	231800	7.8N 136.2E	PCN 6	T1.0/1.0	INIT OBS	PGTW
2	232100	7.6N 134.8E	PCN 6		ULCC FIX	PGTW
3	240000	7.1N 137.3E	PCN 6		ULCC FIX	PGTW
4	240300	7.4N 136.6E	PCN 6	T1.5/1.5	INIT OBS ULCC FIX	PGTW
5	240548	8.0N 136.1E	PCN 5		ULCC FIX	PGTW
6	240548	7.8N 135.5E	PCN 5	T1.0/1.0	INIT OBS	RPMK
7	240900	8.6N 135.8E	PCN 6		ULCC FIX	PGTW
8	241249	8.4N 134.7E	PCN 6		ULCC FIX	PGTW
9	241600	9.1N 134.8E	PCN 6	T2.0/2.0+/D1.0/21HRS	ULCC FIX	PGTW
10	241800	9.2N 134.7E	PCN 6		ULCC FIX	PGTW
11	242100	9.8N 134.0E	PCN 6			PGTW
12	242155	9.5N 134.2E	PCN 3	T3.0/3.0	INIT OBS	RODN
13	242225	9.6N 134.1E	PCN 5			PGTW
14	250000	9.6N 133.5E	PCN 6	T2.5/2.5 /D1.0/21HRS		PGTW
15	250129	10.0N 134.3E	PCN 3		ULCC FIX	RODN
16	250300	9.7N 132.8E	PCN 6			PGTW
17	250537	10.0N 133.1E	PCN 5			PGTW
18	250537	9.8N 133.0E	PCN 5	T2.5/2.5 /D1.5/24HRS		RPMK
19	250900	10.5N 132.6E	PCN 6		ULCC FIX	PGTW
20	251200	10.8N 131.7E	PCN 6		ULCC FIX	PGTW
* 21	251600	11.1N 130.9E	PCN 6	T3.0/3.0 /D0.1/24HRS	ULCC FIX	PGTW
* 22	251800	11.8N 130.5E	PCN 6		ULCC FIX	PGTW
* 23	251823	11.3N 130.5E	PCN 6		ULCC FIX	PGTW
* 24	251823	10.8N 130.6E	PCN 5			RPMK
25	252100	10.8N 131.4E	PCN 6			PGTW
26	252134	10.7N 131.5E	PCN 5	T3.5/3.5+/D0.5/24HRS		RODN
27	260000	11.5N 130.9E	PCN 4	T3.0/3.0 /D0.5/24HRS		PGTW
28	260109	11.6N 130.9E	PCN 3			PGTW
29	260300	12.0N 130.8E	PCN 6			PGTW
30	260527	12.4N 130.8E	PCN 3			RPMK
31	260527	12.0N 131.8E	PCN 6	T3.0/3.0 /D0.5/24HRS		PGTW
32	260900	12.8N 130.6E	PCN 6			PGTW
33	261014	13.0N 130.5E	PCN 6		ULCC 13.0N 131.5E	PGTW
34	261038	12.9N 131.5E	PCN 6			RODN
35	261200	13.2N 130.3E	PCN 6		ULCC 13.0N 130.9E	PGTW
36	261350	13.4N 130.7E	PCN 6		ULCC FIX	PGTW
37	261600	14.2N 130.8E	PCN 6	T4.0/4.0 /D1.0/24HRS	ULCC FIX	PGTW
38	261800	14.3N 130.6E	PCN 4		ULCC FIX	PGTW
39	261812	14.5N 130.5E	PCN 4			PGTW
40	261812	14.4N 130.5E	PCN 6			RODN
41	262100	14.7N 130.4E	PCN 6			PGTW
42	262112	14.9N 130.5E	PCN 5			PGTW
43	262317	15.2N 130.2E	PCN 3			RODN
44	270000	15.0N 130.2E	PCN 6	T4.0/4.0 /D1.0/24HRS	EYE FIX	PGTW
45	270049	15.3N 130.3E	PCN 5			PGTW
46	270049	15.2N 130.0E	PCN 1	T4.0/4.0 /D0.5/26HRS	EYE FIX	RODN
47	270300	15.2N 130.1E	PCN 6			PGTW
48	270516	15.7N 130.2E	PCN 3		EYE FIX	PGTW
49	270516	15.9N 130.0E	PCN 3	T4.0/4.0 /D1.0/24HRS		RPMK
50	270600	15.8N 130.0E	PCN 4		EYE FIX	PGTW
51	270952	16.4N 129.6E	PCN 4			PGTW
52	271014	16.6N 129.7E	PCN 3		ULCC FIX	RPMK
53	271200	16.9N 129.5E	PCN 2		EYEWALL 30 NM DIA	PGTW
54	271327	17.2N 129.4E	PCN 4			PGTW
55	271600	17.5N 129.3E	PCN 2	T4.5/4.5 /D0.5/24HRS	EYE FIX	PGTW

56	271801	17.7N 129.2E	PCN 4					PGTW
57	271801	17.9N 129.6E	PCN 1					RKSO
58	272051	18.2N 129.2E	PCN 1	T4.0/4.0 /D0.5/27HRS		EYE FIX		RODN
59	272100	18.3N 129.7E	PCN 6					PGTW
60	272253	19.1N 130.0E	PCN 5					PGTW
61	280000	18.5N 129.9E	PCN 6	T4.5/4.5 /D0.5/24HRS				PGTW
62	280028	19.0N 129.4E	PCN 1	T4.5/4.5 /D0.5/24HRS		EYE FIX		RODN
63	280029	18.9N 129.9E	PCN 6					PGTW
64	280300	19.2N 129.9E	PCN 6					PGTW
65	280505	19.5N 129.9E	PCN 2	T5.0/5.0 /D1.0/24HRS		EYE FIX		RPMK
66	280600	20.0N 130.0E	PCN 6					PGTW
67	280900	20.7N 130.0E	PCN 4			EYE FIX EYE DIA .5 DEG		PGTW
68	280931	20.8N 129.9E	PCN 2			RAGGED EYE		PGTW
69	280950	20.8N 129.5E	PCN 4			EYE FIX		RPMK
70	281200	21.4N 130.1E	PCN 2			EYE FIX		PGTW
71	281309	21.5N 130.1E	PCN 2			EYE FIX		PGTW
72	281600	22.3N 130.1E	PCN 4	T4.5/4.5-/S0.0/24HRS		RAGGED EYE		PGTW
73	281751	23.0N 130.1E	PCN 2			EYE FIX		RPMK
74	281751	22.8N 130.0E	PCN 2			RAGGED EYE		PGTW
75	282100	23.4N 130.1E	PCN 2					PGTW
76	282221	24.0N 130.5E	PCN 6					RKSO
77	282228	24.0N 130.5E	PCN 3			RAGGED EYE		PGTW
78	290000	24.3N 130.5E	PCN 4			EYE FIX		PGTW
79	290008	24.2N 130.2E	PCN 5	T4.5/4.5		INIT OBS		RKSO
* 80	290149	24.8N 131.0E	PCN 1	T5.0/5.0-/D1.0/24HRS				RODN
* 81	290300	24.3N 130.7E	PCN 4					PGTW
82	290454	25.3N 130.5E	PCN 4	T5.0/5.0-/D0.5/23HRS		EYE FIX		PGTW
83	290600	25.8N 130.5E	PCN 4					PGTW
84	290900	26.5N 130.5E	PCN 4			EYE FIX		PGTW
85	290926	26.0N 130.2E	PCN 4	T4.5/4.5 /D0.5/28HRS		EYE FIX		RPMK
86	291051	26.8N 130.5E	PCN 5			ULCC FIX		RODN
87	291200	26.9N 130.6E	PCN 4			ULCC 26.9N 130.8E		PGTW
88	291430	27.5N 131.0E	PCN 2			EYE FIX		RODN
89	291600	27.8N 131.0E	PCN 4	T3.5/4.5 /W1.0/24HRS				PGTW
90	291740	28.4N 131.0E	PCN 4					PGTW
91	291741	28.3N 131.2E	PCN 1			EYE FIX		RKSO
92	292100	28.9N 131.6E	PCN 4			RAGGED EYE		PGTW
* 93	292204	28.4N 131.3E	PCN 1	T4.0/4.5 /W0.5/22HRS				RKSO
94	300000	29.4N 132.1E	PCN 4			EYE FIX		PGTW
95	300300	30.0N 132.8E	PCN 4					PGTW
96	300443	30.4N 133.2E	PCN 4	T4.0/4.5 /W1.0/24HRS				PGTW
97	300600	30.8N 133.5E	PCN 4					PGTW
98	300901	31.3N 134.5E	PCN 2			EYE FIX		PGTW
99	301200	32.4N 135.6E	PCN 4			EYE FIX		PGTW
100	301600	33.9N 137.6E	PCN 6	T3.0/4.0 /W0.5/24HRS				PGTW
101	301729	34.9N 138.3E	PCN 6					PGTW
102	301729	34.6N 138.8E	PCN 3					RKSO
103	301800	35.1N 138.2E	PCN 6					PGTW
104	302100	36.0N 140.2E	PCN 6			ULCC FIX		PGTW
105	302140	36.2N 140.8E	PCN 6			ULCC FIX		PGTW
106	010000	37.7N 143.0E	PCN 6			ULCC FIX		PGTW
107	010300	39.0N 145.3E	PCN 6			ULCC FIX		PGTW
108	010600	40.0N 146.7E	PCN 6	T3.0/4.0 /W1.0/26HRS		ULCC FIX		PGTW
109	010837	42.8N 146.3E	PCN 5					RKSO
110	010900	42.6N 150.3E	PCN 6			ULCC FIX		PGTW

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN- DIAM/TATION	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	200722	5.5N 148.6E	1500FT		1002	25 010 10	090 15 010 30	5 3			+27 +23 28	1
2	250516	9.9N 133.1E	700MB	3047		65 120 55	270 55 190 35	10 10			+12 +10	2
3	252049	11.2N 131.7E	700MB	3036	991	45 290 30	090 37 330 35	8 2			+15 +15 + 8	3
4	252335	11.5N 131.5E	700MB	3047	994	90 160 57	230 53 150 57	3 5			+12 +15 +10	3
5	260552	12.4N 131.0E	1500FT		992	40 040 45	150 61 040 45	5 4			+13 +27 +22	4
6	260849	12.8N 130.8E	1500FT		991	55 110 54	190 55 110 60	5 4			+27 +26 +24 28	4
7	262035	14.5N 130.4E	700MB	2979	988	45 270 42	150 68 100 63	10 5	CIRCULAR	15	+10 +13 + 9	5
8	262339	14.8N 130.1E	700MB	3002	989	55 180 60	250 67 170 121	10 5	CIRCULAR	50	+10 +14 + 8	5
9	270838	16.2N 129.6E	700MB	2915		95 030 30	120 75 030 120	5 5			+13 +15 +13	6
10	271114	16.6N 129.5E	700MB	2900			040 61 310 58	10 7	CIRCULAR	40	+11 +14 + 8	6
11	272045	18.4N 129.8E	700MB	2802		55 360 42	090 60 360 18	8 2	CIRCULAR	60	+12 +17 +12	7
12	272322	18.7N 129.7E	700MB	2813	967	85 140 20	270 74 170 24	8 4	CIRCULAR	60	+13 +18 +12	7
13	280846	20.7N 130.0E	700MB	2775	963	45 240 90	330 75 240 22	10 4	CIRCULAR	40	+11 +14 +10	8
14	281116	21.4N 129.8E	700MB	2766	962	45 290 90	270 77 190 54	15 5	CIRCULAR	38	+12 +14 +11	8
15	282047	23.6N 130.3E	700MB	2739	958	75 030 90	140 89 030 72	7 5	ELLIPTICAL	50 40 140	+12 +16 +14	9
16	282340	24.2N 130.0E	700MB	2744	960	50 260 80	330 75 260 20	4 5	ELLIPTICAL	50 40 010	+13 + 7 + 5	9
17	290530	25.6N 130.2E	700MB	2721		50 250 20	320 81 250 28	5 8	ELLIPTICAL	60 45 060	+13 +17 +12	10
18	290801	26.1N 130.1E	700MB	2721	957	65 120 14	280 83 180 24	3 8	CIRCULAR	40	+11 +16 +11	10
19	292034	28.8N 130.2E	700MB	2774	964		240 71 130 102	3 5	CIRCULAR	58	+13 +15 +13	11
20	292316	29.6N 131.8E	700MB	2822	970	50 260 90	140 71 030 100	5 3	CIRCULAR	60	+13 +15 +14	11
21	300545	31.1N 133.1E	700MB	2808	968	45 180 150	270 81 180 58	5 7			+11 +14 +13	12
22	300817	31.6N 134.1E	700MB	2807	968	75 060 20	150 58 030 64	3 10	ELLIPTICAL	50 30 010	+11 +14 +12	12

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR TDDFF	COMMENTS	RADAR POSITION	SITE WMO NO
1	282300	24.1N 130.2E	LAND				65//3 53616		26.2N 127.8E	47937
2	290000	24.4N 130.2E	LAND				65//3 53616		26.2N 127.8E	47937
3	290200	24.9N 130.2E	LAND				54973 53616		26.2N 127.8E	47937
4	290300	25.1N 130.2E	LAND				54912 53616		26.2N 127.8E	47937
5	290400	25.4N 130.2E	LAND				54912 53516		26.2N 127.8E	47937
6	290500	25.6N 130.2E	LAND				10933 53311		28.4N 129.5E	47909
7	290500	25.6N 130.2E	LAND				10933 53311		26.2N 127.8E	47937
8	290600	25.8N 130.2E	LAND				11933 53611		28.4N 129.5E	47909
9	290600	25.8N 130.2E	LAND				54912 53608		26.2N 127.8E	47937
10	290700	26.0N 130.2E	LAND				52912 53614		26.2N 127.8E	47937
11	290900	26.4N 130.4E	LAND				10912 50211		28.4N 129.5E	47909
12	290900	26.3N 130.4E	LAND				51912 50411		26.2N 127.8E	47937
13	291000	26.6N 130.4E	LAND				10912 53611		28.4N 129.5E	47909
14	291000	26.5N 130.4E	LAND				51911 70208		26.2N 127.8E	47937
15	291100	26.7N 130.4E	LAND				10912 53605		28.4N 129.5E	47909
16	291200	26.8N 130.5E	LAND				10912 50211		28.4N 129.5E	47909
17	291200	26.7N 130.5E	LAND				64942 70208		26.2N 127.8E	47937
18	291300	27.1N 130.6E	LAND				10912 50216		28.4N 129.5E	47909
19	291300	27.0N 130.6E	LAND				64931 50211		26.2N 127.8E	47937
20	291400	27.3N 130.6E	LAND				10962 53611		28.4N 129.5E	47909
21	291500	27.6N 130.8E	LAND				35961 50319		28.4N 129.5E	47909
22	291600	27.8N 130.8E	LAND				35911 53611		28.4N 129.5E	47909
23	291700	28.1N 130.9E	LAND				55911 40119		28.4N 129.5E	47909
24	291800	28.2N 130.9E	LAND				55911 53611		28.4N 129.5E	47909
25	291900	28.5N 131.0E	LAND				55911 50116		28.4N 129.5E	47909
26	292000	28.7N 131.2E	LAND				55911 50316		28.4N 129.5E	47909
27	292000	28.7N 131.2E	LAND				21912 50216		30.6N 131.0E	47869
28	292100	29.0N 131.4E	LAND				55911 50322		28.4N 129.5E	47909
29	292100	28.5N 131.3E	LAND						31.3N 131.9E	
30	292100	29.0N 131.4E	LAND				21912 50219		30.6N 131.0E	47869
31	292200	29.0N 131.4E	LAND						31.3N 131.9E	
32	292200	29.2N 131.5E	LAND				55911 50111		28.4N 129.5E	47909

33	292200	29.2N	131.5E	LAND		21912	50314	30.6N	131.0E	47869
34	292300	29.2N	131.7E	LAND		55911	50711	28.4N	129.5E	47909
35	292300	29.1N	131.5E	LAND	/			31.3N	131.9E	
36	292300	29.4N	131.6E	LAND		10722	50314	30.6N	131.0E	47869
37	300000	29.3N	131.9E	LAND		65941	50711	28.4N	129.5E	47909
38	300000	29.5N	131.8E	LAND		20612	50514	30.6N	131.0E	47869
39	300100	29.4N	132.1E	LAND		65941	50413	28.4N	129.5E	47909
40	300100	29.8N	132.0E	LAND		11512	50316	30.6N	131.0E	47869
41	300200	29.5N	132.5E	LAND	/			31.3N	131.9E	
42	300200	30.0N	132.3E	LAND		51962	50522	30.6N	131.0E	47869
43	300300	30.3N	132.5E	LAND		55/62	50422	30.6N	131.0E	47869
44	300400	30.2N	132.4E	LAND	/			31.3N	131.9E	
45	300400	30.4N	132.7E	LAND		65/42	50416	30.6N	131.0E	47869
46	300500	30.3N	132.9E	LAND	/			31.3N	131.9E	
47	300500	30.8N	133.0E	LAND		65/42	50424	30.6N	131.0E	47869
48	300600	30.5N	133.1E	LAND	/			31.3N	131.9E	
49	300600	30.9N	133.4E	LAND		65///	50622	30.6N	131.0E	47869
50	300700	31.0N	133.8E	LAND		65///	50722	30.6N	131.0E	47869
51	300700	31.1N	133.7E	LAND		55///	/////	33.3N	134.2E	47899
52	300715	31.0N	133.3E	LAND	/			31.3N	131.9E	
53	300800	31.0N	134.1E	LAND		65///	50816	30.6N	131.0E	47869
54	300800	31.1N	134.0E	LAND	/			31.3N	131.9E	
55	300800	31.3N	133.9E	LAND		55//2	50524	33.3N	134.2E	47899
56	300900	31.4N	134.2E	LAND	/			31.3N	131.9E	
57	300900	31.6N	134.4E	LAND		55//2	50524	33.3N	134.2E	47899
58	301000	31.6N	134.5E	LAND	/			31.3N	131.9E	
59	301000	31.9N	134.7E	LAND		55//2	50422	33.3N	134.2E	47899
60	301100	31.9N	135.0E	LAND		75//4	50516	35.3N	138.7E	47639
61	301100	32.2N	135.1E	LAND		55//2	50624	33.3N	134.2E	47899
62	301200	32.3N	135.3E	LAND		65//4	50632	35.3N	138.7E	47639
63	301200	32.5N	135.4E	LAND		55//2	50427	33.3N	134.2E	47899
64	301300	32.9N	135.8E	LAND		65//4	50338	35.3N	138.7E	47639
65	301300	32.8N	135.9E	LAND		55//2	50527	33.3N	134.2E	47899
66	301400	33.0N	136.3E	LAND		65//3	50630	35.3N	138.7E	47639
67	301400	33.1N	136.3E	LAND		55///	50527	33.3N	134.2E	47899
68	301500	33.5N	136.7E	LAND	/			33.6N	135.8E	
69	301500	33.7N	136.6E	LAND		65//3	50427	35.3N	138.7E	47639
70	301600	33.5N	136.9E	LAND		6///4	50622	35.3N	138.7E	47639
71	301700	34.1N	138.2E	LAND	/			33.6N	135.8E	
72	301700	34.2N	138.1E	LAND		30941	50638	35.3N	138.7E	47639
73	301800	34.9N	138.6E	LAND		6///4	50443	35.3N	138.7E	47639
74	301900	35.3N	139.6E	LAND		6///3	50643	35.3N	138.7E	47639
75	302000	35.8N	140.1E	LAND		6///3	50549	35.3N	138.7E	47639
76	302100	36.6N	140.6E	LAND		/////	/////	37.7N	138.8E	47572
77	302100	36.2N	140.9E	LAND		6///3	50649	35.3N	138.7E	47639
78	302200	36.6N	141.6E	LAND		6///3	50543	35.3N	138.7E	47639
79	302300	37.1N	142.3E	LAND		6////	50546	35.3N	138.7E	47639
80	302300	37.6N	141.9E	LAND		65///	50450	38.3N	140.9E	47590
81	010000	38.2N	142.8E	LAND		6////	50365	35.3N	138.7E	47639
* 82	010000	38.8N	142.2E	LAND		65///	50455	38.3N	140.9E	47590
* 83	010100	39.5N	142.3E	LAND		65///	50255	38.3N	140.9E	47590

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TYPHOON JEFF
BEST TRACK DATA

MO/DA/HR	BEST TRACK POSIT	WIND	WARNING POSIT	WIND	24 HOUR FORECAST ERRORS DST	WIND	POSIT	WIND	48 HOUR FORECAST ERRORS DST	WIND	POSIT	WIND	72 HOUR FORECAST ERRORS DST	WIND	POSIT	WIND	ERRORS DST	WIND
072100Z	19.4 146.0	20	0.0 0.0	0.	-0. 0.	0.	0.0 0.0	0.	-0. 0.	0.	0.0 0.0	0.	-0. 0.	0.	0.0 0.0	0.	-0. 0.	0.
072106Z	20.4 146.2	25	0.0 0.0	0.	-0. 0.	0.	0.0 0.0	0.	-0. 0.	0.	0.0 0.0	0.	-0. 0.	0.	0.0 0.0	0.	-0. 0.	0.
072112Z	21.2 146.3	25	0.0 0.0	0.	-0. 0.	0.	0.0 0.0	0.	-0. 0.	0.	0.0 0.0	0.	-0. 0.	0.	0.0 0.0	0.	-0. 0.	0.
072118Z	22.1 146.2	30	0.0 0.0	0.	-0. 0.	0.	0.0 0.0	0.	-0. 0.	0.	0.0 0.0	0.	-0. 0.	0.	0.0 0.0	0.	-0. 0.	0.
072200Z	22.7 146.1	35	22.3 145.8	30.	29. -5.	24.6	140.7	45.	270. -10.	25.8	135.4	65.	642. 10.	26.0	130.0	90.	806. 45.	
072206Z	23.1 145.8	35	23.2 145.1	30.	39. -5.	24.5	142.4	50.	288. -10.	26.0	138.3	65.	491. 10.	26.7	133.9	80.	560. 35.	
072212Z	23.3 145.3	40	23.7 144.6	30.	45. -10.	25.8	141.8	50.	266. -10.	27.7	138.9	65.	414. 10.	29.0	136.0	30.	385. -10.	
072218Z	23.5 145.2	45	23.5 145.5	45.	17. 0.	24.5	144.3	65.	177. 5.	26.2	141.3	30.	268. 30.	28.3	137.4	90.	247. 55.	
072300Z	24.0 145.6	55	23.8 145.4	50.	16. -5.	25.5	144.3	70.	175. 15.	28.9	142.9	90.	116. 45.	32.7	145.4	85.	417. 55.	
072306Z	24.7 146.2	60	24.7 146.2	60.	0. 0.	28.2	149.1	65.	162. 10.	31.9	153.7	50.	542. 5.	35.4	159.5	40.	1151. 15.	
072312Z	25.5 146.7	60	25.7 146.9	65.	16. 5.	29.6	149.7	70.	179. 15.	33.8	153.9	60.	654. 20.	37.9	159.9	45.	1295. 20.	
072318Z	26.0 147.1	60	26.4 147.8	65.	45. 5.	30.2	151.4	65.	317. 15.	34.3	156.0	55.	824. 20.	38.3	161.9	40.	1488. 10.	
072400Z	26.6 147.3	55	26.6 147.4	60.	5. 5.	29.5	149.2	50.	241. 5.	33.8	151.6	40	696. 10.	38.4	156.2	25.	1344. -15.	
072406Z	27.6 147.3	55	27.2 147.8	55.	36. 0.	30.3	149.8	45.	319. 0.	34.6	152.3	35.	810. 10.	0.0	0.0	0.	-0. 0.	
072412Z	28.2 146.7	55	28.4 147.1	50.	24. -5.	31.1	145.9	35.	238. -5.	33.8	145.3	30.	566. 5.	0.0	0.0	0.	-0. 0.	
072418Z	28.2 145.8	50	28.0 145.6	50.	16. 0.	27.6	143.2	35.	64. 0.	26.6	141.2	25.	285. -5.	0.0	0.0	0.	-0. 0.	
072500Z	28.1 144.9	45	27.9 144.8	45.	13. 0.	27.2	142.5	35.	107. 5.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
072506Z	28.0 144.3	45	28.1 144.5	45.	18. 0.	27.6	142.5	35.	178. 10.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
072512Z	27.9 143.2	40	28.1 143.3	45.	13. 5.	28.1	140.7	35.	173. 10.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
072518Z	27.6 142.0	35	28.1 141.5	40.	40. 5.	28.5	136.2	35.	121. 5.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
072600Z	27.2 140.5	30	27.3 140.4	30.	8. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
072606Z	27.1 139.2	25	27.3 139.2	25.	12. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
072612Z	27.0 137.7	25	0.0 0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
072618Z	26.5 135.9	30	0.0 0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
072700Z	25.8 134.2	40	26.0 133.7	35.	30. -5.	25.5	126.6	60.	123. 10.	25.9	121.7	75	190. 10.	27.0	118.0	40.	241. -30.	
072706Z	25.3 132.8	50	25.6 132.4	45.	28. -5.	24.4	126.2	65.	87. 15.	26.4	122.0	80.	140. 10.	28.1	118.9	40.	163. -35.	
072712Z	24.9 131.3	50	24.8 131.2	45.	8. -5.	24.7	126.3	65.	28. 10.	26.0	122.6	80.	65. 10.	27.5	119.5	45.	104. -30.	
072718Z	24.9 130.0	50	24.7 130.2	40.	16. -10.	24.8	125.6	55.	17. -5.	26.1	122.3	70	56. 0.	27.6	119.2	35.	104. -25.	
072800Z	25.0 128.8	50	25.0 129.0	55.	11. 5.	25.6	124.4	70.	48. 5.	27.2	121.3	70	67. 0.	0.0	0.0	0.	-0. 0.	
072806Z	24.9 127.7	50	24.9 127.6	55.	5. 5.	25.4	123.0	70.	76. 0.	27.2	119.5	60	129. -15.	0.0	0.0	0.	-0. 0.	
072812Z	24.8 126.8	55	24.7 126.7	55.	8. 0.	25.4	122.4	65.	81. -5.	28.1	119.7	45.	91. -30.	0.0	0.0	0.	-0. 0.	
072818Z	24.9 125.9	60	25.0 126.0	55.	8. -5.	25.7	122.4	65.	60. -5.	28.0	119.9	45.	60. -15.	0.0	0.0	0.	-0. 0.	
072900Z	25.1 125.1	65	25.1 125.0	65.	5. 0.	26.3	121.4	60.	69. -10.	28.8	119.4	30.	70. -15.	0.0	0.0	0.	-0. 0.	
072906Z	25.5 124.4	70	25.3 124.1	70.	20. 0.	26.4	120.8	60.	28. -15.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
072912Z	25.9 123.8	70	25.9 123.8	70.	0. 0.	27.4	121.7	75.	34. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
072918Z	26.4 123.2	70	26.2 123.1	70.	13. 0.	28.7	120.3	30.	27. -30.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
073000Z	26.9 122.5	70	26.8 122.6	70.	8. 0.	29.2	120.2	25.	22. -20.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
073006Z	27.5 121.9	75	27.5 121.8	65.	5. -10.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
073012Z	27.9 121.4	75	28.1 121.5	65.	13. -10.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
073018Z	28.6 120.8	60	28.5 121.0	50.	12. -10.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
073100Z	29.3 120.6	45	29.4 120.5	35.	8. -10.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
073106Z	30.0 120.5	40	0.0 0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
073112Z	30.7 120.4	35	0.0 0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
073118Z	31.5 120.4	30	0.0 0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
080100Z	32.4 120.6	30	32.5 120.6	35.	16. 5.	36.4	123.1	55.	67. 10.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
080106Z	33.4 121.0	35	33.2 120.9	40.	13. 5.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
080112Z	34.4 121.7	45	34.0 121.7	45.	24. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
080118Z	35.9 122.2	50	35.1 122.5	50.	50. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	
080200Z	37.5 122.9	45	36.9 123.2	40.	39. -5.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	0.0	0.0	0.	-0. 0.	

ALL FORECASTS

	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	18.	132.	342.	639.
AVG RIGHT ANGLE ERROR	13.	80.	170.	345.
AVG INTENSITY MAGNITUDE ERROR	4.	9.	14.	29.
AVG INTENSITY BIAS	-2.	1.	6.	7.
NUMBER OF FORECASTS	40	30	21	13

TYPHOONS WHILE OVER 35 KTS

	WRNG	24-HR	48-HR	72-HR
	19.	130.	283.	439.
	13.	85.	135.	177.
	4.	9.	15.	31.
	-2.	-0.	6.	-1.
	37	26	17	9

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 2668. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 9. KNOTS

TYPHOON JEFF
FIX POSITIONS FOR CYCLONE NO. 7

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
* 1	202100	18.1N 149.6E	PCN 6	T2.0/2.0	INIT OBS	PGTW
* 2	202327	18.4N 150.5E	PCN 5			PGTW
* 3	210000	18.4N 150.7E	PCN 6			PGTW
* 4	210300	19.2N 150.0E	PCN 6	T1.5/1.5	INIT OBS	PGTW
* 5	210420	19.9N 149.2E	PCN 5			PGTW
* 6	210600	20.2N 149.3E	PCN 6			PGTW
* 7	210807	20.7N 147.8E	PCN 6		ULCC FIX	PGTW
8	210906	20.7N 146.7E	PCN 6		ULCC FIX	PGTW
9	211208	21.4N 146.6E	PCN 6		ULCC FIX	PGTW
10	211600	20.8N 146.5E	PCN 6	T2.0/2.0 /S0.0/16HRS	ULCC FIX	PGTW
11	211706	21.0N 145.9E	PCN 5		ULCC FIX	PGTW
* 12	212047	20.8N 145.8E	PCN 6			PGTW
* 13	212100	22.2N 146.9E	PCN 6		ULCC FIX	PGTW
* 14	212145	20.7N 147.0E	PCN 5			PGTW
15	220000	22.4N 146.0E	PCN 6			PGTW
16	220049	22.5N 145.6E	PCN 5			PGTW
17	220300	23.4N 146.6E	PCN 4	T2.5/2.5 /D1.0/24HRS	EXP LLCC	PGTW
18	220600	23.2N 145.3E	PCN 6			PGTW
19	220927	23.5N 145.0E	PCN 6			PGTW
20	221025	23.5N 144.8E	PCN 6			PGTW
21	221200	23.6N 144.6E	PCN 6		ULCC 23.5N 145.2E	PGTW
22	221329	23.5N 145.0E	PCN 6			PGTW
23	221600	23.5N 144.4E	PCN 6	T2.0/2.0+/S0.0/24HRS		PGTW
24	221655	23.7N 144.2E	PCN 6			PGTW
25	221800	23.8N 144.5E	PCN 6			PGTW
26	222025	23.4N 145.5E	PCN 6			PGTW
27	222304	23.9N 145.2E	PCN 5	T2.5/2.5	INIT OBS	RODN
28	222305	23.5N 145.2E	PCN 5			PGTW
29	230000	23.5N 145.2E	PCN 6			PGTW
30	230359	24.5N 145.8E	PCN 5	T3.5/3.5 /D1.0/24HRS		PGTW
31	230600	24.5N 146.2E	PCN 6			PGTW
32	230905	25.3N 146.5E	PCN 6			PGTW
33	231003	25.5N 146.9E	PCN 6		ULAC 25.6N 146.5E	PGTW
34	231200	25.8N 146.8E	PCN 6			PGTW
35	231309	25.9N 147.2E	PCN 6			PGTW
36	231600	26.2N 147.5E	PCN 6			PGTW
37	231644	25.8N 147.6E	PCN 6		ULCC FIX	PGTW

	38	231800	25.7N	147.9E	PCN 6	T3.5/3.5 /D1.5/26HRS		PGTW
*	39	232004	25.8N	148.3E	PCN 6		ULAC 26.3N 147.9E	PGTW
	40	232242	26.3N	147.7E	PCN 6		EXP LLCC ULAC 27.0N 147.4E	PGTW
	41	240008	26.4N	147.7E	PCN 4		EXP LLCC ULAC 27.1N 148.0E	PGTW
	42	240347	26.7N	147.8E	PCN 4	T2.5/3.0-/W1.0/24HRS	EXP LLCC ULAC 28.0N 148.0E	PGTW
	43	240600	27.6N	147.5E	PCN 6			PGTW
	44	240900	28.1N	147.8E	PCN 6		ULCC FIX	PGTW
	45	240941	28.4N	147.9E	PCN 6			RODN
	46	241200	28.3N	147.8E	PCN 6		ULCC FIX	PGTW
*	47	241248	28.2N	148.2E	PCN 6			RKSO
	48	241600	28.3N	147.0E	PCN 6	T2.5/3.5 /W1.0/22HRS	ULCC FIX	PGTW
	49	241634	28.9N	146.6E	PCN 4			PGTW
*	50	241800	29.2N	146.6E	PCN 6			PGTW
	51	241943	28.0N	146.0E	PCN 6			PGTW
	52	242100	28.5N	145.3E	PCN 6		PSBL EXP LLCC	PGTW
	53	242221	28.0N	145.0E	PCN 3		EXP LLCC	PGTW
	54	242347	28.0N	144.8E	PCN 3	T1.5/1.5	INIT OBS	RODN
	55	242348	28.0N	144.9E	PCN 3		EXP LLCC	PGTW
	56	250000	28.0N	144.8E	PCN 4			PGTW
	57	250337	28.3N	144.8E	PCN 4	T2.5/2.5-/S0.0/24HRS		PGTW
	58	250600	28.3N	144.5E	PCN 6			PGTW
	59	250823	28.0N	144.4E	PCN 6			PGTW
	60	250900	27.9N	144.3E	PCN 6			PGTW
	61	250919	28.3N	144.1E	PCN 6			PGTW
	62	251200	28.5N	143.9E	PCN 6			PGTW
	63	251228	27.9N	142.5E	PCN 3	T1.5/1.5	INIT OBS	RODN
	64	251228	28.0N	142.6E	PCN 5		EXP LLCC	PGTW
	65	251600	28.0N	142.0E	PCN 6	T1.5/2.5 /W1.0/24HRS		PGTW
	66	251804	27.8N	140.9E	PCN 6			PGTW
	67	251805	27.0N	142.9E	PCN 5			RKSO
	68	252159	27.4N	140.7E	PCN 3		EXP LLCC	PGTW
	69	252327	27.4N	140.6E	PCN 3		EXP LLCC	PGTW
	70	252327	27.3N	140.5E	PCN 3	T1.5/1.5 /S0.0/24HRS		RODN
	71	260109	27.3N	140.4E	PCN 3			PGTW
	72	260300	27.4N	139.8E	PCN 4	T0.0/1.0 /W2.5/24HRS		PGTW
	73	260508	27.3N	139.4E	PCN 3		EXP LLCC	PGTW
	74	260508	27.1N	139.3E	PCN 3	T1.5/1.5	INIT OBS	RPMK
	75	260943	27.6N	138.5E	PCN 4		EXP LLCC	PGTW
	76	261039	26.7N	138.4E	PCN 5			RKSO
	77	261200	27.2N	137.9E	PCN 6		EXP LLCC	PGTW
	78	261600	26.9N	136.7E	PCN 6	T1.5/1.5 /S0.0/24HRS		PGTW
	79	261754	27.0N	136.6E	PCN 6		PSBL SCNDRY LLCC 26.0N 133.6E	PGTW
*	80	261754	27.8N	136.9E	PCN 5			RKSO
	81	262100	26.1N	134.7E	PCN 6		ULAC 25.8N 134.6E	PGTW
	82	262318	26.3N	133.5E	PCN 5			PGTW
	83	270048	25.5N	133.5E	PCN 3	T3.0/3.0 /D1.5/25HRS		RODN
	84	270048	25.9N	133.2E	PCN 5	T2.5/2.5 /D2.5/22HRS		PGTW
	85	270300	25.6N	133.1E	PCN 6			PGTW
	86	270458	25.3N	132.5E	PCN 5			PGTW
	87	270600	25.4N	132.8E	PCN 6			PGTW
	88	270921	24.9N	132.0E	PCN 5		ULCC FIX	RODN
	89	270921	24.8N	131.6E	PCN 3		ULAC 24.6N 131.4E	PGTW
	90	271017	25.0N	131.8E	PCN 4		ULAC 24.6N 131.4E	PGTW
	91	271200	24.6N	131.3E	PCN 6		ULCC FIX	PGTW
	92	271329	24.6N	131.5E	PCN 5			PGTW
	93	271600	24.4N	130.8E	PCN 6		ULCC FIX	PGTW
	94	271743	24.9N	129.9E	PCN 2		EYE FIX	RODN
	95	271743	24.7N	130.7E	PCN 6	T2.5/2.5 /D1.0/25HRS		PGTW
	96	272100	25.5N	130.0E	PCN 6			PGTW
	97	272256	25.3N	129.0E	PCN 3	T3.0/3.0+/S0.0/23HRS		RODN
	98	272256	25.0N	129.0E	PCN 6			PGTW
	99	280000	25.1N	129.0E	PCN 6			PGTW
	100	280028	24.9N	128.5E	PCN 3			PGTW
	101	280210	24.9N	128.3E	PCN 3	T3.0/3.0	INIT OBS EXP LLCC	RPMK
	102	280300	24.7N	128.5E	PCN 6			PGTW
	103	280600	24.8N	127.4E	PCN 6	T3.0/3.0 /D0.5/29HRS		PGTW
	104	280900	24.7N	127.2E	PCN 6		ULCC FIX	PGTW
	105	281136	24.6N	126.7E	PCN 3		EXP LLCC	RPMK
	106	281136	25.4N	126.4E	PCN 6			RKSO
	107	281200	25.0N	126.7E	PCN 6		ULCC FIX	PGTW
	108	281450	24.6N	126.6E	PCN 6		ULCC FIX	RKSO
	109	281600	24.8N	126.3E	PCN 6	T3.5/3.5-/D1.0/23HRS	ULCC FIX	PGTW
	110	281800	25.1N	126.2E	PCN 6		ULCC FIX	PGTW
	111	282100	25.4N	125.4E	PCN 6			PGTW
	112	282140	24.9N	125.3E	PCN 6			PGTW
	113	290000	25.4N	125.0E	PCN 6			PGTW
	114	290016	25.5N	124.9E	PCN 3	T4.0/4.0-/D1.0/24HRS	PSBL EYE FORMING	RODN
	115	290016	25.3N	124.7E	PCN 5	T3.5/3.5	INIT OBS	RKSO
	116	290149	25.5N	124.7E	PCN 3			RODN
	117	290300	25.2N	124.5E	PCN 6			PGTW
	118	290600	25.6N	124.2E	PCN 2	T4.5/4.5-/D1.5/24HRS	RAGGED EYE FIX	PGTW
	119	290618	25.1N	124.3E	PCN 3			RODN
	120	290900	25.5N	124.0E	PCN 4			PGTW
	121	291020	25.8N	123.9E	PCN 4			PGTW
	122	291114	25.8N	123.5E	PCN 3			RPMK
	123	291114	25.7N	123.9E	PCN 4		ULCC FIX	RODN
	124	291200	25.9N	123.8E	PCN 4			PGTW
	125	291430	26.0N	123.5E	PCN 1			RPMK
	126	291600	26.1N	123.2E	PCN 6	T4.0/4.0-/D0.5/24HRS		PGTW
	127	291800	26.2N	123.1E	PCN 6		ULCC FIX	PGTW
	128	292100	26.6N	122.7E	PCN 6		ULCC FIX	PGTW
	129	292118	26.6N	123.1E	PCN 6			PGTW
	130	292354	26.9N	122.6E	PCN 3	T4.0/4.0	INIT OBS EYE FIX EYE OPN WEST	RPMK
	131	292354	26.8N	122.4E	PCN 1	T4.5/4.5 /D1.0/24HRS	EYE FIX EYE OPN SW	RKSO
	132	300000	26.9N	122.5E	PCN 6		ULCC FIX	PGTW
	133	300300	27.3N	122.0E	PCN 2		EYE FIX	PGTW
	134	300600	27.6N	121.7E	PCN 6	T4.5/4.5 /S0.0/24HRS		PGTW
	135	300607	27.4N	122.0E	PCN 1		EYE FIX	RPMK
	136	300900	27.5N	121.8E	PCN 6		ULCC FIX	PGTW
	137	300959	27.4N	121.5E	PCN 4			PGTW
	138	301052	27.9N	121.6E	PCN 6			PGTW
	139	301200	28.1N	121.7E	PCN 6			PGTW
	140	301409	28.0N	121.4E	PCN 1		EYE FIX	PGTW
	141	301600	28.3N	121.0E	PCN 6			PGTW
	142	301800	28.5N	121.1E	PCN 6			PGTW
	143	301853	28.3N	121.0E	PCN 6		ULCC FIX	RKSO
	144	302100	28.4N	121.4E	PCN 6		ULCC FIX	PGTW
	145	302239	28.8N	121.2E	PCN 4	T3.5/3.5	INIT OBS	RODN
	146	302339	29.4N	121.0E	PCN 3			RODN
	147	310000	29.4N	120.7E	PCN 6		ULCC FIX	PGTW
	148	310108	29.5N	120.4E	PCN 3			PGTW
	149	310109	29.3N	120.7E	PCN 5		ULCC FIX	RPMK
	150	310300	29.9N	120.5E	PCN 6		ULCC FIX	PGTW
	151	310556	30.3N	120.7E	PCN 5			RPMK
	152	310556	30.2N	120.6E	PCN 3			RKSO
	153	310600	30.3N	120.6E	PCN 6			PGTW
	154	310900	30.3N	120.9E	PCN 6			PGTW

155	311119	30.2N	120.0E	PCN 6				RODN
156	311200	30.5N	120.6E	PCN 6				PGTW
*157	311349	30.8N	120.2E	PCN 5				PGTW
*158	311600	31.1N	120.5E	PCN 6				PGTW
159	311800	31.0N	120.4E	PCN 6				PGTW
160	312100	32.6N	120.6E	PCN 6			ULCC FIX	PGTW
161	010400	32.5N	120.9E	PCN 6			ULCC FIX	PGTW
162	010051	32.6N	121.7E	PCN 5			ULCC FIX	RODN
163	010230	32.1N	121.6E	PCN 5				RPMK
164	010300	32.8N	120.8E	PCN 6				PGTW
165	010600	32.9N	121.1E	PCN 6				PGTW
166	010900	33.6N	122.3E	PCN 6			ULCC FIX	PGTW
167	011008	34.0N	122.7E	PCN 5	T3.0/3.0		INIT OBS ULCC FIX	RKSO
*168	011200	34.3N	123.4E	PCN 6			ULCC FIX	PGTW
*169	011600	35.6N	123.8E	PCN 6	T3.5/3.5		INIT OBS	PGTW
*170	011800	36.2N	124.6E	PCN 6			ULCC FIX	PGTW
*171	012100	36.9N	125.2E	PCN 6				PGTW
*172	012156	36.8N	126.7E	PCN 5			ULCC FIX	RPMK
173	020000	37.4N	123.1E	PCN 6				PGTW
*174	020209	36.9N	123.2E	PCN 3	T3.0/3.0		INIT OBS	RPMK
175	020300	37.8N	123.3E	PCN 6	T3.0/3.0		INIT OBS	PGTW
*176	020535	38.4N	124.0E	PCN 3				RPMK
177	020600	38.6N	123.4E	PCN 4			PARTIALLY EXP LLCC	PGTW
178	020900	39.6N	125.0E	PCN 6				PGTW
*179	020946	41.6N	128.1E	PCN 6				RODN
180	021036	40.2N	125.4E	PCN 3			EXP LLCC	RKSO

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR	TDOFF	COMMENTS	RADAR POSITION	SITE WMO NO.
1	272100	25.0N 129.6E	LAND				55//3	52708		26.2N 127.8E	47937
2	272200	25.0N 129.3E	LAND				65//3	72611		26.2N 127.8E	47837
3	280100	25.0N 128.6E	LAND				55//3	72712		26.2N 127.8E	47937
4	280200	25.0N 128.4E	LAND				55//3	72714		26.2N 127.8E	47937
5	280300	24.9N 128.2E	LAND				55//2	72611		26.2N 127.8E	47937
6	280400	24.7N 127.7E	LAND				35//3	5////		24.8N 125.3E	47927
7	280400	25.0N 128.0E	LANt				55//1	72711		26.2N 127.8E	47937
8	280425	25.3N 128.0E	LAND	POOR						26.4N 127.8E	47931
9	280500	25.1N 127.8E	LAND				55//1	72811		26.2N 127.8E	47937
10	280500	24.8N 127.5E	LAND				35//4	52914		24.8N 125.3E	47927
11	280515	24.8N 127.9E	LAND	GOOD		25				26.1N 127.7E	47937
12	280600	24.6N 127.5E	LAND				35//3	51814		24.8N 125.3E	47927
13	280600	25.0N 127.6E	LAND				55//1	72811		26.2N 127.8E	47937
14	280700	24.8N 127.4E	LAND				35//4	53322		24.8N 125.3E	47927
15	280700	24.8N 127.4E	LAND				55//1	72512		26.2N 127.8E	47937
16	280715	24.8N 127.3E	LAND	GOOD		25				26.1N 127.7E	47937
17	280800	24.7N 127.3E	LAND				65//2	72312		26.2N 127.8E	47937
18	280800	24.8N 127.0E	LAND				35//4	52722		24.8N 125.3E	47927
19	280900	24.7N 127.2E	LAND				65//2	72308		26.2N 127.8E	47937
20	280900	24.7N 126.9E	LAND				65//4	52310		24.8N 125.3E	47927
21	280901	25.0N 127.0E	LAND	POOR		25			YOZADAKE 280900Z	26.1N 127.7E	47937
22	281000	24.5N 126.4E	LAND				65//3	52219		24.8N 125.3E	47927
23	281000	24.7N 127.2E	LAND				65//2	72404		26.2N 127.8E	47937
24	281100	24.6N 126.8E	LAND				65//3	5////		24.8N 125.3E	47927
25	281100	24.7N 126.9E	LAND				65//1	72716		26.2N 127.8E	47937
26	281101	24.5N 126.5E	LAND	FAIR		50			YOZADAKE 281100Z	26.1N 127.7E	47937
27	281200	24.6N 126.8E	LAND				6//13	40000		24.3N 124.2E	47918
28	281200	24.7N 126.8E	LAND				65//3	50104		24.8N 125.3E	47927
29	281200	24.7N 126.8E	LAND				65//1	72709		26.2N 127.8E	47937
30	281300	24.8N 126.7E	LAND				65//3	53211		24.8N 125.3E	47927
31	281300	24.7N 126.7E	LAND				65//2	72709		26.2N 127.8E	47937
32	281400	24.8N 126.5E	LAND				65//3	52711		24.8N 125.3E	47927
33	281400	24.8N 126.5E	LAND				65//1	72908		26.2N 127.8E	47937
34	281500	24.7N 126.2E	LAND				6//13	72811		24.3N 124.2E	47918
35	281500	25.0N 126.4E	LAND				65//1	73111		26.2N 127.8E	47937
36	281500	24.8N 126.3E	LAND				55//3	52908		24.8N 125.3E	47927
37	281600	24.8N 126.2E	LAND				65//1	72809		26.2N 127.8E	47937
38	281600	24.8N 126.2E	LAND				6///3	52511		24.8N 125.3E	47927
39	281700	24.9N 126.1E	LAND				65//2	72908		26.2N 127.8E	47937
40	281700	24.9N 126.1E	LAND				5///3	53108		24.8N 125.3E	47927
41	281800	25.0N 125.9E	LAND				6//13	42916		24.3N 124.2E	47918
42	281800	24.9N 125.9E	LAND				5///3	52911		24.8N 125.3E	47927
43	281800	25.0N 125.9E	LAND				65//2	72808		26.2N 127.8E	47937
44	281900	24.9N 125.8E	LAND				6//14	52208		24.3N 124.2E	47918
45	281900	25.2N 125.6E	LAND				65//2	73113		26.2N 127.8E	47937
46	281900	25.0N 125.7E	LAND				6///3	52811		24.8N 125.3E	47927
47	282000	24.8N 125.5E	LAND				6//14	52618		24.3N 124.2E	47918
48	282000	25.0N 125.5E	LAND				5///3	52711		24.8N 125.3E	47927
49	282000	25.2N 125.4E	LAND				65//2	73014		26.2N 127.8E	47937
50	282100	25.0N 125.4E	LAND				6//13	72708		24.3N 124.2E	47918
51	282100	25.1N 125.4E	LAND				65//2	72809		26.2N 127.8E	47937
52	282100	25.0N 125.5E	LAND				5///3	52000		24.8N 125.3E	47927
53	282200	25.1N 125.3E	LAND				6//13	73009		24.3N 124.2E	47918
54	282200	24.9N 125.3E	LAND				35//3	52516		24.8N 125.3E	47927
55	282200	25.2N 125.4E	LAND				65//2	72704		26.2N 127.8E	47937
56	282300	25.2N 125.4E	LAND				6//23	73508		24.3N 124.2E	47918
57	282300	25.3N 125.3E	LAND				65//3	73204		26.2N 127.8E	47937
58	282300	25.2N 125.3E	LAND				25//3	50114		24.8N 125.3E	47927
59	290000	25.3N 125.2E	LAND				65//1	73204		26.2N 127.8E	47937
60	290000	25.1N 125.1E	LAND				35//3	52410		24.8N 125.3E	47927
61	290100	25.2N 125.1E	LAND				35//3	73205		24.8N 125.3E	47927
62	290200	25.3N 124.9E	LAND				65//3	72709		24.3N 124.2E	47918
63	290200	25.3N 124.9E	LAND				55//3	53111		24.8N 125.3E	47927
64	290200	25.3N 125.0E	LAND				6///2	27805		26.2N 127.8E	47937
65	290400	25.4N 124.5E	LAND				65//3	52708		24.3N 124.2E	47918
* 66	290400	25.4N 125.6E	LAND				75//2	52712		26.2N 127.8E	47937
67	290400	25.6N 124.4E	LAND				35//3	52916		24.8N 125.3E	47927
68	290500	25.5N 124.5E	LAND				65//3	73110		24.3N 124.2E	47918
69	290500	25.6N 124.4E	LAND				35//3	50000		24.8N 125.3E	47927
70	290600	25.6N 124.1E	LAND				6////	54963		24.0N 121.6E	46699
71	290600	25.5N 124.3E	LAND				35//3	50000		24.8N 125.3E	47927
72	290600	25.4N 124.3E	LAND				65//3	72708		24.3N 124.2E	47918
73	290700	25.6N 124.3E	LAND				65//3	50000		24.8N 125.3E	47927
74	290700	25.6N 124.2E	LAND	GOOD		40			MOV 302@	26.3N 126.8E	47929
75	290700	25.4N 124.3E	LAND				65//3	72705		24.3N 124.2E	47918
76	290720	25.6N 124.0E	LAND				6////	52809		25.1N 121.6E	46696
77	290800	25.7N 124.2E	LAND				65//3	53011		24.8N 125.3E	47927
78	290800	25.3N 124.2E	LAND				6///3	72402		24.3N 124.2E	47918
79	290800	25.7N 124.3E	LAND				34933	50411		24.0N 121.6E	46699
80	290830	25.7N 124.3E	LAND				6////	5////		25.1N 121.6E	46696
81	290900	25.7N 124.0E	LAND				25//4	52711		24.8N 125.3E	47927
82	290900	25.7N 124.1E	LAND	FAIR		60			MOV 3515	26.3N 126.8E	47929
83	290900	25.8N 124.0E	LAND				22923	53016		24.0N 121.6E	46699
84	290930	25.8N 124.3E	LAND				6////	52909		25.1N 121.6E	46696
85	291000	25.7N 124.2E	LAND	FAIR		40				26.3N 126.8E	47929
86	291000	25.8N 123.9E	LAND				55//4	53108		24.8N 125.3E	47927
87	291030	25.2N 124.1E	LAND				6////	52807		25.1N 121.6E	46696
88	291100	25.9N 123.9E	LAND				55//2	53408		24.8N 125.3E	47927
89	291100	25.8N 124.0E	LAND				25923	52305		24.0N 121.6E	46699
90	291200	26.0N 123.7E	LAND				65//2	52808		24.8N 125.3E	47927
91	291200	26.0N 123.8E	LAND				22363	53106		24.0N 121.6E	46699
92	291300	26.0N 123.5E	LAND				65//2	52814		24.8N 125.3E	47927
* 93	291340	25.6N 124.1E	LAND				6////	53406		25.1N 121.6E	46696
94	291400	26.2N 123.3E	LAND				65//2	53311		24.8N 125.3E	47927
95	291430	26.3N 123.3E	LAND				6////	53203		25.1N 121.6E	46696
96	291500	26.2N 123.2E	LAND				65//2	52808		24.8N 125.3E	47927
97	291600	26.4N 122.9E	LAND				35963	53414		24.0N 121.6E	46699
98	302214	26.7N 122.7E	ACFT	FAIR						26.6N 123.5E	
99	273335	25.5N 129.2E	LAND	POOR						26.4N 127.8E	47931

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	301800	28.6N 120.7E	050	020	58653 58659 58646 58666
2	302100	29.0N 120.7E	040	015	58653 58556 58549
3	310000	29.3N 120.8E	040	015	58556 58653 58549
4	310300	29.7N 120.6E	030	020	58556 58457 58549
5	310600	30.0N 120.5E	030	025	58457 58556 58549
6	310900	30.5N 120.5E	030	015	58457 58464 58358 58445
7	311200	30.8N 120.2E	030	030	58457 58445 58358 58345
8	311800	31.6N 120.3E	030	040	58345 58367 58265 58251
9	312100	32.0N 120.6E	030	015	58259 58343 58358 58251
10	010000	32.3N 120.8E	030	015	58259 58251 58343
11	010300	32.8N 121.0E	020	030	58251 58265 58150
12	010600	33.2N 121.0E	020	030	58251 58259 58150

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TYPHOON KIT
BEST TRACK DATA

MO/DA/HR	BEST TRACK POSIT	WIND	WARNING POSIT	WIND	24 HOUR FORECAST ERRORS DST	WIND	POSIT	WIND	48 HOUR FORECAST ERRORS DST	WIND	POSIT	WIND	72 HOUR FORECAST ERRORS DST	WIND	POSIT	WIND	ERRORS DST	WIND
073106Z	20.8 145.9	20	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
073112Z	20.8 145.0	20	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
073118Z	20.9 144.1	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
080100Z	21.2 143.0	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
080106Z	21.7 142.0	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
080112Z	22.3 140.7	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
080118Z	23.0 139.2	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
080200Z	23.7 137.7	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
080206Z	24.5 136.6	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
080212Z	25.0 135.8	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
080218Z	25.5 135.2	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
080300Z	25.9 134.7	25	25.9 134.5	25.	11.	0.	28.3 132.6	45.	58.	10.	32.2 132.7	55.	249.	5.	37.4 134.5	40.	524.	-20.
080306Z	26.4 134.2	30	27.2 134.1	30.	48.	0.	31.5 133.5	45.	231.	5.	36.0 135.2	30.	490.	-25.	0.0 0.0	0.	-0.	0.
080312Z	26.8 133.9	30	27.9 133.9	30.	66.	0.	32.7 133.9	40.	302.	-5.	37.9 137.1	30.	619.	-25.	0.0 0.0	0.	-0.	0.
080318Z	27.3 133.6	30	28.3 133.5	30.	60.	0.	32.9 133.9	40.	311.	-5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
080400Z	27.5 133.2	35	27.6 133.0	35.	12.	0.	29.9 131.4	50.	112.	0.	34.4 131.3	50.	333.	-10.	39.2 134.6	50.	604.	-30.
080406Z	27.7 132.8	40	27.8 132.7	40.	8.	0.	30.0 131.5	55.	105.	0.	34.4 132.0	45.	324.	-20.	39.3 135.0	45.	597.	-35.
080412Z	27.8 132.6	45	27.8 132.3	40.	16.	-5.	29.6 130.8	55.	91.	0.	34.5 131.7	35.	326.	-35.	39.4 136.5	35.	611.	-45.
080418Z	27.9 132.3	45	27.9 132.1	45.	11.	0.	30.2 130.6	55.	116.	0.	35.2 132.4	35.	360.	-40.	40.0 137.6	35.	666.	-45.
080500Z	28.1 132.0	50	28.1 131.9	50.	5.	0.	30.3 130.7	60.	111.	0.	35.6 131.3	35.	264.	-45.	38.6 135.6	35.	552.	-45.
080506Z	28.3 132.0	55	28.4 131.9	55.	8.	0.	30.8 131.3	75.	118.	10.	34.6 132.2	40.	300.	-40.	39.5 135.5	35.	597.	-50.
080512Z	28.5 132.0	55	28.6 131.9	55.	8.	0.	30.0 131.6	75.	68.	5.	33.8 131.6	65.	120.	-15.	37.5 134.5	35.	477.	-50.
080518Z	28.7 132.0	55	28.7 131.9	55.	5.	0.	30.4 131.6	70.	83.	-5.	33.3 131.7	45.	184.	-35.	38.1 135.2	35.	531.	-45.
080600Z	28.9 132.1	60	29.0 132.1	60.	6.	0.	30.4 132.1	70.	68.	-10.	33.2 132.7	65.	203.	-15.	37.9 136.3	35.	570.	-40.
080606Z	29.0 132.2	65	29.1 132.3	65.	8.	0.	30.1 132.3	70.	30.	-10.	32.1 132.7	65.	177.	-20.	35.8 134.5	45.	441.	-30.
080612Z	29.1 132.4	70	29.1 132.7	75.	16.	5.	29.9 133.9	85.	115.	5.	31.8 134.7	85.	305.	0.	33.6 135.0	85.	442.	10.
080618Z	29.2 132.4	75	29.2 132.5	75.	5.	0.	29.8 133.3	85.	123.	5.	31.6 134.2	85.	317.	5.	33.6 134.8	85.	429.	15.
080700Z	29.3 132.4	80	29.3 132.3	80.	5.	0.	30.0 133.0	90.	143.	10.	31.8 134.1	85.	357.	10.	33.7 134.6	80.	415.	15.
080706Z	29.6 132.3	80	29.5 132.4	80.	8.	0.	30.5 132.9	85.	171.	0.	32.3 134.2	85.	390.	10.	34.2 134.8	80.	396.	20.
080712Z	30.0 131.7	80	30.0 131.8	80.	8.	0.	32.8 130.6	60.	137.	-25.	36.6 131.6	50.	335.	-25.	0.0 0.0	0.	-0.	0.
080718Z	30.3 131.0	80	30.2 131.0	80.	6.	0.	33.0 129.5	65.	118.	-15.	37.1 131.3	55.	322.	-15.	0.0 0.0	0.	-0.	0.
080800Z	30.5 130.3	80	30.5 130.3	80.	0.	0.	33.3 128.8	75.	112.	0.	37.6 131.3	55.	306.	-10.	0.0 0.0	0.	-0.	0.
080806Z	30.8 129.6	85	30.8 129.5	85.	5.	0.	33.5 127.2	90.	64.	15.	38.7 131.2	60.	286.	0.	0.0 0.0	0.	-0.	0.
080812Z	31.1 128.8	85	31.0 128.8	85.	6.	0.	33.7 126.7	85.	39.	10.	39.0 130.2	50.	155.	10.	0.0 0.0	0.	-0.	0.
080818Z	31.5 128.0	80	31.5 127.9	85.	5.	5.	35.0 126.9	75.	85.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
080900Z	32.1 127.1	75	32.1 127.1	75.	0.	0.	36.2 127.7	50.	123.	-15.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
080906Z	32.6 126.5	75	32.6 126.6	75.	5.	0.	37.2 128.7	45.	139.	-15.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
080912Z	33.2 126.2	75	33.1 126.3	75.	8.	0.	36.9 128.2	45.	27.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
080918Z	33.7 126.5	70	34.0 126.1	75.	19.	5.	38.4 128.3	50.	100.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
081000Z	34.5 126.3	65	34.3 126.4	65.	13.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
081006Z	35.4 126.9	60	35.4 126.7	60.	10.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
081012Z	36.7 128.7	40	36.8 128.5	45.	11.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
081018Z	39.0 130.3	45	38.4 130.2	45.	36.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
081100Z	40.8 132.3	45	41.1 131.5	40.	40.	-5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

ALL FORECASTS	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	14.	118.	305.	523.
AVG RIGHT ANGLE ERROR	9.	56.	156.	259.
AVG INTENSITY MAGNITUDE ERROR	1.	7.	19.	33.
AVG INTENSITY BIAS	0.	-1.	-15.	-25.
NUMBER OF FORECASTS	33	28	22	15

TYPHOONS WHILE OVER 35 KTS	WRNG	24-HR	48-HR	72-HR
	10.	118.	305.	523.
	6.	56.	156.	259.
	1.	7.	19.	33.
	0.	-1.	-15.	-25.
	29	28	22	15

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1953. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 8. KNOTS

TYPHOON KIT
FIX POSITIONS FOR CYCLONE NO. 8

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	310300	20.9N 145.5E	PCN 6	T1.0/1.0	INIT OBS	PGTW
	2	310600	20.8N 146.0E	PCN 6			PGTW
	3	310900	21.1N 145.9E	PCN 6			PGTW
	4	311200	21.3N 145.9E	PCN 5			PGTW
	5	311600	20.8N 144.2E	PCN 6	T1.5/1.5	INIT OBS ULCC FIX	PGTW
	6	311700	21.2N 144.5E	PCN 6			PGTW
	7	311800	20.6N 144.5E	PCN 6		ULCC FIX	PGTW
	8	312036	20.3N 143.5E	PCN 6			PGTW
	9	312129	21.0N 143.8E	PCN 6			PGTW
	10	010048	21.7N 143.1E	PCN 5			PGTW
	11	010300	21.9N 142.9E	PCN 6	T1.5/1.5 /D0.5/24HRS		PGTW
*	12	010403	20.8N 140.9E	PCN 5	T2.0/2.0	INIT OBS	PGTW
	13	010916	22.2N 141.0E	PCN 6			RODN
	14	011008	22.1N 141.0E	PCN 6			PGTW
	15	011200	22.8N 140.2E	PCN 6			PGTW
	16	011329	22.5N 141.3E	PCN 5			PGTW
	17	011600	22.9N 139.3E	PCN 6	T1.5/1.5 /S0.0/24HRS		PGTW
	18	011649	23.0N 139.2E	PCN 6			PGTW
	19	011800	23.0N 138.7E	PCN 6			PGTW
	20	012056	22.7N 138.2E	PCN 6			PGTW
	21	012248	23.5N 138.1E	PCN 5			PGTW
	22	020028	24.1N 137.7E	PCN 3			PGTW
	23	020300	24.8N 137.4E	PCN 4	T1.5/1.5 /S0.0/24HRS		PGTW
	24	020535	24.5N 137.1E	PCN 5			PGTW
	25	020855	24.9N 136.2E	PCN 6		EXP LLCC	PGTW
	26	021308	25.4N 135.8E	PCN 6			PGTW
	27	021600	25.8N 135.8E	PCN 6			PGTW
	28	021820	25.6N 135.3E	PCN 6	T2.0/2.0 /D0.5/24HRS		PGTW
	29	022135	26.3N 135.3E	PCN 6			PGTW
	30	022226	26.3N 134.7E	PCN 6			PGTW
	31	030000	26.7N 134.6E	PCN 6			PGTW
	32	030300	27.1N 134.5E	PCN 6	T2.0/2.0 /D0.5/24HRS		PGTW
	33	030524	27.3N 134.2E	PCN 5			PGTW
*	34	030900	28.0N 134.5E	PCN 6			PGTW
*	35	030924	27.9N 134.0E	PCN 6			PGTW
	36	031015	27.7N 134.3E	PCN 5	T2.0/2.0	INIT OBS	PGTW
	37	031106	28.0N 134.0E	PCN 6			RPMK
*	38	031200	28.1N 134.0E	PCN 6			RPMK
	39	031430	28.0N 133.2E	PCN 5			PGTW
	40	031600	28.1N 134.0E	PCN 6	T2.0/2.0 /S0.0/24HRS		RODN
	41	031810	28.0N 133.4E	PCN 5			PGTW
	42	031810	27.9N 132.8E	PCN 5			PGTW
	43	032114	27.8N 133.4E	PCN 3			RPMK
	44	032345	27.5N 133.3E	PCN 3			PGTW
							RPMK

45	032345	27.7N	133.1E	PCN 5	T2.0/2.0	INIT OBS EXP LLCC	RODN
46	040129	27.4N	132.9E	PCN 5			PGTW
47	040129	28.2N	133.0E	PCN 5	T1.5/1.5	INIT OBS ULCC FIX	RKSO
48	040300	27.7N	132.5E	PCN 6	T2.5/2.5 /D0.5/24HRS		PGTW
49	040513	28.0N	132.9E	PCN 5		ULCC FIX	PGTW
50	040600	27.9N	132.8E	PCN 6		ULCC FIX	PGTW
51	040900	28.0N	132.9E	PCN 6			PGTW
52	040954	27.8N	132.6E	PCN 5			PGTW
53	041044	27.7N	133.0E	PCN 3		PARTIALLY EXP LLCC	RPMK
54	041200	27.9N	133.0E	PCN 6			PGTW
55	041600	27.9N	132.7E	PCN 6	T2.0/2.0 /S0.0/24HRS		PGTW
56	041759	27.5N	132.7E	PCN 5			PGTW
57	041759	27.9N	132.1E	PCN 5			RKSO
58	042053	28.2N	132.0E	PCN 5			RKSO
59	042100	28.2N	131.3E	PCN 6			PGTW
60	042323	28.4N	132.1E	PCN 5			PGTW
61	042323	28.4N	132.0E	PCN 5	T3.5/3.5 /D2.0/22HRS		RKSO
62	050000	28.3N	131.9E	PCN 6			PGTW
63	050108	28.4N	132.0E	PCN 5			PGTW
64	050108	28.1N	132.1E	PCN 5	T3.5/3.5 /D1.5/25HRS		RODN
65	050300	28.4N	132.1E	PCN 6	T3.5/3.5-/D1.0/24HRS		PGTW
66	050502	28.3N	131.6E	PCN 5			PGTW
67	050502	28.4N	131.7E	PCN 3			RODN
68	050600	28.5N	131.9E	PCN 6			PGTW
69	050932	28.4N	131.4E	PCN 6		ULCC FIX	PGTW
70	051021	28.6N	131.8E	PCN 4			RODN
71	051022	28.6N	131.1E	PCN 6		ULCC FIX	PGTW
72	051200	28.6N	131.5E	PCN 6		ULCC FIX	PGTW
73	051349	28.7N	131.7E	PCN 5		ULCC FIX	PGTW
74	051600	29.4N	131.4E	PCN 6	T2.5/2.5 /D0.5/24HRS	ULCC FIX	PGTW
75	051748	29.0N	131.6E	PCN 6		EYE FIX	PGTW
76	051749	28.9N	131.9E	PCN 5		ULCC FIX	RKSO
77	052031	29.1N	132.0E	PCN 6		ULCC FIX	PGTW
78	052100	29.3N	132.1E	PCN 6		ULCC FIX	PGTW
79	052301	28.8N	132.0E	PCN 3	T3.5/3.5 /S0.0/24HRS		RODN
80	052301	28.9N	132.0E	PCN 5	T3.5/3.5 /S0.0/24HRS		RKSO
81	060000	28.9N	132.2E	PCN 2	T4.0/4.0 /D0.5/21HRS		PGTW
82	060048	28.9N	132.2E	PCN 3	T3.5/3.5	INIT OBS	RPMK
83	060300	29.0N	132.3E	PCN 2			PGTW
84	060451	29.0N	132.2E	PCN 1		EYE FIX	RODN
85	060600	29.0N	132.6E	PCN 2			PGTW
86	060911	29.2N	132.4E	PCN 1		EYE OPN SW	RKSO
87	061052	28.9N	132.8E	PCN 1		EYE FIX 5NM	RODN
88	061200	29.0N	132.7E	PCN 2		EYE FIX EYE DIA 3NM	PGTW
89	061329	29.1N	132.5E	PCN 1		EYE FIX EYE DIA 3NM	PGTW
90	061329	29.2N	132.5E	PCN 1		EYE FIX	RKSO
91	061600	29.2N	132.5E	PCN 2	T4.0/4.0 /D1.5/24HRS	EYE FIX	PGTW
92	061737	29.2N	132.5E	PCN 1		EYE FIX	RKSO
93	061800	29.3N	132.5E	PCN 2		EYE FIX	PGTW
94	062010	29.2N	132.1E	PCN 4		POOR EYE DEFINITION	PGTW
95	062100	29.3N	132.2E	PCN 4		POOR EYE DEFINITION	PGTW
96	062239	29.2N	132.2E	PCN 1	T4.5/4.5 /D1.0/23HRS	EYE FIX	RODN
97	070028	29.3N	132.4E	PCN 1		EYE FIX	PGTW
98	070300	29.5N	132.4E	PCN 2	T4.5/4.5 /D0.5/27HRS		PGTW
99	070440	29.7N	132.1E	PCN 1		EYE FIX 10NM	RODN
100	070600	29.7N	132.3E	PCN 2		EYE FIX	PGTW
101	070900	29.9N	132.1E	PCN 2		EYE FIX	PGTW
102	070938	29.9N	131.8E	PCN 2			RODN
103	071031	30.0N	132.2E	PCN 1		EYE FIX	RPMK
104	071200	30.1N	131.9E	PCN 2		EYE FIX	PGTW
105	071308	30.0N	131.3E	PCN 1		EYE FIX	PGTW
106	071726	30.1N	130.8E	PCN 2	T4.5/4.5 /D0.5/26HRS	EYE FIX	PGTW
107	071726	30.2N	131.1E	PCN 5		ULCC FIX	RKSO
108	072100	30.2N	130.6E	PCN 2			PGTW
109	072130	30.3N	130.9E	PCN 3	T4.0/4.0	INIT OBS	RPMK
110	072359	30.4N	130.1E	PCN 3	T4.0/4.0 /W0.5/25HRS		RODN
111	072359	30.5N	130.5E	PCN 1	T4.0/4.0	INIT OBS RGD EYE FIX	RKSO
112	080000	30.4N	130.4E	PCN 4			PGTW
113	080008	30.4N	130.0E	PCN 5			PGTW
114	080300	30.6N	129.9E	PCN 6			PGTW
115	080430	30.6N	129.3E	PCN 1		EYE FIX	RODN
116	080430	30.8N	129.6E	PCN 1	T4.5/4.5 /S0.0/25HRS	EYE FIX	PGTW
117	080600	30.7N	129.6E	PCN 4		VIS EYE (POORLY DEFINED)	PGTW
118	080900	31.0N	129.1E	PCN 6			PGTW
119	081010	30.9N	129.1E	PCN 1		EYE FIX	PGTW
120	081057	31.0N	129.1E	PCN 1		EYE FIX	RPMK
121	081200	30.9N	128.9E	PCN 2		EYE FIX	PGTW
122	081430	31.2N	128.7E	PCN 2		EYE FIX	RKSO
123	081600	31.1N	128.2E	PCN 6	T4.5/4.5 /S0.0/23HRS		PGTW
124	081800	31.2N	127.8E	PCN 6			PGTW
125	081858	31.4N	127.8E	PCN 5			RKSO
126	082100	31.4N	127.5E	PCN 6			PGTW
127	082109	31.9N	127.0E	PCN 3	T3.0/4.0 /W1.0/21HRS	PARTIALLY EXP LLCC	RODN
128	082109	31.8N	127.1E	PCN 1	T4.0/4.0-/S0.0/24HRS	RGD EYE FIX	RPMK
129	082337	32.2N	127.0E	PCN 3			RODN
130	082337	32.3N	127.0E	PCN 3		PARTIALLY EXP LLCC	RPMK
131	090000	32.0N	127.2E	PCN 6			PGTW
132	090129	32.4N	127.0E	PCN 3	T4.0/4.0 /S0.0/25HRS		RKSO
133	090300	32.0N	126.7E	PCN 6			PGTW
134	090600	32.3N	126.6E	PCN 6			PGTW
135	090601	32.5N	127.2E	PCN 1		EYE FIX	RODN
136	090948	32.5N	126.3E	PCN 4	T4.5/4.5-/S0.0/29HRS		PGTW
137	091200	33.0N	126.5E	PCN 2			PGTW
138	091409	33.2N	126.2E	PCN 1		EYEWALL OPN ESE	RKSO
139	091600	33.5N	125.5E	PCN 6	T3.5/4.5 /W1.0/24HRS		PGTW
140	091800	33.7N	125.9E	PCN 6			PGTW
141	091847	33.1N	126.3E	PCN 5		ULCC FIX	RKSO
142	092100	33.7N	126.1E	PCN 6			PGTW
143	092314	33.9N	125.8E	PCN 3	T3.0/3.0-/W0.5/26HRS		RODN
144	100000	34.3N	126.4E	PCN 2		EYE FIX OPN SW	PGTW
145	100108	34.3N	125.1E	PCN 3	T3.0/4.0 /W1.0/26HRS		RPMK
146	100300	35.1N	126.5E	PCN 4	T3.5/4.5 /W1.0/18HRS	EXP LLCC	PGTW
147	100550	35.2N	127.6E	PCN 3			RPMK
148	100550	35.5N	127.9E	PCN 5			RODN
149	100600	35.5N	127.3E	PCN 6			PGTW
150	100900	35.9N	128.1E	PCN 6		ULCC FIX	PGTW
151	101013	36.7N	128.8E	PCN 6			RODN
152	101109	36.1N	129.5E	PCN 6			RODN
153	101109	37.0N	128.4E	PCN 5			RKSO
154	101200	36.9N	128.6E	PCN 6		ULCC FIX	PGTW
155	101349	37.2N	129.9E	PCN 6			RODN
156	101600	38.1N	129.5E	PCN 6	T2.5/3.0 /W1.0/24HRS		PGTW
157	101800	39.0N	130.2E	PCN 6			PGTW
158	101836	39.2N	130.5E	PCN 5			RKSO
159	102026	40.4N	131.1E	PCN 5			RKSO
160	102100	40.6N	131.6E	PCN 6			PGTW
161	102253	41.0N	131.2E	PCN 5			RKSO
162	110000	40.9N	132.1E	PCN 6			PGTW

163	110048	41.7N 133.7E	PCN 5				RODN
164	110300	41.0N 133.6E	PCN 6	T2.5/3.0 /W1.0/24HRS	PARTIALLY EXP LLCC		PGTW
165	110600	42.5N 133.6E	PCN 6				PGTW

TYPHOON KIT
FIX POSITIONS FOR CYCLONE NO. 8

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN- DIAM/TATION	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	020516	24.1N 136.6E	1500FT		1005	20 110 86	170 30 110 86	8 15			+25 +26 +23 24	2
2	022204	25.8N 134.6E	1500FT		1000	22 270 30	290 28 280 45	5 3			+26 +27 +25	3
3	030040	25.9N 134.5E	1500FT		1000	25 070 30	290 28 180 32	5 3			+27 +26 +25 28	3
4	030645	26.3N 134.1E	1500FT		998	35 180 12	240 28 180 14	5 10			+27 +26 +26 27	4
5	030944	26.5N 134.1E	1500FT		998	40 340 20	110 32 060 66	5 5			+27 +26 +25 27	4
6	032221	27.4N 133.2E	1500FT		999	40 360 10	100 35 360 34	8 3			+25 +26 +26 29	5
7	040027	27.5N 133.1E	1500FT		999	35 100 15	180 37 100 35	10 3	CIRCULAR	35	+24 +26 +26 37	5
8	040637	27.7N 132.8E	1500FT		994	35 230 50	230 34 140 85	10 4	CIRCULAR	25	+25 +24 +24	6
9	040927	27.5N 132.5E	1500FT		994	40 060 40	120 46 060 30	5 3	CIRCULAR	14	+25 +24 +24	6
10	042110	28.0N 132.1E	1500FT		993	50 110 12	220 47 110 10	5 5	CIRCULAR	12	+26 +26 +25 30	7
11	050020	28.1N 131.9E	1500FT		994	65 100 20	170 41 070 12	5 5	CIRCULAR	13	+25 +27 +25 33	7
12	050639	28.4N 132.0E	1500FT		990	60 270 10	340 54 270 15	10 5	CIRCULAR	15	+27 +28 +27 28	8
13	050935	28.5N 132.0E	700MB	2973	984	60 300 12	150 44 040 23	8 2	CONCENTRIC	4 20	+13 +14 +14	8
14	052137	28.8N 132.1E	700MB	2963		60 130 15	220 57 130 25	6 1	CIRCULAR	10	+12 +14 +12	9
15	060034	28.8N 132.2E	700MB	2945	983	60 010 15	130 59 010 17	5 2	CIRCULAR	12	+12 +14 +10	9
16	060634	29.0N 132.5E	700MB	2838	970	50 290 10	230 71 120 10	5 5	CIRCULAR	8	+14 +16 +14	10
17	060940	29.1N 132.6E	700MB	2781	961	70 130 4	030 78 140 8	5 5	CIRCULAR	10	+15 +18 +13 29	10
18	062135	29.3N 132.4E	700MB	2733		90 300 6	060 83 170 6	5 1	ELLIPTICAL	12 8 360	+13 +15 +11	11
19	070030	29.3N 132.3E	700MB	2776	966	80 270 6	350 74 090 16	4 1	ELLIPTICAL	15 10 330	+14 +14 +13	11
20	070630	29.6N 132.4E	700MB	2782		70 260 10	330 70 130 15	10 1	CIRCULAR	10	+11 +15 +12	12
21	070913	29.9N 132.0E	700MB	2792	966	85 030 10	130 77 030 8	5 1	CIRCULAR	10	+12 +16 +12	12
22	072142	30.4N 130.6E	700MB	2793		65 060 8	330 76 230 6	5 5	CIRCULAR	10	+13 +15 +15	13
23	080048	30.6N 130.2E	700MB	2785	965	75 060 30	130 72 060 16	3 5	ELLIPTICAL	13 10 90	+14 +16 +16 22	13
24	080611	30.8N 129.5E	700MB	2748	960	65 230 20	240 79 110 10	5 2	ELLIPTICAL	13 10 110	+11 +17 +12	14
25	080858	30.9N 129.1E	700MB	2729	959	50 120 30	150 86 090 12	5 2	CIRCULAR	10	+12 +17 +12	14
26	082136	31.9N 127.5E	700MB	2853		65 210 20	270 59 170 13	10 1	CIRCULAR	12	+15 +18 +15	15
27	090027	32.2N 127.1E	700MB	2853	971	55 140 45	200 55 140 20	10 2	CIRCULAR	12	+12 +18 +14	15
28	090651	32.6N 126.6E	700MB	2809	968	75 050 55	150 75 060 28	5 5	CIRCULAR	25	+10 +18 +12 27	16
29	090923	32.8N 126.6E	700MB	2827	968	75 300 20	330 74 230 17	5 5	CIRCULAR	25	+11 +19 +11 26	16

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR TDOFF	COMMENTS	RADAR POSITION	SITE WMO NO.
* 1	040300	28.1N 132.7E	LAND				65//1 /////		28.4N 129.5E	47909
** 2	040400	28.2N 132.7E	LAND				65//2 53605		28.4N 129.5E	47909
* 3	040500	28.2N 132.7E	LAND				65//1 50000		28.4N 129.5E	47909
4	040700	27.8N 132.5E	LAND				65//1 5////		28.4N 129.5E	47909
5	041100	27.8N 132.6E	LAND				65//2 50000		28.4N 129.5E	47909
6	041200	27.8N 132.6E	LAND				65//2 50000		28.4N 129.5E	47909
7	041300	27.9N 132.6E	LAND				65//2 50305		28.4N 129.5E	47909
8	041400	27.9N 132.0E	LAND				65//2 52730		28.4N 129.5E	47909
9	041500	27.9N 131.9E	LAND				/5//3 /2705		28.4N 129.5E	47909
10	041800	27.6N 132.1E	LAND				65//3 51205		28.4N 129.5E	47909
11	041900	27.8N 131.9E	LAND				65//3 53116		28.4N 129.5E	47909
12	042000	28.1N 132.0E	LAND				65//3 50216		28.4N 129.5E	47909
13	042100	27.9N 132.1E	LAND				65//3 51511		28.4N 129.5E	47909
14	042200	27.8N 132.1E	LAND				65//3 51805		28.4N 129.5E	47909
15	042300	27.9N 132.1E	LAND				30973 50000		28.4N 129.5E	47909
16	050000	28.0N 132.0E	LAND				30783 50000		28.4N 129.5E	47909
17	050100	28.0N 132.0E	LAND				55/63 50000		28.4N 129.5E	47909
18	050200	28.1N 132.0E	LAND				55/63 50000		28.4N 129.5E	47909
19	050300	28.2N 132.0E	LAND				558/3 53605		28.4N 129.5E	47909
20	050300	28.2N 131.9E	LAND				55/// 53211		30.6N 131.0E	47869
21	050400	28.2N 132.0E	LAND				65//3 50000		28.4N 129.5E	47909
22	050400	28.3N 131.9E	LAND				5//// 53605		30.6N 131.0E	47869
23	050500	28.3N 132.0E	LAND				65//3 53605		28.4N 129.5E	47909
24	050500	28.3N 131.9E	LAND				5//// 50000		30.6N 131.0E	47869
25	050600	28.4N 132.0E	LAND				65//3 53603		28.4N 129.5E	47909
26	050600	28.4N 131.9E	LAND				5//// 53605		30.6N 131.0E	47869
27	050700	28.5N 132.2E	LAND				65//3 50608		28.4N 129.5E	47909
28	050700	28.4N 131.9E	LAND				5//// 50000		30.6N 131.0E	47869
29	050800	28.5N 132.0E	LAND				65/// 52805		28.4N 129.5E	47909
30	050800	28.5N 132.0E	LAND				5//// 50305		30.6N 131.0E	47869
31	050900	28.5N 132.0E	LAND				55//1 53204		28.4N 129.5E	47909
32	050900	28.5N 132.0E	LAND				5//// 50000		30.6N 131.0E	47869
33	051000	28.5N 132.0E	LAND				5//// 50000		30.6N 131.0E	47869
34	051400	28.7N 131.9E	LAND				65//1 53605		28.4N 129.5E	47909
35	051400	28.6N 131.9E	LAND				5//// 50000		30.6N 131.0E	47869
36	051600	28.7N 131.9E	LAND				65//2 50000		28.4N 129.5E	47909
37	051600	28.6N 131.9E	LAND				5//// 50000		30.6N 131.0E	47869
38	051700	28.7N 131.9E	LAND				65//2 50000		28.4N 129.5E	47909
39	051700	28.7N 131.8E	LAND				5//// 53308		30.6N 131.0E	47869
40	051800	28.7N 131.8E	LAND				55//2 50000		28.4N 129.5E	47909
41	051800	28.7N 131.8E	LAND				5//// 50000		30.6N 131.0E	47869
42	051900	28.7N 131.8E	LAND				55//2 50000		28.4N 129.5E	47909
43	051900	28.7N 131.8E	LAND				5//// 50000		30.6N 131.0E	47869
44	052000	28.7N 131.9E	LAND				55//2 50000		28.4N 129.5E	47909
45	052000	28.8N 131.9E	LAND				5//// 50408		30.6N 131.0E	47869
46	052100	28.7N 132.0E	LAND				51202 50905		28.4N 129.5E	47909
47	052100	28.8N 131.9E	LAND				5//// 50000		30.6N 131.0E	47869
48	052200	28.8N 132.1E	LAND				52332 43608		28.4N 129.5E	47909
49	052200	28.8N 132.0E	LAND				21401 50505		30.6N 131.0E	47869
50	052300	28.8N 132.1E	LAND				52312 40905		28.4N 129.5E	47909
51	052300	28.8N 132.1E	LAND				10321 50905		30.6N 131.0E	47869
52	060000	28.9N 132.2E	LAND				50312 50505		28.4N 129.5E	47909
53	060000	30.8N 129.4E	LAND	GOOD		15		MOV 3005 SEBURI	33.4N 130.4E	
54	060000	28.8N 132.1E	LAND				10211 50000		30.6N 131.0E	47869
55	060100	28.8N 132.2E	LAND				50312 50000		28.4N 129.5E	47909
56	060100	28.9N 132.1E	LAND				10311 53605		30.6N 131.0E	47869
57	060200	28.9N 132.4E	LAND				50312 50311		28.4N 129.5E	47909
58	060200	28.9N 132.2E	LAND				10592 50905		30.6N 131.0E	47869
59	060300	29.0N 132.4E	LAND				5///2 50305		28.4N 129.5E	47909
60	060300	28.9N 132.2E	LAND				20632 50000		30.6N 131.0E	47869
61	060400	29.0N 132.4E	LAND				5///2 50000		28.4N 129.5E	47909
62	060400	28.9N 132.3E	LAND				10281 50000		30.6N 131.0E	47869
63	060500	29.0N 132.4E	LAND				50372 50000		28.4N 129.5E	47909
64	060500	28.9N 132.3E	LAND				10331 50000		30.6N 131.0E	47869
65	060600	29.0N 132.5E	LAND				52412 50000		28.4N 129.5E	47909
66	060600	29.0N 132.4E	LAND				10311 50605		30.6N 131.0E	47869
67	060700	29.1N 132.6E	LAND				50412 50505		28.4N 129.5E	47909
68	060700	29.1N 132.4E	LAND				10311 53610		30.6N 131.0E	47869
69	060800	29.1N 132.6E	LAND				50412 50000		28.4N 129.5E	47909
70	060800	29.0N 132.5E	LAND				10311 51405		30.6N 131.0E	47869
71	060900	29.2N 132.7E	LAND				40412 50505		28.4N 129.5E	47909
72	060900	29.0N 132.5E	LAND				10311 50000		30.6N 131.0E	47869
73	061000	29.0N 132.7E	LAND				50412 50000		28.4N 129.5E	47909
74	061000	29.0N 132.5E	LAND				10312 50000		30.6N 131.0E	47869
75	061100	29.0N 132.7E	LAND				50312 50000		28.4N 129.5E	47909
76	061100	29.0N 132.5E	LAND				/0211 50000		30.6N 131.0E	47869
77	061200	29.1N 132.7E	LAND				50412 50000		28.4N 129.5E	47909
78	061200	29.1N 132.5E	LAND				10211 53605		30.6N 131.0E	47869
79	061300	29.1N 132.6E	LAND				50412 50000		28.4N 129.5E	47909
80	061300	29.1N 132.5E	LAND				10311 50000		30.6N 131.0E	47869
81	061400	29.1N 132.6E	LAND				50412 50000		28.4N 129.5E	47909
82	061400	29.1N 132.4E	LAND				10221 52705		30.6N 131.0E	47869
83	061600	29.1N 132.5E	LAND				50322 50000		28.4N 129.5E	47909
84	061600	29.1N 132.4E	LAND				10211 50000		30.6N 131.0E	47869
85	061700	29.2N 132.4E	LAND				50312 53205		28.4N 129.5E	47909
86	061700	29.2N 132.3E	LAND				10211 35005		30.6N 131.0E	47869
87	061800	29.2N 132.4E	LAND				50312 50000		28.4N 129.5E	47909
88	061800	29.2N 132.3E	LAND				10211 50000		30.6N 131.0E	47869
89	061900	29.3N 132.5E	LAND				50312 50000		28.4N 129.5E	47909

90	061900	29.2N	132.3E	LAND			10212	50000				30.6N	131.0E	47869
91	062000	29.3N	132.4E	LAND			50312	50000				28.4N	129.5E	47909
92	062000	29.2N	132.3E	LAND			10212	50000				30.6N	131.0E	47869
93	062100	29.3N	132.4E	LAND			50312	50000				28.4N	129.5E	47909
94	062100	29.2N	132.3E	LAND			10212	50000				30.6N	131.0E	47869
95	062200	29.3N	132.3E	LAND			50312	50000				28.4N	129.5E	47909
96	062200	29.2N	132.3E	LAND			10311	50000				30.6N	131.0E	47869
97	062300	29.3N	132.3E	LAND			50313	50000				28.4N	129.5E	47909
98	062300	29.2N	132.3E	LAND			10311	50000				30.6N	131.0E	47869
99	070000	29.3N	132.4E	LAND	650D	30						31.3N	131.9E	47743
100	070000	29.3N	132.4E	LAND			22515	50000				28.4N	129.5E	47909
101	070000	30.8N	129.5E	LAND	GOOD	20			MOV	2915	SEBURI	33.4N	130.4E	
102	070000	29.3N	132.3E	LAND			10311	53405				30.6N	131.0E	47869
103	070100	29.3N	132.4E	LAND			22713	20000				28.4N	129.5E	47909
104	070100	29.4N	132.3E	LAND	GOOD	30			MOV	3410		31.3N	131.9E	47743
105	070100	29.3N	132.2E	LAND			10311	52705				30.6N	131.0E	47869
106	070300	29.5N	132.4E	LAND	GOOD	30			MOV	0205		31.3N	131.9E	47743
107	070300	29.5N	132.4E	LAND			20713	50000				28.4N	129.5E	47909
108	070300	29.5N	132.3E	LAND			10512	53508				30.6N	131.0E	47869
109	070400	29.6N	132.3E	LAND			20514	50000				28.4N	129.5E	47909
110	070400	29.5N	132.4E	LAND	GOOD	30						31.3N	131.9E	47743
111	070400	29.6N	132.2E	LAND			10512	53405				30.6N	131.0E	47869
112	070500	29.7N	132.3E	LAND	GOOD				MOV	3405		31.3N	131.9E	47743
113	070500	29.6N	132.3E	LAND			20514	50000				28.4N	129.5E	47909
114	070500	29.6N	132.2E	LAND			10412	53303				30.6N	131.0E	47869
115	070600	29.7N	132.2E	LAND			20614	53105				28.4N	129.5E	47909
116	070600	29.7N	132.3E	LAND	GOOD	20			MOV	3505		31.3N	131.9E	47743
117	070600	29.7N	132.2E	LAND			10412	53605				30.6N	131.0E	47869
118	070700	29.8N	132.3E	LAND	GOOD	15			MOV	3110		31.3N	131.9E	47743
119	070700	29.8N	132.2E	LAND			20514	53305				28.4N	129.5E	47909
120	070700	29.8N	132.1E	LAND			10412	53005				30.6N	131.0E	47869
121	070800	29.9N	132.2E	LAND	GOOD	15			MOV	3210		31.3N	131.9E	47743
122	070800	29.9N	132.1E	LAND			11512	53508				30.6N	131.0E	47869
123	070900	29.9N	132.1E	LAND	GOOD	15			MOV	2905		31.3N	131.9E	47743
124	070900	29.9N	132.1E	LAND			20413	50000				28.4N	129.5E	47909
125	070900	29.9N	132.0E	LAND			10412	52705				30.6N	131.0E	47869
126	071000	29.9N	131.9E	LAND			20413	53011				28.4N	129.5E	47909
127	071000	29.9N	132.0E	LAND	GOOD	15			MOV	3010		31.3N	131.9E	47743
128	071000	29.9N	131.9E	LAND			11512	53008				30.6N	131.0E	47869
129	071100	29.9N	131.8E	LAND	GOOD	30			MOV	2710		31.3N	131.9E	47743
130	071100	29.9N	131.9E	LAND			20412	50000				28.4N	129.5E	47909
131	071100	29.9N	131.9E	LAND			11512	52705				30.6N	131.0E	47869
132	071200	30.0N	131.7E	LAND			20442	53105				28.4N	129.5E	47909
133	071200	29.9N	131.7E	LAND	GOOD	20			MOV	2810		31.3N	131.9E	47743
134	071200	30.0N	131.7E	LAND			11512	53008				30.6N	131.0E	47869
135	071300	30.0N	131.5E	LAND	GOOD	20			MOV	2910		31.3N	131.9E	47743
136	071300	30.0N	131.6E	LAND			20412	52911				28.4N	129.5E	47909
137	071300	30.0N	131.5E	LAND			11632	52711				30.6N	131.0E	47869
138	071400	30.0N	131.4E	LAND			20412	42708				28.4N	129.5E	47909
139	071400	30.0N	131.4E	LAND	GOOD	20			MOV	2905		31.3N	131.9E	47743
140	071400	30.0N	131.3E	LAND			11512	53008				30.6N	131.0E	47869
141	071500	30.0N	131.3E	LAND	GOOD	30			MOV	2910		31.3N	131.9E	47743
142	071500	30.0N	131.3E	LAND			20311	52705				28.4N	129.5E	47909
143	071500	30.0N	131.5E	LAND			5////	52705				30.6N	131.0E	47869
144	071600	30.0N	131.2E	LAND			5////	52803				30.6N	131.0E	47869
145	071700	30.1N	131.1E	LAND	GOOD	30			MOV	3010		31.3N	131.9E	47743
146	071700	30.1N	131.1E	LAND			20312	53105				28.4N	129.5E	47909
147	071700	30.1N	131.2E	LAND			5////	53408				30.6N	131.0E	47869
148	071800	30.2N	131.0E	LAND	GOOD	30			MOV	3010		31.3N	131.9E	47743
149	071800	30.2N	131.0E	LAND			20512	53011				28.4N	129.5E	47909
150	071800	30.2N	131.1E	LAND			4////	53011				30.6N	131.0E	47869
151	071900	30.2N	130.9E	LAND	GOOD	20			MOV	3010		31.3N	131.9E	47743
152	071900	30.2N	130.9E	LAND			20412	52905				28.4N	129.5E	47909
153	071900	30.2N	130.9E	LAND			51572	52708				30.6N	131.0E	47869
154	072000	30.2N	130.8E	LAND			20412	53005				28.4N	129.5E	47909
155	072000	30.3N	130.8E	LAND	GOOD	20			MOV	3010		31.3N	131.9E	47743
156	072000	30.3N	130.8E	LAND			10412	53005				30.6N	131.0E	47869
157	072100	30.3N	130.8E	LAND			20412	53008				28.4N	129.5E	47909
158	072100	30.4N	130.7E	LAND			14412	53308				30.6N	131.0E	47869
159	072200	30.4N	130.8E	LAND			20322	53208				28.4N	129.5E	47909
160	072200	30.4N	130.6E	LAND	GOOD	20			MOV	3010		31.3N	131.9E	47743
161	072200	30.4N	130.5E	LAND			10312	53011				30.6N	131.0E	47869
162	072300	30.5N	130.5E	LAND	GOOD	20			MOV	3010		31.3N	131.9E	47743
163	072300	30.5N	130.5E	LAND			20312	52908				28.4N	129.5E	47909
164	072300	30.5N	130.4E	LAND			11312	52908				30.6N	131.0E	47869
165	080000	30.5N	130.4E	LAND			20313	53108				28.4N	129.5E	47909
166	080000	30.5N	130.3E	LAND	GOOD	20			MOV	3010		31.3N	131.9E	47743
167	080000	30.5N	130.3E	LAND			10212	53011				30.6N	131.0E	47869
168	080100	30.5N	130.2E	LAND	GOOD	20			MOV	2715		31.3N	131.9E	47743
169	080100	30.6N	130.2E	LAND			20312	53011				28.4N	129.5E	47909
170	080100	30.6N	130.1E	LAND			11312	53011				30.6N	131.0E	47869
171	080200	30.6N	130.1E	LAND			20432	52705				28.4N	129.5E	47909
172	080200	30.6N	130.1E	LAND	GOOD	20			MOV	3010		31.3N	131.9E	47743
173	080200	30.7N	130.0E	LAND			11213	53208				30.6N	131.0E	47869
174	080300	30.7N	129.9E	LAND			20432	53011				28.4N	129.5E	47909
175	080300	30.8N	129.9E	LAND			10213	53108				30.6N	131.0E	47869
176	080300	30.6N	130.0E	LAND			10411	/////				33.4N	130.3E	47806
177	080400	30.8N	129.7E	LAND			10213	52911				30.6N	131.0E	47869
178	080400	30.7N	129.7E	LAND			20412	53008				28.4N	129.5E	47909
179	080500	30.8N	129.7E	LAND	GOOD	15			MOV	3015		31.3N	131.9E	47743
180	080500	30.8N	129.6E	LAND			10213	52708				30.6N	131.0E	47869
181	080500	30.7N	129.8E	LAND	GOOD	30			MOV	3010		34.2N	130.8E	47762
182	080600	30.8N	129.5E	LAND	GOOD	15			MOV	3015		31.3N	131.9E	47743
183	080600	30.8N	129.5E	LAND			20412	53008				28.4N	129.5E	47909
184	080600	30.9N	129.5E	LAND			10213	53008				30.6N	131.0E	47869
185	080600	30.8N	129.5E	LAND	GOOD	15			MOV	3015		34.2N	130.8E	47762
186	080700	30.8N	129.5E	LAND			20412	50000				28.4N	129.5E	47909
187	080700	30.8N	129.5E	LAND	GOOD	20			MOV	2915		31.3N	131.9E	47743
188	080700	30.9N	129.4E	LAND			10313	52705				30.6N	131.0E	47869
189	080700	30.8N	129.4E	LAND	GOOD	20			MOV	2915		34.2N	130.8E	47762
190	080800	30.8N	129.3E	LAND	GOOD	20			MOV	2906		34.2N	130.8E	47762
191	080800	30.8N	129.4E	LAND	GOOD				MOV	2707		31.3N	131.9E	47743
192	080800	30.9N	129.3E	LAND			10318	52705				30.6N	131.0E	47869
193	080800	30.9N	129.3E	LAND			20412	52905				28.4N	129.5E	47909
194	080900	30.9N	129.2E	LAND	GOOD	20			MOV	2915		34.2N	130.8E	47762
195	080900	31.1N	129.1E	LAND			20412	53116				28.4N	129.5E	47909
196	080900	30.9N	129.2E	LAND			10313	52908				30.6N	131.0E	47869
197	080900	30.9N	129.2E	LAND	GOOD	20			MOV	3015		31.3N	131.9E	47743
198	081000	31.0N	129.0E	LAND			20412	50000				28.4N	129.5E	47909
199	081000	30.9N	129.0E	LAND	GOOD	20			MOV	3015		34.2N	130.8E	47762
200	081000	31.0N	129.0E	LAND			10213	53011				30.6N	131.0E	47869
201	081000	30.9N	129.1E	LAND	GOOD	20			MOV	2915		31.3N	131.9E	47743
202	081100	31.0N	129.0E	LAND	GOOD	15			MOV	3010		31.3N	131.9E	47743
203	081100	30.9N	128.9E	LAND	GOOD	20			MOV	2915		34.2N	130.8E	47762
204	081100	31.0N	128.9E	LAND			11313	52705				30.6N	131.0E	47869
205	081100	31.0N	128.9E	LAND			22612	52705				28.4N	129.5E	47909
206	081200	31.0N	128.9E	LAND	GOOD	20			MOV	3015		31.3N	131.9E	47743
207	081200	31.0N	128.7E	LAND			5//62	53011				28.4N	129.5E	47909
208	081200	31.0N	128.7E	LAND			5//63	52808				30.6N	131.0E	47869
209	081200	31.0N	128.8E	LAND	GOOD	20			MOV	3015		34.2N	130.8E	47762
210	081300	31.0N	128.5E	LAND			6///2	52708				28.4N	129.5E	47909
211	081300	31.1N	128.6E	LAND			5//6/	53108				30.6N	131.0E	47869
212	081300	31.0N	128.7E	LAND	GOOD	20			MOV	3015		34.2N	130.8E	47762
213	081400	31.2N	128.4E	LAND			6//6/	53011				30.6N	131.0E	47869
214	081400	31.1N	128.5E	LAND	GOOD	20			MOV	3015		34.2N	130.8E	47762
215	081500	31.2N	128.3E	LAND			62/6/	53005				30.6N	131.0E	47869
216	081500	31.2N	128.2E	LAND	GOOD	20			MOV	3215		34.2N	130.8E	47762
217	081600	31.3N	128.2E	LAND			65/4/	53111				30.6N	131.0E	47869
218	081600	31.3N	128.2E	LAND	GOOD	20			MOV	3210		34.2N	130.8E	47762
219	081700	31.3N	128.1E	LAND			6////	52805				30.6N	131.0E	47869
220	081700	31.4N	128.1E	LAND	GOOD	20			MOV	3220		34.2N	130.8E	47762
221	081800	31.4N	128.0E	LAND			6////	53211				30.6N	131.0E	47869
222	081800	31.5N	127.9E	LAND	GOOD	20			MOV	3120		34.2N	130.8E	47762
223	081900	31.6N	127.6E	LAND	GOOD	15			MOV	3120		34.2N	130.8E	47762
224	082000	31.6N	127.5E	LAND	GOOD	15			MOV	3015		34.2N	130.8E	47762
225	082100	31.8N	127.4E	LAND	POOR	15			MOV	3115		34.2N	130.8E	47762
226	082200	31.9N	127.4E	LAND	POOR	20			MOV	3215		34.2N	130.8E	47762
227	082200	32.0N	127.4E	LAND	POOR	30			MOV	3215		34.2N	130.8E	47762
228	090000	32.1N	127.1E	LAND	POOR	25			MOV	3320		34.2N	130.8E	47762
229	090100	32.2N	127.0E	LAND	POOR	30			MOV	2915		34.2N	130.8E	47762
230	090200	32.2N	126.8E	LAND	POOR	30			MOV	2910		34.2N	130.8E	47762
231	090300	32.3N	126.8E	LAND	POOR	30			MOV	3315		34.2N	130.8E	47762
232	090400	32.3N	126.7E	LAND	GOOD	35			MOV	2610		34.2N	130.8E	47762
233	090400	32.3N	126.7E	LAND	GOOD	35			MOV	3010		32.7N	128.8E	47844
234	090500	32.5N	126.7E	LAND	GOOD	35			MOV	3610		34.2N	130.8E	47762
235	090500	32.5N	126.7E	LAND	GOOD	35			MOV	3610		32.7N	128.8E	47844

236	090600	32.6N 126.6E	LAND	GOOD		35	MOV 3010	34.2N 130.8E	47768
237	090800	32.8N 126.5E	LAND	GOOD		35	MOV 3510	32.7N 128.8E	47844
238	091000	32.8N 126.4E	LAND	GOOD		30	MOV 3410	32.7N 128.8E	47844
239	091200	32.9N 126.3E	LAND	GOOD		30	MOV 3410	32.7N 128.8E	47844
240	091500	33.2N 126.0E	LAND	POOR		20	MOV 3415	32.7N 128.8E	47844
241	091505	33.8N 126.5E	LAND	POOR				35.9N 126.6E	47141
242	091535	33.9N 126.4E	LAND	POOR				35.9N 126.6E	47141
*243	091605	34.1N 126.0E	LAND	POOR				35.9N 126.6E	47141
244	091630	33.5N 126.0E	LAND	FAIR			SPRL BARL BANA	35.1N 126.8E	47158
245	091635	34.1N 126.0E	LAND	POOR				35.9N 126.6E	47141
*246	091735	34.3N 125.7E	LAND	POOR				35.9N 126.6E	47141
247	091735	33.5N 127.0E	LAND	FAIR			SPRL BAND AREA	35.1N 126.8E	47158
248	091835	34.5N 125.8E	LAND	POOR				35.9N 126.6E	47141
249	091835	33.5N 127.0E	LAND	FAIR			SPRL BAND AREA	35.1N 126.8E	47158
250	091905	34.5N 126.0E	LAND	POOR				35.9N 126.6E	47141
*251	091935	34.5N 126.0E	LAND	POOR			EYE FIX DIFFUSE	35.9N 126.6E	47141
252	091950	33.9N 126.0E	LAND	FAIR			SPRL BAND AREA	35.1N 126.8E	47158
253	092035	34.1N 126.3E	LAND	FAIR			SPRL BAND AREA	35.1N 126.8E	47158
254	092100	33.8N 126.1E	LAND	POOR		20	MOV 3620	32.7N 128.8E	47844
255	092130	34.2N 126.3E	LAND	POOR			SPRL BAND AREA	35.1N 126.8E	47158
256	092230	34.3N 126.4E	LAND	POOR			SPRL BAND AREA	35.1N 126.8E	47158

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR TDDFF	COMMENTS	RADAR POSITION	SITE WMO NO
1	080400	30.8N 129.8E	LAND				10411 53113		33.4N 130.3E	47806
2	080500	30.8N 129.6E	LAND				1041/ 52711		33.4N 130.3E	47806
3	080600	30.8N 129.5E	LAND				1041/ 52705		33.4N 130.3E	47806
4	080700	30.8N 129.4E	LAND				1041/ 52805		33.4N 130.3E	47806
5	080800	30.9N 129.4E	LAND				1041/ 53005		33.4N 130.3E	47806
6	080900	30.9N 129.1E	LAND				1041/ 52711		33.4N 130.3E	47806
7	081000	30.9N 129.0E	LAND				1061/ 52708		33.4N 130.3E	47806
8	081100	30.9N 128.9E	LAND				1061/ 52805		33.4N 130.3E	47806
9	081200	31.0N 128.7E	LAND				2064/ 53011		33.4N 130.3E	47806
10	081300	31.1N 128.6E	LAND				2071/ 52705		33.4N 130.3E	47806
11	081400	31.1N 128.4E	LAND				2071/ 52911		33.4N 130.3E	47806
12	081500	31.2N 128.3E	LAND				2171/ 53011		33.4N 130.3E	47806
13	081600	31.2N 128.2E	LAND				2162/ 53006		33.4N 130.3E	47806
14	081700	31.4N 128.1E	LAND				2154/ 53011		33.4N 130.3E	47806
15	081800	31.5N 127.9E	LAND				45/// 53113		33.4N 130.3E	47806
16	081900	31.6N 127.8E	LAND				55/// 53108		33.4N 130.3E	47806
17	082000	31.6N 127.6E	LAND				65/// 52708		33.4N 130.3E	47806
18	082100	31.7N 127.6E	LAND				55/// 53508		33.4N 130.3E	47806
19	082200	31.9N 127.4E	LAND				55/// 53413		33.4N 130.3E	47806
20	082300	32.0N 127.3E	LAND				65/// 53411		33.4N 130.3E	47806
21	090000	32.1N 127.1E	LAND				65/// 53211		33.4N 130.3E	47806
22	090100	32.2N 126.9E	LAND				65/// 53011		33.4N 130.3E	47806
23	090200	32.2N 126.7E	LAND				65/// 52711		33.4N 130.3E	47806
24	090300	32.3N 126.6E	LAND				65/// 53111		33.4N 130.3E	47806
25	090400	32.4N 126.6E	LAND				55/// 50211		33.4N 130.3E	47806
26	090500	32.6N 126.7E	LAND				55/// 50111		33.4N 130.3E	47806
27	090600	32.6N 126.6E	LAND				54/// 53305		33.4N 130.3E	47806
28	090700	32.6N 126.6E	LAND				55/// 50000		33.4N 130.3E	47806
29	090800	32.6N 126.6E	LAND				55/// 53005		33.4N 130.3E	47806
30	090900	32.6N 126.5E	LAND				55/// 53505		33.4N 130.3E	47806
31	091000	32.9N 126.3E	LAND				55/// 53411		33.4N 130.3E	47806
32	091100	33.0N 126.3E	LAND				65/// 53408		33.4N 130.3E	47806
33	091200	33.1N 126.3E	LAND				65/// 53605		33.4N 130.3E	47806

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	092100	34.2N 126.2E	065	036	47165 47158 47182 47189
2	100000	34.5N 126.6E	065	015	47165 47156 47182 47189
3	100600	35.4N 126.8E	060	015	47158 47165 47133 47129
4	100900	36.4N 128.0E	045	015	47133 47135 47143

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL STORM LEE
BEST TRACK DATA

	BEST TRACK			WARNING		ERRORS			24 HOUR FORECAST		ERRORS			48 HOUR FORECAST		ERRORS			72 HOUR FORECAST		ERRORS		
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
081006Z	22.7	131.3	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081012Z	22.8	131.1	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081018Z	23.0	130.8	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081100Z	23.1	130.5	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081106Z	23.4	130.2	35	23.5	130.2	30.	6.	-5.	24.5	128.5	50.	132.	0.	26.4	126.6	65.	275.	5.	29.1	126.3	75.	620.	30.
081112Z	23.9	129.7	40	23.8	129.8	40.	8.	0.	24.8	127.8	65.	168.	15.	27.2	126.8	85.	308.	25.	30.5	126.0	95.	694.	70.
081118Z	24.7	129.1	45	24.8	129.1	45.	6.	0.	27.7	127.3	70.	67.	15.	30.7	126.2	90.	231.	30.	0.0	0.0	0.	-0.	0.
081200Z	25.5	128.7	50	25.6	128.6	50.	8.	0.	28.7	125.8	65.	65.	5.	32.2	124.9	80.	253.	25.	0.0	0.0	0.	-0.	0.
081206Z	26.4	128.6	50	26.8	127.9	50.	45.	0.	30.6	126.3	65.	40.	5.	33.8	126.3	65.	339.	20.	0.0	0.0	0.	-0.	0.
081212Z	27.6	128.0	50	27.8	127.8	50.	16.	0.	32.0	126.7	65.	92.	5.	36.1	127.5	55.	354.	30.	0.0	0.0	0.	-0.	0.
081218Z	28.8	127.1	55	28.8	127.5	55.	21.	0.	33.0	126.9	65.	149.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081300Z	29.7	126.3	60	30.0	126.1	60.	21.	0.	34.4	125.0	65.	122.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081306Z	30.9	125.6	60	31.4	125.3	60.	34.	0.	36.5	124.9	60.	176.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081312Z	32.2	124.9	60	32.1	125.3	60.	21.	0.	37.5	125.8	55.	282.	30.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081318Z	34.2	124.3	60	34.0	124.4	60.	13.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081400Z	36.4	124.5	55	36.3	124.2	55.	16.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081406Z	39.4	125.4	45	39.5	125.1	40.	15.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081412Z	42.0	127.6	25	41.8	127.1	25.	25.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	18.	129.	293.	657.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	12.	51.	77.	17.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	1.	11.	23.	50.	0.	0.	0.	0.
AVG INTENSITY BIAS	-1.	11.	23.	50.	0.	0.	0.	0.
NUMBER OF FORECASTS	14	10	6	2	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1307. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 13. K'SUT$

TROPICAL STORM LEE
FIX POSITIONS FOR CYCLONE NO. 9

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	092315	23.5N 129.7E	PCN 5	T1.0/1.0	INIT OBS PART EXP LLCC	PGTW
	2	100300	23.7N 129.8E	PCN 6			PGTW
*	3	100550	23.6N 130.6E	PCN 5			PGTW
	4	101013	23.3N 131.5E	PCN 6	T1.0/1.0	INIT OBS	RPMK
*	5	101349	23.3N 132.0E	PCN 6			PGTW
	6	101600	23.3N 131.8E	PCN 6	T1.5/1.5	INIT OBS	PGTW
	7	102253	23.4N 130.2E	PCN 5			PGTW
	8	110048	23.5N 130.3E	PCN 3	T1.5/1.5	INIT OBS	RODN
	9	110048	23.0N 130.1E	PCN 5		ULAC 21.0N 129.1E	PGTW
	10	110300	23.4N 130.1E	PCN 6	T1.5/1.5 /D0.5/27HRS	ULAC 21.0N 130.1E	PGTW
	11	110539	23.1N 131.3E	PCN 5			PGTW
	12	110900	23.8N 130.7E	PCN 6			PGTW
	13	110951	23.3N 130.3E	PCN 6			PGTW
	14	111047	22.9N 130.2E	PCN 6			RPMK
	15	111200	23.1N 129.6E	PCN 6			PGTW
*	16	111329	23.2N 129.1E	PCN 6			PGTW
	17	111600	23.8N 128.9E	PCN 6	T2.5/2.5 /D1.0/24HRS		PGTW
*	18	111825	23.1N 129.3E	PCN 5			RKSO
	19	111825	24.1N 129.7E	PCN 6			PGTW
*	20	112100	24.1N 127.9E	PCN 6			PGTW
*	21	112146	24.0N 128.6E	PCN 5			PGTW
	22	120028	25.7N 128.7E	PCN 5			PGTW
	23	120300	25.4N 127.9E	PCN 6			PGTW
	24	120529	26.1N 128.4E	PCN 5	T2.5/2.5 /D1.0/26HRS		PGTW
	25	120529	26.2N 128.0E	PCN 5	T2.5/2.5	INIT OBS	RPMK
*	26	120900	26.0N 128.4E	PCN 6		ULCC FIX	PGTW
	27	121026	26.7N 127.6E	PCN 6			RPMK
	28	121111	27.6N 128.7E	PCN 5			RKSO
	29	121111	27.5N 128.4E	PCN 6			RODN
	30	121200	27.3N 127.9E	PCN 6			PGTW
*	31	121450	27.0N 128.7E	PCN 6			RODN
	32	121600	27.5N 127.9E	PCN 6	T3.5/3.5 /D1.0/24HRS		PGTW
	33	121800	27.8N 127.5E	PCN 6			PGTW
*	34	121814	28.8N 128.3E	PCN 6			PGTW
	35	122350	29.9N 127.3E	PCN 5			RKSO
	36	122350	30.2N 126.0E	PCN 5	T2.5/2.5	INTI OBS	RODN
	37	130000	30.2N 125.8E	PCN 4	T3.0/3.0-/D0.5/19HRS	PART EXP LLCC	PGTW
	38	130149	29.4N 126.1E	PCN 5	T3.0/3.0	INIT OBS	RKSO
	39	130300	31.2N 125.7E	PCN 6			PGTW
	40	130518	31.4N 125.3E	PCN 5			PGTW
	41	130518	30.7N 125.1E	PCN 3		PART EXP LLCC	RKSO
*	42	130900	30.5N 125.0E	PCN 6		ULAC 32.3N 127.0E	PGTW
	43	131005	30.7N 125.1E	PCN 6		PART EXP LLCC	PGTW
	44	131200	31.7N 125.8E	PCN 6		PART EXP LLCC	PGTW
	45	131429	33.4N 124.1E	PCN 6			RODN
	46	131600	33.3N 125.1E	PCN 6	T3.5/3.5-/S0.0/24HRS	PART EXP LLCC	PGTW
	47	131804	34.5N 123.6E	PCN 4		PART EXP LLCC	PGTW
	48	131804	34.2N 123.2E	PCN 6			RODN
	49	132100	35.7N 124.3E	PCN 6		ULCC FIX	PGTW
	50	132329	36.3N 123.6E	PCN 3	T3.5/3.5-/D1.0/18HRS	EXP LLCC	RPMK
	51	140000	36.6N 124.5E	PCN 6			PGTW
	52	140129	37.2N 125.0E	PCN 5	T3.0/3.0 /S0.0/24HRS		RKSO
	53	140300	37.9N 125.2E	PCN 6			PGTW
	54	140507	40.1N 125.4E	PCN 5			RODN
	55	140600	40.1N 126.3E	PCN 6			PGTW
	56	140900	40.3N 126.5E	PCN 6			PGTW
	57	140943	41.4N 126.4E	PCN 5			RKSO
*	58	141027	42.7N 127.6E	PCN 6			RKSO
*	59	141125	43.1N 128.1E	PCN 6		ULCC FIX	RKSO
	60	141200	41.8N 127.7E	PCN 6			PGTW
	61	141600	42.6N 128.6E	PCN 6			PGTW

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN-TATION	EYE DIAM	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	190650	22.8N 131.3E	1500FT		997	10 040 45	120 23 040 45	10 30				+26 +26 +24	
* 2	110019	22.1N 130.6E	700MB	3053	997	6 330 80	250 27 230 100	20 30				+12 +12 + 5	1
3	110656	23.6N 130.2E	1500FT		992	40 350 80	300 39 220 150	8 10				+28 +27 +26 28	2
4	110933	24.9N 129.9E	1500FT		991	15 310 70	310 67 270 150	8 10				+27 +27 +26 28	3
5	112203	25.3N 128.8E	1500FT		990	50 060 60	140 51 060 60	10 10				+27 +26 +26 28	4
6	120034	25.7N 128.5E	1500FT		990	50 120 90	180 51 120 90	10 4				+26 +26 +26 28	4
* 7	120642	27.5N 127.6E	700MB	3015		45 040 48	130 41 040 48	2 5				+13 +15 + 6	5
8	120940	27.4N 128.0E	1500FT		989	25 190 90	290 36 190 90	1 4				+25 +26 +25	5
9	122146	29.2N 126.3E	700MB	2984		60 080 72	140 63 080 72	15 10				+14 +15 + 8	6
10	130021	29.8N 126.0E	1500FT			40 360 65	100 50 360 65	15 3				+24 +26 +25	6

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR TDDFF	COMMENTS	RADAR POSITION	SITE WMO NO.
1	120300	26.1N 128.9E	LAND				5///3 /////		26.2N 127.8E	47937
2	120400	26.1N 128.9E	LAND				5///3 50000		26.2N 127.8E	47937
3	120500	26.2N 128.8E	LAND	POOR		35		MOV 021S	26.3N 126.8E	47929
4	120500	26.2N 128.9E	LAND				55//3 53611		26.2N 127.8E	47937
5	120500	26.1N 128.8E	LAND				6///1 50000		28.4N 129.5E	47909
6	120600	26.3N 128.9E	LAND				55//2 73604		26.2N 127.8E	47937
7	120600	26.2N 128.9E	LAND				6///2 50305		28.4N 129.5E	47909
8	120607	26.2N 128.8E	LAND	POOR					26.4N 127.8E	47931
9	120700	26.4N 128.9E	LAND				55//3 73608		26.2N 127.8E	47937
10	120700	26.4N 128.8E	LAND				6///2 53411		28.4N 129.5E	47909
11	120800	27.1N 128.9E	LAND				65//3 73616		26.2N 127.8E	47937
12	120800	26.6N 128.8E	LAND				6///2 53610		28.4N 129.5E	47909
* 13	120900	27.3N 128.9E	LAND				65//3 73620		26.2N 127.8E	47937
14	120900	27.2N 128.6E	LAND				6///2 53530		28.4N 129.5E	47909
15	121000	27.6N 128.4E	LAND				6///2 53427		28.4N 129.5E	47909
16	121100	28.1N 128.1E	LAND				6///2 53330		28.4N 129.5E	47909
* 17	121200	28.5N 127.5E	LAND				6///2 53132		28.4N 129.5E	47909
18	122100	29.0N 127.2E	LAND				5///5 53528		26.2N 127.8E	47937
* 19	130800	32.5N 125.1E	LAND				6//// 73317		31.2N 121.5E	58367
20	132130	35.0N 124.9E	LAND	FAIR					35.9N 126.6E	47141
21	132205	36.0N 124.9E	LAND	FAIR					35.9N 126.6E	47141
22	132230	36.2N 125.0E	LAND	POOR					35.9N 126.6E	47141
23	132305	36.3N 125.0E	LAND	POOR					35.9N 126.6E	47141
24	132335	36.3N 125.0E	LAND	POOR					35.9N 126.6E	47141
25	140005	36.5N 125.0E	LAND	POOR					35.9N 126.6E	47141
26	140035	36.8N 125.2E	LAND	POOR					35.9N 126.6E	47141
27	140105	36.9N 125.2E	LAND	POOR					35.9N 126.6E	47141
28	140135	37.0N 125.2E	LAND	POOR					35.9N 126.6E	47141

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TYPHOON MAMIE
BEST TRACK DATA

	BEST TRACK			WARNING			ERRORS		24 HOUR FORECAST			ERRORS		48 HOUR FORECAST			ERRORS		72 HOUR FORECAST			ERRORS	
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
081506Z	25.2	124.4	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081512Z	25.7	125.0	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081518Z	26.0	125.7	35	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081600Z	26.6	125.9	45	26.4	126.1	45.	16.	0.	28.1	126.4	65.	68.	0.	29.8	124.5	75.	123.	5.	31.6	121.9	65.	260.	15.
081606Z	27.1	126.0	50	26.8	126.3	50.	24.	0.	28.6	125.9	70.	68.	5.	30.6	123.5	75.	121.	10.	33.7	121.4	60.	227.	20.
081612Z	27.6	125.9	50	27.4	126.2	50.	20.	0.	29.6	125.3	70.	68.	0.	32.3	124.6	75.	195.	10.	35.9	124.8	75.	259.	35.
081618Z	28.2	125.7	60	27.8	126.0	55.	29.	-5.	29.7	125.2	70.	98.	0.	32.4	124.5	80.	237.	20.	36.4	124.7	75.	316.	45.
081700Z	28.7	125.3	65	28.0	125.3	65.	18.	0.	32.7	124.2	80.	138.	10.	37.3	125.4	65.	268.	15.	0.0	0.0	0.	-0.	0.
081706Z	29.2	124.8	65	29.5	124.7	70.	19.	5.	33.0	123.7	75.	128.	10.	38.0	125.7	55.	254.	15.	0.0	0.0	0.	-0.	0.
081712Z	29.7	124.0	70	29.6	124.2	70.	12.	0.	32.1	123.8	75.	121.	10.	36.9	125.0	60.	223.	20.	0.0	0.0	0.	-0.	0.
081718Z	30.2	123.4	70	30.0	123.8	70.	24.	0.	32.1	122.5	75.	168.	15.	36.6	124.2	60.	299.	30.	0.0	0.0	0.	-0.	0.
081800Z	30.9	122.5	70	30.6	122.9	70.	27.	0.	33.3	121.9	75.	167.	25.	38.3	124.7	50.	338.	35.	0.0	0.0	0.	-0.	0.
081806Z	31.8	121.6	65	31.7	122.1	65.	26.	0.	36.9	123.0	55.	128.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081812Z	32.9	120.8	65	33.2	121.1	65.	23.	0.	38.7	123.6	55.	111.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081818Z	34.2	120.3	60	33.9	120.8	60.	31.	0.	39.4	123.2	45.	126.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081900Z	35.7	120.2	50	35.0	119.8	50.	46.	0.	41.3	123.7	25.	175.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081906Z	37.4	120.4	40	36.8	119.8	40.	46.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081912Z	39.2	121.3	40	39.1	121.3	40.	6.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
081918Z	41.5	123.0	30	41.3	122.4	30.	30.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
082000Z	43.9	125.5	25	43.3	125.2	25.	38.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	+4-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	26.	120.	229.	266.	25.	115.	203.	249.
AVG RIGHT ANGLE ERROR	14.	70.	147.	122.	13.	73.	139.	91.
AVG INTENSITY MAGNITUDE ERROR	1.	9.	18.	29.	1.	10.	14.	23.
AVG INTENSITY BIAS	0.	9.	18.	29.	0.	10.	14.	23.
NUMBER OF FORECASTS	17	13	9	4	15	11	7	3

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1335. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 12. KNOTS

TYPHOON MAMIE
FIX POSITIONS FOR CYCLONE NO. 10

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	150600	25.8N 125.2E	PCN 6	T1.5/1.5	INIT OBS	RODN
	2	150900	26.2N 124.5E	PCN 6	T1.0/1.0	INIT OBS	PGTW
	3	151200	25.8N 125.0E	PCN 6			PGTW
	4	151349	26.0N 125.5E	PCN 6			PGTW
	5	151600	25.8N 125.4E	PCN 6			PGTW
	6	151800	25.8N 125.4E	PCN 6			PGTW
	7	152100	26.0N 126.0E	PCN 6			PGTW
	8	152245	26.4N 126.3E	PCN 3		PARTIALLY EXP LLCC	PGTW
	9	160000	26.5N 126.3E	PCN 6			PGTW
	10	160026	26.3N 126.7E	PCN 5			RODN
	11	160026	26.3N 126.6E	PCN 5	T2.5/2.5	INIT OBS	RPMK
	12	160048	26.3N 126.6E	PCN 5			PGTW
	13	160300	26.9N 126.0E	PCN 6	T2.5/2.5	INIT OBS	PGTW
	14	160600	26.8N 126.3E	PCN 6			PGTW
	15	160627	27.0N 126.2E	PCN 5	T2.5/2.5 /D1.0/24HRS		RODN
	16	160900	27.3N 126.2E	PCN 6			PGTW
	17	161042	27.3N 126.0E	PCN 3			RODN
*	18	161124	26.8N 126.1E	PCN 5		ULCC FIX	RKSO
	19	161124	26.8N 125.4E	PCN 5			RPMK
	20	161200	27.4N 126.1E	PCN 6	T2.5/2.5 /D1.5/27HRS		PGTW
	21	161328	27.2N 126.2E	PCN 5			PGTW
	22	161600	27.5N 125.8E	PCN 6			PGTW
	23	161800	27.7N 125.7E	PCN 6			PGTW
	24	161913	27.7N 126.1E	PCN 5			RKSO
	25	162100	28.6N 125.8E	PCN 6			PGTW
	26	162141	28.3N 125.4E	PCN 3		WELL DEFINED CENTER	PGTW
	27	170000	28.4N 125.8E	PCN 6			PGTW
	28	170004	28.9N 125.4E	PCN 3			RODN
	29	170004	28.3N 125.9E	PCN 3	T3.5/3.5-/D1.0/24HRS	PARTIALLY EXP LLCC	RPMK
	30	170028	28.2N 125.5E	PCN 5			PGTW
	31	170300	29.1N 125.0E	PCN 4	T3.0/3.0 /D0.5/24HRS	PARTIALLY EXP LLCC	PGTW
	32	170600	29.0N 124.6E	PCN 6			PGTW
	33	170617	29.0N 124.6E	PCN 3	T3.0/3.0	INIT OBS PARTIALLY EXP LLCC	RKSO
	34	170900	29.3N 124.3E	PCN 6			PGTW
	35	171021	29.3N 124.1E	PCN 4			PGTW
	36	171102	29.2N 124.5E	PCN 3			RKSO
	37	171200	29.4N 123.9E	PCN 6			PGTW
	38	171450	29.7N 123.7E	PCN 4			RKSO
	39	171600	29.5N 123.3E	PCN 6	T3.0/3.0-/D0.5/28HRS		PGTW
	40	171800	29.5N 123.1E	PCN 6			PGTW
	41	171902	30.2N 123.0E	PCN 3			RODN
	42	172100	29.9N 123.1E	PCN 6			PGTW
	43	172342	31.2N 122.3E	PCN 3	T4.0/4.0	INIT OBS	RODN
	44	180000	30.6N 122.6E	PCN 6			PGTW
	45	180149	31.4N 122.3E	PCN 3	T4.5/4.5-/D1.0/25HRS		RPMK
	46	180300	31.4N 122.2E	PCN 4	T4.0/4.0-/D1.0/24HRS		PGTW
	47	180600	31.7N 122.0E	PCN 6			PGTW
	48	180606	32.1N 121.5E	PCN 3			RPMK
	49	180900	32.3N 121.2E	PCN 6			PGTW
	50	181000	32.6N 121.0E	PCN 3			PGTW
	51	181040	32.5N 120.9E	PCN 4			RODN
	52	181200	33.0N 121.2E	PCN 6			PGTW
	53	181429	33.5N 120.8E	PCN 4			RODN
	54	181600	33.7N 120.9E	PCN 6			PGTW
	55	181800	34.2N 120.5E	PCN 6	T2.0/3.0 /W1.0/26HRS		PGTW
	56	181851	33.9N 120.8E	PCN 5			RSKO
	57	182100	34.4N 119.7E	PCN 6			PGTW
	58	182320	35.5N 120.6E	PCN 3	T2.5/2.5	INIT OBS	RKSO
	59	190000	35.4N 120.1E	PCN 6			PGTW
	60	190300	36.3N 119.5E	PCN 6	T2.0/2.5 /W2.0/24HRS	PARTIALLY EXP LLCC	PGTW
	61	190555	37.6N 121.0E	PCN 5		ULCC FIX	RPMK
	62	190600	37.5N 120.7E	PCN 6			PGTW

63	190900	38.8N 121.6E	PCN 6			PGTW
64	191200	40.2N 122.0E	PCN 6			PGTW
65	191409	39.9N 121.6E	PCN 5	EXP LLCC		RKSO
66	191600	41.6N 122.2E	PCN 6	ULCC FIX		PGTW
67	191841	42.4N 123.6E	PCN 6	ULCC FIX		RKSO
68	200000	43.3N 125.0E	PCN 6			PGTW
69	200039	44.2N 125.4E	PCN 5			RKSO
70	200108	44.1N 126.4E	PCN 5			RKSO

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN-DIAM/TATION	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	152340	26.4N 126.1E	1500FT		996	55 100 10	160 52 050 60	5 5				
2	162049	28.6N 125.6E	700MB	2986	983	65 090 70	170 69 090 60	15 4			+26 +27 +25 +10 +19 + 9	1 2

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR TDIFF	COMMENTS	RADAR POSITION	SITE WMO NO.
1	160200	26.7N 125.5E	LAND				6///2 73008		26.2N 127.8E	47937
2	160300	26.9N 125.5E	LAND				6///3 73405		26.2N 127.8E	47937
3	160400	27.0N 125.5E	LAND				6///3 73409		26.2N 127.8E	47937
4	160500	27.1N 125.5E	LAND				6///3 73609		26.2N 127.8E	47937
5	160500	26.9N 125.9E	LAND				6///6 5////		24.8N 125.3E	47927
6	171500	29.5N 123.9E	LAND				34//3 73208	STA LAT/LONG UNK	*****N ******E	58760
7	171501	29.6N 123.7E	LAND				12323 53010	1500 FIX TIME STA LAT/LONG UNK	*****N ******E	58760
8	172000	30.3N 123.1E	LAND				34764 53112	STA LAT/LONG UNK	*****N ******E	58760
9	172100	30.5N 123.0E	LAND				34894 53112		*****N ******E	58760

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	181200	33.1N 121.1E	065	055	58150 58251
2	181500	33.4N 120.3E	065	015	58150 58251
3	181800	34.1N 120.0E	060	030	58150 58040
4	182100	34.8N 119.8E	050	030	58040 58150
5	190900	38.9N 120.9E	030	040	58656 58662 58454 58539
6	191200	39.0N 121.3E	035	020	58662 58656
7	192100	43.0N 125.3E	025	040	54157 54259 54273 54172

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TYPHOON NELSON
BEST TRACK DATA

	BEST TRACK		WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS				ERRORS				ERRORS			
MO/DA/HR	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
0816122	16.9 143.6	20	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0	-0.	0.	0.0 0.0	0.	-0.	0.
0816182	17.5 142.8	20	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0	-0.	0.	0.0 0.0	0.	-0.	0.
0817002	18.1 142.1	20	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0	-0.	0.	0.0 0.0	0.	-0.	0.
0817062	18.8 141.7	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0	-0.	0.	0.0 0.0	0.	-0.	0.
0817122	19.6 141.4	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0	-0.	0.	0.0 0.0	0.	-0.	0.
0817182	20.4 140.9	30	20.3 141.0	30.	8.	0.	22.0 138.6	55.	58.	-5.	23.0 135.3	70	83.	0.	24.0 131.0	90.	42.	10.
0818002	21.2 140.0	40	21.0 139.6	40.	25.	0.	22.7 135.4	60.	61.	-5.	23.8 131.3	75	108.	5.	25.0 128.0	90.	131.	10.
0818062	21.8 139.4	45	21.4 139.3	45.	29.	0.	23.2 135.8	70.	18.	0.	24.6 132.1	85.	91.	10.	26.1 128.5	95.	129.	5.
0818122	22.3 138.7	55	22.2 138.3	55.	23.	0.	24.4 134.8	80.	84.	15.	25.9 130.7	90.	175.	15.	26.7 126.4	95.	178.	5.
0818182	22.5 137.7	60	22.8 137.5	65.	21.	5.	24.6 133.6	90.	108.	20.	26.6 129.8	95.	208.	15.	28.1 125.7	100.	234.	5.
0819002	22.7 136.5	65	22.6 136.5	65.	6.	0.	23.9 132.2	85.	65.	15.	25.4 127.4	100.	121.	10.	28.3 123.6	105.	230.	20.
0819062	22.9 135.8	70	22.8 135.8	75.	6.	5.	23.7 131.8	90.	45.	15.	25.6 126.6	105.	118.	15.	27.4 121.4	95.	207.	10.
0819122	23.0 134.8	65	23.1 134.9	70.	8.	5.	24.0 131.2	90.	58.	15.	25.6 124.3	105.	173.	10.	27.7 119.2	85.	245.	5.
0819182	23.0 133.8	70	23.2 133.7	70.	13.	0.	24.5 129.4	90.	114.	10.	26.2 124.3	105.	173.	10.	27.7 119.2	85.	245.	5.
0820002	23.1 133.1	70	23.1 133.1	70.	0.	0.	23.8 129.0	90.	55.	10.	25.5 124.5	110	89.	20.	27.9 121.0	100.	150.	20.
0820062	23.1 132.3	75	23.2 132.2	75.	8.	0.	24.0 128.3	90.	36.	0.	25.8 123.7	110	90.	25.	28.2 120.2	70.	158.	0.
0820122	23.1 131.6	75	23.1 131.5	75.	6.	0.	23.5 128.0	95.	36.	5.	25.4 123.1	110	57.	25.	27.9 118.5	60.	152.	-10.
0820182	23.3 131.0	80	23.1 130.8	80.	16.	0.	23.6 127.1	100.	47.	5.	25.8 122.3	110	46.	30.	28.3 117.5	45.	180.	-5.
0821002	23.8 130.0	80	23.8 130.1	80		5.	25.0 126.9	100.	72.	10.	27.4 122.8	110	126.	30.	29.8 119.3	35.	262.	0.
0821062	24.0 129.0	90	24.1 129.0	85		6.	-5. 25.5 125.4	105.	66.	20.	27.8 121.7	105	142.	35.	0.0 0.0	0.	-0.	0.
0821122	24.1 128.0	90	24.2 127.9	90.		8.	-5. 25.5 123.7	105.	68.	20.	29.2 120.0	45	217.	-25.	0.0 0.0	0.	-0.	0.
0821182	24.3 126.7	95	24.2 126.8	90.		8.	-5. 25.6 122.4	105.	32.	25.	29.6 118.0	30.	249.	-20.	0.0 0.0	0.	-0.	0.
0822002	24.5 125.7	90	24.5 125.7	80.		0.	-10. 26.5 121.5	70.	62.	-10.	0 0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0822062	24.6 124.7	85	24.8 124.7	80.	12.	-5.	27.0 120.6	65.	84.	-5.	0 0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0822122	24.7 123.8	85	24.7 123.7	80.	5.	-5.	26.6 119.9	65.	61.	-5.	0 0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0822182	25.2 122.8	80	25.2 122.7	75.	5.	-5.	26.5 118.7	40.	60.	-10.	0 0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0823002	25.5 121.8	80	25.6 121.8	70.	6.	-10.	27.5 118.1	25.	111.	-10.	0 0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0823062	25.6 120.7	70	25.7 120.9	70.	12.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0823122	25.6 119.7	70	25.7 119.8	70.	8.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0823182	25.5 118.7	50	25.6 118.6	50	8.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0824002	25.7 117.6	35	25.5 117.5	35.	13.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0824062	26.1 116.7	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	10.	64.	132.	182.	10.	64.	132.	182.
AVG RIGHT ANGLE ERROR	9.	47.	88.	148.	9.	47.	88.	148.
AVG INTENSITY MAGNITUDE ERROR	2.	11.	18.	8.	2.	11.	18.	8.
AVG INTENSITY BIAS	-1.	6.	13.	6.	-1.	6.	13.	6.
NUMBER OF FORECASTS	26	22	17	14	25	22	17	14

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1676. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 9. KNOTS

TYPHOON NELSON
FIX POSITIONS FOR CYCLONE NO. 11

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
*	1	152245	13.2N 142.1E	PCN 6	T1.0/1.0	INIT OBS	PGTW
	2	160300	15.8N 142.2E	PCN 6	T1.0/1.0	INIT OBS	PGTW
	3	160901	17.1N 143.6E	PCN 6			PGTW
	4	160943	17.2N 143.7E	PCN 6			PGTW
	5	161200	17.4N 143.7E	PCN 6			PGTW
	6	161328	17.3N 143.4E	PCN 5			PGTW
	7	161731	17.4N 143.5E	PCN 6	T1.5/1.5	INIT OBS	PGTW
*	8	162100	16.7N 142.7E	PCN 6		INIT OBS	RPMK
*	9	162223	17.4N 143.3E	PCN 5	T1.0/1.0	SCNDRY LLCC 16.0N 140.1E	PGTW
	10	170028	18.6N 142.4E	PCN 6			PGTW
	11	170435	19.4N 142.5E	PCN 5	T1.5/1.5 /D0.5/24HRS		PGTW
	12	170600	19.6N 141.8E	PCN 6			PGTW
	13	170900	19.9N 141.5E	PCN 6			PGTW
	14	171200	20.1N 141.3E	PCN 6			PGTW
	15	171600	20.0N 141.5E	PCN 6	T2.5/2.5+/D1.0/22HRS		PGTW
	16	171720	20.2N 141.1E	PCN 6			PGTW
	17	172120	20.5N 140.1E	PCN 6		ULAC 20.8N 140.2E	PGTW
	18	172201	20.5N 139.7E	PCN 5			PGTW
	19	180007	20.5N 139.8E	PCN 5	T2.5/2.5+/D1.0/24HRS		PGTW
	20	180423	21.5N 140.0E	PCN 5			PGTW
	21	180600	21.3N 139.9E	PCN 6			PGTW
	22	180900	22.4N 139.0E	PCN 6			PGTW
	23	181000	22.4N 138.7E	PCN 5			PGTW
	24	181200	22.5N 138.5E	PCN 6			PGTW
	25	181248	22.5N 138.1E	PCN 6			PGTW
	26	181600	22.7N 137.7E	PCN 6	T4.0/4.0 /D1.5/24HRS		PGTW
	27	181709	22.6N 137.6E	PCN 6			RODN
	28	181709	22.6N 137.6E	PCN 5			PGTW
	29	182058	22.4N 136.9E	PCN 6			PGTW
	30	182100	22.3N 136.4E	PCN 6			RPMK
	31	182320	22.3N 136.8E	PCN 5	T3.0/3.0	INIT OBS	PGTW
	32	182320	22.5N 136.5E	PCN 5			PGTW
	33	190128	22.3N 136.2E	PCN 5			PGTW
	34	190300	22.8N 136.1E	PCN 6	T4.5/4.5 /D2.0/24HRS	PSBL EYE FORMING	RPMK
	35	190555	22.6N 136.1E	PCN 5	T4.0/4.0	INIT OBS	PGTW
	36	190555	23.0N 135.9E	PCN 3			RODN
	37	190555	23.0N 135.7E	PCN 3	T4.5/4.5	INIT OBS	PGTW
	38	190938	23.1N 135.0E	PCN 6			PGTW
	39	191018	23.2N 134.9E	PCN 6			RPMK
	40	191018	22.9N 135.2E	PCN 5	T4.0/4.0	INIT OBS	PGTW
	41	191200	23.1N 134.0E	PCN 6			PGTW
	42	191409	22.8N 134.3E	PCN 6		ULCC FIX	PGTW
	43	191600	23.0N 133.8E	PCN 6	T4.0/4.0+/S0.0/24HRS	ULCC FIX	PGTW
	44	191800	22.9N 133.7E	PCN 6		ULCC FIX	RPMK
	45	191841	22.8N 133.3E	PCN 6			PGTW
	46	192037	23.0N 133.5E	PCN 5			PGTW
	47	192258	23.0N 133.3E	PCN 5			PGTW
	48	200000	22.9N 133.2E	PCN 6			PGTW
	49	200544	23.1N 132.4E	PCN 4	T4.5/4.5+/S0.0/26HRS		RKSO
	50	200544	23.2N 132.2E	PCN 3	T4.5/4.5	INIT OBS	PGTW
	51	200917	23.0N 131.9E	PCN 4			

52	200957	23.2N	131.7E	PCN 4				PGTW
53	201200	23.4N	131.8E	PCN 4				PGTW
54	201349	23.0N	131.2E	PCN 4			I DEVELOPING EYE WALL	PGTW
55	201600	23.0N	131.5E	PCN 6	T4.5/4.5 /D0.5/24HRS		I	PGTW
56	201830	23.3N	130.9E	PCN 5				RPMK
57	201830	23.0N	130.7E	PCN 6			I	PGTW
58	202100	23.4N	130.8E	PCN 6			I	PGTW
59	202157	23.6N	130.7E	PCN 5			B	PGTW
60	202236	23.7N	130.3E	PCN 3	T4.5/4.5		INIT OBS WELL DEFINED EYE	RODN
61	210048	24.0N	129.9E	PCN 1			BANDING EYE	RKSO
62	210048	23.9N	130.0E	PCN 5			B	PGTW
63	210300	24.0N	129.6E	PCN 2	T4.5/4.5+/S0.0/22HRS		B BANDING EYE	PGTW
64	210533	24.1N	129.0E	PCN 3			B POORLY DEFINED EYE	PGTW
65	210533	24.1N	129.1E	PCN 1	T5.0/5.0		INIT OBS RAGGED EYE FIX	RPMK
66	210533	24.2N	129.0E	PCN 1	T4.5/4.5 /S0.0/24HRS			RKSO
67	210900	24.1N	128.4E	PCN 4			I POSSIBLE EYE WALL	PGTW
68	211037	23.9N	128.6E	PCN 2			RAGGED EYE	RPMK
69	211116	24.0N	128.0E	PCN 1				RKSO
70	211116	24.1N	128.5E	PCN 1			RAGGED EYE 6NM DIA	RPMK
71	211200	24.1N	128.1E	PCN 4			I	PGTW
72	211328	24.0N	127.6E	PCN 4			I	PGTW
73	211600	24.2N	127.2E	PCN 2	T5.0/5.0-/D0.5/24HRS		I ILL DEFINED EYE 15NM	PGTW
74	211819	24.5N	126.7E	PCN 3				RPMK
75	211819	24.0N	126.6E	PCN 4			I ILL DEFINED EYE	PGTW
76	212100	24.3N	126.5E	PCN 2			I RAGGED ELONGATED EYE	PGTW
77	212136	24.4N	126.2E	PCN 1			B ELONGATED BANDING EYE	PGTW
78	212356	24.6N	126.0E	PCN 3				RKSO
79	212356	24.2N	126.1E	PCN 1			EYE FIX	RPMK
80	220000	24.4N	125.7E	PCN 4				PGTW
81	220028	24.3N	125.7E	PCN 3				PGTW
82	220209	24.5N	125.6E	PCN 1	T5.5/5.5-/D0.5/21HRS		EYE FIX	RPMK
83	220523	24.9N	124.7E	PCN 1	T4.5/4.5 /S0.0/24HRS		RAGGED EYE FIX	RKSO
84	220523	24.7N	124.8E	PCN 3	T4.5/4.5 /S0.0/26HRS			PGTW
85	221016	24.6N	124.0E	PCN 2			RAGGED EYE 12NM DIA	PGTW
86	221054	24.6N	123.9E	PCN 2			RAGGED EYE 12NM DIA	PGTW
87	221200	24.6N	123.7E	PCN 4				PGTW
88	221449	24.9N	123.9E	PCN 1			RAGGED EYE FIX	RPMK
89	221600	24.9N	123.1E	PCN 4	T5.0/5.0-/S0.0/24HRS			PGTW
90	221808	25.3N	122.8E	PCN 3				PGTW
91	222114	25.3N	122.1E	PCN 6				PGTW
92	222334	25.3N	121.9E	PCN 1			RAGGED EYE FIX	RKSO
93	222334	25.3N	121.8E	PCN 3				PGTW
94	230149	25.4N	121.3E	PCN 1	T5.0/5.0-/W0.5/24HRS		20NM RAGGED EYE	RPMK
95	230149	25.4N	121.6E	PCN 1	T5.0/5.0		INIT OBS 25 NM RAGGED EYE FI	RODN
96	230300	25.5N	121.3E	PCN 2			RAGGED EYE FIX	PGTW
97	230512	25.6N	120.8E	PCN 1	T4.5/4.5-/S0.0/24HRS			PGTW
* 98	230512	25.5N	120.3E	PCN 1			RAGGED EYE	RODN
99	230900	25.7N	120.6E	PCN 2			EYE FIX	PGTW
100	230957	25.6N	120.4E	PCN 1			EYE FIX	PGTW
101	231032	25.6N	120.1E	PCN 2			EYE FIX	PGTW
102	231135	25.4N	120.3E	PCN 2			EYE FIX	RODN
103	231136	25.4N	120.3E	PCN 3				RPMK
104	231200	25.6N	119.8E	PCN 4				PGTW
105	231429	25.5N	119.1E	PCN 3				RPMK
106	231600	25.3N	119.0E	PCN 4				PGTW
107	231800	25.5N	118.2E	PCN 6				PGTW
108	231940	25.1N	117.9E	PCN 5				RPMK
109	232100	25.8N	117.3E	PCN 6				PGTW
110	232235	25.7N	117.9E	PCN 6				RKSO
111	240000	26.0N	117.4E	PCN 6				PGTW
*112	240052	24.5N	116.9E	PCN 5				RODN
113	240600	26.3N	116.5E	PCN 6				PGTW

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN-DIAM/TATION	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
* 1	162357	16.7N 139.8E	1500FT		1302	20 120 150	230 11 040 60	8 50			+24 +24 +23	1
2	172131	20.6N 140 7E	700MB	2991	989	45 150 84	080 40 150 72	10 3			+ +25 +25 29	2
3	172337	20 8N 139.7E	1500FT		990	55 050 90	140 55 050 30	10 1			+24 +26 +26 29	3
4	180752	21.9N 139.4E	1500FT		990	60 050 72	150 56 050 90	15 2			+25 +26 +	4
5	181032	22.2N 139.0E	700MB	2988	984		280 55 160 140	20 15			+11 +16 + 3	3
6	182115	22.4N 137.0E	700MB	2930	981	55 030 30	120 55 030 30	5 5			+10 +13 +12	5
7	182346	22.6N 136.6E	700MB	2912	979	75 130 55	280 62 130 45	3 3			+11 +15 +10	5
8	190855	23.1N 135.7E	700MB	2903		65 150 50	230 54 150 67	10 6			+13 +19 +14	6
9	191135	23.1N 135.0E	700MB	2933	981		320 57 210 96	10 3			+13 +17 +11	6
10	192129	23.0N 133.5E	700MB	2860		70 040 18	130 72 040 30	10 3			+14 +16 +11	7
11	192359	23.1N 133.1E	700MB	2865	971	50 040 32	040 58 300 32	10 3			+14 +20 +11	7
12	200835	23.1N 132.2E	700MB	2852		50 230 60	120 73 030 90	6 10			+ +14 +10	8
13	201140	23.0N 131.7E	700MB	2841	971		250 61 170 78	5 20			+14 +15 +10	8
14	210058	23.9N 131.0E	700MB	2837	968	80 140 78	080 68 140 72	5 3			+15 +15 +12	9
15	210856	24.1N 128.5E	700MB	2798	966	50 150 40	130 68 040 115	5 10	CIRCULAR	20	+13 +15 +10	10
16	211140	24.2N 128.0E	700MB	2799	965		120 73 010 60	4 10	CIRCULAR	15	+13 +16 +10	10
17	212038	24.3N 126.4E	700MB	2803	963	55 040 120	120 62 040 84	4 6			+15 +16 +10	11
18	212344	24.5N 125.8E	700MB	2783	963	50 230 60	040 62 290 60	10 6	CIRCULAR	20	+15 +16 + 7	11
19	220833	24.7N 124.4E	700MB	2714		65 190 60	160 71 050 30	5 3			+13 +16 +14	12
20	221105	24.6N 123.8E	700MB	2721		65 040 90	100 81 040 72	5 2			+13 +17 +14	12

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR TDDFF	COMMENTS	RADAR POSITION	SITE WMO NO.
1	210300	24.1N 129.5E	LAND				5///2 /////		26.2N 127.8E	47937
2	210400	24.1N 129.2E	LAND	@			5///2 52816		26.2N 127.8E	47937
3	210500	24.1N 129.0E	LAND				5///2 52611		26.2N 127.8E	47937
4	210600	24.1N 128.9E	LAND				5///2 72709		26.2N 127.8E	47937
5	210700	24.1N 128.8E	LAND				5///2 72608		26.2N 127.8E	47937
6	210800	24.1N 128.7E	LAND				5///2 72707		26.2N 127.8E	47937
7	210900	24.0N 128.5E	LAND	FAIR		30		MOV 2720	26.3N 126.8E	47929
8	210900	24.1N 128.4E	LAND				5///3 72709		26.2N 127.8E	47937
9	211000	24.2N 128.2E	LAND	POOR				MOV 2930	26.3N 126.8E	47929
10	211000	24.1N 128.3E	LAND				5///3 72709		26.2N 127.8E	47937
11	211100	24.2N 128.1E	LAND	POOR		20		MOV 2720	26.3N 126.8E	47929
12	211100	24.1N 128.0E	LAND				6///3 5////		24.8N 125.3E	47927
13	211100	24.1N 128.2E	LAND				5//13 72709		26.2N 127.8E	47937
14	211200	24.1N 128.0E	LAND				6///3 50000		24.8N 125.3E	47927
15	211200	24.1N 127.9E	LAND	POOR				MOV 2720	26.3N 126.8E	47929
16	211200	24.1N 128.1E	LAND				5///2 72705		26.2N 127.8E	47937
17	211300	24.2N 127.8E	LAND	POOR		40		MOV 2920	26.3N 126.8E	47929
18	211300	24.1N 127.9E	LAND				6///3 52705		24.8N 125.3E	47927
19	211300	24.1N 127.9E	LAND				35/11 72706		26.2N 127.8E	47937
20	211400	24.1N 127.7E	LAND				6///3 52716		24.8N 125.3E	47927
21	211400	24.2N 127.6E	LAND	POOR		40		MOV 2720	26.3N 126.8E	47929
22	211400	24.1N 127.6E	LAND				5///2 72511		26.2N 127.8E	47937
23	211500	24.1N 127 4E	LAND				25903 52712		24.8N 125.3E	47927
24	211500	24.1N 127.4E	LAND				5///2 72712		26.2N 127.8E	47937
25	211600	24.2N 127.3E	LAND				20874 53012		24.8N 125.3E	47927
26	211600	24.2N 127.2E	LAND	POOR		40		MOV 2720	26.3N 126.8E	47929

27	211600	24.2N	127.2E	LAND				5///2	72812			26.2N	127.8E	47937
28	211700	24.2N	127.0E	LAND	POOR	40				MOV	2720	26.3N	126.8E	47929
29	211700	24.3N	127.1E	LAND				65//3	/////			24.3N	124.2E	47918
30	211800	24.2N	126.9E	LAND	POOR	40				MOV	2720	26.3N	126.8E	47929
31	211800	24.2N	126.8E	LAND				31913	52511			24.3N	124.2E	47918
32	211900	24.2N	126.7E	LAND	POOR	50				MOV	2720	26.3N	126.8E	47929
33	211900	24.2N	126.8E	LAND				21883	50000			24.3N	124.2E	47918
34	212000	24.6N	126.3E	LAND	POOR	40				MOV	2720	26.3N	126.8E	47929
35	212000	24.4N	126.6E	LAND				21813	53012			24.8N	125.3E	47927
36	212000	24.3N	126.5E	LAND				5///2	72807			26.2N	127.8E	47937
37	212100	24.5N	126.5E	LAND	POOR	40				MOV	3020	26.3N	126.8E	47929
38	212100	24.3N	126.5E	LAND				55/63	52916			24.3N	124.2E	47918
39	212200	24.3N	126.2E	LAND	POOR	40				MOV	3020	26.3N	126.8E	47929
40	212200	24.4N	126.2E	LAND				55/13	52919			24.3N	124.2E	47918
41	212300	24.5N	126.2E	LAND	POOR	40				MOV	3020	26.3N	126.8E	47929
42	212300	24.4N	126.0E	LAND				21883	72815			24.3N	124.2E	47918
43	220000	24.5N	125.9E	LAND				2//13	52705			24.8N	125.3E	47927
44	220000	24.3N	127.0E	LAND	GOOD	35				MOV	2830	24.8N	125.3E	47927
45	220000	24.3N	125.8E	LAND				50933	72715			24.3N	124.2E	47918
46	220000	24.5N	126.8E	LAND	POOR	40				MOV	2920	26.3N	126.8E	47929
47	220000	24.5N	125.9E	LAND				5///2	72809			26.2N	127.8E	47937
48	220100	24.5N	125.8E	LAND				50723	72707			24.3N	124.2E	47918
49	220100	24.5N	125.8E	LAND	POOR	30				MOV	2810	24.8N	125.3E	47927
50	220100	24.5N	125.7E	LAND	GOOD	20				MOV	2810	26.3N	126.8E	47929
51	220100	24.5N	125.7E	LAND				12722	52711			24.8N	125.3E	47927
52	220100	24.5N	125.7E	LAND				5///2	72810			26.2N	127.8E	47937
53	220200	24.5N	125.5E	LAND				12712	52714			24.8N	125.3E	47927
54	220200	24.5N	125.6E	LAND				50814	73009			24.3N	124.2E	47918
55	220200	24.6N	125.5E	LAND	GOOD	20				MOV	2810	26.3N	126.8E	47929
56	220200	24.6N	125.5E	LAND				5/972	72912			26.2N	127.8E	47937
57	220300	24.6N	125.2E	LAND	GOOD	20				MOV	2710	26.3N	126.8E	47929
58	220300	24.7N	125.3E	LAND				50812	73011			24.3N	124.2E	47918
59	220300	24.6N	125.3E	LAND				25//2	53016			24.8N	125.3E	47927
60	220300	24.6N	125.2E	LAND				5///3	72812			26.2N	127.8E	47937
61	220400	24.6N	125.0E	LAND	GOOD	25				MOV	2720	26.3N	126.8E	47929
62	220400	24.6N	125.1E	LAND				25/12	52711			24.8N	125.3E	47927
63	220400	24.6N	125.1E	LAND				20892	72812			24.3N	124.2E	47918
64	220400	24.6N	125.0E	LAND				5///3	72812			26.2N	127.8E	47937
65	220500	24.6N	124.9E	LAND				25//2	52711			24.8N	125.3E	47927
66	220500	24.8N	124.8E	LAND	FAIR	45				MOV	2720	26.3N	126.8E	47929
67	220500	24.6N	124.9E	LAND				51552	72811			24.3N	124.2E	47918
68	220500	24.6N	124.8E	LAND				5///2	72709			26.2N	127.8E	47937
69	220600	24.7N	124.8E	LAND				55/52	72809			24.3N	124.2E	47918
70	220600	24.7N	124.7E	LAND	FAIR	20				MOV	2720	26.3N	126.8E	47929
71	220600	24.6N	124.6E	LAND				25//2	52816			24.8N	125.3E	47927
72	220600	24.7N	124.7E	LAND				6///2	72811			26.2N	127.8E	47937
73	220700	24.7N	124.6E	LAND				65///2	72809			24.3N	124.2E	47918
74	220700	24.6N	124.4E	LAND				2.///3	52711			24.8N	125.3E	47927
75	220700	24.8N	124.5E	LAND	POOR	20				MOV	3020	26.3N	126.8E	47929
76	220800	24.9N	124.4E	LAND	POOR					MOV	3020	26.3N	126.8E	47929
77	220800	24.7N	124.4E	LAND				22573	53605			24.8N	125.3E	47927
78	220800	24.7N	124.5E	LAND				55/12	72809			24.3N	124.2E	47918
79	220800	24.7N	124.5E	LAND				24823	51705			24.0N	121.6E	46699
80	220900	24.7N	124.2E	LAND				20714	52911			24.8N	125.3E	47927
81	220900	24.7N	124.3E	LAND				55/12	72709			24.3N	124.2E	47918
82	220900	24.8N	124.3E	LAND				35965	528//			24.0N	121.6E	46699
83	221000	24.8N	124.2E	LAND				55/12	72909			24.3N	124.2E	47918
84	221000	24.8N	124.2E	LAND	GOOD	20				MOV	2720	24.8N	125.3E	47927
85	221000	24.7N	124.1E	LAND				22834	52511			24.8N	125.3E	47927
86	221100	24.8N	124.1E	LAND	GOOD	20				MOV	2720	24.8N	125.3E	47927
87	221100	24.8N	124.1E	LAND				55/12	72809			24.3N	124.2E	47911
88	221100	24.7N	124.0E	LAND				55/43	52705			24.8N	125.3E	47927
89	221200	24.8N	123.9E	LAND				52813	72909			24.3N	124.2E	47918
90	221200	24.8N	123.8E	LAND	GOOD	30				MOV	2730	24.8N	125.3E	47927
91	221200	24.8N	123.8E	LAND				55/43	53111			24.8N	125.3E	47927
92	221200	24.9N	124.0E	LAND				24852	53309			24.0N	121.6E	46699
93	221300	24.8N	123.7E	LAND				22993	72809			24.3N	124.2E	47918
94	221300	24.7N	123.6E	LAND				55/44	52411			24.8N	125.3E	47927
95	221300	24.8N	123.8E	LAND	GOOD	30				MOV	2720	24.8N	125.3E	47927
96	221400	24.8N	123.6E	LAND	GOOD	30				MOV	2720	24.8N	125.3E	47927
97	221400	24.9N	123.5E	LAND				55/43	53215			24.8N	125.3E	47927
98	221400	24.9N	123.6E	LAND				22913	72808			24.3N	124.2E	47918
99	221500	25.1N	123.4E	LAND				22912	73011			24.3N	124.2E	47918
100	221500	25.0N	123.4E	LAND				5///4	53308			24.8N	125.3E	47927
101	221500	25.0N	123.4E	LAND	GOOD	30				MOV	2720	24.8N	125.3E	47927
102	221600	25.2N	123.2E	LAND	GOOD	55				MOV	2920	24.8N	125.3E	47927
103	221700	25.2N	122.7E	LAND				11972	50911			****	*****	58760
104	221700	25.4N	123.1E	LAND	GOOD	55				MOV	2920	24.8N	125.3E	47927
105	221700	25.4N	123.1E	LAND				5///4	53219			24.8N	125.3E	47927
106	221700	25.4N	123.1E	LAND				52962	73209			24.3N	124.2E	47918
107	221800	25.3N	122.5E	LAND				11912	52911			****	*****	58760
108	221800	25.4N	122.9E	LAND				6///2	52808			24.8N	125.3E	47927
109	221800	25.4N	122.8E	LAND	GOOD	55				MOV	2720	24.8N	125.3E	47927
110	221800	25.5N	122.8E	LAND				62962	73022			24.3N	124.2E	47918
111	221800	25.5N	122.7E	LAND				20994	52821			24.0N	121.6E	46699
112	221900	25.5N	122.7E	LAND				62912	73112			24.3N	124.2E	47918
113	221900	25.4N	122.5E	LAND	GOOD	55				MOV	2720	24.8N	125.3E	47927
114	221900	25.5N	122.7E	LAND				6///3	52912			27.1N	119.6E	58749
115	221900	25.4N	122.3E	LAND				10922	52912			24.0N	121.6E	46699
116	221900	25.5N	122.6E	LAND				24994	52806			24.8N	125.3E	47927
117	222000	25.5N	122.4E	LAND				6///3	52819			****	*****	58760
118	222000	25.4N	122.1E	LAND				10822	52912			24.8N	125.3E	47927
119	222000	25.5N	122.2E	LAND	GOOD	55				MOV	2920	24.3N	124.2E	47918
120	222000	25.5N	122.4E	LAND				62913	72812			****	*****	58760
121	222100	25.4N	121.9E	LAND				10822	52912			24.8N	125.3E	47927
122	222100	25.6N	122.0E	LAND	FAIR	40				MOV	2820	25.1N	121.6E	46696
123	222100	25.7N	122.2E	LAND				6////	5////			24.3N	124.2E	47918
124	222100	25.5N	122.2E	LAND				61912	72811			25.1N	121.6E	46696
125	222200	25.7N	121.8E	LAND				6////	5////			24.3N	124.2E	47918
126	222200	25.5N	121.9E	LAND				61913	72714			24.3N	124.2E	47918
127	222300	25.4N	121.8E	LAND				65/62	72611			****	*****	58760
128	222300	25.4N	121.6E	LAND				11812	52912			24.3N	124.2E	47918
129	230000	25.4N	121.6E	LAND				21812	52615			****	*****	58760
130	230000	25.4N	121.4E	LAND				10822	52812			24.0N	121.6E	46699
131	230000	25.4N	121.5E	LAND				6////	52306			24.3N	124.2E	47918
132	230100	25.5N	121.4E	LAND				21933	62811			24.3N	124.2E	47918
133	230200	25.4N	121.3E	LAND				21923	72709			****	*****	58760
134	230300	25.5N	120.9E	LAND				10812	52812			****	*****	58760
135	230400	25.5N	120.8E	LAND				10812	52812			****	*****	58760
136	230500	25.6N	120.6E	LAND				10812	52811			****	*****	58760
137	230700	25.6N	120.4E	LAND				10812	52811			****	*****	58760
138	230800	25.6N	120.2E	LAND				10812	52811			****	*****	58760
139	230900	25.6N	120.1E	LAND				10713	52811			****	*****	58760
140	231200	25.7N	119.7E	LAND				10712	52811			****	*****	58760
141	231400	25.7N	119.4E	LAND				24542	52710			****	*****	58760

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	220600	24.5N 124.7E	080	035	47927 47918

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TYPHOON ODESSA
BEST TRACK DATA

MO/DA/HR	BEST TRACK POSIT		WIND	WARNING POSIT		WIND	24 HOUR FORECAST ERRORS DST	ERRORS WIND	POSIT		WIND	48 HOUR FORECAST ERRORS DST	ERRORS WIND	POSIT		WIND	72 HOUR FORECAST ERRORS DST	ERRORS WIND	POSIT		WIND	ERRORS DST	ERRORS WIND	
082300Z	13.4	141.1	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
082306Z	18.0	141.6	25	18.5	141.6	25.	30.	0.	19.2	141.1	45.	172.	0.	20.0	140.2	65.	216.	-5.	20.8	138.2	90.	390.	10.	
082312Z	17.6	142.0	30	18.5	141.5	30.	61.	-0.	19.4	140.8	50.	189.	0.	20.7	139.2	70.	253.	-5.	21.8	136.0	90.	444.	5.	
082318Z	17.2	142.5	35	18.4	141.5	30.	92.	-5.	19.1	140.9	45.	185.	-10.	20.0	140.0	50.	283.	-25.	21.0	138.3	65.	427.	-20.	
082400Z	17.0	143.1	40	16.9	143.1	45.	6.	5.	17.1	145.0	60.	238.	-5.	19.0	143.3	70.	369.	-10.	20.6	140.8	85.	438.	0.	
082406Z	17.6	143.6	45	17.4	143.4	50.	17.	5.	19.3	143.9	65.	164.	-5.	20.6	141.7	75.	332.	-5.	21.6	138.9	90.	407.	0.	
082412Z	18.5	144.0	50	17.9	143.9	55.	36.	5.	19.8	143.8	70.	197.	-5.	21.5	141.3	80.	326.	-5.	22.6	138.5	95.	353.	5.	
082418Z	19.7	144.1	55	19.7	144.2	55.	6.	0.	22.7	143.5	70.	90.	-5.	24.4	141.1	85.	187.	0.	25.9	138.5	100.	154.	15.	
082500Z	20.9	143.8	65	21.0	144.0	70.	13.	5.	24.2	142.7	100.	55.	20.	25.9	140.2	110.	129.	25.	27.5	137.5	110.	76.	15.	
082506Z	22.0	143.4	70	22.0	143.6	75.	11.	5.	24.7	141.2	100.	103.	20.	26.3	138.5	110.	160.	20.	27.7	135.8	110.	110.	20.	
082512Z	23.0	143.0	75	22.9	142.8	75.	13.	0.	25.5	139.8	95.	141.	10.	26.9	137.1	100.	180.	10.	28.3	134.3	100.	137.	10.	
082518Z	24.0	142.7	75	23.7	142.2	70.	33.	-5.	26.0	138.9	90.	166.	-5.	27.4	136.2	95.	183.	10.	28.7	133.4	100.	137.	10.	
082600Z	25.1	142.5	80	25.1	142.5	80.	0.	0.	27.9	141.1	90.	0.	5.	29.2	138.3	100.	64.	15.	29.2	135.1	100.	16.	15.	
082606Z	26.1	142.3	80	26.0	142.2	90.	8.	10.	28.4	140.4	100.	16.	10.	29.2	137.2	105.	68.	15.	29.0	134.1	100.	45.	15.	
082612Z	26.9	141.9	85	26.8	141.9	80.	6.	-5.	28.9	139.6	90.	45.	0.	29.4	136.4	100.	71.	10.	29.4	133.2	100.	77.	15.	
082618Z	27.5	141.5	85	27.6	141.5	85.	6.	0.	29.2	138.8	90.	65.	5.	29.5	135.6	100.	58.	10.	29.5	132.4	100.	139.	15.	
082700Z	27.9	141.1	85	28.0	141.1	85.	6.	0.	29.3	138.4	95.	68.	10.	29.4	135.4	95.	36.	10.	29.4	132.1	90.	212.	5.	
082706Z	28.2	140.6	90	28.4	140.6	95.	12.	5.	29.3	138.8	95.	84.	5.	29.3	135.3	85.	91.	0.	29.0	131.7	80.	272.	-5.	
082712Z	28.3	140.1	90	28.3	140.1	85.	0.	-5.	28.9	138.0	85.	68.	-5.	29.0	134.7	75.	158.	-10.	28.8	131.6	70.	329.	-10.	
082718Z	28.3	139.5	85	28.3	139.5	85.	0.	0.	28.3	136.8	75.	46.	-15.	28.2	133.7	70.	235.	-15.	27.8	130.6	60.	306.	-10.	
082800Z	28.2	138.7	85	28.2	138.7	75.	0.	-10.	27.8	135.0	50.	72.	-35.	28.3	129.6	30.	146.	-55.	0.0	0.0	0.	-0.	0.	
082806Z	28.2	137.8	90	28.2	137.7	75.	5.	-15.	27.9	133.7	75.	102.	-10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
082812Z	28.3	136.9	90	28.2	137.0	80.	8.	-10.	28.2	132.8	55.	118.	-30.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
082818Z	28.6	136.0	90	28.4	136.0	80.	12.	-10.	28.2	131.6	45.	154.	-40.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
082900Z	29.0	134.9	85	28.9	135.0	80.	8.	-5.	29.9	130.9	80.	143.	-5.	30.3	126.6	80.	22.	20.	31.3	122.7	80.	512.	40.	
082906Z	29.6	133.6	85	29.6	133.7	80.	5.	-5.	31.0	128.5	70.	102.	-15.	31.3	124.3	70.	160.	15.	31.3	120.7	60.	738.	20.	
082912Z	30.0	131.9	85	30.0	132.0	80.	5.	-5.	30.0	126.4	70.	55.	-10.	30.0	122.8	70.	347.	20.	0.0	0.0	0.	-0.	0.	
082918Z	30.3	129.9	85	30.3	129.9	80.	0.	-5.	29.7	124.0	70.	77.	0.	30.0	121.3	55.	513.	10.	0.0	0.0	0.	-0.	0.	
083000Z	30.4	128.2	85	30.2	128.2	80.	12.	-5.	30.1	122.0	75.	218.	15.	30.7	118.3	35.	727.	-5.	0.0	0.0	0.	-0.	0.	
083006Z	30.3	126.7	85	30.2	126.5	85.	12.	0.	30.3	121.0	70.	334.	15.	30.7	118.2	30.	868.	-10.	0.0	0.0	0.	-0.	0.	
083012Z	29.7	125.4	80	29.9	125.7	80.	20.	0.	29.0	123.4	65.	353.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
083018Z	30.1	125.4	70	29.7	125.1	70.	29.	0.	29.5	122.8	40.	467.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
083100Z	30.4	126.2	60	30.2	126.0	70.	16.	10.	31.7	127.6	70.	303.	30.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
083106Z	31.1	127.4	55	30.8	127.0	70.	27.	15.	34.1	130.5	55.	236.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
083112Z	32.5	128.9	50	32.5	128.9	50.	0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
083118Z	34.2	130.1	45	34.1	129.9	50.	12.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
090100Z	35.5	131.6	40	35.5	131.5	40.			0.0	0.0				0.0	0.0				0.0	0.0				
090106Z	36.8	134.0	40	36.9	133.7	40.	16.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	

ALL FORECASTS

	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	15.	146.	238.	272.
AVG RIGHT ANGLE ERROR	8.	66.	111.	128.
AVG INTENSITY MAGNITUDE ERROR	4.	12.	13.	13.
AVG INTENSITY BIAS	-1.	-1.	2.	9.
NUMBER OF FORECASTS	37	33	26	21

TYPHOONS WHILE OVER 35 KTS

	WRNG	24-HR	48-HR	72-HR
	13.	146.	238.	272.
	8.	66.	111.	128.
	5.	12.	13.	13.
	-1.	-1.	2.	9.
	35	33	26	21

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 2328. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 10. KNOTS

TYPHOON ODESSA
FIX POSITIONS FOR CYCLONE NO. 12

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	230007	18.5N 141.2E	PCN 5	T1.0/1.0	INIT OBS	PGTW
	2	230512	18.4N 141.8E	PCN 6			PGTW
	3	230512	18.2N 141.6E	PCN 5	T1.5/1.5	INIT OBS	RODN
	4	230954	18.5N 142.0E	PCN 6			PGTW
	5	231032	18.2N 141.8E	PCN 6			PGTW
*	6	231200	18.5N 141.0E	PCN 6			PGTW
*	7	231248	18.5N 141.3E	PCN 6			PGTW
*	8	231600	18.4N 142.0E	PCN 6	T1.0/1.0	INIT OBS	PGTW
*	9	231757	18.7N 142.3E	PCN 6			PGTW
*	10	231757	18.3N 143.0E	PCN 5			RODN
	11	232053	16.7N 142.6E	PCN 6			PGTW
	12	232312	17.1N 142.7E	PCN 6			PGTW
	13	240000	16.6N 142.7E	PCN 6			PGTW
	14	240300	16.9N 143.3E	PCN 6	T2.5/2.5 /D1.5/24HRS		PGTW
	15	240501	17.0N 143.4E	PCN 4			PGTW
	16	240501	17.2N 143.0E	PCN 6	T2.0/2.0	INIT OBS	RPMK
	17	240900	17.4N 143.6E	PCN 6			PGTW
	18	240933	17.5N 143.6E	PCN 6			PGTW
	19	241010	17.6N 144.0E	PCN 5			PGTW
	20	241200	17.7N 143.9E	PCN 6			PGTW
	21	241227	17.7N 144.1E	PCN 6			PGTW
	22	241600	17.9N 144.0E	PCN 6	T2.5/2.5 /D1.5/24HRS		PGTW
	23	241747	18.6N 143.6E	PCN 5			PGTW
	24	241747	19.6N 144.2E	PCN 6		ULCC FIX	RPMK
	25	242032	20.7N 143.9E	PCN 6			PGTW
	26	242250	21.1N 144.0E	PCN 4			PGTW
	27	242327	21.0N 143.9E	PCN 4			PGTW
	28	250450	22.0N 143.9E	PCN 3	T4.0/4.0 /D1.5/26HRS		PGTW
	29	250600	22.2N 143.6E	PCN 6			PGTW
	30	250912	22.4N 143.2E	PCN 4			PGTW
	31	250948	22.5N 143.2E	PCN 6			PGTW
	32	251207	22.7N 142.9E	PCN 4			PGTW
	33	251348	22.7N 142.8E	PCN 4			PGTW
	34	251600	23.6N 142.4E	PCN 6	T3.5/3.5+/D1.0/24HRS		PGTW
	35	251736	24.0N 142.5E	PCN 6			PGTW
	36	251736	23.8N 142.8E	PCN 6			PGTW
	37	252011	24.3N 142.4E	PCN 4			RODN
	38	252100	24.4N 142.5E	PCN 4		ULAC 24.4N 142.2E	PGTW
	39	252228	24.9N 142.7E	PCN 1			PGTW
	40	260048	25.4N 142.6E	PCN 1		EYE 6 NM	PGTW
	41	260439	25.7N 142.3E	PCN 3	T5.0/5.0 /D1.0/24HRS	EYE 6 NM	PGTW
	42	260851	26.4N 142.1E	PCN 2		EYE 12 NM	PGTW
	43	260926	26.5N 142.0E	PCN 2		10 NM RAGGED EYE	PGTW
	44	261200	27.0N 142.0E	PCN 2		ELONGATED RAGGED EYE	PGTW
	45	261328	27.0N 141.9E	PCN 1		RAGGED EYE	PGTW
*	46	261600	27.2N 141.7E	PCN 2	T5.0/5.0-/D1.5/24HRS	ELONGATED EYE	PGTW
*	47	261800	27.5N 141.6E	PCN 2		EYE WIDTH 13NM LENGTH 18NM	PGTW
	48	261949	27.2N 141.1E	PCN 4		EYE WIDTH 12NM LENGTH 15NM	PGTW
	49	262100	27.7N 141.5E	PCN 4		RAGGED EYE	PGTW
						EYE FIX	PGTW

50	262206	27.7N	141.8E	PCN 1		EYE WIDTH 12 NM LENGTH 15 NM	PGTW
51	270027	27.9N	141.1E	PCN 1		EYE 12 NM DIA	PGTW
52	270300	28.0N	141.0E	PCN 2	T5.5/5.5-/D0.5/23HRS	EYE 12 NM	PGTW
53	270429	28.2N	140.8E	PCN 2		EYE 12 NM	PGTW
54	270600	28.3N	140.7E	PCN 2		CIRCULAR EYE	PGTW
55	270900	28.5N	140.4E	PCN 2		EYE FIX	PGTW
56	271011	28.5N	140.2E	PCN 1	T5.0/5.0	INIT OBS EYE FIX	RPMK
57	271200	28.3N	140.0E	PCN 2		EYE FIX	PGTW
58	271308	28.2N	139.9E	PCN 2		ELONGATED EYE	RKSO
59	271600	28.1N	139.6E	PCN 2	T5.0/5.0 /S0.0/24HRS	EYE FIX	PGTW
60	271714	28.2N	139.5E	PCN 1		EYE FIX	RKSO
61	271714	28.3N	139.1E	PCN 1		EYE FIX	RODN
62	271800	28.2N	139.5E	PCN 2		EYE FIX	PGTW
63	272100	28.2N	139.1E	PCN 2		EYE FIX	PGTW
64	272109	28.1N	139.2E	PCN 1		EYE FIX	RODN
65	272303	29.0N	135.3E	PCN 1	T4.5/4.5	INIT OBS EYE FIX	RKSO
66	272325	28.1N	139.0E	PCN 1	T5.0/5.0	INIT OBS EYE 20 NM	RODN
67	272325	28.0N	139.2E	PCN 1	T4.5/4.5	INIT OBS	RPMK
68	280000	28.2N	138.8E	PCN 2		EYE FIX	PGTW
69	280300	28.3N	138.3E	PCN 2	T5.0/5.5 /W0.5/24HRS	EYE FIX	PGTW
70	280417	28.2N	137.8E	PCN 1		EYE FIX	RODN
71	280600	28.2N	137.9E	PCN 2		EYE FIX	PGTW
72	280900	28.3N	137.5E	PCN 2		EYE FIX	PGTW
73	280949	28.2N	137.4E	PCN 1		EYE FIX	PGTW
74	281200	28.4N	137.0E	PCN 2		EYE FIX	PGTW
75	281248	28.3N	136.5E	PCN 1		EYE FIX	PGTW
76	281600	28.5N	136.3E	PCN 2	T5.0/5.0-/S0.0/24HRS	EYE FIX	PGTW
77	281800	28.6N	136.1E	PCN 2		EYE FIX	PGTW
78	282048	28.8N	135.6E	PCN 1		EYE FIX	PGTW
79	282303	28.9N	135.2E	PCN 1		EYE FIX	PGTW
80	282347	28.9N	134.8E	PCN 1		EYE FIX	PGTW
81	290128	29.3N	135.1E	PCN 1	T5.0/5.0 /S0.0/26HRS	EYE 12 NM DIA	RODN
82	290128	29.3N	134.9E	PCN 1	T4.5/4.5 /S0.0/26HRS	EYE FIX	RPMK
83	290300	29.3N	134.4E	PCN 2		EYE FIX	PGTW
84	290407	29.5N	134.2E	PCN 1	T4.5/5.0 /W0.5/25HRS	EYE FIX	PGTW
85	290549	29.7N	133.6E	PCN 1		EYE FIX	RPMK
86	290600	29.6N	133.8E	PCN 2		EYE FIX	PGTW
87	290928	29.9N	132.6E	PCN 1		EYE FIX	PGTW
88	291002	30.0N	132.6E	PCN 1		EYE 5 NM	PGTW
89	291200	30.0N	132.1E	PCN 4			PGTW
90	291600	30.2N	130.6E	PCN 6	T4.0/5.0 /W1.0/24HRS		PGTW
91	291800	30.4N	130.0E	PCN 6		ULCC FIX	PGTW
92	292100	30.8N	129.1E	PCN 6			PGTW
93	292208	30.4N	128.7E	PCN 3			RODN
94	292241	30.4N	128.4E	PCN 5	T3.5/3.5 /W1.0/21HRS		RODN
95	300000	30.4N	128.2E	PCN 4			PGTW
96	300108	30.4N	128.0E	PCN 5			PGTW
97	300538	30.3N	126.6E	PCN 5	T3.5/4.5 /W1.0/28HRS		RPMK
98	300600	30.3N	126.6E	PCN 6	T4.5/4.5 /S0.0/26HRS		PGTW
99	300900	29.9N	126.2E	PCN 4		PART EXP LLCC	PGTW
100	301048	30.0N	125.7E	PCN 1		EYE FIX	RKSO
101	301121	30.2N	125.9E	PCN 3			RKSO
102	301121	29.8N	125.6E	PCN 5			RODN
103	301200	29.9N	125.7E	PCN 6			PGTW
104	301348	29.8N	125.0E	PCN 5			PGTW
105	301600	29.7N	125.0E	PCN 6	T3.0/4.0-/W1.0/24HRS		PGTW
106	301824	29.7N	125.3E	PCN 6			PGTW
107	301824	29.8N	125.3E	PCN 5			RPMK
108	302100	29.9N	125.7E	PCN 6			PGTW
109	310001	29.7N	126.1E	PCN 5	T2.5/3.5-/W1.0/23HRS		RODN
110	310001	30.4N	125.7E	PCN 5	T3.0/3.0	INIT OBS	RKSO
111	310001	30.1N	126.1E	PCN 5			RPMK
112	310048	30.1N	126.3E	PCN 3			RKSO
113	310048	30.1N	126.3E	PCN 6			PGTW
114	310300	30.5N	126.7E	PCN 6			PGTW
115	310527	30.7N	127.2E	PCN 6			PGTW
116	310527	30.9N	127.6E	PCN 5	T2.5/3.5 /W1.0/24HRS		RPMK
117	310900	32.2N	128.2E	PCN 6			PGTW
118	311027	32.5N	129.0E	PCN 6			RODN
119	311059	32.3N	128.8E	PCN 5			RPMK
120	311200	32.4N	129.0E	PCN 6			PGTW
121	311328	32.5N	129.2E	PCN 4			PGTW
122	311600	33.3N	129.3E	PCN 6	T2.5/3.0 /W0.5/24HRS		PGTW
123	311800	34.4N	129.3E	PCN 6			PGTW
124	311813	34.3N	129.8E	PCN 5			RPMK
125	312100	34.9N	130.3E	PCN 6		ULCC FIX	PGTW
126	312339	35.4N	131.7E	PCN 5	T2.0/2.5 /W0.5/24HRS		RODN
127	010000	35.5N	131.3E	PCN 6		ULCC FIX	PGTW
128	010027	35.7N	132.2E	PCN 5			RODN
129	010300	36.2N	132.9E	PCN 6		ULCC FIX	PGTW
130	010517	36.6N	133.6E	PCN 5			RODN
131	010600	36.7N	133.6E	PCN 6	T1.5/2.5 /W1.0/29HRS	ULCC FIX	PGTW
132	011005	37.8N	136.0E	PCN 3			RKSO
133	011037	37.7N	136.2E	PCN 5			RODN
134	011037	38.0N	136.3E	PCN 3			RKSO
135	011200	37.6N	136.7E	PCN 6			PGTW

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN- DIAM/TATION	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	232249	16.9N 143.1E	1500FT		1000	55 120 30	190 55 120 03	4 2			+25 +28 +24	1
2	240735	17.6N 143.6E	1500FT		993	45 160 10		5 1			+25 +25 +19	2
3	240836	17.6N 143.6E	1500FT		992	50 020 15		5 1			+24 +25 +20	2
4	242055	20.3N 144.1E	700MB	2979		65 040 30	290 61 180 26	5 1	CIRCULAR	20	+11 +15 + 8	3
5	242340	20.9N 143.9E	700MB	2955		80 130 10	200 77 130 10	5 2	CIRCULAR	15	+11 +14 + 8	3
6	250530	21.9N 143.5E	700MB	2924	978	70 170 20	110 77 030 10	8 10			+ +18 +10	5
7	250806	22.2N 143.4E	700MB	2910	978	70 180 15	300 51 200 20	10 5	CIRCULAR	10	+11 +16 +10	5
8	252115	24.6N 142.6E	700MB	2916		80 180 10	240 78 190 7	2 2	CIRCULAR	30	+14 +16 +10	6
9	252347	25.0N 142.5E	700MB	2884	974	85 150 10	050 58 120 11	2 5	CIRCULAR	30	+ 9 +17 +10	6
10	260909	26.4N 142.2E	700MB	2810		30 200 17	300 64 200 17	1 4	ELLIPTICAL	20 15 050	+12 +18 + 6	8
11	261148	26.8N 142.0E	700MB	2809	967		200 60 290 10	1 1	CIRCULAR	23	+10 +16 + 9	8
12	262150	27.8N 141.3E	700MB	2762		45 040 40	210 90 140 16	12 2	CIRCULAR	14	+ +17 + 7	9
13	262354	27.8N 141.1E	700MB	2783	965	60 060 5	290 60 220 12	15 2	CIRCULAR	13	+11 +17 + 5	9
14	270857	28.3N 140.4E	700MB	2772		70 100 5	160 55 080 35	2 2	CIRCULAR	10	+11 +16 + 4	10
15	271152	28.2N 140.1E	700MB	2785			080 55 010 50	5 5	ELLIPTICAL	20 10 360	+11 +14 + 5	10
16	272018	28.3N 139.4E	700MB	2791		40 040 30	130 57 040 15	10 2	CIRCULAR	10	+11 +14 + 9	11
17	272331	28.2N 138.8E	700MB	2799	967	65 140 8	050 60 340 15	7 2	CIRCULAR	15	+11 +14 + 7	11
18	280830	28.2N 137.5E	700MB	2749	960	90 170 2	320 57 270 30	10 1	CIRCULAR	10	+12 +17 + 7	12
19	281101	28.3N 137.1E	700MB	2752	961		130 83 030 30	8 5	CIRCULAR	14	+12 +15 + 7	12
20	282232	28.8N 135.3E	700MB	2695	957	80 180 8	300 88 240 1	5 5	CIRCULAR	10	+11 +15 +13	13
21	290607	29.7N 133.6E	700MB	2750	959	45 210 40	270 71 210 15	5 2	CONCENTRIC	08 20	+12 +14 +10	14
22	292035	30.3N 129.0E	700MB	2772		50 030 60	130 90 060 15	4 2	CIRCULAR	10	+11 +18 +12	15
23	292311	30.3N 128.3E	700MB	2768	959	90 090 10	170 86 090 10	3 2	CIRCULAR	10	+11 +22 +10	15
24	300695	30.3N 126.5E	700MB	2810		90 090 5	280 71 200 25	5 2	CIRCULAR	30	+12 +17 +11	16
25	300841	30.2N 126.1E	700MB	2848		70 120 5	110 88 030 10	5 1			+11 +20 +10	16
26	310909	31.7N 127.8E	700MB	3024		40 180 30	160 32 060 60	5 2	CIRCULAR	20	+12 +15 +10	17
27	311148	32.5N 128.7E	700MB	3041	986		230 44 140 60	3 5			+13 +14 +10	17

28	312107	34.9N	130.7E	700MB	3040	35	180	5	210	60	060	60	5	2	+11	+12	+ 8	18
29	312318	35.4N	131.5E	700MB	3052	35	300	15	170	40	040	45	5	4	+10	+11	+ 7	18
30	010523	36.9N	133.5E	700MB	3097	45	170	60	190	51	100	50	2	20	+10	+ 9	+ 9	19
31	010821	37.2N	135.3E	700MB	3086	40	190	35	380	47	180	50	2	20	+ 9	+ 9	+ 9	19

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR	TDDFF	COMMENTS	RADAR POSITION	SITE WMO NO.
1	290400	29.4N 134.1E	LAND				20311	53116		30.6N 131.0E	47869
2	290500	29.4N 133.7E	LAND				20311	52819		30.6N 131.0E	47869
3	290600	29.5N 133.6E	LAND				20311	52911		30.6N 131.0E	47869
4	290700	29.6N 133.3E	LAND				20311	52916		30.6N 131.0E	47869
5	290800	29.7N 133.1E	LAND				20311	52916		30.6N 131.0E	47869
6	290800	29.8N 133.1E	LAND	GOOD		30			MOV 2825	31.3N 131.9E	
7	290900	29.8N 132.8E	LAND				20311	52916		30.6N 131.0E	47869
8	290900	29.8N 132.9E	LAND				10301	52816		28.4N 129.5E	47909
9	290900	29.8N 133.0E	LAND	GOOD		25			MOV 3025	31.3N 131.9E	
10	291000	29.9N 132.6E	LAND				10311	52916		28.4N 129.5E	47909
11	291000	29.9N 132.5E	LAND				20432	52816		30.6N 131.0E	47869
12	291000	29.9N 132.5E	LAND	GOOD		25			MOV 3040	31.3N 131.9E	
13	291100	29.9N 132.1E	LAND				20411	52819		30.6N 131.0E	47869
14	291100	30.0N 132.2E	LAND				10311	52819		28.4N 129.5E	47909
15	291100	30.0N 132.2E	LAND	GOOD		20			MOV 2930	31.3N 131.9E	
16	291200	30.0N 131.9E	LAND				10311	52816		28.4N 129.5E	47909
17	291200	30.0N 131.8E	LAND				20512	52816		30.6N 131.0E	47869
18	291200	30.0N 131.9E	LAND	GOOD		20			MOV 2830	31.3N 131.9E	
19	291300	30.1N 131.4E	LAND				20322	52922		30.6N 131.0E	47869
20	291300	30.1N 131.6E	LAND				10311	52819		28.4N 129.5E	47909
21	291300	30.1N 131.5E	LAND	GOOD		20			MOV 2930	31.3N 131.9E	
22	291400	30.1N 131.2E	LAND				10341	52722		28.4N 129.5E	47909
23	291400	30.1N 131.0E	LAND				20311	52722		30.6N 131.0E	47869
24	291400	30.1N 131.2E	LAND	GOOD		20			MOV 2835	31.3N 131.9E	
25	291500	30.1N 130.7E	LAND				20311	52816		30.6N 131.0E	47869
26	291500	30.1N 130.8E	LAND				10311	52722		28.4N 129.5E	47909
27	291500	30.1N 130.8E	LAND	GOOD		15			MOV 2830	31.3N 131.9E	
28	291600	30.2N 130.5E	LAND				25/51	52922		28.4N 129.5E	47909
29	291600	30.2N 130.3E	LAND				20311	52922		30.6N 131.0E	47869
30	291600	30.3N 130.4E	LAND	GOOD		10			MOV 2940	31.3N 131.9E	
31	291700	30.3N 130.0E	LAND				20311	52819		30.6N 131.0E	47869
32	291700	30.3N 130.1E	LAND				20141	52822		28.4N 129.5E	47909
33	291700	30.3N 130.0E	LAND	GOOD		5			MOV 2730	31.3N 131.9E	
34	291800	30.3N 129.7E	LAND				20311	52816		30.6N 131.0E	47869
35	291800	30.4N 129.5E	LAND	GOOD		20			MOV 2940	34.2N 130.8E	47762
36	291300	30.3N 129.8E	LAND				10271	52716		28.4N 129.5E	47909
37	291900	30.3N 129.5E	LAND				10212	52719		28.4N 129.5E	47909
38	291900	30.2N 129.4E	LAND	GOOD		10			MOV 2830	34.2N 130.8E	47762
39	291900	30.3N 129.4E	LAND				20312	52716		30.6N 131.0E	47869
40	292000	30.3N 129.2E	LAND	GOOD		10			MOV 2830	34.2N 130.8E	47762
41	292100	30.4N 128.8E	LAND				20312	52816		30.6N 131.0E	47869
42	292100	30.3N 128.9E	LAND	GOOD		20			MOV 2830	34.2N 130.8E	47762
43	292200	30.4N 128.5E	LAND				20312	52714		30.6N 131.0E	47869
44	292200	30.3N 128.5E	LAND	GOOD		20			MOV 2830	34.2N 130.8E	47762
45	292200	30.3N 128.6E	LAND				21311	52716		28.4N 129.5E	47909
46	292300	30.5N 128.3E	LAND				21311	53016		28.4N 129.5E	47909
47	292300	30.3N 128.2E	LAND	GOOD		20			MOV 2830	34.2N 130.8E	47762
48	292300	30.4N 128.2E	LAND				20432	52716		30.6N 131.0E	47869
49	300000	30.4N 127.9E	LAND				20412	52716		30.6N 131.0E	47869
50	300000	30.3N 128.0E	LAND	GOOD		15			MOV 2820	34.2N 130.8E	47762
51	300000	30.4N 128.0E	LAND				20612	52519		28.4N 129.5E	47909
52	300100	30.4N 127.7E	LAND				22612	52713		28.4N 129.5E	47909
53	300100	30.3N 127.7E	LAND	GOOD		30			MOV 2820	34.2N 130.8E	47762
54	300100	30.4N 127.5E	LAND				20532	52719		30.6N 131.0E	47869
55	300200	30.3N 127.4E	LAND				22612	52616		28.4N 129.5E	47909
56	300200	30.4N 127.1E	LAND				20432	52722		30.6N 131.0E	47869
57	300200	30.3N 127.4E	LAND	GOOD		35			MOV 2720	32.7N 128.8E	47844
58	300300	30.4N 127.0E	LAND				20512	52708		30.6N 131.0E	47869
59	300300	30.4N 127.2E	LAND				21512	52811		28.4N 129.5E	47909
60	300300	30.3N 127.1E	LAND	GOOD		35			MOV 2725	32.7N 128.8E	47844
61	300400	30.4N 127.0E	LAND				52511	52711		28.4N 129.5E	47909
62	300400	30.3N 127.0E	LAND	GOOD		30			MOV 2720	32.7N 128.8E	47844
63	300500	30.4N 126.7E	LAND				52711	52813		28.4N 129.5E	47909
64	300500	30.3N 126.8E	LAND	GOOD		30			MOV 2720	32.7N 128.8E	47844
65	300600	30.3N 126.5E	LAND				50411	52611		28.4N 129.5E	47909
66	300600	30.2N 126.6E	LAND	FAIR		30			MOV 2820	32.7N 128.8E	47844
67	310900	31.8N 128.2E	LAND				2061/	50613		33.4N 130.3E	47806
68	310900	31.8N 128.2E	LAND				2061/	50613		30.6N 131.0E	47869
69	311000	31.9N 128.6E	LAND				2286/	50719		33.4N 130.3E	47806
70	311000	31.9N 128.6E	LAND				2286/	50719		30.6N 131.0E	47869
71	311100	32.3N 128.7E	LAND				85///	50222		33.4N 130.3E	47806
72	311100	32.4N 128.7E	LAND				55/41	50322		30.6N 131.0E	47869
73	311200	32.6N 128.8E	LAND				6////	50222		33.4N 130.3E	47806
74	311200	32.5N 128.8E	LAND				25/41	50611		30.6N 131.0E	47869
75	311300	32.7N 129.0E	LAND				6////	50511		33.4N 130.3E	47806
76	311300	32.9N 129.1E	LAND				55/61	50327		30.6N 131.0E	47869
77	311400	32.9N 129.2E	LAND				6////	50316		33.4N 130.3E	47806
78	311500	33.2N 129.5E	LAND				6////	50522		33.4N 130.3E	47806
79	311600	33.6N 129.7E	LAND				225/1	5////		34.3N 132.6E	47792
80	311600	33.6N 129.6E	LAND				6////	50124		33.4N 130.3E	47806
81	311700	34.0N 129.6E	LAND				22831	53619		34.3N 132.6E	47792
82	311700	33.8N 129.7E	LAND				2031/	50116		33.4N 130.3E	47806
83	311705	34.0N 129.7E	LAND	FAIR						33.8N 130.3E	47803
84	311800	34.1N 130.0E	LAND				2151/	50422		33.4N 130.3E	47806
85	311800	34.1N 130.1E	LAND				22871	50622		34.3N 132.6E	47792
86	311810	34.1N 130.0E	LAND	FAIR						33.8N 130.3E	47803
87	311900	34.5N 130.2E	LAND				12871	50222		34.3N 132.6E	47792
88	311900	34.3N 130.2E	LAND				2251/	50422		33.4N 130.3E	47806
89	311910	34.3N 130.3E	LAND	FAIR						33.8N 130.3E	47803
90	312000	34.6N 130.4E	LAND	FAIR						33.8N 130.3E	47803
91	312000	34.5N 130.4E	LAND				24///	50416		33.4N 130.3E	47806
92	312000	34.6N 130.4E	LAND				12811	50511		34.3N 132.6E	47792
93	312000	34.5N 130.6E	LAND				32901	/////		35.5N 133.1E	47791
94	312100	34.7N 130.7E	LAND	FAIR						33.8N 130.3E	47803
95	312100	34.7N 130.7E	LAND				24/1/	50522		33.4N 130.3E	47806
96	312100	34.7N 130.7E	LAND				24651	50314		35.5N 133.1E	47791
97	312100	34.8N 130.7E	LAND				12811	50519		34.3N 132.6E	47792
98	312200	35.0N 131.0E	LAND				12811	50519		34.3N 132.6E	47792
99	312200	34.9N 131.0E	LAND				11791	50522		35.5N 133.1E	47791
100	312200	34.9N 131.0E	LAND				24/1/	50519		33.4N 130.3E	47806
101	312300	35.2N 131.4E	LAND				12811	50522		34.3N 132.6E	47792
102	312300	35.2N 131.4E	LAND				2//1/	50524		33.4N 130.3E	47806
103	010000	36.4N 131.8E	LAND				12871	50524		34.3N 132.6E	47792
104	010000	36.4N 131.8E	LAND				2183/	50627		33.4N 130.3E	47806
105	010000	36.4N 131.7E	LAND				11721	50522		35.5N 133.1E	47791
106	010000	36.3N 131.8E	LAND	GOOD		25			MOV 0450	35.6N 133.2E	47743
107	010100	36.7N 132.1E	LAND				12521	50419		34.3N 132.6E	47792
108	010100	36.6N 132.0E	LAND				11811	50422		35.5N 133.1E	47791
109	010100	36.2N 132.9E	LAND				3284/	50522		36.2N 136.2E	47705
110	010100	36.6N 132.1E	LAND				3284/	50522		33.4N 130.3E	47806
111	010200	36.7N 132.7E	LAND				85///	50838		35.5N 133.1E	47791
112	010200	36.9N 132.4E	LAND				12521	50519		34.3N 132.6E	47792
113	010200	36.6N 133.5E	LAND				6///1	50538		36.2N 136.2E	47705
114	010200	36.9N 132.5E	LAND				6////	50524		33.4N 130.3E	47806
115	010300	36.9N 132.8E	LAND				65///	50316		35.5N 133.1E	47791
116	010300	36.0N 132.8E	LAND	GOOD		25			MOV 0450	35.6N 133.2E	47743
117	010300	36.0N 133.1E	LAND				6////	50727		33.4N 130.3E	47806
118	010300	36.1N 132.8E	LAND				10411	50519		34.3N 132.6E	47792
119	010300	36.9N 132.8E	LAND				5///3	/////		36.2N 136.2E	47705
120	010400	36.1N 133.4E	LAND				5///3	50630		36.2N 136.2E	47705
121	010400	36.2N 132.8E	LAND				/////	40622		34.6N 135.7E	47773
122	010400	36.1N 133.4E	LAND				5///3	50630		35.5N 133.1E	47791
123	010400	36.2N 133.3E	LAND				10411	50622		34.3N 132.6E	47792
124	010500	36.5N 133.8E	LAND				20341	50622		34.3N 132.6E	47792
125	010500	36.5N 133.5E	LAND				/////	40532		34.6N 135.7E	47773
126	010500	36.4N 133.7E	LAND				65///	50632		35.5N 133.1E	47791
127	010500	36.3N 133.8E	LAND				5///1	50725		36.2N 136.2E	47705
128	010600	36.8N 134.2E	LAND				75//1	50524		34.3N 132.6E	47792
129	010600	36.6N 134.2E	LAND				/////	50727		34.6N 135.7E	47773

130	010600	36.5N	134.5E	LAND		5///1	50730	36.2N 136.2E	47705
131	010600	36.4N	134.3E	LAND		65///	50922	35.5N 133.1E	47791
132	010600	36.7N	133.9E	LAND	POOR			35.8N 135.3E	
133	010700	36.5N	134.5E	LAND		65///	50716	35.5N 133.1E	47791
134	010700	36.8N	134.8E	LAND		/////	50632	34.6N 135.7E	47773
135	010700	36.5N	134.9E	LAND		5///1	60725	36.2N 136.2E	47705
136	010800	36.8N	134.9E	LAND		65///	50527	35.5N 133.1E	47791
137	010900	37.1N	135.5E	LAND		/////	/////	37.7N 138.8E	47572
138	011000	37.2N	136.0E	LAND		/////	/////	37.7N 138.8E	47572
139	011100	37.3N	136.4E	LAND		/////	/////	37.7N 138.8E	47572
140	011200	37.6N	137.0E	LAND		/////	/////	37.7N 138.8E	47572
141	011300	37.6N	137.2E	LAND		/////	/////	37.7N 138.8E	47572
142	011400	37.6N	137.6E	LAND		/////	/////	37.7N 138.8E	47572
143	011500	37.7N	138.4E	LAND		/////	/////	37.7N 138.8E	47572
144	313200	35.2N	131.4E	LAND		12811	50624	35.5N 133.1E	47791

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TYPHOON PAT
BEST TRACK DATA

	BEST TRACK			WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
082700Z	21.3	125.8	45	21.3	126.2	45.	22.	0.	22.1	125.2	65.	204.	5.	22.9	123.8	75.	355.	-5.	23.2	121.6	85.	541.	0.
082706Z	21.6	126.6	55	21.3	126.2	55.	29.	0.	21.9	125.5	75.	223.	10.	22.5	124.4	85.	347.	-5.	23.1	123.3	90.	485.	0.
082712Z	21.9	127.4	55	21.8	127.1	55.	18.	0.	22.8	128.8	75.	53.	5.	24.3	127.3	90.	191.	10.	25.2	124.8	90.	383.	-5.
082718Z	22.3	128.2	55	22.0	127.7	60.	33.	5.	23.4	128.6	80.	72.	5.	24.5	126.7	90.	230.	5.	25.5	124.2	90.	457.	-5.
082800Z	22.8	128.8	60	22.7	128.9	60.	8.	0.	25.4	129.8	80.	110.	0.	27.0	127.3	90.	217.	5.	27.4	124.2	90.	463.	5.
082806Z	23.1	129.3	65	23.2	129.4	65.	8.	0.	25.9	129.8	85.	126.	5.	27.5	127.3	90.	198.	0.	28.4	124.3	90.	539.	15.
082812Z	23.3	129.6	70	23.4	130.0	70.	23.	0.	25.6	131.1	85.	80.	5.	27.8	129.2	90.	100.	-5.	30.0	126.6	90.	542.	20.
082818Z	23.4	129.9	75	23.6	130.5	70.	35.	-5.	26.3	130.7	80.	91.	-5.	28.4	128.6	90.	174.	-5.	30.5	126.0	90.	702.	30.
082900Z	23.6	130.2	80	23.6	130.2	70.	0.	-10.	24.7	131.0	80.	66.	-5.	26.8	130.2	90.	384.	5.	0.0	0.0	0.	-0.	0.
082906Z	23.9	130.5	80	23.8	130.4	75.	8.	-5.	25.2	130.8	90.	120.	0.	27.3	129.6	95.	496.	20.	0.0	0.0	0.	-0.	0.
082912Z	24.3	130.8	80	24.4	130.9	75.	8.	-5.	27.0	130.6	90.	103.	-5.	29.3	128.1	95.	546.	25.	0.0	0.0	0.	-0.	0.
082918Z	24.8	130.9	85	24.7	131.1	80.	12.	-5.	27.0	130.7	90.	235.	-5.	28.4	129.2	95.	736.	35.	0.0	0.0	0.	-0.	0.
083000Z	25.8	131.1	85	25.8	131.2	80.	5.	-5.	28.3	129.2	90.	298.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
083006Z	27.2	131.0	90	27.1	130.8	80.	12.	-10.	30.0	127.2	90.	377.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
083012Z	28.7	130.8	95	28.7	130.7	90.	5.	-5.	35.0	130.6	75.	182.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
083018Z	30.9	130.3	95	30.9	130.3	105.	0.	10.	37.5	134.2	65.	140.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
083100Z	33.2	130.1	85	33.0	130.1	95.	12.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
083106Z	35.5	130.8	75	35.4	130.7	85.	8.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
083112Z	37.7	132.3	70	37.5	131.9	75.	22.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
083118Z	39.8	134.7	60	39.5	133.8	70.	45.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	16.	155.	331.	514.	16.	155.	331.	514.
AVG RIGHT ANGLE ERROR	8.	44.	122.	259.	8.	44.	122.	259.
AVG INTENSITY MAGNITUDE ERROR	5.	5.	10.	10.	5.	5.	10.	10.
AVG INTENSITY BIAS	0.	3.	8.	8.	0.	3.	8.	8.
NUMBER OF FORECASTS	20	16	12	8	20	16	12	8

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1337. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 12. KNOTS

TYPHOON PAT
FIX POSITIONS FOR CYCLONE NO. 13

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	241747	23.0N 123.5E	PCN 5	T1.0/1.0	INIT OBS	PGTW
2	250108	23.3N 124.4E	PCN 6			PGTW
3	251348	23.5N 122.8E	PCN 4	T1.0/1.0 /S0.0/20HRS	EXP LLCC	PGTW
4	252152	23.1N 122.0E	PCN 5	T1.5/1.5	INIT OBS	RPMK
5	252152	23.1N 122.0E	PCN 5	T1.5/1.5	INIT OBS	RODN
6	260009	22.7N 121.9E	PCN 5			RPMK
7	260009	22.7N 121.9E	PCN 5			RODN
8	260229	22.3N 122.1E	PCN 5			RPMK
9	260229	22.3N 122.1E	PCN 5			RODN
10	261328	21.3N 124.9E	PCN 6			PGTW
11	261907	20.6N 126.0E	PCN 6		ULCC FIX	RODN
12	262131	21.6N 126.0E	PCN 5	T2.5/2.5	INIT OBS	RODN
13	262347	21.4N 126.0E	PCN 5	T2.5/2.5 /D1.0/26HRS		RPMK
14	270000	21.1N 125.9E	PCN 6			PGTW
15	270209	21.1N 126.1E	PCN 5		EXP LLCC	RPMK
16	270300	21.0N 126.3E	PCN 6	T3.0/3.0	INIT OBS	PGTW
17	270600	21.4N 126.3E	PCN 6			PGTW
18	270611	21.6N 126.7E	PCN 5			RPMK
19	270900	21.8N 127.1E	PCN 6			PGTW
20	271011	21.9N 127.5E	PCN 5			RPMK
21	271200	22.1N 127.5E	PCN 6			PGTW
22	271449	22.0N 127.4E	PCN 5			RKSO
23	271600	21.7N 128.1E	PCN 6	T3.0/3.0	INIT OBS	PGTW
24	271800	22.0N 128.1E	PCN 6			PGTW
25	271856	22.4N 128.0E	PCN 5			RKSO
26	272009	22.5N 129.1E	PCN 3		EXP LLCC	RODN
27	272100	22.8N 128.3E	PCN 6			PGTW
28	272325	23.1N 129.3E	PCN 3	T3.5/3.5 /D1.0/24HRS		RPMK
29	272325	22.7N 129.3E	PCN 5	T3.5/3.5 /D1.0/26HRS		RODN
30	280000	22.7N 129.3E	PCN 6			PGTW
31	280149	23.1N 129.3E	PCN 3			RPMK
32	280300	23.1N 129.2E	PCN 4	T4.0/4.0 /D1.0/24HRS		PGTW
33	280600	22.9N 129.5E	PCN 5		EYE FORMING	RPMK
34	280600	23.0N 129.4E	PCN 3	T3.5/3.5	INIT OBS	RKSO
35	280600	23.0N 129.6E	PCN 4			PGTW
36	280900	23.5N 129.8E	PCN 4			PGTW
37	280949	23.1N 129.8E	PCN 3		DEVELPNG EYE	PGTW
38	281200	23.2N 129.9E	PCN 4			PGTW
39	281429	23.1N 129.9E	PCN 5		PARTIAL EYEWALL	RPMK
40	281429	23.1N 129.9E	PCN 5		PSBL EYEWALL	RODN
41	281600	23.3N 130.2E	PCN 6	T4.0/4.0 /D1.0/24HRS		PGTW
42	281800	23.3N 130.3E	PCN 4			PGTW
43	282048	23.4N 130.4E	PCN 5			PGTW
44	282303	23.5N 130.1E	PCN 5			PGTW
45	282303	23.5N 129.8E	PCN 2			RKSO
46	290128	23.6N 130.4E	PCN 3		BANDING EYE FORMING	PGTW
47	290128	23.7N 130.4E	PCN 1	T4.5/4.5 /D1.0/26HRS	RAGGED EYE LARGE EYEWALL	RPMK
48	290128	23.7N 130.5E	PCN 1	T4.0/4.0 /D0.5/26HRS	EYE FORMING	RODN
49	290300	23.8N 130.4E	PCN 2		BANDING EYE	PGTW
50	290549	23.8N 130.4E	PCN 1		RAGGED EYE	RPMK
51	290549	23.8N 130.4E	PCN 1	T4.5/4.5 /D0.5/27HRS	BANDING EYE	PGTW
52	290549	23.8N 130.4E	PCN 1			RODN
53	290928	24.0N 130.5E	PCN 2		EYE FIX	PGTW
54	291002	24.1N 130.7E	PCN 1		18 NM RAGGED EYE	PGTW
55	291200	24.3N 130.8E	PCN 2			PGTW
56	291409	24.4N 130.8E	PCN 1		19 NM EYE	PGTW
57	291600	24.5N 130.9E	PCN 2	T4.5/4.5 /D0.5/24HRS	STADIUM EYE 25NM INNER EYE 6N	PGTW
58	291834	24.8N 131.1E	PCN 1			PGTW
59	292100	25.3N 131.2E	PCN 2		EYE FIX	PGTW
60	292208	25.4N 131.4E	PCN 1	T4.0/4.0 /D0.5/24HRS	EYE FIX	RODN
61	292241	25.6N 130.7E	PCN 1	T5.5/5.5 /D1.5/21HRS	SMALL EYE FIX	RODN

62	300000	26.0N 131.2E	PCN 4				PGTW
63	300108	26.2N 131.3E	PCN 1	T4.5/4.5+/S0.0/19HRS	BANDING EYE		PGTW
64	300300	26.6N 131.2E	PCN 2		EYE FIX		PGTW
65	300538	27.2N 131.1E	PCN 2				PGTW
66	300538	27.1N 131.2E	PCN 1	T5.0/5.0 /D0.5/28HRS	RAGGED EYE		RPMK
67	300900	27.9N 131.0E	PCN 2				PGTW
68	300940	28.1N 130.8E	PCN 1				PGTW
69	301048	28.3N 131.0E	PCN 1		EXP LLCC WITHIN EYE		RKSO
70	301121	28.6N 131.0E	PCN 1				RKSO
71	301121	28.6N 131.1E	PCN 1				RODN
72	301200	28.4N 131.0E	PCN 2				PGTW
73	301348	29.3N 130.8E	PCN 1				PGTW
74	301600	30.0N 130.6E	PCN 2	T6.0/6.0-/D1.5/24HRS	EYE FIX		PGTW
75	301823	31.0N 130.4E	PCN 2				PGTW
76	301824	31.0N 130.1E	PCN 1				RPMK
77	302100	31.8N 130.6E	PCN 4				PGTW
78	310000	32.7N 130.1E	PCN 4				PGTW
79	310001	33.4N 130.4E	PCN 3	T5.0/5.0	INIT OBS EYEWALL		RKSO
80	310001	33.1N 130.7E	PCN 6				RPMK
81	310001	33.2N 130.7E	PCN 3				RODN
82	310048	33.6N 130.2E	PCN 5		ULCC FIX		RKSO
83	310300	34.1N 130.7E	PCN 6				PGTW
84	310527	35.4N 131.1E	PCN 6	T5.0/5.0-/S0.0/24HRS	ULCC FIX		RPMK
85	310527	35.6N 131.1E	PCN 5		ULCC FIX		RKSO
86	310900	36.0N 131.7E	PCN 6				PGTW
87	311027	37.7N 132.7E	PCN 6				RODN
88	311059	37.6N 132.7E	PCN 6				RPMK
* 89	311200	37.8N 134.2E	PCN 6				PGTW
90	311328	38.0N 133.2E	PCN 6				PGTW
91	311813	39.2N 134.0E	PCN 5		EXP LLCC		RKSO
92	311813	39.2N 134.0E	PCN 5		EXP LLCC		RPMK
93	312100	41.5N 137.3E	PCN 6		ULCC FIX		PGTW
94	312338	41.6N 136.8E	PCN 3	T2.0/2.0	INIT OBS EXP LLCC		RKSO
95	312339	41.6N 136.8E	PCN 3				RODN
96	010000	42.0N 138.9E	PCN 6		ULCC FIX		PGTW
97	010027	41.5N 137.7E	PCN 3		EXP LLCC		RKSO
98	010027	41.5N 137.7E	PCN 3				RODN
99	010600	42.0N 139.6E	PCN 6	T1.5/1.5	INIT OBS EXP LLCC		PGTW
100	011005	43.0N 144.1E	PCN 5				RKSO
101	011200	42.5N 148.0E	PCN 6				PGTW

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE DIAM	ORIEN-TATION	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	260114	21.3N 126.1E	1500FT		987	70 360 25	050 68 360 25	5 3				+26 +26 +25	2
2	272143	22.8N 128.3E	700MB	2961		55 110 80	300 60 200 30	6 20				+11 +11 +11	3
3	280012	22.8N 128.8E	700MB	2951	983	45 360 50	080 45 020 60	10 2				+13 +14 +12 24	3
4	280614	23.2N 129.4E	1500FT		976	60 320 35	070 65 320 35	7 2	CIRCULAR	35		+25 +27 +25	4
5	280910	23.3N 129.7E	1500FT		978	75 360 35	080 68 360 35	5 3	CIRCULAR	35		+26 +27 +25	4
6	290024	23.6N 130.1E	700MB	2885	976	70 060 20	140 62 060 28	5 10	CIRCULAR	30		+11 +14 +10	5
7	290258	23.7N 130.3E	700MB	2879		65 200 10	260 57 320 35	5 5	CIRCULAR	30		+11 +14 +11	5
8	290803	23.9N 130.6E	700MB	2867		55 030 40	100 56 030 40	15 3	CIRCULAR	35		+13 +13 + 7	6
9	291005	24.2N 130.9E	700MB	2868	975	40 200 75	330 62 260 30	6 3	CIRCULAR	35		+12 +14 + 6	6
10	292149	25.5N 131.1E	700MB	2851	971	65 040 60	140 85 040 60	10 4	ELLIPTICAL	40	25 170	+11 +15 + 8	7
11	300023	25.9N 131.1E	700MB	2849	972	70 120 50	350 75 280 35	5 5	ELLIPTICAL	35	25 180	+12 +17 + 8	7
12	300857	28.0N 130.9E	700MB	2767		60 230 40	150 83 060 30	4 3	CIRCULAR	35		+14 +17 +14	8
13	301035	28.4N 130.7E	700MB	2761	961		240 65 130 30	4 2	CIRCULAR	35		+13 +16 +14	8
14	302133	32.1N 130.0E	700MB	2843		65 320 110	250 75 150 10	1 2	CIRCULAR	30		+11 +18 +10	9
15	302335	32.9N 130.2E	700MB	2885		45 240 40	240 83 210 10	2 5				+10 +15 +11	9
16	310836	36.2N 131.0E	700MB	2931	978	75 080 66	210 85 080 60	5 3				+17 +19 + 9	10

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR TDDFF	COMMENTS	RADAR POSITION	SITE WMO NO.
1	270000	21.5N 125.5E	LAND				6///3 42608		24.3N 124.2E	47918
2	270300	21.6N 126.1E	LAND				6///2 70811		24.3N 124.2E	47918
3	281900	23.7N 129.8E	LAND				5///1 52111		26.2N 127.8E	47937
4	282000	23.7N 130.0E	LAND				5///2 50911		26.2N 127.8E	47937
5	282100	23.7N 130.1E	LAND				5///2 71304		26.2N 127.8E	47937
6	282200	23.7N 130.1E	LAND				5///2 70905		26.2N 127.8E	47937
7	282300	23.8N 130.2E	LAND				5///2 70604		26.2N 127.8E	47937
8	290000	23.8N 130.3E	LAND				6///2 70505		26.2N 127.8E	47937
9	290100	23.8N 130.4E	LAND				6///2 70506		26.2N 127.8E	47937
10	291500	24.5N 130.9E	LAND				5///1 /////		26.2N 127.8E	47937
11	291600	24.7N 130.9E	LAND				5///3 53410		26.2N 127.8E	47937
12	291900	25.0N 130.9E	LAND				25//3 73606		26.2N 127.8E	47937
13	292100	25.3N 131.0E	LAND				25//2 73611		26.2N 127.8E	47937
14	292300	25.5N 131.0E	LAND				4///2 70111		26.2N 127.8E	47937
15	292300	25.7N 131.1E	LAND				35//2 70112		26.2N 127.8E	47937
16	300000	25.8N 131.1E	LAND				209/2 70111		26.2N 127.8E	47937
17	300100	26.1N 131.1E	LAND				10972 73612		26.2N 127.8E	47937
18	300200	26.4N 131.1E	LAND				10812 73513		26.2N 127.8E	47937
19	300300	26.6N 131.1E	LAND				10912 73515		26.2N 127.8E	47937
20	300400	26.8N 131.0E	LAND				10912 73615		26.2N 127.8E	47937
21	300500	27.0N 131.0E	LAND				20942 73513		26.2N 127.8E	47937
22	300600	27.2N 131.1E	LAND				20912 73612		26.2N 127.8E	47937
23	300700	27.4N 131.1E	LAND				12812 53619		28.4N 129.5E	47909
24	300720	27.6N 130.9E	LAND				20822 73516		26.2N 127.8E	47937
25	300800	27.6N 131.0E	LAND				10913 53516		28.4N 129.5E	47909
26	300800	27.7N 131.1E	LAND				354/2 70115		26.2N 127.8E	47937
27	300900	28.0N 130.8E	LAND				10912 5////		30.6N 131.0E	47869
28	300900	27.9N 130.9E	LAND				10913 53516		28.4N 129.5E	47909
29	300900	28.0N 131.1E	LAND				6///2 73616		26.2N 127.8E	47937
30	301000	28.2N 130.9E	LAND				10913 53616		28.4N 129.5E	47909
31	301000	28.2N 130.8E	LAND				10912 53616		30.6N 131.0E	47869
32	301100	28.5N 130.9E	LAND				10913 53519		28.4N 129.5E	47909
33	301100	28.5N 130.8E	LAND				10912 53616		30.6N 131.0E	47869
34	301200	28.8N 130.8E	LAND				10913 53522		28.4N 129.5E	47909
35	301200	28.8N 130.7E	LAND				10912 53516		30.6N 131.0E	47869
36	301200	28.8N 130.8E	LAND	GOOD		40	MOV 3525		31.3N 131.9E	
37	301300	29.2N 130.6E	LAND				10912 53522		30.6N 131.0E	47869
38	301300	29.1N 130.8E	LAND				10913 53516		28.4N 129.5E	47909
39	301400	29.5N 130.6E	LAND				10912 53619		30.6N 131.0E	47869
40	301400	29.5N 130.7E	LAND				10913 53522		28.4N 129.5E	47909
41	301400	29.4N 130.7E	LAND	GOOD		40	MOV 3525		31.3N 131.9E	
42	301500	29.8N 130.7E	LAND	GOOD		40	MOV 3630		31.3N 131.9E	
43	301600	30.2N 130.5E	LAND				22962 53622		30.6N 131.0E	47869
44	301600	30.2N 130.5E	LAND				11913 53522		28.4N 129.5E	47909
45	301600	30.0N 130.5E	LAND	GOOD		40	MOV 3530		31.3N 131.9E	
46	301700	30.6N 130.5E	LAND				10913 53524		28.4N 129.5E	47909
47	301700	30.6N 130.4E	LAND				10982 53524		30.6N 131.0E	47869
48	301700	30.5N 130.4E	LAND	GOOD		40	MOV 3535		31.3N 131.9E	
49	301800	30.9N 130.3E	LAND				219// /////		33.4N 130.3E	47806
50	301800	30.9N 130.4E	LAND				11912 53619		30.6N 131.0E	47869
51	301800	30.9N 130.4E	LAND				10913 53516		28.4N 129.5E	47909
52	301800	30.9N 130.4E	LAND	GOOD		40	MOV 3640		31.3N 131.9E	
53	301900	31.3N 130.3E	LAND				11912 53522		30.6N 131.0E	47869
54	301900	31.3N 130.3E	LAND				1292/ 53624		33.4N 130.3E	47806
55	301900	31.4N 130.4E	LAND				10913 53530		28.4N 129.5E	47909

56	301900	31.3N	130.3E	LAND	GOOD	40			MOV 3635	31.3N	131.9E	
57	302000	31.7N	130.3E	LAND			20942	53522		28.4N	129.5E	47909
58	302000	31.7N	130.3E	LAND			2182/	53624		33.4N	130.3E	47806
59	302000	31.7N	130.3E	LAND			11912	53622		30.6N	131.0E	47869
60	302000	31.6N	130.2E	LAND	GOOD	40			MOV 3540	31.3N	131.9E	
61	302100	32.0N	130.2E	LAND			2455/	53522		33.4N	130.3E	47806
62	302100	32.1N	130.3E	LAND			65/62	53622		30.6N	131.0E	47869
63	302200	32.6N	130.2E	LAND			23/5/	53632		33.4N	130.3E	47806
64	302300	32.9N	130.2E	LAND			20401	/3622		34.3N	132.6E	47792
65	302300	32.7N	130.1E	LAND			5////	53319		33.4N	130.3E	47806
66	310000	33.1N	130.2E	LAND			20411	53611		34.3N	132.6E	47792
67	310100	33.8N	130.2E	LAND			20//1	43627		34.3N	132.6E	47792
68	310100	33.5N	130.1E	LAND			5////	5////		33.4N	130.3E	47806
69	310200	34.0N	130.3E	LAND			229/1	50314		34.3N	132.6E	47792
70	310200	33.9N	130.2E	LAND			6////	50222		33.4N	130.3E	47806
71	310200	34.0N	130.2E	LAND	POOR					33.8N	130.3E	47803
72	310300	34.3N	130.3E	LAND			6////	50122		33.4N	130.3E	47806
73	310300	34.3N	130.4E	LAND			60/61	53622		34.3N	132.6E	47792
74	310300	34.1N	130.0E	LAND	FAIR					33.8N	130.3E	47803
75	310400	34.6N	130.4E	LAND			65/41	53622		34.3N	132.6E	47792
76	310400	34.6N	130.3E	LAND			6////	51024		33.4N	130.3E	47806
77	310400	34.8N	130.7E	LAND			65///	/////		35.5N	133.1E	47791
78	310400	34.5N	130.2E	LAND	FAIR					33.8N	130.3E	47803
79	310500	35.1N	130.7E	LAND			65///	53616		35.5N	133.1E	47791
80	310500	35.0N	130.4E	LAND			6////	50222		33.4N	130.3E	47806
81	310600	35.4N	130.7E	LAND			65///	53619		35.5N	133.1E	47791
82	310600	35.4N	130.7E	LAND			6////	50324		33.4N	130.3E	47806
83	310800	36.2N	131.2E	LAND			55//2	54038		35.5N	133.1E	47791
84	310800	36.2N	131.4E	LAND			50432	45317		33.4N	130.3E	47806
85	310900	36.5N	131.3E	LAND			55//2	50219		35.5N	133.1E	47791
86	311000	36.8N	131.5E	LAND			55//2	50322		35.5N	133.1E	47791
87	311100	37.2N	131.8E	LAND			55//2	50327		35.5N	133.1E	47791
88	311200	37.6N	132.0E	LAND			55//2	50327		35.5N	133.1E	47791

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	010600	41.8N 141.1E	025	006	47431 47544 47423

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL STORM RUBY
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST					48 HOUR FORECAST					72 HOUR FORECAST				
						ERRORS					ERRORS					ERRORS					ERRORS
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
082700Z	21.6	139.0	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
082706Z	22.0	140.0	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
082712Z	22.3	141.2	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
082718Z	22.9	142.7	40	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
082800Z	23.7	143.6	50	23.8	143.7	50.	8.	0.	27.5	144.7	70.	114.	15.	30.4	143.3	85.	193.	35.	32.1	140.7	85.	330.	40.
082806Z	24.7	143.9	50	24.7	144.1	55.	11.	5.	28.5	144.3	75.	130.	20.	31.1	142.3	85.	192.	35.	32.6	139.5	85.	424.	40.
082812Z	25.7	143.9	50	25.7	144.0	55.	5.	5.	29.3	143.5	80.	120.	25.	31.5	141.6	90.	214.	40.	0.0	0.0	0.	-0.	0.
082818Z	26.8	143.3	55	26.7	143.5	60.	12.	5.	29.7	141.8	80.	92.	25.	31.5	139.3	90.	279.	50.	0.0	0.0	0.	-0.	0.
082900Z	27.9	142.6	55	27.8	142.7	60.	8.	5.	30.5	139.4	65.	97.	15.	31.8	136.2	65.	421.	20.	0.0	0.0	0.	-0.	0.
082906Z	29.0	141.9	55	28.9	142.0	55.	8.	0.	31.3	137.7	65.	170.	15.	32.4	133.3	65.	609.	20.	0.0	0.0	0.	-0.	0.
082912Z	29.9	141.3	55	29.7	141.0	50.	20.	-5.	31.7	136.2	65.	252.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
082918Z	30.9	140.7	55	30.9	140.5	50.	10.	-5.	34.0	136.4	60.	221.	20.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
083000Z	32.1	140.1	50	32.2	139.9	50.	12.	0.	34.2	134.9	50.	360.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
083006Z	33.5	139.8	50	33.5	139.4	55.	20.	5.	38.0	140.9	35.	107.	-10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
083012Z	34.7	139.7	50	34.7	139.6	55.	5.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
083018Z	36.1	140.1	40	36.0	140.0	45.	8.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
083100Z	37.6	141.0	45	37.8	140.7	45.	19.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
083106Z	39.2	142.6	45	39.5	142.3	45.	23.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	12.	166.	318.	377.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	11.	110.	137.	27.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	3.	17.	33.	40.	0.	0.	0.	0.
AVG INTENSITY BIAS	2.	15.	33.	40.	0.	0.	0.	0.
NUMBER OF FORECASTS	14	10	6	2	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1310. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 13. KNOTS

TROPICAL STORM RUBY
FIX POSITIONS FOR CYCLONE NO. 14

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	270429	22.0N 139.4E	PCN 6	T1.0/1.0	INIT OBS	PGTW
2	270600	22.2N 139.5E	PCN 6			PGTW
3	271200	21.8N 140.4E	PCN 6			PGTW
4	271600	22.2N 141.9E	PCN 6	T1.5/1.5	INIT OBS	PGTW
5	271714	22.0N 142.8E	PCN 5			RKSO
6	271800	21.8N 142.9E	PCN 6			PGTW
* 7	272100	21.3N 143.3E	PCN 6			PGTW
8	272109	22.5N 143.8E	PCN 5			RODN
9	280000	24.0N 143.8E	PCN 6			PGTW
10	280300	24.0N 143.6E	PCN 6	T2.5/2.5 /D1.5/24HRS		PGTW
11	280417	24.4N 144.0E	PCN 5	T2.5/2.5	INIT OBS	RODN
12	280600	24.5N 143.5E	PCN 6			PGTW
13	280900	25.1N 144.3E	PCN 6			PGTW
14	280949	25.7N 144.3E	PCN 6			PGTW
15	281200	25.4N 144.0E	PCN 6			PGTW
16	281248	26.2N 143.5E	PCN 6			PGTW
17	281600	26.3N 143.4E	PCN 6	T3.0/3.0 /D1.5/24HRS	PART EXP LLCC	PGTW
18	281800	26.7N 142.9E	PCN 6			PGTW
19	282048	27.0N 142.9E	PCN 5			PGTW
20	282303	27.5N 142.8E	PCN 5			PGTW
21	282303	27.2N 143.1E	PCN 5	T3.5/3.5	INIT OBS	RKSO
22	282326	32.0N 140.1E	PCN 3	T3.5/3.5	INIT OBS EYE FORMING	RODN
23	282347	27.7N 142.6E	PCN 5			PGTW
24	290407	28.2N 142.7E	PCN 5	T3.0/3.0 /D0.5/25HRS		PGTW
25	290600	28.9N 142.0E	PCN 6			PGTW
26	290928	29.6N 141.3E	PCN 4		EXP LLCC	PGTW
27	291002	29.4N 141.4E	PCN 6			PGTW
28	291227	29.8N 141.0E	PCN 6			PGTW
29	291653	30.5N 140.4E	PCN 5	T2.5/2.5+/S0.0/24HRS		PGTW
30	291800	30.7N 140.4E	PCN 6		ULCC FIX	PGTW
31	292100	31.5N 140.0E	PCN 6			PGTW
32	300000	32.0N 140.2E	PCN 6			PGTW
33	300356	32.9N 139.8E	PCN 5	T3.5/3.5-/D0.5/24HRS		PGTW
34	300538	33.8N 139.7E	PCN 5	T3.0/3.0	INIT OBS	RPMK
35	300600	33.8N 140.0E	PCN 6			PGTW
36	300900	33.8N 139.6E	PCN 6			PGTW
37	300940	34.1N 139.5E	PCN 3		ULCC FIX	PGTW
38	301200	34.7N 139.5E	PCN 6		ULCC FIX	PGTW
39	301600	35.6N 140.0E	PCN 6		ULCC FIX	PGTW
40	301800	36.0N 140.2E	PCN 6		ULCC FIX	PGTW
41	302005	36.8N 140.7E	PCN 6		ULCC FIX	PGTW
42	310000	38.1N 141.0E	PCN 6		ULCC FIX	PGTW
43	310300	38.8N 141.6E	PCN 6			PGTW
44	310600	39.3N 142.5E	PCN 6	T2.5/3.5 /W1.0/26HRS		PGTW
45	310900	39.6N 143.5E	PCN 6			PGTW
46	311200	39.8N 144.7E	PCN 6			PGTW
47	311600	40.2N 146.7E	PCN 6	T2.5/2.5	INIT OBS	PGTW
48	311800	40.4N 148.3E	PCN 6			RKSO
49	311813	40.7N 148.8E	PCN 6		ULCC FIX	RKSO
50	311944	40.5N 149.9E	PCN 6		ULCC FIX	PGTW
51	010000	41.5N 150.3E	PCN 6		EXP LLCC	PGTW
52	010600	42.1N 155.7E	PCN 6	T1.5/2.5 /W1.0/24HRS	EXP LLCC	

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN-TATION	EYE DIAM	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	280020	23.9N 143.7E	700MB	2943	982	65 320 10	320 44 320 15	10 5	ELLIPTICAL	090	15 10	+ +15 +10	1
2	282105	27.3N 142.9E	700MB	3003		07 020 15	190 64 090 29	4 3				+11 +19 + 9	2
3	282347	27.8N 142.7E	700MB	3051	992	45 310 50	300 37 210 73	6 4				+15 +19 + 8	2
4	290532	28.9N 142.0E	700MB	3044		40 320 60	090 38 320 60	10 4				+12 +15 +10	3

5	290811	29.2N	141.6E	1500FT		995	45	080	45	160	55	080	45	8	5				+26	+24	+25	25	3
6	291150	31.7N	140.3E	700MB	3110	998	65	030	30	130	60	030	64	5	3				+26	+27	+27		4
7	292336	32.2N	140.0E	700MB	3041		45	130	10	100	36	320	62	5	1	CIRCULAR	30		+14	+17	+12		4
8	300848	34.1N	139.7E	850MB			55	070	47	160	69	060	12	2	3				+17	+21	+21		5

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR TDDFF	COMMENTS	RADAR POSITION	SITE WMO NO
1	292200	31.7N 140.5E	LAND				20711 53519		35.3N 138.7E	47639
2	292300	32.0N 140.4E	LAND				55/42 53417		35.3N 138.7E	47639
3	292330	32.1N 140.2E	LAND	GOOD		20		MOV 3320	35.2N 140.1E	
4	300000	32.3N 140.2E	LAND				11772 53319		35.3N 138.7E	47639
5	300100	32.4N 139.9E	LAND				11482 53016		35.3N 138.7E	47639
6	300200	32.6N 140.0E	LAND				11741 51016		35.3N 138.7E	47639
7	300300	32.9N 139.9E	LAND				11832 53619		35.3N 138.7E	47639
8	300400	33.1N 139.9E	LAND				10611 53616		35.3N 138.7E	47639
9	300430	31.2N 139.8E	LAND	GOOD		20		MOV 0930	35.2N 140.1E	
10	300500	33.3N 139.7E	LAND	GOOD		20		MOV 3430	35.2N 140.1E	
11	300500	33.3N 139.8E	LAND				11612 53316		35.3N 138.7E	47639
12	300600	33.5N 139.7E	LAND	GOOD		20		MOV 3630	35.2N 140.1E	
13	300600	33.5N 139.7E	LAND				65//2 53511		35.3N 138.7E	47639
14	300700	33.7N 139.7E	LAND	GOOD		10		MOV 3620	35.2N 140.1E	
15	300700	33.7N 139.7E	LAND				////1 53616		35.3N 138.7E	47639
16	300800	33.9N 139.7E	LAND				////1 53611		35.3N 138.7E	47639
17	300830	34.0N 139.7E	LAND	GOOD		20		MOV 3620	35.2N 140.1E	
18	300900	34.2N 139.6E	LAND				65//2 53516		35.3N 138.7E	47639
19	301000	34.3N 139.6E	LAND	GOOD		40		MOV 3625	35.2N 140.1E	
20	301000	34.3N 139.5E	LAND				55//1 53411		35.3N 138.7E	47639
21	301035	34.5N 139.6E	LAND	FAIR				MOV 1715	35.7N 139.3E	47642
22	301100	34.4N 139.4E	LAND	FAIR		40		MOV 3425	35.2N 140.1E	
23	301100	34.5N 139.5E	LAND				55//2 53614		35.3N 138.7E	47639
24	301200	34.7N 139.7E	LAND				6///2 50216		35.3N 138.7E	47639
25	301235	35.0N 139.6E	LAND	FAIR		28		MOV 1810	35.7N 139.3E	47642
26	301300	34.9N 139.7E	LAND				45//3 53611		35.3N 138.7E	47639
27	301400	35.2N 139.8E	LAND				45//3 50216		35.3N 138.7E	47639
28	301435	35.3N 139.7E	LAND	POOR				MOV 1815	35.7N 139.3E	47642
29	301500	35.5N 139.9E	LAND	FAIR				MOV 0240	36.2N 140.4E	47715
30	301500	35.6N 140.0E	LAND				6///2 50227		35.3N 138.7E	47639
31	301535	35.6N 139.8E	LAND	FAIR				MOV 2015	35.7N 139.3E	47642
32	301600	35.7N 139.9E	LAND				45//2 53408		35.3N 138.7E	47639
33	301600	35.7N 139.8E	LAND				75/// /////		37.7N 138.8E	47572
34	301700	36.0N 140.2E	LAND				45//2 50322		35.3N 138.7E	47639
35	301700	36.1N 140.1E	LAND				75/// /////		37.7N 138.8E	47572
36	301800	36.4N 140.2E	LAND				6///2 50122		35.3N 138.7E	47639
37	301800	36.3N 140.3E	LAND				75/// /////		37.7N 138.8E	47572
38	301900	36.6N 140.4E	LAND				6///2 50316		35.3N 138.7E	47639
39	301900	36.5N 140.4E	LAND				75/// /////		37.7N 138.8E	47572
40	301900	36.6N 140.5E	LAND				65//2 536//		38.3N 140.9E	47590
41	301930	37.0N 140.6E	LAND	POOR				MOV 1920	35.7N 139.3E	47642
42	302000	36.7N 140.7E	LAND				75/// /////		37.7N 138.8E	47572
43	302000	37.0N 140.5E	LAND				6///2 50122		35.3N 138.7E	47639
44	302000	36.8N 140.5E	LAND				20272 50222		38.3N 140.9E	47590
45	302033	36.6N 140.7E	LAND	POOR		10		MOV 2120	35.7N 139.3E	47642
46	302100	37.3N 140.8E	LAND				10212 50227		38.3N 140.9E	47590
47	302200	37.4N 141.0E	LAND				75/// /////		37.7N 138.8E	47572
48	302200	37.4N 141.0E	LAND				75/// /////		38.3N 140.9E	47590
49	310000	38.1N 141.1E	LAND				10392 50227		38.3N 140.9E	47590
50	310200	38.6N 141.4E	LAND				55/62 50222		38.3N 140.9E	47590
51	310300	38.9N 141.6E	LAND				55/42 50322		38.3N 140.9E	47590
52	310400	39.1N 141.9E	LAND				54512 50320		38.3N 140.9E	47590

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TYPHOON SKIP02C
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST ERRORS				48 HOUR FORECAST ERRORS				72 HOUR FORECAST ERRORS			
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
083018Z	12.8	180.8	35	12.8	180.5	30.	18.	-5.	13.0	174.5	45.	191.	-10.	13.5	169.6	50.	402.	-20.	14.0	164.6	60.	554.	10.
083100Z	13.6	178.9	35	12.9	179.3	30.	48.	-5.	13.8	174.3	45.	168.	-10.	14.0	168.8	55.	415.	-5.	13.8	163.2	70.	608.	20.
083106Z	14.4	177.5	40	14.5	177.7	35.	13.	-5.	16.2	173.1	50.	162.	-10.	15.0	167.5	60.	434.	10.	14.2	161.5	75.	666.	25.
083112Z	15.1	176.8	45	15.2	176.7	40.	8.	-5.	17.0	172.8	50.	201.	-15.	16.4	166.9	60.	493.	10.	15.4	161.6	75.	621.	25.
083118Z	15.6	176.4	55	15.6	176.2	50.	12.	-5.	17.3	172.5	65.	143.	-5.	17.8	168.3	70.	275.	20.	17.0	162.8	80.	514.	35.
090100Z	16.0	176.1	55	15.8	175.9	55.	17.	0.	16.9	172.8	70.	131.	10.	17.0	167.3	80.	312.	30.	16.1	161.8	90.	589.	45.
090106Z	16.5	175.9	60	15.8	175.9	55.	42.	-5.	17.0	172.7	75.	111.	25.	17.0	167.1	85.	302.	35.	16.0	161.3	95.	630.	55.
090112Z	16.9	175.7	65	17.2	175.6	65.	19.	0.	18.1	173.3	65.	23.	15.	17.4	168.7	80.	204.	30.	17.1	164.5	95.	467.	50.
090118Z	17.2	175.4	70	17.6	175.3	65.	25.	-5.	18.1	172.8	70.	21.	20.	17.5	168.7	80.	206.	35.	17.2	164.5	95.	524.	50.
090200Z	17.5	175.0	60	17.8	174.8	70.	21.	10.	17.8	171.4	75.	79.	25.	17.4	167.3	85.	281.	40.	17.2	163.2	95.	662.	50.
090206Z	17.7	174.5	50	17.7	174.4	60.	6.	10.	17.7	171.3	70.	82.	20.	17.3	166.8	85.	326.	45.	17.1	161.5	95.	809.	50.
090212Z	18.1	173.7	50	18.0	173.3	60.	24.	10.	18.5	169.3	75.	141.	25.	17.9	164.8	85.	426.	40.	17.6	160.0	95.	990.	45.
090218Z	18.3	173.1	50	18.2	172.9	55.	13.	5.	18.8	169.3	65.	131.	20.	18.3	164.5	75.	492.	30.	18.0	159.5	85.	934.	30.
090300Z	18.6	172.5	50	18.4	172.4	50.	13.	0.	19.4	170.4	50.	72.	5.	20.7	168.4	60.	310.	15.	20.7	164.1	65.	642.	10.
090306Z	18.9	172.0	50	18.9	172.0	50.	0.	0.	20.3	170.2	50.	62.	10.	21.0	167.4	60.	412.	15.	20.8	163.6	65.	688.	10.
090312Z	19.4	171.6	50	19.2	171.4	50.	17.	0.	20.5	169.5	55.	117.	10.	21.1	167.2	60.	442.	10.	21.1	163.8	65.	704.	5.
090318Z	19.9	171.3	45	19.8	171.1	50.	13.	5.	21.4	169.4	50.	173.	5.	22.1	167.4	55.	427.	0.	22.2	164.8	60.	668.	-5.
090400Z	20.4	171.1	45	20.5	171.5	50.	23.	5.	22.9	171.1	50.	161.	5.	24.9	170.9	45.	202.	-10.	27.9	172.4	40.	198.	-10.
090406Z	20.9	171.1	40	21.0	171.4	50.	18.	10.	23.0	171.1	45.	195.	0.	25.2	171.2	40.	197.	-15.	28.7	173.4	30.	233.	-15.
090412Z	21.5	171.3	45	21.4	171.4	45.	8.	0.	23.4	171.3	40.	187.	-10.	28.2	171.4	35.	192.	-25.	0.0	0.0	0.	-0.	0.
090418Z	21.6	172.5	45	21.7	172.9	50.	23.	5.	23.2	175.8	40.	99.	-15.	25.1	173.7	40.	292.	-25.	27.2	181.2	40.	484.	-25.
090500Z	21.9	173.8	45	22.0	173.7	50.	8.	5.	23.4	176.5	40.	154.	-15.	25.4	179.3	40.	364.	-40.	0.0	0.0	0.	-0.	0.
090506Z	22.6	174.6	45	22.7	174.6	50.	6.	5.	24.2	177.1	40.	129.	-15.	30.5	179.5	40.	191.	-35.	0.0	0.0	0.	-0.	0.
090512Z	23.6	174.7	50	23.7	175.1	50.	23.	0.	27.7	177.4	50.	142.	-10.	32.4	179.9	45.	144.	-25.	0.0	0.0	0.	-0.	0.
090518Z	24.5	174.7	55	24.7	175.2	55.	30.	0.	28.8	177.6	50.	143.	-15.	33.4	180.4	45.	125.	-20.	0.0	0.0	0.	-0.	0.
090600Z	25.3	174.6	55	25.2	174.6	60.	6.	5.	28.9	174.5	50.	84.	-30.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
090606Z	26.1	174.7	55	26.0	174.5	60.	12.	5.	29.6	174.8	50.	148.	-25.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
090612Z	27.2	174.8	60	27.3	174.7	60.	8.	0.	31.5	176.5	50.	121.	-20.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
090618Z	28.6	174.9	65	28.4	174.9	55.	12.	-10.	32.6	177.4	45.	160.	-20.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
090700Z	30.2	175.1	80	30.2	175.0	65.	5.	-15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
090706Z	31.8	176.1	75	31.9	175.7	70.	21.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
090712Z	33.4	177.3	70	33.9	177.3	70.	6.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
090718Z	35.0	178.8	65	35.0	178.9	65.	5.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	16.	129.	311.	605.	16.	129.	311.	605.
AVG RIGHT ANGLE ERROR	12.	85.	248.	473.	12.	85.	248.	473.
AVG INTENSITY MAGNITUDE ERROR	4.	14.	23.	32.	4.	14.	23.	32.
AVG INTENSITY BIAS	0.	-1.	6.	20.	0.	-1.	6.	20.
NUMBER OF FORECASTS	33	29	25	20	33	29	25	20

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1822. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 9. KNOTS

TYPHOON SKIP02C
FIX POSITIONS FOR CYCLONE NO. 2

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	301800	12.9N 179.9E	PCN 6		ULCC FIX	PGTW
	2	301824	12.9N 179.3W	PCN 6	T2.5/2.5 /D1.5/25HRS	ULAC 12.6N 179.4W	KGWC
	3	302100	13.3N 179.3E	PCN 6		ULCC FIX	PGTW
	4	310000	13.7N 178.8E	PCN 4	T2.5/2.5	INIT OBS ULAC 13.7N 178.9E	PGTW
	5	310300	14.2N 178.0E	PCN 6			PGTW
	6	310600	14.7N 177.6E	PCN 6			PGTW
	7	310704	14.4N 177.3E	PCN 6		ULAC 14.8N 177.6E	KGWC
	8	310900	14.9N 177.3E	PCN 6			PGTW
	9	311005	15.0N 176.9E	PCN 6			KGWC
	10	311200	15.2N 176.9E	PCN 6			PGTW
	11	311448	15.6N 176.4E	PCN 2		PART EYE WALL ULAC 15.6 177.6	KGWC
	12	311600	15.4N 176.7E	PCN 6	T3.5/3.5	INIT OBS	PGTW
	13	311800	15.6N 176.5E	PCN 6			PGTW
	14	311802	15.6N 176.1E	PCN 6			KGWC
	15	312100	15.5N 176.3E	PCN 6		ULCC FIX	PGTW
	16	312245	15.7N 176.1E	PCN 2	T3.5/3.5 /D1.0/28HRS	EYE FIX	KGWC
	17	312246	15.7N 176.0E	PCN 4		DEVLOPNG EYE	PGTW
	18	010000	15.8N 176.0E	PCN 6			PGTW
	19	010152	16.0N 176.1E	PCN 2		EYE FIX	KGWC
	20	010300	15.8N 176.0E	PCN 6			PGTW
	21	010600	16.0N 176.2E	PCN 6	T3.5/3.5 /D1.0/30HRS		PGTW
	22	010642	16.6N 175.4E	PCN 6			KGWC
	23	010900	16.8N 175.7E	PCN 6			PGTW
	24	011126	17.0N 175.9E	PCN 2		EYE FIX	PGTW
	25	011126	16.9N 176.0E	PCN 4	T4.5/4.5	INIT OBS PSBL EYE	KGWC
	26	011438	17.1N 175.5E	PCN 6			KGWC
	27	011600	17.0N 175.5E	PCN 6	T4.5/4.5 /D1.0/24HRS		PGTW
*	28	011741	17.3N 174.4E	PCN 2			KGWC
	29	011800	17.2N 175.3E	PCN 6			PGTW
	30	012100	17.5N 175.3E	PCN 6			PGTW
	31	012225	17.3N 174.6E	PCN 6		ULAC 18.8N 175.3E	KGWC
	32	020000	17.4N 175.1E	PCN 4	T4.0/4.0 /D0.5/18HRS		PGTW
	33	020300	17.5N 174.8E	PCN 4		EXP LLCC	PGTW
	34	020324	17.7N 174.6E	PCN 6		EXP LLCC	PGTW
	35	020600	17.8N 174.6E	PCN 4			PGTW
	36	020621	17.4N 173.5E	PCN 6			KGWC
	37	020900	18.1N 174.3E	PCN 6			PGTW
	38	021106	18.1N 173.7E	PCN 6	T4.0/4.5 /W0.5/24HRS		KGWC
	39	021200	18.1N 173.8E	PCN 6			PGTW
	40	021427	18.1N 173.5E	PCN 6		ULAC 18.7N 173.8E	KGWC
	41	021600	18.2N 173.2E	PCN 6			PGTW
	42	021800	18.2N 172.8E	PCN 6	T3.5/4.5+/W1.0/26HRS		PGTW
	43	021901	18.3N 172.8E	PCN 4		PART EXP LLCC	PGTW
	44	022114	18.3N 172.5E	PCN 4		PART EXP LLCC	PGTW
	45	022205	18.3N 172.6E	PCN 4	T2.5/2.5 /S0.0/24HRS	EXP LLCC ULAC 19.6N 172.9E	KGWC
	46	030000	18.4N 172.5E	PCN 6			PGTW
	47	030312	18.8N 172.1E	PCN 6	T3.0/4.0 /W1.0/27HRS		PGTW
	48	030312	18.8N 172.2E	PCN 6			KGWC
	49	030600	18.9N 172.1E	PCN 4			PGTW
	50	030741	19.1N 171.5E	PCN 6		ULAC 20.0N 174.9E	KGWC
	51	030900	19.0N 171.8E	PCN 6			PGTW
	52	031045	18.7N 171.8E	PCN 6	T4.0/4.0 /S0.0/24HRS	ULAC 18.8N 172.0E	KGWC
	53	031200	19.2N 171.4E	PCN 6			PGTW
	54	031558	19.3N 170.8E	PCN 6	T3.5/3.5 /S0.0/22HRS		PGTW
	55	031558	19.0N 170.7E	PCN 6		ULAC 20.0N 172.4E	KGWC

56	031840	19.3N 171.0E	PCN 6				KGWC
57	032052	20.0N 171.5E	PCN 4				PGTW
58	032144	20.9N 170.5E	PCN 6	T3.0/3.0 /W1.0/24HRS			KGWC
59	040000	20.9N 171.1E	PCN 6	T3.0/3.0+/S0.0/21HRS			PGTW
60	040300	21.3N 171.5E	PCN 6				PGTW
61	040302	20.9N 171.1E	PCN 4		EXP LLCC ULAC 21.2N 172.5E		KGWC
62	040600	21.0N 171.2E	PCN 6				PGTW
63	040720	20.8N 171.2E	PCN 4		EXP LLCC ULAC 21.4N 173.0E		KGWC
64	040900	21.2N 171.5E	PCN 6				PGTW
65	041025	21.1N 170.4E	PCN 6	T3.5/4.0 /W0.5/24HRS	ULAC 21.7N 172.5E		KGWC
66	041200	21.2N 171.6E	PCN 6				PGTW
67	041547	21.9N 171.4E	PCN 6		ULAC 22.0N 174.4E		KGWC
68	041600	21.3N 172.2E	PCN 6	T3.5/3.5 /S0.0/24HRS			PGTW
69	041800	21.3N 172.7E	PCN 6				PGTW
70	041818	22.0N 172.0E	PCN 6		ULAC 22.0N 173.3E		KGWC
71	042306	21.7N 173.5E	PCN 5				PGTW
72	042306	21.6N 173.5E	PCN 6	T3.0/3.0 /S0.0/25HRS	ULAC 22.0N 174.3E		KGWC
73	050000	21.9N 173.6E	PCN 6				PGTW
74	050251	22.0N 173.6E	PCN 4		EXP LLCC ULAC 22.4N 174.2E		KGWC
75	050300	22.4N 174.0E	PCN 4	T3.5/3.5-/D0.5/27HRS			PGTW
76	050600	22.4N 174.4E	PCN 6				PGTW
77	050658	22.3N 174.5E	PCN 4		PART EXP LLCC ULAC 22.6N 175.		KGWC
78	050900	23.1N 174.5E	PCN 6				PGTW
* 79	051005	23.0N 173.3E	PCN 6	T3.0/3.5 /W0.5/24HRS	ULAC 23.9N 172.8E		KGWC
80	051147	23.5N 174.5E	PCN 6				PGTW
81	051536	24.2N 174.7E	PCN 6		ULAC 24.8N 174.3E		KGWC
82	051600	23.9N 174.7E	PCN 6	T3.5/3.5-/S0.0/24HRS			PGTW
83	051757	24.4N 174.6E	PCN 6		ULAC 24.6N 174.1E		KGWC
84	051800	24.3N 174.6E	PCN 6				PGTW
85	052100	24.8N 174.8E	PCN 6				PGTW
86	052245	25.0N 174.5E	PCN 6	T2.5/3.0 /W0.5/24HRS			KGWC
87	052246	25.4N 174.4E	PCN 4		EXP LLCC		PGTW
88	060000	25.3N 174.6E	PCN 6				PGTW
89	060240	25.6N 174.4E	PCN 6				KGWC
90	060300	25.7N 174.7E	PCN 4	T4.0/4.0-/D0.5/24HRS			PGTW
91	060600	26.0N 174.8E	PCN 6				PGTW
92	060637	26.1N 174.6E	PCN 2		EYE FIX		KGWC
93	060900	26.7N 174.9E	PCN 6		ULCC FIX		PGTW
94	061126	26.8N 175.0E	PCN 4	T2.5/3.0 /W0.5/25HRS	PART EXP LLCC ULAC 27.2N 174.		KGWC
95	061200	27.3N 174.8E	PCN 6				PGTW
96	061526	27.8N 174.8E	PCN 6				KGWC
97	061600	28.3N 174.8E	PCN 4	T3.5/3.5-/S0.0/24HRS	ULCC FIX PSBL EYE		PGTW
98	061736	28.2N 174.3E	PCN 6		PSBL BANDING EYE		KGWC
99	061800	28.6N 175.0E	PCN 6		ULCC FIX		PGTW
100	062100	29.6N 174.9E	PCN 6				PGTW
101	062226	29.8N 175.1E	PCN 2	T4.5/4.5 /D2.0/24HRS	EYE FIX		KGWC
102	070000	30.1N 175.7E	PCN 2	T5.0/5.0-/D1.0/21HRS	20 NM CIRCULR EYE		PGTW
103	070229	31.3N 175.6E	PCN 2		EYE 24 NM DIA		KGWC
104	070300	30.9N 175.7E	PCN 2		EYE FIX		PGTW
105	070600	31.8N 176.3E	PCN 2		EYE FIX		PGTW
106	070616	31.8N 176.2E	PCN 2		EYE 24 NM DIA		KGWC
107	070900	32.5N 176.7E	PCN 2		EYE FIX		PGTW
*108	071105	32.6N 176.2E	PCN 2	T4.5/4.5 /D2.0/24HRS	EYE 24NM DIA		KGWC
109	071200	33.4N 177.3E	PCN 4		EYE FIX		PGTW
110	071515	34.1N 178.0E	PCN 2		RAGGED EYE FIX		KGWC
111	071600	34.7N 178.5E	PCN 4	T3.5/3.5-/S0.0/24HRS			PGTW
112	071800	35.0N 178.7E	PCN 6		ULCC FIX		PGTW
113	072100	36.1N 179.4E	PCN 6		ULCC 36.4N 179.2E		PGTW
114	072205	36.4N 179.8E	PCN 6	T3.0/4.0 /W1.5/24HRS			KGWC
115	080000	36.8N 179.7W	PCN 6		ULAC 37.2N 180.0E		PGTW
116	080219	38.2N 179.4W	PCN 6				KGWC
117	080300	37.6N 179.7W	PCN 6	T3.0/4.0+/W2.0/27HRS			PGTW
118	081046	39.0N 178.8W	PCN 4		EXP LLCC		KGWC

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN- DIAM/TATION	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	011153	17.2N 175.6E	700MB	2930	979		300 69 040 10	10 5	CIRCULAR	20	+10 +19 +10	2
2	012051	17.5N 175.2E	700MB	3050	992	75 050 10	300 48 220 10	8 3			+ 9 +19 + 3	3
3	012158	17.5N 175.1E	700MB	3053		75 040 10	150 52 040 18	8 2			+ 8 +17 + 3	3
4	020733	17.8N 174.4E	700MB	3072	996	35 210 40	320 43 210 44	8 5			+13 +17 + 8	4
5	021004	18.1N 173.7E	700MB	3062			120 54 070 35	8 5			+10 +17 +12	4
6	021824	18.3N 173.0E	1500FT		994	55 040 15	130 57 040 8	8 1			+ +25 +24 27	5
7	022112	18.3N 172.6E	1500FT		994	50 320 15	020 54 320 10	8 1			+24 +25 +26 27	5
8	030657	18.9N 171.9E	1500FT		994	50 330 20	040 51 330 15	12 2			+25 +27 +25 32	6
9	031818	20.0N 171.5E	1500FT		998	45 040 40	130 60 040 20	10 3			+ +29 +28 28	7
10	032103	20.2N 171.5E	1500FT		998	50 300 8	210 48 110 11	10 2			+ +28 +25 28	7
11	040532	20.9N 171.4E	1500FT		996	35 010 30	080 38 010 23	8 1			+25 +26 +26 27	8
12	040805	21.1N 170.7E	700MB	3113	1010		340 36 110 30	8 4			+10 +11 + 7	8
13	042032	21.6N 173.6E	1500FT		998	55 050 15	210 57 060 22	7 1			+25 +28 +25 28	9
14	042328	21.6N 173.6E	1500FT		1002	35 300 30	280 34 040 25	6 2			+25 +25 +25 28	9
15	050615	22.7N 174.7E	1500FT		994	55 040 15	180 42 040 16	12 1			+23 +26 +25 26	10
16	050815	23.4N 174.8E	700MB	2982	986		150 57 130 15	8 2	CIRCULAR	30	+ 8 +16 + 4	10
17	052121	24.9N 174.6E	1500FT		989	60 170 25	130 77 020 20	5 3	CIRCULAR	60	+24 +26 +22	11
18	052303	25.1N 174.5E	700MB	2997	990	55 280 15	280 59 210 20	8 2	ELLIPTICAL	60 40 030	+11 +14 + 4	11
19	062039	29.4N 174.9E	700MB	2888		80 060 25	170 92 060 30	8 2	CIRCULAR	10	+10 +16	13
20	062310	30.1N 175.0E	700MB	2870	974	80 330 10	330 75 060 10	12 3	CIRCULAR	15	+10 +15	13

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TYPHOON TESS
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST ERRORS				48 HOUR FORECAST ERRORS				72 HOUR FORECAST ERRORS			
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
083118Z	15.0	134.0	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.	0.	0.0	0.	-0.	0.
090100Z	15.0	132.8	30	15.0	132.7	30.	6.	0.	16.6	129.6	45.	217.	-5.	18.0	125.3	65.	195.	0.	19.1	120.4	90.	136.	40.
090106Z	15.1	131.1	35	15.5	132.0	30.	57.	-5.	17.2	128.7	45.	255.	-10.	18.6	124.3	65.	178.	-5.	19.4	119.4	90.	144.	35.
090112Z	15.3	129.2	40	15.8	129.3	35.	31.	-5.	17.4	124.3	55.	156.	0.	19.1	120.4	75.	117.	40.	20.8	117.5	90.	153.	35.
090118Z	15.1	127.6	45	15.3	127.1	45.	31.	0.	16.0	120.3	55.	191.	-5.	18.5	117.0	70.	145.	30.	20.9	114.9	90.	109.	30.
090200Z	14.7	126.4	50	14.7	126.2	50.	12.	0.	15.5	120.9	50.	111.	-15.	18.1	117.7	65.	29.	15.	21.2	114.8	65.	119.	0.
090206Z	14.6	125.2	55	14.7	125.3	55.	8.	0.	15.8	120.5	50.	104.	-20.	18.1	117.5	65.	41.	10.	22.2	115.7	65.	188.	-5.
090212Z	14.8	124.3	55	14.7	124.2	55.	8.	0.	16.6	119.6	50.	101.	15.	18.9	116.8	70.	62.	15.	23.0	115.2	60.	189.	-15.
090218Z	15.2	123.5	60	14.8	123.1	60.	33.	0.	16.9	119.0	55.	53.	15.	19.8	116.1	75.	90.	15.	24.2	115.1	40.	227.	-35.
090300Z	15.8	122.8	65	15.6	122.8	65.	12.	0.	16.4	119.8	40.	142.	-10.	18.5	115.5	65.	106.	0.	22.2	113.0	65.	51.	15.
090306Z	16.4	122.2	70	16.5	122.3	70.	8.	0.	17.4	118.0	55.	92.	0.	19.2	113.8	65.	56.	-5.	21.6	110.4	60.	94.	35.
090312Z	17.3	121.2	35	17.2	121.6	50.	24.	15.	18.5	117.7	55.	116.	0.	20.1	113.3	70.	34.	-5.	0.0	0.0	0.	-0.	0.
090318Z	17.7	119.4	40	17.9	120.1	40.	42.	0.	18.9	116.0	65.	75.	5.	21.0	112.0	75.	36.	0.	0.0	0.0	0.	-0.	0.
090400Z	18.2	118.2	50	19.1	118.2	50.	54.	0.	21.0	113.5	75.	99.	10.	23.2	111.0	30.	107.	-20.	0.0	0.0	0.	-0.	0.
090406Z	18.6	117.0	55	18.7	116.9	55.	8.	0.	20.8	112.2	70.	78.	0.	23.3	109.0	30.	155.	5.	0.0	0.0	0.	-0.	0.
090412Z	18.9	115.7	55	19.3	115.7	55.	24.	0.	21.1	111.4	65.	95.	-10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
090418Z	19.1	114.7	60	19.4	114.5	60.	21.	0.	21.5	110.9	50.	97.	-25.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
090500Z	19.4	113.9	65	19.4	113.9	65.	0.	0.	20.6	110.6	75.	115.	25.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
090506Z	20.0	113.3	70	19.9	113.3	70.	6.	0.	21.5	110.5	75.	94.	50.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
090512Z	20.6	113.0	75	20.5	112.9	70.	8.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
090518Z	21.2	112.6	75	21.3	112.6	75.	6.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
090600Z	21.8	112.2	50	22.0	112.0	65.	16.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
090606Z	22.6	111.7	25	22.7	111.7	45.	6.	20.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	19.	122.	97.	141.	21.	123.	92.	146.
AVG RIGHT ANGLE ERROR	15.	70.	56.	115.	15.	68.	56.	118.
AVG INTENSITY MAGNITUDE ERROR	3.	12.	12.	25.	3.	10.	12.	23.
AVG INTENSITY BIAS	2.	1.	7.	14.	1.	-2.	7.	11.
NUMBER OF FORECASTS	22	18	14	10	20	17	13	9

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1470. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 11. KNOTS

TYPHOON TESS
FIX POSITIONS FOR CYCLONE NO. 15

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	301348	16.4N 138.6E	PCN 5	T1.0/1.0	INIT OBS ULCC FIX	PGTW
	2	301800	14.3N 138.8E	PCN 6		ULCC FIX	PGTW
*	3	310048	10.9N 136.2E	PCN 5			PGTW
*	4	310527	10.5N 134.9E	PCN 5	T1.0/1.0	INIT OBS	PGTW
*	5	311059	12.0N 133.2E	PCN 6			PGTW
	6	311600	15.3N 133.8E	PCN 6			PGTW
	7	311813	14.6N 133.1E	PCN 6	T2.0/2.0 /D1.0/28HRS		PGTW
	8	312100	15.7N 132.5E	PCN 6			PGTW
	9	010027	15.1N 131.8E	PCN 6			PGTW
	10	010300	15.4N 131.6E	PCN 6			PGTW
	11	010600	15.5N 130.4E	PCN 6	T1.5/1.5 /D0.5/25HRS		PGTW
	12	010900	15.1N 129.9E	PCN 6			PGTW
	13	011005	15.4N 129.6E	PCN 6			PGTW
	14	011037	15.6N 129.3E	PCN 6			PGTW
	15	011200	15.5N 129.2E	PCN 6			PGTW
	16	011308	15.5N 128.6E	PCN 6			PGTW
	17	011600	15.3N 127.8E	PCN 6	T3.0/3.0 /D1.0/22HRS		PGTW
	18	011800	15.0N 126.9E	PCN 6			PGTW
	19	011802	15.0N 126.9E	PCN 6			PGTW
	20	012100	14.7N 126.9E	PCN 6			PGTW
	21	012317	14.6N 126.1E	PCN 4			PGTW
	22	020000	14.6N 125.9E	PCN 4	T3.5/3.5-/D2.0/18HRS		PGTW
	23	020148	14.6N 125.3E	PCN 3	T3.5/3.5	INIT OBS	RODN
	24	020300	14.5N 125.7E	PCN 6			PGTW
	25	020506	14.5N 126.1E	PCN 6	T3.5/3.5	INIT OBS	RPMK
	26	020600	14.6N 125.3E	PCN 4			PGTW
	27	020900	14.7N 124.5E	PCN 6			PGTW
	28	020944	14.7N 124.4E	PCN 6			PGTW
	29	021200	14.9N 124.1E	PCN 6			PGTW
	30	021429	14.7N 123.4E	PCN 5		ULCC FIX	RPMK
	31	021600	14.9N 123.5E	PCN 6	T4.0/4.0-/D1.0/24HRS		PGTW
	32	021751	14.8N 123.2E	PCN 5			RPMK
	33	021751	15.0N 123.1E	PCN 6			PGTW
	34	022100	15.2N 122.7E	PCN 6			PGTW
	35	022224	14.9N 122.9E	PCN 6	T3.5/3.5 /S0.0/18HRS		RPMK
	36	022255	15.5N 122.5E	PCN 5		ULCC FIX	PGTW
	37	030000	15.4N 122.5E	PCN 6			PGTW
	38	030128	15.2N 122.7E	PCN 5	T3.5/3.5 /S0.0/20HRS		RPMK
	39	030128	15.4N 122.4E	PCN 5	T3.5/3.5 /S0.0/25HRS	ULCC FIX	PGTW
	40	030128	15.7N 122.0E	PCN 6	T4.0/4.0 /D0.5/24HRS	ULCC FIX	RODN
	41	030600	16.5N 122.4E	PCN 6		ULCC FIX	PGTW
	42	030636	16.5N 122.1E	PCN 5			RODN
	43	030900	16.8N 122.4E	PCN 6			PGTW
	44	031104	17.6N 121.6E	PCN 4			RODN
	45	031134	17.1N 121.2E	PCN 5			RPMK
	46	031409	17.3N 120.0E	PCN 6			PGTW
	47	031600	17.1N 119.8E	PCN 6			PGTW
	48	031800	17.2N 119.3E	PCN 6	T3.0/4.0+/W1.0/26HRS		PGTW
	49	031923	17.7N 120.0E	PCN 5			RPMK
	50	032100	17.6N 119.2E	PCN 6			PGTW
	51	040000	18.0N 118.5E	PCN 6		ULCC FIX	PGTW
	52	040014	17.9N 118.5E	PCN 5	T3.5/3.5+/S0.0/24HRS		RPMK
	53	040108	18.1N 118.7E	PCN 6	T3.0/3.5+/W0.5/24HRS		PGTW
	54	040249	18.2N 117.7E	PCN 6			RPMK
	55	040300	18.2N 118.0E	PCN 6			PGTW
	56	040600	18.7N 116.8E	PCN 6		ULCC FIX	PGTW
	57	040900	18.9N 116.7E	PCN 6			PGTW
	58	041043	19.3N 116.2E	PCN 6			RPMK
	59	041113	19.2N 115.9E	PCN 5			RKSO
	60	041200	19.3N 115.7E	PCN 6			PGTW
	61	041530	19.0N 115.3E	PCN 4		EXP LLCC	RODN

62	041600	19.1N 114.9E	PCN 6	T4.0/4.0-/D1.0/22HRS			PGTW
63	041800	19.2N 114.7E	PCN 6				PGTW
64	041912	19.4N 114.6E	PCN 4				RPMK
65	042100	19.2N 114.5E	PCN 6				PGTW
66	042352	19.3N 114.0E	PCN 1	T4.0/4.0	INIT OBS EYE FIX		RKSO
67	042352	19.3N 113.8E	PCN 1	T5.0/5.0 /S0.0/24HRS	EYE 14 NM DIA		RODN
68	050000	19.3N 114.0E	PCN 4				PGTW
69	050229	19.5N 113.9E	PCN 3	T4.0/4.0-/D0.5/26HRS	OPN EYE		RPMK
70	050300	19.5N 113.9E	PCN 4	T4.5/4.5 /D1.5/26HRS			PGTW
71	050600	19.9N 113.4E	PCN 4		PSBL EYE		PGTW
72	050615	20.0N 113.5E	PCN 1		EYE 30 NM DIA		RODN
73	050900	20.2N 113.2E	PCN 4				PGTW
74	051200	20.7N 113.1E	PCN 4		PSBL EYE		PGTW
75	051509	20.9N 113.1E	PCN 1		RAGGED EYE FIX		RODN
76	051600	21.1N 112.7E	PCN 4	T4.5/4.5-/D0.5/24HRS			PGTW
77	051800	21.3N 112.6E	PCN 4		RAGGED EYE		PGTW
78	051901	21.5N 112.5E	PCN 2		EYE FIX		RKSO
79	052100	21.6N 112.4E	PCN 4		PSBL EYE		PGTW
80	052302	21.6N 112.1E	PCN 2		RAGGED EYE		RPMK
81	060000	21.8N 112.2E	PCN 4		PSBL EYE		PGTW
82	060209	22.2N 111.9E	PCN 6				RPMK
83	060300	22.3N 111.8E	PCN 6				PGTW
84	060600	22.9N 111.7E	PCN 6				PGTW
85	060900	23.2N 111.1E	PCN 6		ULCC FIX		PGTW
86	070300	24.9N 109.3E	PCN 6				PGTW

AIRCRAFT FIXES

	FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN- DIAM/TATION	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
	1	010126	15.1N 132.6E	1500FT		1003	35 030 20	170 40 060 5	12 4			+24 +25 +24 27	2
	2	012338	14.7N 126.6E	1500FT		995	50 220 15	280 36 210 60	6 2			+25 +26 +20 27	4
	3	020030	14.7N 126.3E	1500FT		993	50 140 10	210 42 140 10	6 2			+25 +26 +21 27	4
	4	020544	14.8N 125.4E	1500FT		989	50 340 14	040 50 340 14	10 2			+26 +28 +26 25	5
	5	020826	14.7N 124.9E	1500FT		987	45 090 50	190 47 090 50	10 1			+26 +27 +25 25	5
	6	022104	15.7N 123.5E	700MB	2933		50 140 20	260 53 140 20	15 2			+15 +12 + 7	6
	7	022351	15.6N 123.0E	700MB	2938	983	65 360 10	100 62 360 11	2 4			+12 +13 + 5	6
	8	030515	16.3N 122.4E	700MB	2940		65 030 20	130 65 030 30	3 5	CIRCULAR	10	+25 +15 +12	7
*	9	032134	19.0N 119.1E	700MB	3015		31 310 90	040 47 310 120	8 10			+11 +13 +13	8
*	10	040027	19.5N 118.0E	1500FT		992	48 060 90	140 54 060 90	10 10			+24 +24 +24	8
	11	040645	18.8N 116.7E	700MB	2988		50 080 60	160 61 080 36	10 10			+14 +16 +11	9
	12	040918	18.9N 116.4E	700MB	2965		50 040 60	150 43 040 60	10 10			+12 +16 +11	9

RADAR FIXES

	FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR TDDFF	COMMENTS	RADAR POSITION	SITE WMO NO.
	1	021730	15.1N 124.2E	LAND			4		SPRL OVERLAY	16.3N 120.6E	98321
	2	021800	15.1N 124.3E	LAND				1060/ 4////	EYE 90 PRCNT CIRCLR OPN S	16.3N 120.6E	98321
	3	021830	15.2N 124.1E	LAND				1061/ 42905	EYE 90 PRCNT CIRCLR DIA 35 KMS	16.3N 120.6E	98321
	4	021900	15.2N 124.0E	LAND				1061/ 52910	EYE 90 PRCNT CIRCLR DIA 35 KMS	16.3N 120.6E	98321
	5	021930	15.2N 123.9E	LAND				1161/ 43206	EYE ELPTICL DIA 30-35 KMS	16.3N 120.6E	98321
	6	022000	15.4N 123.6E	LAND				1052/ 53215	EYE 100 PRCNT CIRCLR DIA 30KMS	18.4N 121.6E	98231
	7	022000	15.3N 123.8E	LAND				1161/ 53214	EYE ELPTICL DIA 25-35 KMS	16.3N 120.6E	98321
	8	030000	15.7N 123.1E	LAND				1052/ 42902	EYE 100 PRCNT CIRCULR DIA 30KM	16.3N 120.6E	98321
	9	030200	15.8N 123.0E	LAND				12726 4////	ELIPTICAL EYE	16.3N 120.6E	98321
	10	030400	16.2N 122.9E	LAND				1042/ 43505	EYE 90 PRCNT CIRCULR DIA 20 KM	16.3N 120.6E	98321
	11	030430	16.3N 122.7E	LAND				1241/ 43511	EYE ELPTICL DIA 15/30 KM	16.3N 120.6E	98321
	12	030500	16.4N 122.6E	LAND				1042/ 43410	EYE 100 PRCNT CIRCULR DIA 20KM	16.3N 120.6E	98321
	13	030530	16.6N 122.4E	LAND				10351 43412	EYE 100 PRCNT CIRCULR DIA 20KM	16.3N 120.6E	98321
	14	030600	16.4N 122.1E	LAND				11501 /////	EYE 100 PRCNT ELIPTCAL	18.4N 121.6E	98231
	15	030600	16.4N 122.1E	LAND				11501 /////	100 PRCNT ELPTCL DIA 15/25 KMS	16.3N 120.6E	98321
	16	030630	17.6N 122.3E	LAND				1235/ 53412	EYE ELPTCL DIA 15/35 DIA KMS	16.3N 120.6E	98321
	17	030700	16.4N 122.2E	LAND				10571 40904	EYE 80 PRCNT CIRCLR OPN EYE	18.4N 121.6E	98231
	18	030700	16.8N 122.2E	LAND				1048/ 43310	EYE 100 PRCNT CIRCLR MOVNG NW	16.3N 120.6E	98321
	19	030800	16.7N 121.8E	LAND				11671 42903	EYE 90 PRCNT ELPTCAL	18.4N 121.6E	98231
	20	030800	16.9N 121.9E	LAND				1041/ 43006	EYE 100 PRCNT CIRCLR MOVNG WNW	16.3N 120.6E	98321
	21	030900	17.1N 121.9E	LAND				11581 43604	EYE 100 PRCNT ELPTCAL	18.4N 121.6E	98231
	22	031000	17.5N 121.8E	LAND				11581 43604	EYE 90 PCT ELIPTICAL	18.4N 121.6E	98231
	23	031300	15.8N 123.0E	LAND				10526 5////	EYE 100 PRCNT CIRCLR DIA 30KMS	16.3N 120.6E	98321
	24	031930	18.0N 118.9E	LAND				4//// /////		16.3N 120.6E	98321
	25	032000	18.1N 118.8E	LAND				10/// 43205		16.3N 120.6E	98321
	26	032030	18.2N 118.8E	LAND				10/// 43310		16.3N 120.6E	98321
*	27	040200	19.3N 118.0E	LAND				1064/ 43208	EYE 50 PCT OPN NW FAIR	16.3N 120.6E	98321
	28	040230	19.2N 118.0E	LAND				1067/ 63422	EYE 70 PCT CIR GOOD	16.3N 120.6E	98321
	29	050000	19.5N 114.0E	LAND				5///3 /////		22.3N 114.2E	45005
	30	050100	19.4N 113.9E	LAND				50973 /////		22.3N 114.2E	45005
	31	050200	19.5N 113.9E	LAND				5//03 /////	EYE FORMING	22.3N 114.2E	45005
	32	050300	19.6N 113.7E	LAND				20973 /////		22.3N 114.2E	45005
	33	050400	19.8N 113.6E	LAND				20973 /////		22.3N 114.2E	45005
	34	050500	19.9N 113.5E	LAND				20914 73111		22.3N 114.2E	45005
	35	050600	19.9N 113.4E	LAND				20914 73110		22.3N 114.2E	45005
	36	050700	20.0N 113.4E	LAND				20914 83208		22.3N 114.2E	45005
	37	050800	20.1N 113.4E	LAND				20914 83208		22.3N 114.2E	45005
	38	050900	20.2N 113.3E	LAND				21914 83208		22.3N 114.2E	45005
	39	051000	20.3N 113.3E	LAND				20914 83306		22.3N 114.2E	45005
	40	051100	20.5N 113.2E	LAND				21914 83306		22.3N 114.2E	45005
	41	051200	20.6N 113.1E	LAND				21914 83308		22.3N 114.2E	45005
	42	051300	20.6N 113.0E	LAND				20914 83207		22.3N 114.2E	45005
	43	051400	20.7N 112.9E	LAND				20913 83308		22.3N 114.2E	45005
	44	051500	20.8N 112.7E	LAND				21913 83309		22.3N 114.2E	45005
	45	051600	20.9N 112.7E	LAND				10983 83208		22.3N 114.2E	45005
	46	051800	21.3N 112.7E	LAND				10884 83309		22.3N 114.2E	45005
	47	051900	21.4N 112.5E	LAND				10844 83409		22.3N 114.2E	45005
	48	052000	21.6N 112.5E	LAND				10844 83409		22.3N 114.2E	45005
	49	052100	21.7N 112.3E	LAND				20814 83409		22.3N 114.2E	45005
	50	052200	21 7N 112.2E	LAND				10714 83310		22.3N 114.2E	45005
	51	052300	21.8N 112.1E	LAND				10624 83210		22.3N 114.2E	45005
	52	060000	21.9N 112.0E	LAND				11644 83110		22.3N 114.2E	45005
	53	060100	22.2N 112.0E	LAND				30253 83210		22.3N 114.2E	45005
	54	060200	22.3N 111.8E	LAND				45343 83210		22.3N 114.2E	45005

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL STORM VAL
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS				ERRORS				ERRORS	
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
091306Z	14.2	141.7	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
091312Z	14.7	140.8	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
091318Z	15.4	139.7	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
091400Z	16.2	138.5	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
091406Z	17.4	137.4	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
091412Z	18.4	136.1	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
091418Z	18.2	133.9	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
091500Z	18.1	132.0	35	18.0	131.9	35.	8.	0.	18.2	124.7	55.	192.	10.	18.9	118.8	65.	181.	20.	19.7	113.3	90.	249.	70.
091506Z	19.5	130.6	40	19.5	131.0	35.	23.	-5.	19.5	124.7	55.	132.	10.	19.5	118.7	65.	143.	25.	0.0	0.0	0.	-0.	0.
091512Z	20.6	129.0	40	20.2	129.3	45.	29.	5.	21.9	123.3	60.	84.	10.	20.5	117.9	70.	91.	35.	0.0	0.0	0.	-0.	0.
091518Z	21.2	127.0	45	20.9	127.7	45.	43.	0.	21.0	121.6	65.	29.	15.	21.9	116.6	30.	56.	50.	0.0	0.0	0.	-0.	0.
091600Z	21.4	124.9	45	21.5	125.4	45.	29.	0.	22.9	117.9	50.	175.	5.	24.8	113.5	30.	175.	10.	0.0	0.0	0.	-0.	0.
091606Z	21.2	123.2	45	21.3	123.2	45.	6.	0.	23.0	115.3	50.	269.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
091612Z	21.2	122.0	50	21.2	121.4	50.	34.	0.	22.3	114.8	65.	231.	30.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
091618Z	21.3	121.2	50	21.3	119.9	50.	73.	0.	22.3	114.1	55.	195.	25.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
091700Z	21.4	120.6	45	21.5	119.2	45.	78.	0.	22.5	113.7	45.	131.	25.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
091706Z	21.6	119.9	40	21.6	120.0	45.	6.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
091712Z	21.7	118.9	35	21.8	119.2	40.	18.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
091718Z	22.0	117.6	30	21.8	118.3	40.	41.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
091800Z	23.0	116.0	20	22.9	115.8	25.	13.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	31.	160.	129.	249.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	10.	84.	104.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	3.	16.	28.	70.	0.	0.	0.	0.
AVG INTENSITY BIAS	2.	16.	28.	70.	0.	0.	0.	0.
NUMBER OF FORECASTS	13	9	5	1	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1630. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 14. KNOTS

TROPICAL STORM VAL
FIX POSITIONS FOR CYCLONE NO. 16

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	122100	11.4N 146.9E	PCN 6	T1.0/1.0	INIT OBS	PGTW
*	2	122346	9.4N 144.5E	PCN 5			PGTW
*	3	130300	9.0N 143.6E	PCN 6	T1.0/1.0	INIT OBS	PGTW
	4	130449	14.2N 141.6E	PCN 5			PGTW
	5	130600	14.4N 141.2E	PCN 6			PGTW
	6	130912	14.4N 141.4E	PCN 6			PGTW
	7	131200	14.6N 141.4E	PCN 6			PGTW
	8	131600	15.3N 140.0E	PCN 6	T1.5/1.5	INIT OBS	PGTW
	9	131734	15.2N 139.9E	PCN 6			PGTW
	10	132011	15.0N 139.8E	PCN 6			PGTW
	11	132100	15.3N 139.5E	PCN 6			PGTW
	12	140000	16.3N 138.6E	PCN 6			PGTW
	13	140107	16.7N 138.3E	PCN 5			PGTW
	14	140300	16.4N 137.6E	PCN 6	T1.5/1.5 /D0.5/24HRS		PGTW
	15	140438	17.1N 137.2E	PCN 5			PGTW
	16	140600	17.4N 137.1E	PCN 6			PGTW
	17	140900	17.9N 136.8E	PCN 6		ULCC FIX	PGTW
	18	141200	19.1N 136.4E	PCN 6		ULCC FIX	PGTW
	19	141348	18.7N 136.2E	PCN 5		ULCC FIX	PGTW
	20	141724	18.7N 135.6E	PCN 5		ULCC FIX	PGTW
	21	141800	18.8N 134.5E	PCN 6	T2.0/2.0 /D0.5/26HRS	ULCC FIX	PGTW
	22	142100	17.9N 134.0E	PCN 6		ULAC FIX	PGTW
	23	142131	17.6N 133.5E	PCN 6		ULAC FIX	PGTW
	24	150000	17.7N 132.2E	PCN 6		ULAC FIX	PGTW
	25	150047	18.0N 131.2E	PCN 4			PGTW
	26	150300	18.8N 131.1E	PCN 6	T2.5/2.5+/D1.0/24HRS		PGTW
	27	150600	20.4N 130.6E	PCN 6		ULAC FIX	PGTW
	28	150609	20.4N 130.4E	PCN 6			PGTW
	29	150900	20.2N 129.8E	PCN 6		ULCC FIX	PGTW
	30	151011	20.3N 130.0E	PCN 5		ULCC FIX	PGTW
	31	151200	20.6N 129.4E	PCN 6		ULCC FIX	PGTW
	32	151328	20.9N 129.1E	PCN 5		ULCC FIX	PGTW
	33	151600	21.0N 127.9E	PCN 6	T3.0/3.0 /D1.0/22HRS	ULCC FIX	PGTW
	34	151800	21.2N 127.5E	PCN 6		ULCC FIX	PGTW
	35	151855	21.7N 127.2E	PCN 5			RPMK
	36	151855	22.0N 127.2E	PCN 5		ULCC FIX	RODN
	37	152110	20.9N 126.8E	PCN 6		ULCC FIX	PGTW
*	38	160000	22.2N 125.8E	PCN 6		ULCC FIX	PGTW
	39	160208	21.4N 124.3E	PCN 3	T3.5/3.5	INIT OBS EXP LLCC	RPMK
	40	160208	21.3N 124.6E	PCN 3		EXP LLCC	RODN
	41	160300	21.3N 124.1E	PCN 4	T2.5/2.5-/S0.0/24HRS	EXP LLCC	PGTW
	42	160558	21.2N 123.3E	PCN 4		EXP LLCC	PGTW
	43	160558	21.1N 123.0E	PCN 3		EXP LLCC	RPMK
	44	160900	21.0N 122.6E	PCN 6			PGTW
	45	160950	21.0N 122.4E	PCN 6			PGTW
	46	161200	21.0N 121.9E	PCN 6			PGTW
	47	161449	21.2N 121.0E	PCN 6			RODN
	48	161600	21.1N 121.0E	PCN 6	T3.0/3.0 /S0.0/24HRS		PGTW
	49	161800	21.2N 120.3E	PCN 6			PGTW
	50	162100	20.9N 121.1E	PCN 6		EXP LLCC	PGTW
	51	170000	21.4N 121.0E	PCN 6			PGTW
	52	170148	21.6N 121.1E	PCN 3	T3.5/3.5 /S0.0/24HRS		RPMK
	53	170300	21.6N 120.4E	PCN 6	T3.0/3.0-/D0.5/24HRS		PGTW
	54	170548	22.2N 120.2E	PCN 6			RPMK
	55	170548	21.6N 120.1E	PCN 4		EXP LLCC	PGTW
	56	170600	21.5N 120.0E	PCN 4		EXP LLCC	PGTW
	57	170900	21.7N 119.8E	PCN 6			PGTW
	58	171110	21.6N 118.9E	PCN 5			RPMK
	59	171200	21.5N 119.6E	PCN 6			PGTW
*	60	171428	22.7N 117.1E	PCN 6			RODN
	61	171600	21.8N 118.7E	PCN 6	T1.5/3.0 /W1.5/24HRS		PGTW
	62	171800	21.8N 118.4E	PCN 6			PGTW
	63	172100	21.9N 116.8E	PCN 6		EXP LLCC	PGTW
	64	180011	23.1N 116.2E	PCN 5			RPMK

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN-TATION	EYE DIAM	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	150007	17.9N 131.9E	1500FT		1004	45 060 13	120 47 070 150	8 10				+25 +26 +23	3
2	150736	19.2N 130.0E	1500FT		1002	45 080 60	140 48 080 30	16 3				+23 +23 +23	3
3	160230	21.3N 124.3E	1500FT		999	35 300 20	150 42 040 90	4 1				+25 +26 +26	86

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL STORM WINONA
BEST TRACK DATA

	BEST TRACK			WARNING			ERRORS			24 HOUR FORECAST			ERRORS			48 HOUR FORECAST			ERRORS			72 HOUR FORECAST			ERRORS		
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND	
091900Z	14.8	115.0	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
091906Z	15.5	114.7	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
091912Z	16.2	114.2	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
091918Z	16.7	113.3	25	16.4	113.2	25.	19.	0.	18.3	110.3	40.	85.	5.	20.3	108.3	30	129.	-15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
092000Z	17.3	112.7	30	16.6	113.0	30.	45.	0.	17.7	110.4	40.	128.	0.	19.0	108.3	35.	170.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
092006Z	17.9	112.4	30	17.8	112.3	30.	8.	0.	19.3	109.9	65.	95.	-25.	20.9	108.0	30.	122.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
092012Z	18.4	112.0	30	18.5	111.7	30.	18.	0.	20.7	109.6	30.	81.	-20.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
092018Z	18.8	111.7	35	19.1	111.2	30	34.	-5	21.0	109.3	30.	68.	-15.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
092100Z	19.5	111.6	40	19.5	111.4	40	11.	0.	21.8	110.8	40.	49.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
092106Z	20.0	111.4	50	20.1	111.6	45.	13.	-5.	22.6	111.6	35.	104.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
092112Z	20.4	111.0	50	20.5	111.4	50.	23.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
092118Z	20.9	110.5	45	20.7	110.8	45.	21.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
092200Z	21.2	110.2	40	21.3	110.3	40.	8.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
092206Z	21.7	110.0	35	21.7	110.0	35.	0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	18.	87.	140.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	14.	69.	136.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	1.	9.	8.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	-1.	-8.	-8.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	11	7	3	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 518. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 7. KNOTS

TROPICAL STORM WINONA
FIX POSITIONS FOR CYCLONE NO. 17

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	180300	10.6N 114.6E	PCN 6	T1.0/1.0		PGTW
2	190000	14.6N 114.8E	PCN 6		ULCC FIX	PGTW
3	190249	15.6N 114.9E	PCN 5	T1.0/1.0	INIT OBS	RPMK
4	190300	15.2N 115.0E	PCN 6	T2.5/2.5	INIT OBS	PGTW
5	190600	15.9N 114.4E	PCN 6			PGTW
6	190900	16.2N 113.9E	PCN 6		ULCC FIX	PGTW
7	191200	15.9N 113.8E	PCN 6		ULCC FIX	PGTW
8	191600	16.3N 113.3E	PCN 6	T2.5/2.5	INIT OBS ULCC FIX	PGTW
9	191800	16.6N 113.2E	PCN 6		ULCC FIX	PGTW
10	192100	16.4N 112.8E	PCN 6		ULCC FIX	PGTW
11	192307	16.5N 113.3E	PCN 5	T2.0/2.0 /D1.0/20HRS	ULCC FIX	RPMK
12	192307	16.5N 113.2E	PCN 5	T2.5/2.5	INIT OBS	RODN
13	200000	16.5N 112.9E	PCN 6		ULCC FIX	PGTW
14	200228	17.6N 112.7E	PCN 3			RPMK
15	200300	17.6N 112.7E	PCN 4	T2.5/2.5-/S0.0/24HRS		PGTW
16	200600	17.8N 112.3E	PCN 4			PGTW
17	200900	18.1N 112.2E	PCN 6			PGTW
18	201200	18.5N 111.8E	PCN 6		EXP LLCC	PGTW
19	201600	18.9N 111.4E	PCN 6	T2.0/2.5-/W0.5/25HRS		PGTW
20	201800	19.1N 111.4E	PCN 6			PGTW
21	201942	19.2N 112.0E	PCN 6			RODN
22	202100	19.4N 111.5E	PCN 6			PGTW
23	210000	19.4N 111.6E	PCN 4			PGTW
24	210046	19.8N 112.0E	PCN 6			RODN
25	210208	19.4N 110.9E	PCN 3	T3.0/3.0 /D1.0/24HRS		RPMK
26	210300	19.5N 111.9E	PCN 6	T3.5/3.5-/D1.0/24HRS		PGTW
27	210600	20.0N 111.7E	PCN 6			PGTW
28	210646	20.2N 111.5E	PCN 3			RODN
29	210900	20.2N 111.5E	PCN 6			PGTW
30	211126	20.4N 110.6E	PCN 5			RPMK
31	211126	20.5N 111.3E	PCN 4		PSBL EYE	RODN
32	211200	20.4N 111.2E	PCN 6			PGTW
33	211449	20.9N 111.0E	PCN 3			RPMK
34	211600	20.4N 110.8E	PCN 6	T3.0/3.0-/D1.0/24HRS		PGTW
35	211800	20.5N 110.8E	PCN 6			PGTW
36	211932	21.3N 110.5E	PCN 4			RODN
37	212100	20.7N 110.6E	PCN 6			PGTW
38	212225	21.2N 110.3E	PCN 5			RPMK
39	220000	21.2N 110.5E	PCN 6			PGTW
40	220024	21.7N 110.6E	PCN 5			RPMK
41	220148	20.9N 109.9E	PCN 5			RKSO
42	220300	21.3N 110.2E	PCN 6			PGTW
43	220600	21.6N 110.1E	PCN 6			PGTW
44	220636	21.6N 110.0E	PCN 5		ULCC FIX	RKSO
45	220900	21.9N 110.2E	PCN 6		ULCC FIX	PGTW
46	221105	22.3N 110.1E	PCN 5		ULCC FIX	RKSO
47	230000	22.7N 110.6E	PCN 6			PGTW

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR TDDFF	COMMENTS	RADAR POSITION	SITE WMO NO.
1	192100	16.9N 112.7E	LAND				21442 52906		16.8N 112.3E	59981
2	192200	16.9N 112.6E	LAND				21442 52906		16.8N 112.3E	59981
3	192300	17.2N 112.6E	LAND				21442 53006		16.8N 112.3E	59981
4	200000	17.3N 112.5E	LAND				21562 52906		16.8N 112.3E	59981
5	200100	17.4N 112.4E	LAND				21522 53206		16.8N 112.3E	59981
6	200200	17.5N 112.3E	LAND				10422 53406		16.8N 112.3E	59981
7	200300	17.6N 112.3E	LAND				10422 53506		16.8N 112.3E	59981
8	200400	17.7N 112.3E	LAND				24352 53506		16.8N 112.3E	59981
9	200500	17.8N 112.2E	LAND				24542 53006		16.8N 112.3E	59981
10	200600	17.8N 112.2E	LAND				24542 53302		16.8N 112.3E	59981
11	200700	17.8N 112.3E	LAND				24512 53502		16.8N 112.3E	59981
12	200900	17.9N 112.4E	LAND				24512 53604		16.8N 112.3E	59981
13	201100	18.2N 112.2E	LAND				24665 53406		16.8N 112.3E	59981
14	201200	18.3N 112.1E	LAND				34763 53406		16.8N 112.3E	59981
15	201200	18.3N 112.3E	LAND				6///2 43403		20.0N 110.4E	59758
16	201400	18.6N 111.9E	LAND				12883 53406		16.8N 112.3E	59981
17	201500	18.7N 111.9E	LAND				12873 53306		16.8N 112.3E	59981
18	201700	19.0N 111.9E	LAND				24643 53408		16.8N 112.3E	59981
19	201800	19.0N 111.8E	LAND				24459 83306		16.8N 112.3E	59981

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	211800	20.7N 110.5E	040	030	56658 59647 59754
2	220000	21.2N 110.2E	040	010	59658 59647
3	220600	21.6N 110.2E	035	025	59658 59446

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TYPHOON ANDY
BEST TRACK DATA

	BEST TRACK			WARNING		ERRORS			24 HOUR FORECAST		ERRORS			48 HOUR FORECAST		ERRORS			72 HOUR FORECAST		ERRORS		
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
092700Z	18.4	117.3	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
092706Z	18.6	116.6	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
092712Z	18.7	116.0	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
092718Z	18.9	115.5	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
092800Z	19.2	115.0	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
092806Z	19.2	114.4	35	19.5	114.4	30.	18.	-5.	20.5	112.3	45.	117.	-20.	20.5	110.2	45	156.	-20.	20.2	108.2	40.	157.	-25.
092812Z	19.0	113.7	40	19.3	114.0	40.	25.	0.	19.6	111.9	50.	87.	-20.	19.6	109.8	50	120.	-15.	19.5	107.7	50.	129.	0.
092818Z	18.8	112.9	45	18.9	113.0	45.	8.	0.	19.1	110.4	55.	40.	-10.	19.2	108.3	50	72.	-20.	19.2	106.6	50.	101.	10.
092900Z	18.7	112.2	55	18.6	112.2	50.	6.	-5.	18.5	109.9	60.	31.	-5.	18.6	107.8	50	42.	-20.	18.9	106.1	60.	93.	35.
092906Z	18.7	111.5	65	18.6	111.5	65.	6.	0.	18.7	109.2	60.	35.	-5.	18.9	107.0	70	57.	5.	0.0	0.0	0.	-0.	0.
092912Z	18.7	110.7	70	18.8	110.9	65.	13.	-5.	18.9	108.5	55.	48.	-10.	18.8	106.1	65	61.	15.	0.0	0.0	0.	-0.	0.
092918Z	18.5	110.1	65	18.5	110.0	65.	6.	0.	18.4	107.1	70.	44.	0.	18.5	104.2	40	103.	0.	0.0	0.0	0.	-0.	0.
093000Z	18.3	109.4	65	18.3	109.4	65.	0.	0.	18.4	106.8	70.	26.	0.	18.5	104.3	30	87.	5.	0.0	0.0	0.	-0.	0.
093006Z	18.2	108.9	65	18.2	108.7	65.	11.	0.	18.2	106.3	70.	26.	5.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
093012Z	18.1	108.4	65	18.1	108.3	65.	6.	0.	17.9	106.3	70.	6.	20.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
093018Z	18.1	107.8	70	18.0	107.9	70.	8.	0.	17.7	105.9	50.	6.	10.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
100100Z	18.2	107.2	70	18.1	107.1	70.	8.	0.	18.1	104.5	30.	63.	5.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
100106Z	18.0	106.7	65	18.1	106.5	65.	13.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
100112Z	17.8	106.3	50	17.9	106.2	50.	8.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
100118Z	17.7	105.8	40	17.7	105.8	40.	0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
100200Z	17.5	105.4	25	17.6	105.3	25.	8.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.

ALL FORECASTS	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	9.	44.	87.	120.
AVG RIGHT ANGLE ERROR	6.	30.	63.	84.
AVG INTENSITY MAGNITUDE ERROR	1.	9.	13.	18.
AVG INTENSITY BIAS	-1.	-3.	-6.	5.
NUMBER OF FORECASTS	16	12	8	4

TYPHOONS WHILE OVER 35 KTS	WRNG	24-HR	48-HR	72-HR
	9.	42.	87.	129.
	6.	30.	63.	91.
	1.	10.	14.	18.
	-1.	-3.	-8.	-5.
	15	11	7	3

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 705. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 6. KNOTS

TYPHOON ANDY
FIX POSITIONS FOR CYCLONE NO. 18

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	251849	16.4N 122.9E	PCN 5			RKSO
2	270000	18.4N 116.9E	PCN 6	T2.0/2.0	INIT OBS	PGTW
3	270300	18.5N 116.8E	PCN 6		PART EXP LLCC	PGTW
4	270542	18.4N 116.4E	PCN 6		PART EXP LLCC	PGTW
5	270600	18.5N 116.5E	PCN 4		PART EXP LLCC	PGTW
* 6	271100	19.1N 113.9E	PCN 6	T1.0/1.0	INIT OBS ULCC FIX	RPMK
7	271827	18.6N 114.9E	PCN 5			RKSO
8	272158	19.0N 115.4E	PCN 3	T1.5/1.5 /D0.5/11HRS		RPMK
9	272354	19.2N 115.3E	PCN 3	T2.5/2.5	INIT OBS PART EXP LLCC	RODN
10	280127	19.6N 114.6E	PCN 5	T3.0/3.0 /D1.0/26HRS		PGTW
11	280127	19.6N 115.2E	PCN 3	T2.0/2.0	INIT OBS	RKSO
12	280300	19.3N 114.5E	PCN 6		ULCC FIX	PGTW
13	280600	18.7N 114.2E	PCN 6		ULCC FIX	PGTW
14	280713	18.5N 114.2E	PCN 5	T2.0/2.0 /D1.0/20HRS	ULCC FIX	RPMK
15	280900	18.6N 113.8E	PCN 6		ULCC FIX	PGTW
16	281038	19.4N 114.8E	PCN 5			RODN
17	281200	19.0N 113.7E	PCN 6		ULCC FIX	PGTW
18	281408	19.0N 113.2E	PCN 5			RODN
19	281600	18.8N 112.8E	PCN 6	T3.5/3.5	INIT OBS ULCC FIX	PGTW
20	281800	18.7N 112.7E	PCN 6		ULCC FIX	PGTW
21	281959	18.4N 112.5E	PCN 3			RPMK
22	282100	18.7N 112.7E	PCN 6			PGTW
23	290000	18.6N 112.2E	PCN 4			PGTW
24	290248	18.7N 112.1E	PCN 1	T4.0/4.0 /D1.5/27HRS	EYE FIX	RODN
25	290300	18.6N 111.7E	PCN 4	T4.0/4.0 /D1.0/26HRS		PGTW
26	290600	18.6N 111.5E	PCN 4			PGTW
27	290721	18.9N 111.5E	PCN 1		EYE FIX	RODN
28	290900	18.9N 111.0E	PCN 2		EYE FIX	PGTW
29	291200	18.8N 110.9E	PCN 2		EYE FIX	PGTW
30	291529	18.6N 110.4E	PCN 1		EYE FIX	RODN
31	291600	18.6N 110.2E	PCN 2	T4.5/4.5-/D1.0/24HRS	EYE FIX	PGTW
32	291800	18.5N 110.2E	PCN 2		EYE FIX	PGTW
33	291948	18.6N 109.9E	PCN 1		EYE FIX	RODN
34	292100	18.4N 109.7E	PCN 2		EYE FIX	PGTW
35	300000	18.3N 109.4E	PCN 2		EYE FIX	PGTW
36	300228	18.1N 109.2E	PCN 1	T4.5/4.5	INIT OBS EYE FIX	RPMK
37	300300	18.2N 109.2E	PCN 2	T4.5/4.5-/D0.5/24HRS	EYE FIX	PGTW
38	300600	18.2N 108.7E	PCN 2		EYE FIX	PGTW
39	300608	18.1N 108.7E	PCN 3			RPMK
40	300900	18.4N 108.4E	PCN 6		ULCC FIX	PGTW
41	301137	18.1N 108.5E	PCN 3		EYE FIX	RPMK
42	301137	18.1N 109.1E	PCN 3			RODN
43	301200	18.1N 108.5E	PCN 4			PGTW
44	301508	17.9N 108.2E	PCN 4			RODN
45	301600	18.1N 108.2E	PCN 6		ULCC FIX	PGTW
46	301800	18.0N 108.1E	PCN 6	T4.0/4.5-/W0.5/26HRS		PGTW
47	301936	18.1N 107.9E	PCN 5			RODN
48	302100	18.4N 107.8E	PCN 6			PGTW
49	302235	18.3N 107.2E	PCN 5			RODN
50	010000	18.1N 107.3E	PCN 6			PGTW
51	010208	18.3N 107.2E	PCN 5	T3.5/4.5 /W1.0/24HRS	ULCC FIX	RPMK
52	010300	18.0N 107.1E	PCN 6	T3.0/3.5 /W1.5/24HRS		PGTW
53	010600	18.2N 106.5E	PCN 6			PGTW
54	010640	18.2N 106.9E	PCN 5			RPMK
55	010900	18.0N 106.4E	PCN 6		ULCC FIX	PGTW
56	011115	17.9N 106.4E	PCN 5			RODN
57	011116	17.6N 106.7E	PCN 5		PART EXP LLCC	RPMK
58	011200	17.8N 106.3E	PCN 6		ULCC FIX	PGTW
59	011448	17.6N 106.6E	PCN 5		ULCC FIX	RPMK
60	011926	16.9N 106.1E	PCN 5			RODN

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR TDDFF	COMMENTS	RADAR POSITION	SITE WMO NO.
1	260200	17.7N 122.0E	LAND				1096/ 532//	EYE 50 FRONT CIRCLR OPN S	16.3N 120.6E	98321
2	281400	18.8N 112.8E	LAND				21382 32811		16.8N 112.3E	59981
3	281500	18.8N 112.7E	LAND				21632 52706		16.8N 112.3E	59981
4	281800	18.7N 112.5E	LAND				11482 53206		16.8N 112.3E	59981
5	281900	18.7N 112.4E	LAND				24542 53206		16.8N 112.3E	59981
6	282100	18.6N 112.2E	LAND				12412 52806		16.8N 112.3E	59981
7	282300	18.5N 112.0E	LAND				11184 52707		16.8N 112.3E	59981
8	290100	18.6N 111.8E	LAND				10384 52806		16.8N 112.3E	59981
9	290200	18.6N 111.7E	LAND				11375 52706		16.8N 112.3E	59981
10	290500	18.7N 111.5E	LAND				24832 52806		16.8N 112.3E	59981
11	290600	18.8N 111.4E	LAND				10522 52806		16.8N 112.3E	59981
12	290700	18.8N 111.3E	LAND				14512 52808		16.8N 112.3E	59981
13	290900	18.8N 110.9E	LAND				22641 52810		16.8N 112.3E	59981
14	291000	18.8N 110.8E	LAND				22641 52708		16.8N 112.3E	59981

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	281200	18.2N 113.3E	040	040	59981 AND SHIPS
2	291500	18.5N 110.4E	065	055	59948 59855 59981 59838 59845

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TYPHOON BRENDA
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS				ERRORS				ERRORS	
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
092906Z	16.7	132.9	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
092912Z	16.5	132.3	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
092918Z	16.4	131.6	25	16.5	131.6	25.	6.	0.	16.8	128.8	40.	81.	-5.	17.3	125.4	60	185.	-5.	18.2	122.1	80.	245.	0.
093000Z	16.1	131.0	25	16.4	130.9	25.	19.	0.	16.6	128.1	45.	104.	-10.	17.3	124.8	65	236.	-5.	18.3	121.6	80.	324.	-5.
093006Z	16.0	130.7	30	16.0	130.2	30.	29.	0.	16.1	127.3	50.	153.	-10.	17.0	123.6	70.	276.	-5.	19.0	120.0	75.	259.	-15.
093012Z	16.1	130.4	35	15.8	129.6	35.	50.	0.	15.9	127.1	60.	166.	0.	16.7	123.5	70.	251.	-10.	18.4	119.7	55.	283.	-35.
093018Z	16.3	130.1	45	15.8	130.0	40.	31.	-5.	15.7	128.5	55.	120.	-10.	16.2	125.2	65	185.	-15.	17.5	121.5	60.	341.	-30.
100100Z	16.7	129.9	55	16.0	129.9	50.	42.	-5.	16.2	128.1	65.	106.	-5.	16.7	124.9	70.	175.	-15.	18.1	121.0	60.	401.	-30.
100106Z	17.4	129.6	60	17.1	129.3	55.	25.	-5.	18.2	127.9	70.	21.	-5.	18.6	124.9	90	119.	0.	18.9	121.2	75.	433.	-15.
100112Z	17.9	129.1	60	18.0	129.2	55.	8.	-5.	19.3	126.2	75.	69.	-5.	20.2	122.4	90	101.	0.	22.8	119.0	95.	377.	10.
100118Z	17.7	128.6	65	17.7	128.9	60.	17.	-5.	18.8	126.6	80.	25.	0.	19.3	122.9	90	222.	0.	20.5	118.8	90.	627.	10.
100200Z	17.8	128.9	70	17.7	129.7	70.	13.	0.	18.4	126.7	85.	107.	0.	19.5	123.0	90	306.	0.	21.3	119.4	90.	722.	20.
100206Z	18.4	128.2	75	18.1	128.2	70.	18.	-5.	19.1	126.5	90.	150.	0.	20.5	123.0	90	331.	0.	21.6	118.8	85.	879.	20.
100212Z	18.8	127.3	80	18.8	127.2	75.	6.	-5.	20.4	124.3	95.	88.	5.	23.3	121.9	95	279.	10.	0.0	0.0	0.	-0.	0.
100218Z	19.1	126.3	80	19.4	126.4	75.	19.	-5.	21.6	123.4	95.	87.	5.	25.2	121.7	95	303.	15.	0.0	0.0	0.	-0.	0.
100300Z	19.6	125.3	85	19.5	125.6	85.	18.	0.	21.8	122.8	105.	168.	15.	25.7	121.7	95	430.	25.	0.0	0.0	0.	-0.	0.
100306Z	20.5	124.3	90	20.5	124.3	90.	0.	0.	25.5	121.9	95.	48.	5.	30.7	124.0	85	275.	20.	0.0	0.0	0.	-0.	0.
100312Z	21.6	123.4	90	21.5	123.5	90.	8.	0.	26.4	121.9	90.	109.	5.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
100318Z	23.0	123.0	90	22.7	123.0	90.	18.	0.	28.0	123.2	90.	117.	10.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
100400Z	24.6	122.7	90	24.5	122.7	90.	6.	0.	31.7	125.8	75.	12.	5.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
100406Z	26.0	122.6	90	26.3	122.6	90.	18.	0.	33.5	127.5	70.	31.	5.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
100412Z	27.8	123.2	85	27.8	123.1	90.	15.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
100418Z	29.7	124.3	80	29.4	124.2	85.	19.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
100500Z	31.8	126.0	70	31.9	126.1	70.	8.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
100506Z	33.8	128.0	65	33.8	128.2	65.	10.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	17.	93.	245.	436.	17.	93.	245.	436.
AVG RIGHT ANGLE ERROR	12.	43.	106.	230.	12.	43.	106.	230.
AVG INTENSITY MAGNITUDE ERROR	2.	6.	8.	17.	3.	6.	8.	17.
AVG INTENSITY BIAS	-1.	0.	1.	-6.	-2.	0.	1.	-6.
NUMBER OF FORECASTS	23	19	15	11	20	19	15	11

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1551. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 11. KNOTS

TYPHOON BRENDA
FIX POSITIONS FOR CYCLONE NO. 19

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	251600	5.3N 156.6E	PCN 6	T0.5/0.5	INIT OBS	PGTW
2	260300	8.3N 150.3E	PCN 6	T1.5/1.5	INIT OBS	PGTW
3	261200	9.9N 152.3E	PCN 6		ULCC FIX	PGTW
4	261656	10.8N 145.9E	PCN 6		ULCC FIX	PGTW
5	262038	13.4N 144.2E	PCN 6		ULCC FIX	PGTW
6	270359	15.1N 143.1E	PCN 6	T1.0/1.5+/W0.5/24HRS	ULCC FIX	PGTW
7	271247	14.9N 141.7E	PCN 5		ULCC FIX	PGTW
8	272213	14.5N 140.2E	PCN 5		ULCC FIX	PGTW
9	272346	15.0N 140.2E	PCN 6		ULCC FIX	PGTW
10	280000	15.3N 139.7E	PCN 6		ULCC FIX	PGTW
11	280300	16.9N 139.0E	PCN 6	T1.5/1.5 /D0.5/23HRS	ULCC FIX	PGTW
12	280900	16.9N 138.9E	PCN 6		ULCC FIX	PGTW
13	282100	16.5N 137.4E	PCN 6			PGTW
14	290000	16.6N 137.3E	PCN 6			PGTW
15	290107	16.5N 137.1E	PCN 5			PGTW
16	290300	17.1N 134.4E	PCN 6	T1.5/1.5+/S0.0/24HRS		PGTW
17	290520	16.3N 133.5E	PCN 5			PGTW
18	290900	17.0N 132.9E	PCN 6			PGTW
19	291017	17.1N 132.9E	PCN 6			PGTW
20	291200	16.9N 132.4E	PCN 6	T1.5/1.5	INIT OBS	PGTW
21	291347	16.9N 132.3E	PCN 5			PGTW
22	291600	17.0N 131.5E	PCN 6			PGTW
23	291806	16.7N 131.7E	PCN 6			PGTW
24	292116	17.0N 131.5E	PCN 5			PGTW
25	300047	16.3N 130.8E	PCN 5			PGTW
26	300300	16.0N 130.2E	PCN 6	T2.5/2.5 /D1.0/24HRS		PGTW
27	300509	16.0N 130.1E	PCN 5			PGTW
* 28	300509	16.8N 129.8E	PCN 6	T1.5/1.5	INIT OBS	RPMK
29	300956	15.7N 129.9E	PCN 5			PGTW
30	301200	16.1N 129.3E	PCN 6	T2.5/2.5 /D1.0/24HRS		PGTW
* 31	301327	15.9N 129.1E	PCN 5			PGTW
* 32	301600	16.2N 128.7E	PCN 6		ULCC FIX	PGTW
* 33	301754	16.2N 128.7E	PCN 5		ULCC FIX	PGTW
34	301755	15.8N 128.6E	PCN 5			RODN
35	302100	16.5N 129.0E	PCN 6			PGTW
36	010000	16.1N 129.4E	PCN 6			PGTW
37	010026	16.5N 130.2E	PCN 4		EXP LLCC	PGTW
38	010208	15.9N 129.8E	PCN 5	T2.5/2.5 /D1.0/21HRS		RPMK
39	010300	16.4N 129.8E	PCN 4	T3.5/3.5 /D1.0/24HRS	PART EXP LLCC	PGTW
40	010458	17.0N 129.8E	PCN 4		EXP LLCC	PGTW
41	010600	17.5N 129.4E	PCN 6			PGTW
42	011307	18.0N 129.5E	PCN 3	T3.0/3.0 /D0.5/25HRS	EXP LLCC	PGTW
43	011600	18.5N 129.3E	PCN 6			PGTW
44	011744	18.5N 129.1E	PCN 6			PGTW
* 45	011744	18.0N 127.2E	PCN 6		ULCC FIX	RODN
46	012100	17.8N 128.5E	PCN 6			PGTW
47	012214	18.1N 129.9E	PCN 5	T3.5/3.5	INIT OBS	RODN
48	020000	17.8N 128.5E	PCN 6			PGTW
49	020147	18.0N 128.3E	PCN 5			PGTW
50	020147	17.4N 128.6E	PCN 5	T3.5/3.5 /D1.0/24HRS		RPMK
51	020300	18.3N 128.1E	PCN 6	T4.0/4.0+/D0.5/24HRS		PGTW
52	020447	18.5N 128.0E	PCN 5			PGTW
53	020630	17.6N 127.8E	PCN 5			RPMK
54	020900	18.9N 127.7E	PCN 6			PGTW
55	021054	18.4N 127.2E	PCN 5			RPMK
56	021105	19.1N 127.3E	PCN 5			PGTW
57	021200	19.0N 127.0E	PCN 6			PGTW

58	021428	19.3N 126.8E	PCN 5				RODN
59	021600	19.0N 126.5E	PCN 6	T3.5/3.5 /D0.5/27HRS			PGTW
60	021800	19.3N 126.2E	PCN 6				PGTW
61	022153	19.6N 126.0E	PCN 6		EXP LLCC ULAC 19.1N 125.4E		PGTW
* 62	030127	20.5N 125.1E	PCN 1	T5.0/5.0 /D1.5/27HRS			RODN
63	030127	20.4N 125.1E	PCN 4	T4.5/4.5 /D0.5/22HRS			PGTW
64	030300	20.2N 124.7E	PCN 6		DEVELOPING EYE		PGTW
65	030600	20.7N 124.3E	PCN 4		RAGGED EYE		PGTW
66	030619	20.6N 123.7E	PCN 1	T5.0/5.0 /D1.5/29HRS	RAGGED EYE		RPMK
67	030900	21.0N 123.7E	PCN 4		POORLY DEFINED EYE		PGTW
68	031033	21.2N 123.6E	PCN 2		90 PRCNT CLOSD EYEWL OPN SW		RPMK
69	031044	21.2N 123.5E	PCN 6		POORLY DEFINED EYE		PGTW
70	031200	21.4N 123.3E	PCN 4		RAGGED EYE		PGTW
71	031407	21.9N 123.2E	PCN 3		RAGGED EYE		PGTW
72	031600	22.2N 123.1E	PCN 2	T4.5/4.5 /D1.0/24HRS	EYE FIX		PGTW
73	031800	22.6N 123.2E	PCN 4		EYE FIX		PGTW
* 74	031904	23.1N 123.6E	PCN 1		RAGGED EYE		RODN
75	032132	23.8N 122.3E	PCN 2				PGTW
76	040107	24.8N 122.7E	PCN 4	T5.0/5.0-/D0.5/24HRS			PGTW
77	040300	25.5N 122.4E	PCN 6		POORLY DEFINED EYE		PGTW
78	040600	26.1N 122.1E	PCN 4				PGTW
79	040608	25.9N 122.8E	PCN 3	T4.5/4.5	INIT OBS		RKSO
80	040900	26.8N 123.0E	PCN 4				PGTW
81	041012	27.0N 123.2E	PCN 4				PGTW
82	041022	27.2N 123.1E	PCN 2		EYE FIX		RKSO
83	041200	27.7N 123.4E	PCN 4				PGTW
84	041347	28.0N 123.8E	PCN 4				PGTW
85	041600	28.6N 124.2E	PCN 6	T4.0/4.5-/W0.5/24HRS			PGTW
86	041800	29.3N 124.2E	PCN 6		PART EXP LLCC		PGTW
87	041854	30.0N 124.8E	PCN 3		PART EXP LLCC		RPMK
88	042100	30.6N 125.0E	PCN 6		ULCC 30.9N 126.1E		PGTW
89	042301	31.7N 126.1E	PCN 3	T3.5/3.5	INIT OBS		RODN
90	042302	31.2N 125.8E	PCN 5		ULCC 31.5N 126.3E		PGTW
91	050000	31.9N 126.0E	PCN 6		ULCC 32.3N 126.4E		PGTW
92	050046	32.0N 126.3E	PCN 6	T3.5/4.5 /W1.5/24HRS			PGTW
* 93	050557	35.2N 129.9E	PCN 5	T3.0/4.0 /W1.5/24HRS	ULCC FIX		RKSO
94	050600	33.2N 128.2E	PCN 6				PGTW
* 95	050900	33.5N 129.8E	PCN 6				PGTW

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN- DIAM/TATION	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	290329	16.7N 133.2E	1500FT		1003	15 350 48	080 17 350 48	2 10			+26 +25 +25	4
2	292159	16.3N 131.4E	1500FT		1000	25 310 120	040 22 130 30	4 20			+25 +25 +22	26 5
3	300038	16.1N 130.9E	1500FT		1001	15 210 85	330 25 210 85	4 20			+23 +25 +21	5
4	300623	15.8N 130.5E	1500FT		995	30 090 110	140 36 090 106	12 8			+26 +26 +20	28 7
5	300857	15.9N 130.4E	1500FT		995	35 300 85	020 41 300 11	6 6			+26 +26 +19	28 7
6	302212	15.7N 130.0E	700MB	3029		50 040 60	200 43 100 32	5 5			+13 +15 + 5	8
7	010050	16.5N 129.9E	700MB	3022	990	65 150 30	050 27 300 56	5 5			+13 +15 + 7	8
8	010620	17.4N 129.5E	700MB	3036		70 220 50	200 50 140 125	4 5			+ +12 +12	10
9	010835	17.8N 129.4E	700MB	3013	986	65 080 50	170 45 070 50	4 5	CIRCULAR	50	+13 +13 +12	10
10	012041	17.5N 128.7E	700MB	2937	981	60 170 120	260 65 170 110	10 2			+ +16 +11	11
11	012337	17.5N 128.9E	700MB	2935	985	75 060 30	150 70 060 91	7 2			+15 +15 + 6	11
12	020545	18.4N 128.2E	700MB	2931	980	60 140 140	200 58 130 68	10 4			+13 +16 +12	12
13	020820	18.5N 127.7E	700MB	2925	980	80 050 60	140 65 050 154	10 5			+13 +15 +12	12
14	022030	19.3N 125.2E	700MB	2800			220 75 130 110	5 10	CIRCULAR	40	+14 +13 +12	13
15	022345	19.5N 125.7E	700MB	2783	965	90 030 130	050 71 320 09	4 4	CIRCULAR	40	+15 +17 +13	13
16	030557	20.6N 124.3E	700MB	2799	966	80 110 80	230 88 120 46	3 5			+ +16 +12	14
17	030852	21.0N 123.9E	700MB	2785	964	75 040 90	130 86 040 60	5 2			+14 +17 +13	14
18	032101	23.8N 122.5E	700MB	2738		70 070 120	170 97 070 60	5 7			+13 +18 + 7	15
19	032336	24.6N 122.8E	700MB	2747		70 150 120	060 81 320 24	5 7			+11 +17 + 5	15
20	042110	31.4N 125.2E	700MB	2898	980	60 100 105	230 91 160 65	15 2			+ +14 + 7	17
21	042346	32.4N 126.6E	700MB	2940		60 160 100	160 92 050 98	6 15			+ 9 +10 + 8	17

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR TDDFF	COMMENTS	RADAR POSITION	SITE WMO NO.
1	030600	20.9N 124.1E	LAND				6///4 43219		24.3N 124.2E	47918
2	030900	21.4N 123.9E	LAND				65/14 73411		24.3N 124.2E	47918
3	031000	21.6N 123.6E	LAND				65/15 53022		24.3N 124.2E	47918
4	031100	21.7N 123.5E	LAND				65/14 63114		24.3N 124.2E	47918
5	031200	21.7N 123.4E	LAND				65/15 73011		24.3N 124.2E	47918
6	031300	21.9N 123.3E	LAND				65/14 73107		24.3N 124.2E	47918
7	031400	20.0N 123.3E	LAND				21904 73308		24.3N 124.2E	47918
8	031500	22.1N 123.0E	LAND				20974 52702		24.0N 121.6E	46699
9	031500	22.1N 123.2E	LAND				21914 73310		24.3N 124.2E	47918
10	031600	22.3N 123.3E	LAND				22214 53418		24.0N 121.6E	46699
11	031600	22.3N 123.2E	LAND				21914 73310		24.3N 124.2E	47918
12	031600	22.3N 123.2E	LAND				6///4 5////		24.8N 125.3E	47927
13	031700	22.6N 123.0E	LAND				20914 73412		24.3N 124.2E	47918
14	031700	22.5N 123.2E	LAND				10974 53612		24.0N 121.6E	46699
15	031700	22.5N 123.0E	LAND				6///5 53416		24.8N 125.3E	47927
16	031800	22.8N 123.2E	LAND				14984 53619		24.0N 121.6E	46699
17	031800	22.8N 123.0E	LAND				20914 53411		24.3N 124.2E	47918
18	031900	23.1N 123.1E	LAND				14984 53317		24.0N 121.6E	46699
19	031900	23.1N 123.0E	LAND				20913 53611		24.3N 124.2E	47918
20	031900	23.0N 122.9E	LAND				6///4 53616		24.8N 125.3E	47927
21	032000	23.4N 123.0E	LAND				20913 73616		24.3N 124.2E	47918
22	032000	23.0N 123.0E	LAND				14923 53416		24.0N 121.6E	46699
23	032000	23.2N 123.0E	LAND				6///5 59216		24.8N 125.3E	47927
24	032100	23.7N 122.8E	LAND				22914 73519		24.3N 124.2E	47918
25	032100	23.6N 123.0E	LAND				6///4 53622		24.8N 125.3E	47927
26	032200	24.0N 122.8E	LAND				21914 73519		24.3N 124.2E	47918
27	032200	24.0N 123.0E	LAND	GOOD		70		MOV 3640	24.8N 125.3E	47927
28	032200	23.9N 123.0E	LAND				10922 53617		24.0N 121.6E	46699
29	032200	23.9N 123.0E	LAND				6///4 50119		24.8N 125.3E	47927
30	032300	24.2N 122.8E	LAND	GOOD		70		MOV 3420	24.8N 125.3E	47927
31	032300	24.2N 122.8E	LAND				21914 73516		24.3N 124.2E	47918
32	032300	24.1N 122.9E	LAND				30974 53415		24.8N 125.3E	47927
33	040000	24.6N 122.8E	LAND				20915 73617		24.3N 124.2E	47918
34	040000	24.5N 122.9E	LAND				30914 53623		24.8N 125.3E	47927
35	040100	25.1N 122.7E	LAND				22935 73622		24.3N 124.2E	47918
36	040100	25.0N 123.0E	LAND				22952 53627		24.0N 121.6E	46699
37	040100	25.0N 123.0E	LAND	GOOD		90		MOV 3640	24.8N 125.3E	47927
38	040100	24.9N 122.7E	LAND				6///4 53427		24.8N 125.3E	47927
39	040200	25.3N 122.7E	LAND	FAIR		50		MOV 3440	24.8N 125.3E	47927
40	040200	25.3N 122.7E	LAND				24953 53324		24.0N 121.6E	46699
41	040200	25.5N 122.6E	LAND				65945 73527		24.3N 124.2E	47918
42	040200	25.4N 122.7E	LAND				6///4 53527		24.8N 125.3E	47927
43	040300	25.7N 122.7E	LAND	POOR				MOV 3640	24.8N 125.3E	47927
44	040300	25.7N 122.3E	LAND				65//5 73423		24.3N 124.2E	47918
45	040400	25.7N 122.3E	LAND				///// /////		25.1N 121.6E	46696
46	040400	26.0N 123.0E	LAND				35963 53323		24.0N 121.6E	46699
47	040500	25.8N 122.3E	LAND				///// /////		25.1N 121.6E	46696
48	040500	26.2N 122.4E	LAND				35654 50210		24.0N 121.6E	46699
49	040600	25.9N 122.5E	LAND				6//// 5////		25.1N 121.6E	46696
50	040600	25.9N 122.5E	LAND				6//// 5////		24.0N 121.6E	46699
51	040700	26.3N 122.6E	LAND				6//// 5////		25.1N 121.6E	46696
52	040800	26.5N 122.8E	LAND				6//// 5////		25.1N 121.6E	46696
53	040900	26.7N 122.8E	LAND				6//// 5////		25.1N 121.6E	46696
* 54	041400	28.5N 124.2E	LAND				34962 70520	STA LAT AND LONG UNK	****N *****E	58760
55	050200	32.7N 127.1E	LAND				65//4 /////		33.4N 130.3E	47806
56	050300	33.1N 127.4E	LAND				55//4 50424		33.4N 130.3E	47806
57	050400	33.6N 127.8E	LAND				65/// 50432		33.4N 130.3E	47806

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	050600	34.0N 128.1E	055	050	47168 47162 47800 47182 47805 47843
2	050900	34.7N 128.9E	050	040	47168 47800 47805 47843 47182
3	051200	35.3N 130.1E	045	050	47152 47138 47800 47755
4	051500	36.3N 131.2E	040	075	47115 47138 47152 47755 47740

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TYPHOON CECIL
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS				ERRORS				ERRORS	
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
101206Z	10.7	120.3	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	-0.	0.0	0.0	0.	-0.	0.
101212Z	11.1	119.0	35	10.5	118.9	30.	36.	-5.	10.6	114.1	45.	160.	-15.	11.9	109.7	60	268.	-20.
101218Z	11.4	117.9	40	10.8	118.0	35.	36.	-5.	11.0	113.2	55.	172.	-10.	12.5	109.0	55	256.	-30.
101300Z	11.7	117.1	45	11.8	116.9	50.	13.	5.	11.5	112.4	70.	181.	0.	12.5	108.2	45	264.	-50.
101306Z	12.2	116.5	55	12.0	116.2	55.	21.	0.	12.0	112.3	75.	163.	0.	12.5	108.4	45	241.	-55.
101312Z	12.6	115.9	60	12.4	116.0	55.	13.	-5.	13.3	113.3	75.	67.	-5.	14.1	109.3	65	144.	-35.
101318Z	13.0	115.3	65	12.7	115.4	60.	19.	-5.	13.7	112.5	75.	67.	-10.	14.6	108.5	45	135.	-55.
101400Z	13.4	114.8	70	13.4	114.9	70.	6.	0.	14.7	112.1	90.	43.	-5.	15.5	107.6	45	104.	-45.
101406Z	13.9	114.3	75	14.0	114.1	75.	13.	0.	15.3	110.7	95.	36.	-5.	16.6	106.3	50	57.	0.
101412Z	14.4	113.5	80	14.4	113.5	80.	0.	0.	16.3	109.6	95.	21.	-5.	19.1	105.5	75	141.	45.
101418Z	14.8	112.7	85	14.8	112.7	80.	0.	-5.	16.9	108.9	95.	52.	-5.	0.0	0.0	0.	-0.	0.
101500Z	15.3	111.7	95	15.3	111.7	90.	0.	-5.	17.6	108.0	95.	83.	5.	0.0	0.0	0.	-0.	0.
101506Z	15.9	110.6	100	16.0	110.7	100.	8.	0.	18.7	106.6	95.	123.	45.	0.0	0.0	0.	-0.	0.
101512Z	16.5	109.3	100	16.7	109.4	100.	13.	0.	20.1	105.0	50.	186.	20.	0.0	0.0	0.	-0.	0.
101518Z	16.8	108.0	100	17.0	108.2	100.	17.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101600Z	17.0	106.7	90	17.2	106.5	90.	17.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101606Z	17.0	105.4	50	17.1	105.5	50.	8.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101612Z	17.1	104.2	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	14.	104.	179.	196.	14.	97.	184.	238.
AVG RIGHT ANGLE ERROR	11.	93.	159.	139.	11.	85.	163.	187.
AVG INTENSITY MAGNITUDE ERROR	2.	10.	27.	45.	2.	9.	36.	80.
AVG INTENSITY BIAS	-2.	1.	-27.	-45.	-2.	-1.	-36.	-80.
NUMBER OF FORECASTS	16	13	9	2	16	12	8	1

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1034. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 10. KNOTS

TYPHOON CECIL
FIX POSITIONS FOR CYCLONE NO. 20

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	081800	5.8N 138.8E	PCN 6	T1.5/1.5	INIT OBS ULCC FIX	PGTW
2	091200	5.3N 135.4E	PCN 6		ULCC FIX	PGTW
3	100000	7.3N 132.3E	PCN 6			PGTW
4	100400	7.6N 130.9E	PCN 6			PGTW
5	101200	8.1N 131.7E	PCN 6			PGTW
6	101600	8.6N 130.2E	PCN 6	T1.5/1.5	INIT OBS	PGTW
7	101800	8.6N 129.7E	PCN 6			PGTW
8	111600	9.5N 121.4E	PCN 6	T2.0/2.0 /D0.5/24HRS		PGTW
9	111800	9.6N 121.1E	PCN 6			PGTW
10	120147	10.7N 119.8E	PCN 6	T1.5/1.5	INIT OBS	PGTW
11	120400	10.6N 120.9E	PCN 6			PGTW
12	120600	10.9N 120.4E	PCN 6			PGTW
13	120617	11.2N 120.0E	PCN 5	T1.5/1.5	INIT OBS	RODN
14	120900	10.4N 119.2E	PCN 6		ULCC FIX	PGTW
15	121044	11.2N 119.8E	PCN 6		ULCC FIX	RPMK
16	121200	10.6N 119.1E	PCN 6			PGTW
17	121428	11.0N 118.8E	PCN 6		ULCC FIX	RPMK
18	121600	10.7N 118.6E	PCN 6	T2.5/2.5 /D0.5/24HRS		PGTW
19	121800	10.9N 118.2E	PCN 6			PGTW
20	121909	11.3N 117.9E	PCN 5			RODN
21	122100	11.8N 117.2E	PCN 6		ULCC FIX	PGTW
22	130000	12.0N 117.0E	PCN 4	T3.5/3.5 /D2.0/23HRS		PGTW
23	130127	12.1N 116.7E	PCN 3	T3.5/3.5	INIT OBS	RPMK
24	130400	12.0N 116.6E	PCN 4		PSBL EYE ULCC FIX	PGTW
25	130600	11.9N 116.5E	PCN 4		PSBL EYE	PGTW
26	130612	12.1N 116.7E	PCN 3	T3.0/3.0 /D1.5/25HRS	ULCC FIX	RODN
27	131200	12.2N 115.7E	PCN 6			PGTW
28	131208	12.2N 116.0E	PCN 5			RPMK
29	131600	12.5N 115.6E	PCN 6	T3.5/3.5 /D1.0/24HRS		PGTW
30	131800	12.7N 115.5E	PCN 6			PGTW
31	131858	13.6N 115.2E	PCN 5		ULCC FIX	RODN
32	132303	13.8N 115.1E	PCN 5			RPMK
33	140000	13.3N 115.1E	PCN 4	T4.5/4.5 /D1.0/24HRS	ULCC FIX	PGTW
34	140248	13.9N 114.8E	PCN 1	T4.5/4.5 /D1.0/25HRS	SMALL EYE	RPMK
35	140300	13.7N 114.5E	PCN 2		SMALL EYE	PGTW
36	140600	13.9N 114.1E	PCN 2		EYE	PGTW
37	140612	14.0N 114.4E	PCN 3		EYE FIX	RPMK
38	140900	14.1N 113.7E	PCN 2		SMALL EYE	PGTW
39	141146	14.1N 113.6E	PCN 5		ULCC FIX	RPMK
40	141200	14.4N 113.4E	PCN 2		RAGGED EYE	PGTW
41	141528	14.0N 113.4E	PCN 5		ULCC FIX	RPMK
42	141600	14.6N 113.0E	PCN 4	T4.5/4.5 /D1.0/24HRS		PGTW
43	141800	14.8N 112.8E	PCN 2		SMALL EYE	PGTW
44	141848	15.2N 112.6E	PCN 1		DEVLPNG EYE	RODN
45	142100	15.1N 112.4E	PCN 2		EYE FIX	PGTW
46	142241	15.3N 111.8E	PCN 1	T5.5/5.0-/D1.0/20HRS	EYE FIX	RPMK
47	150000	15.4N 111.7E	PCN 2	T5.5/5.5 /D1.0/24HRS	EYE FIX	PGTW
48	150026	15.3N 111.2E	PCN 1	T5.5/5.5	INIT OBS	RODN
49	150227	15.5N 111.4E	PCN 1	T5.5/5.5-/D1.0/24HRS	SMALL EYE	RPMK
50	150227	15.5N 110.9E	PCN 1		RAGGED EYE 30 NM	RODN
51	150300	15.7N 111.1E	PCN 2		EYE FIX	PGTW
52	150600	16.0N 110.7E	PCN 2		EYE FIX	PGTW
53	150733	15.9N 110.3E	PCN 1		.4 DEG EYE	RPMK
54	150845	16.4N 109.2E	PCN 2		30 NM EYE	RPMK
55	150900	16.4N 110.1E	PCN 2		EYE FIX	PGTW
56	151121	16.7N 109.5E	PCN 2		EYE 30 NM	RODN
57	151200	16.6N 109.6E	PCN 2		EYE FIX	PGTW
58	151508	16.7N 108.5E	PCN 1		30 NM EYE	RPMK
59	151600	16.7N 108.4E	PCN 2	T5.5/5.5 /D1.0/24HRS	EYE FIX	PGTW
60	151800	16.8N 108.1E	PCN 2		EYE FIX	PGTW
61	152100	16.9N 107.4E	PCN 4			PGTW
62	152220	17.1N 106.9E	PCN 4			RODN
63	160000	16.8N 106.6E	PCN 3			RPMK
64	160000	17.1N 106.8E	PCN 4			PGTW
65	160207	16.8N 106.2E	PCN 4			RPMK
66	160207	17.0N 106.2E	PCN 3			RODN

67	160300	17.0N 106.0E	PCN 4		PGTW
68	160600	16.6N 104.9E	PCN 6		PGTW
69	160722	17.2N 105.5E	PCN 5	ULCC FIX	RODN
70	161448	17.1N 102.2E	PCN 4		RKSO

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE DIAM	EYE ORIEN-TATION	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	110222	9.4N 128.3E	1500FT		1006	22 360 19	070 30 360 19	3 15				+24 +24 +23 28	1
2	130000	11.8N 117.0E	700MB	2990	990	60 310 45	060 52 310 45	5 10	CIRCULAR	40		+12 +14 +10	3
3	130156	12.0N 116.8E	700MB	2987		80 030 50	130 38 060 90	5 10				+10 +13 +13	3
4	130824	12.4N 116.4E	700MB	2954	984	65 140 120	230 39 140 60	2 10	CIRCULAR	20		+11 +13 + 3	4
5	132115	13.3N 115.1E	700MB	2886	975	45 320 95	140 64 090 10	10 5				+13 +13 +13	5
6	140044	13.4N 114.9E	700MB	2874	974	75 150 15	210 67 150 15	5 5	ELLIPTICAL	40 20	030	+13 +15 +13	5
7	140618	13.9N 114.2E	700MB	2821	968	80 950 18	160 62 950 18	8 5	CIRCULAR	20		+15 +15 + 6	6
8	140851	14.0N 114.0E	700MB	2775	963	60 110 60	180 90 110 30	8 5	ELLIPTICAL	15 5	100	+11 +17 + 6	6

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR TDDFF	COMMENTS	RADAR POSITION	SITE WMO NO.
1	150300	15.5N 110.9E	LAND				108/2 /////		16.8N 112.3E	59981
2	150400	15.5N 110.8E	LAND				10785 53108		16.8N 112.3E	59981
3	150500	15.7N 110.7E	LAND				10772 53208		16.8N 112.3E	59981
4	150600	15.8N 110.5E	LAND				10772 53109		16.8N 112.3E	59981
5	150700	15.9N 110.4E	LAND				10782 5309/		16.8N 112.3E	59981
6	150900	16.3N 109.8E	LAND				10772 53111		16.8N 112.3E	59981
7	151000	16.4N 109.5E	LAND				10862 53011		16.8N 112.3E	59981
8	161000	17.0N 105.0E	LAND				/6/// /////		17.1N 104.1E	48356

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

SUPER TYPHOON DOT
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST					48 HOUR FORECAST					72 HOUR FORECAST				
						ERRORS			ERRORS					ERRORS					ERRORS		
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
101118Z	7.0	155.5	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101200Z	8.0	154.3	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101206Z	8.7	152.9	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101212Z	9.4	151.4	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101218Z	10.0	149.9	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101300Z	10.5	148.3	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101306Z	10.9	146.6	35	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101312Z	11.2	145.0	40	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101318Z	11.4	143.6	45	11.5	143.6	40.	6.	-5.	12.5	137.8	65.	71.	0.	13.4	132.5	80.	131.	-45.	14.5	127.7	95.	128.	-55.
101400Z	11.6	142.4	50	11.6	142.3	50.	6.	0.	12.3	137.4	70.	56.	-5.	13.4	132.2	85.	97.	-55.	14.9	127.1	100.	83.	-50.
101406Z	11.8	141.2	55	11.8	141.0	55.	12.	0.	12.7	136.1	75.	55.	-15.	13.8	131.4	95.	72.	-50.	15.2	126.7	110.	55.	-35.
101412Z	12.2	140.1	60	12.0	140.3	60.	17.	0.	12.5	136.5	80.	84.	-30.	13.2	131.7	100.	89.	-50.	14.3	126.2	115.	6.	-25.
101418Z	12.7	139.0	65	12.5	138.9	65.	13.	0.	13.8	134.1	105.	35.	-20.	15.1	128.6	115.	79.	-35.	16.5	123.5	120.	168.	-15.
101500Z	13.1	137.9	75	13.1	137.8	75.	6.	0.	14.0	132.8	105.	53.	-35.	14.3	127.1	130.	83.	-20.	15.7	121.6	115.	172.	-15.
101506Z	13.4	136.7	90	13.5	136.7	90.	6.	0.	14.1	131.3	125.	68.	-20.	14.2	125.7	135.	95.	-10.	15.9	120.7	105.	172.	-15.
101512Z	13.6	135.6	110	13.7	135.6	110.	6.	0.	14.4	130.8	135.	26.	-15.	14.7	125.1	140.	74.	0.	16.2	119.8	100.	159.	-10.
101518Z	13.8	134.7	125	13.8	134.5	125.	12.	0.	14.4	129.8	145.	19.	-5.	14.7	124.5	135.	52.	0.	16.3	119.4	90.	99.	5.
101600Z	14.1	133.7	140	14.1	133.7	135.	0.	-5.	14.5	129.2	150.	41.	0.	14.7	123.5	135.	48.	5.	16.6	119.0	90.	64.	25.
101606Z	14.5	132.4	145	14.4	132.7	145.	18.	0.	14.6	127.8	150.	30.	5.	15.2	122.1	130.	81.	10.	17.7	118.1	95.	118.	25.
101612Z	14.6	131.2	150	14.6	131.2	145.	0.	-5.	15.2	126.4	150.	54.	10.	15.7	121.0	100.	83.	-10.	18.2	116.7	100.	133.	25.
101618Z	14.7	129.9	150	14.8	130.0	150.	8.	0.	15.1	125.3	145.	48.	10.	15.9	120.5	100.	33.	15.	18.6	116.4	105.	121.	25.
101700Z	14.6	128.5	150	14.8	128.6	150.	13.	0.	15.1	123.4	145.	63.	15.	16.8	118.8	105.	80.	40.	19.7	114.8	115.	171.	30.
101706Z	14.5	127.3	145	14.7	127.5	155.	13.	10.	15.2	122.1	140.	81.	20.	17.4	117.7	105.	109.	35.	20.6	113.8	115.	199.	30.
101712Z	14.3	126.3	140	14.4	126.2	145.	8.	5.	15.3	121.4	125.	53.	15.	17.5	117.0	105.	88.	30.	19.9	112.2	115.	135.	25.
101718Z	14.3	125.3	135	14.3	125.2	140.	6.	5.	14.9	120.7	90.	38.	5.	16.9	116.1	110.	39.	30.	19.9	111.1	110.	120.	20.
101800Z	14.5	124.3	130	14.4	124.2	130.	8.	0.	14.9	120.1	90.	58.	25.	16.5	115.4	110.	24.	25.	19.1	110.7	115.	92.	35.
101806Z	14.7	123.4	120	14.5	123.3	120.	13.	0.	15.2	119.3	90.	54.	20.	16.8	114.9	110.	55.	25.	19.4	110.7	115.	179.	45.
101812Z	15.1	122.3	110	15.0	122.4	110.	8.	0.	16.2	118.7	85.	58.	10.	16.9	114.1	110.	93.	20.	17.9	109.2	100.	190.	40.
101818Z	15.5	120.9	85	15.5	120.9	95.	0.	10.	16.5	117.0	90.	18.	10.	17.3	112.4	110.	83.	20.	18.5	108.0	95.	183.	55.
101900Z	15.6	119.4	65	15.5	119.2	80.	13.	15.	16.6	113.9	110.	88.	25.	17.6	109.5	95.	36.	15.	0.0	0.0	0.	-0.	0.
101906Z	15.8	118.6	70	15.8	118.4	85.	12.	15.	16.9	114.0	110.	25.	25.	17.9	109.6	95.	114.	25.	0.0	0.0	0.	-0.	0.
101912Z	16.2	117.7	75	16.1	117.6	75.	8.	0.	16.9	113.0	100.	51.	10.	18.1	108.1	95.	127.	35.	0.0	0.0	0.	-0.	0.
101918Z	16.6	116.7	80	16.3	116.5	80.	21.	0.	17.2	111.9	105.	62.	15.	18.3	107.1	90.	136.	50.	0.0	0.0	0.	-0.	0.
102000Z	16.9	115.4	85	17.0	115.6	80.	13.	-5.	18.8	111.9	100.	147.	20.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
102006Z	17.3	114.1	85	17.5	114.6	85.	31.	0.	19.6	110.6	85.	177.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
102012Z	17.7	112.7	90	17.6	112.7	85.	6.	-5.	18.7	107.4	70.	80.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
102018Z	17.9	111.1	90	17.9	111.2	85.	6.	-5.	19.2	106.9	65.	120.	25.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
102100Z	18.2	109.4	80	18.3	109.5	85.	8.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
102106Z	18.5	107.7	70	18.6	107.7	80.	6.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
102112Z	18.8	106.0	60	18.8	106.0	70.	0.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
102118Z	18.9	104.8	40	19.0	105.3	55.	29.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	10.	63.	80.	131.	10.	63.	80.	131.
AVG RIGHT ANGLE ERROR	8.	32.	31.	68.	8.	32.	31.	68.
AVG INTENSITY MAGNITUDE ERROR	4.	15.	26.	29.	4.	15.	26.	29.
AVG INTENSITY BIAS	2.	5.	4.	8.	2.	5.	4.	8.
NUMBER OF FORECASTS	33	29	25	21	33	29	25	21

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 3074. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 13. KNOTS

SUPER TYPHOON DOT
FIX POSITIONS FOR CYCLONE NO. 21

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	111200	5.5N 155.9E	PCN 6	T1.0/1.0	INIT OBS	PGTW
2	111600	6.7N 155.5E	PCN 6			PGTW
3	111800	6.9N 155.2E	PCN 6			PGTW
4	120006	8.7N 153.8E	PCN 6	T1.5/1.5	INIT OBS	PGTW
5	120400	8.5N 153.0E	PCN 6			PGTW
6	120600	8.6N 153.0E	PCN 6			PGTW
7	120900	8.8N 152.8E	PCN 6			PGTW
8	121200	9.0N 151.5E	PCN 6		ULCC FIX	PGTW
9	121246	8.5N 151.2E	PCN 6		ULCC FIX	PGTW
10	121600	9.6N 150.5E	PCN 6	T1.5/1.5 /D0.5/28HRS		PGTW
11	121800	9.4N 150.0E	PCN 6		ULCC FIX	PGTW
* 12	122100	9.7N 150.6E	PCN 6		ULCC FIX	PGTW
13	130000	10.5N 148.8E	PCN 6	T2.5/2.5 /D1.0/24HRS		PGTW
14	130400	11.4N 147.5E	PCN 6		ULCC FIX	PGTW
15	130431	11.1N 147.7E	PCN 5		ULCC FIX	RODN
16	130600	10.9N 146.3E	PCN 6		ULCC FIX	PGTW
17	130900	10.1N 145.9E	PCN 6		ULCC FIX	PGTW
18	131027	11.1N 145.2E	PCN 4			RODN
19	131200	11.3N 145.1E	PCN 6		ULCC FIX	PGTW
20	131600	11.4N 143.6E	PCN 6	T2.0/2.0+/D0.5/24HRS	ULCC FIX	PGTW
21	131716	11.9N 143.4E	PCN 5			RPMK
22	131800	11.5N 143.4E	PCN 6		ULCC FIX	PGTW
23	132307	11.8N 142.5E	PCN 4	T3.5/3.5	INIT OBS	RODN
24	140000	11.9N 142.6E	PCN 4	T3.5/3.5+/D1.0/24HRS		PGTW
25	140300	11.8N 141.5E	PCN 4		PSBL IR EYE	PGTW
26	140600	11.7N 140.8E	PCN 4			PGTW
27	140900	11.9N 140.7E	PCN 4			PGTW
28	141200	12.0N 140.6E	PCN 4			PGTW
29	141600	12.5N 139.7E	PCN 6	T4.0/4.0+/D2.0/24HRS		PGTW
30	141705	12.6N 138.9E	PCN 4			RODN
31	141800	13.1N 139.0E	PCN 6			PGTW
32	142100	13.1N 138.5E	PCN 2		RAGGED EYE	PGTW
33	142100	13.2N 138.1E	PCN 1		EYE 30 NM DIA RAGGED EYE	RODN
34	142245	13.1N 138.1E	PCN 1	T4.5/4.5+/D1.0/25HRS	EYE FIX	RODN
35	150000	13.2N 138.0E	PCN 2	T5.0/5.0 /D1.5/24HRS	RAGGED EYE	PGTW
36	150046	13.1N 137.5E	PCN 2	T4.5/4.5	INIT OBS 12 NM DIA RAGGED EYE	RPMK
37	150300	13.2N 137.2E	PCN 2		EYE FIX	PGTW
38	150551	13.4N 136.4E	PCN 2		EYE .5 DEG	RPMK
39	150600	13.3N 136.7E	PCN 2		EYE FIX	PGTW
40	150900	13.7N 136.2E	PCN 2		WELL DEFINED EYE	PGTW
41	150940	13.6N 136.1E	PCN 2		EYE 30 NM DIA	RPMK
42	151200	13.7N 135.7E	PCN 2		WELL DEFINED EYE	PGTW
43	151600	13.6N 135.1E	PCN 2	T6.5/6.5 /D2.5/24HRS	WELL DEFINED EYE	PGTW
44	151655	14.0N 134.1E	PCN 2		EYE FIX	RODN
45	151800	13.6N 134.9E	PCN 2		WELL DEFINED EYE	PGTW
46	152039	13.6N 133.9E	PCN 2		EYE FIX	RPMK
47	152100	13.8N 134.5E	PCN 2		EYE FIX	PGTW
48	152223	13.9N 133.9E	PCN 2	T5.5/5.5 /D1.0/23HRS	WELL DEFINED 20 NM DIA EYE	RPMK
49	160000	14.0N 133.9E	PCN 2	T7.5/7.5-/D2.5/24HRS		PGTW

50	160026	14.2N	133.6E	PCN 1	T7.0/7.0 /D2.5/25HRS	WELL DEFINED EYE		RODN
51	160300	14.3N	133.3E	PCN 2		EYE FIX		PGTW
52	160540	14.2N	132.4E	PCN 2		20 NM DIA EYE		RPMK
53	160540	14.2N	132.6E	PCN 1		20 NM EYE		RODN
54	160600	14.6N	132.6E	PCN 2		EYE FIX		PGTW
55	160900	14.6N	132.1E	PCN 2		WELL DEFINED EYE		PGTW
56	160918	14.6N	131.3E	PCN 2		20 NM EYE		RODN
57	161102	14.6N	131.6E	PCN 1		SMALL EYE		RPMK
58	161200	14.6N	131.3E	PCN 2		EYE LOWLVL 6NM UPPER LVL 18NM		PGTW
59	161600	14.7N	130.3E	PCN 2	T7.0/7.0 /D0.5/24HRS	WELL DEFINED EYE		PGTW
60	161800	14.7N	130.0E	PCN 2		WELL DEFINED EYE		PGTW
61	161826	14.8N	129.7E	PCN 1				RKSO
62	162100	14.7N	129.4E	PCN 2		WELL DEFINED 18 NM EYE		PGTW
63	162159	14.8N	129.0E	PCN 1	T7.0/7.0	INIT OBS EYE FIX		RKSO
64	162342	14.8N	128.7E	PCN 1		EYE FIX		RKSO
65	170000	14.8N	128.7E	PCN 2		18 NM EYE		PGTW
66	170147	14.7N	128.4E	PCN 1	T7.0/7.0-/D1.5/27HRS			RPMK
67	170147	14.5N	128.3E	PCN 1	T7.5/7.5 /D0.5/25HRS	EYE FIX		RODN
68	170300	14.7N	128.0E	PCN 2	T7.5/7.0-/S0.0/24HRS	WELL DEFINED EYE		PGTW
69	170529	14.4N	127.7E	PCN 1		SCNDRY EYEWL 20NM DIA APPROX.		RPMK
70	170600	14.6N	127.4E	PCN 2		16NM ELLIPTICAL EYE		PGTW
71	170900	14.5N	126.8E	PCN 2				PGTW
72	171039	14.3N	126.7E	PCN 1				RODN
73	171200	14.3N	126.3E	PCN 2				PGTW
74	171427	14.3N	126.0E	PCN 1		WELL DEFINED EYE		RODN
75	171600	14.3N	125.4E	PCN 2	T7.0/7.0-/S0.0/24HRS	EYE FIX		PGTW
76	171800	14.3N	125.1E	PCN 2				PGTW
77	171815	14.4N	125.3E	PCN 2				RKSO
78	172100	14.3N	124.7E	PCN 2		ILL DEFINED EYE		PGTW
79	172137	14.3N	124.5E	PCN 2	T6.5/7.0 /W0.5/24HRS			RKSO
80	180000	14.4N	124.1E	PCN 2		RAGGED EYE		PGTW
81	180126	14.4N	123.8E	PCN 1		16NM EYE		PGTW
82	180126	14.5N	124.1E	PCN 1	T7.0/7.0-/W0.5/24HRS	EYE OPN SE		RODN
83	180127	14.5N	124.3E	PCN 2		EYE FIX		RPMK
84	180300	14.3N	123.8E	PCN 4	T6.5/7.0 /W1.0/24HRS	ILL DEFINED EYE		PGTW
85	180518	14.5N	123.1E	PCN 3				PGTW
86	180518	14.7N	123.0E	PCN 3				RODN
87	180900	14.7N	123.0E	PCN 6				PGTW
88	181017	14.8N	122.7E	PCN 4				PGTW
89	181017	15.0N	122.6E	PCN 3				RODN
90	181200	15.0N	122.6E	PCN 6				PGTW
91	181407	15.0N	121.8E	PCN 4				PGTW
92	181600	15.5N	121.4E	PCN 6				PGTW
93	181804	15.2N	120.1E	PCN 6				RKSO
94	181804	15.5N	120.0E	PCN 6	T5.5/6.5+/W1.5/26HRS			PGTW
95	182100	15.3N	119.7E	PCN 6		ULCC FIX		PGTW
96	190000	15.6N	118.8E	PCN 6				PGTW
97	190106	15.6N	118.6E	PCN 4				PGTW
98	190300	16.0N	119.1E	PCN 4	T4.5/5.5+/W2.0/24HRS			PGTW
99	190600	16.2N	118.6E	PCN 4				PGTW
100	190900	15.9N	118.0E	PCN 6				
101	191137	15.9N	118.2E	PCN 5		RAGGED 20NM EYE		RPMK
102	191137	16.1N	118.3E	PCN 4				RODN
103	191200	16.1N	117.8E	PCN 6				PGTW
104	191347	16.6N	117.3E	PCN 6				PGTW
105	191600	16.5N	116.9E	PCN 6	T4.5/5.5+/W1.0/22HRS			PGTW
106	191800	16.5N	116.6E	PCN 6				PGTW
107	191935	16.9N	116.0E	PCN 6				RODN
108	192100	16.6N	115.2E	PCN 4		PSBL DEVELPNG EYE		PGTW
109	192236	17.4N	115.8E	PCN 4				RPMK
110	192352	17.5N	115.6E	PCN 3	T4.5/4.5	INIT OBS		RPMK
111	192352	17.2N	115.5E	PCN 3	T4.5/4.5	INIT OBS		RODN
112	200000	17.1N	115.3E	PCN 4				PGTW
113	200227	17.2N	115.1E	PCN 3				RPMK
114	200300	17.3N	114.9E	PCN 4	T5.5/5.5 /D1.0/24HRS			PGTW
115	200600	17.3N	114.1E	PCN 4				PGTW
116	200639	17.7N	114.1E	PCN 1		12NM EYE		RPMK
117	200900	17.2N	113.0E	PCN 4				PGTW
118	201049	17.6N	112.9E	PCN 2		EYE WALL		RKSO
119	201116	17.7N	113.2E	PCN 1		EYE FIX		RPMK
120	201116	17.7N	112.8E	PCN 1		ILL DEFINED EYE		RODN
121	201200	17.6N	112.9E	PCN 2		24 NM EYE POORLY DEFINED		PGTW
122	201508	17.7N	112.2E	PCN 1		SMALL EYE		PGTW
123	201508	17.7N	112.2E	PCN 1				RODN
124	201600	17.8N	111.9E	PCN 2	T5.5/5.5-/D1.0/24HRS			PGTW
125	201800	18.0N	111.2E	PCN 4				PGTW
126	201923	18.2N	110.8E	PCN 3		PSBL SMALL EYE		RPMK
127	202100	18.2N	110.5E	PCN 2		SMALL EYE		PGTW
128	202215	18.1N	109.5E	PCN 3				RODN
129	202328	18.5N	108.8E	PCN 4				RPMK
130	210000	18.4N	109.4E	PCN 4		ULCC FIX		PGTW
131	210200	18.1N	108.2E	PCN 3	T4.0/4.5-/W0.5/28HRS			RODN
132	210207	18.4N	108.5E	PCN 3	T4.0/4.5-/W0.5/26HRS			RPMK
133	210300	18.4N	108.5E	PCN 6	T4.0/5.0-/W1.5/24HRS			PGTW
134	210600	18.4N	107.6E	PCN 6		ULCC FIX		PGTW
135	210628	18.2N	107.2E	PCN 3				RODN
136	210900	18.5N	106.6E	PCN 6				PGTW
137	211055	18.4N	105.7E	PCN 3				RPMK
138	211200	18.8N	106.0E	PCN 6		PART EXP LLCC		PGTW
*139	211447	18.1N	104.5E	PCN 3				RODN
140	211600	18.9N	105.6E	PCN 6	T3.5/4.0-/W1.5/24HRS	ULCC FIX		PGTW
141	211800	18.8N	105.6E	PCN 6		PART EXP LLCC		PGTW
142	211914	19.0N	104.7E	PCN 6				RPMK
143	212100	18.9N	104.5E	PCN 6		ULCC FIX		PGTW
144	212335	19.0N	103.3E	PCN 6				RPMK

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN-TATION DIAM/	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	132204	11.5N 142.7E	1500FT		992	50 070 25	070 67 070 25	10 3			+24 +27 +26	2
2	140027	11.6N 142.2E	1500FT		992	50 310 20	360 60 310 20	7 1	CIRCULAR	15	+25 +28 +26	2
3	140530	11.8N 141.3E	700MB	2975		65 060 40	120 55 060 43	10 3			+13 +15 +10	4
4	140804	11.9N 141.0E	700MB	2976	982	45 190 30	260 54 190 20	10 4			+11 +16 + 9	4
5	142130	13.0N 138.4E	700MB	2865	975	70 300 28	080 60 180 72	2 3	CONCENTRIC	10 30	+12 +14 +13	5
6	150022	13.1N 137.8E	700MB	2827	969	80 130 10	280 70 130 17	2 2	CIRCULAR	25	+13 +16 + 8	5
7	150615	13.5N 136.7E	700MB	2669		95 060 8	130 88 060 18	10 1	CIRCULAR	25	+ 9 +17 +11	5
8	150853	13.4N 136.2E	700MB	2598	941		240 92 170 15	10 2	CIRCULAR	20	+ 9 +20 + 8	7
9	152102	14.0N 134.4E	700MB	2268		130 320 12	130 145 090 24	8 1	CIRCULAR	15	+14 +30 +11	8
10	152342	14.1N 133.7E	700MB	2243	969	110 270 6	010 117 310 10	10 1	CIRCULAR	18	+13 +30 + 8	8
11	160959	14.6N 131.6E	700MB	2157			160 115 110 25	4 1	CONCENTRIC	25 15	+13 +28 +10	10
12	161214	14.6N 131.1E	700MB	2193	897		110 108 350 24	4 1	CONCENTRIC	15 25	+11 +27 + 5	10
13	162307	14.7N 128.6E	700MB	2178	897	130 270 10	360 98 270 13	5 10	CIRCULAR	10	+12 +22 + 6	11
14	170905	14.4N 126.7E	700MB	2282		110 080 9	360 106 250 12	15 2	CIRCULAR	15	+13 +20 +16	12
15	171208	14.3N 126.3E	700MB	2283	908		080 109 330 12	10 1	CIRCULAR	12	+13 +18 +17	12
16	172116	14.4N 124.8E	700MB	2312		45 130 90	020 93 130 30	10 1	CIRCULAR	13	+18 +21 +16	13
17	172353	14.4N 124.3E	700MB	2352	915	100 270 10	340 102 270 30	10 2	ELLIPTICAL	15 10 330	+13 +20 +16	13
18	180534	14.7N 123.5E	700MB	2440	926	100 360 8	080 99 360 8	5 4	ELLIPTICAL	15 10 360	+14 +18 +16	14
19	180828	14.8N 123.2E	700MB	2455		50 040 106	120 99 360 8	4 5	CIRCULAR	15	+12 +16 +16	14

20	190915	15.9N	118.4E	700MB	2894	979	50	340	50	070	61	340	55	10	2	CIRCULAR	30			+12	+14	+11	15
21	191152	16.2N	117.6E	700MB	2905					160	64	080	77	10	2	CONCENTRIC	10	40		+12	+15	+13	15
22	192111	16.5N	116.3E	700MB	2831					140	76	050	80	10	3	ELLIPTICAL	15	10	280	+13	+15	+12	16
23	192335	17.0N	114.8E	700MB	2821	970	70	120	95	180	79	160	44	10	2	ELLIPTICAL	15	5	360	+11	+16	+11	16
24	200831	17.3N	113.7E	700MB	2755	962	75	040	21	190	66	110	60	5	5	ELLIPTICAL	15	10	160	+14	+14	+ 9	17

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR	TDIFF	COMMENTS	RADAR POSITION	SITE WMO NO.
1	171200	14.3N 126.3E	LAND				10623	52510		14.0N 124.3E	98447
2	171500	14.4N 125.8E	LAND				10613	52813	EYE CIRCULAR OPN 50 PRCNT	14.0N 124.3E	98447
3	171600	14.3N 125.6E	LAND				10613	52619		14.0N 124.3E	98447
4	171700	14.4N 125.3E	LAND				10422	52910		14.0N 124.3E	98447
5	171700	14.7N 125.2E	LAND				20512	52712		14.1N 123.0E	98440
6	171800	14.8N 125.3E	LAND				10418	52709		14.0N 124.3E	98447
7	172100	14.6N 124.9E	LAND				20572	52709		14.1N 123.0E	98440
8	172200	14.4N 124.7E	LAND				10512	52511		14.0N 124.3E	98447
9	172300	14.6N 124.4E	LAND				20481	52712		14.1N 123.0E	98440
10	180000	14.5N 124.4E	LAND				20412	52712		14.1N 123.0E	98440
11	180300	14.6N 123.9E	LAND				/0403	52714		14.1N 123.0E	98440
12	180300	14.6N 124.4E	LAND				4////	4////		16.3N 120.6E	98321
13	180600	14.7N 123.9E	LAND				2041/	42911		16.3N 120.6E	98321
14	180700	14.9N 123.7E	LAND				2041/	52911	EYE 100 PRCNT CIR EYEWL SE GOOD	16.3N 120.6E	98321
15	180800	14.9N 123.6E	LAND				2041/	52912	EYE 100 PRCNT CIR EYEWL SE GOOD	16.3N 120.6E	98321
16	180830	15.0N 123.5E	LAND				2041/	52910		16.3N 120.6E	98321
17	180900	15.0N 123.4E	LAND				20415	52910		16.3N 120.6E	98321
18	181000	15.0N 122.8E	LAND				20212	53218		14.1N 123.0E	98440
19	181100	15.1N 122.5E	LAND				20212	52916		14.1N 123.0E	98440
20	181125	15.0N 122.5E	LAND	POOR						15.2N 120.6E	98327
21	181200	15.3N 122.8E	LAND				1021/	42806		16.3N 120.6E	98321
22	181200	15.1N 122.3E	LAND				20233	52912		14.1N 123.0E	98440
23	181210	15.0N 122.4E	LAND	FAIR						15.2N 120.6E	98327
24	181235	15.1N 122.2E	LAND	FAIR						15.2N 120.6E	98327
25	181300	15.3N 122.5E	LAND				1021/	42809		16.3N 120.6E	98321
26	181335	15.2N 122.1E	LAND	POOR						15.2N 120.6E	98327
27	181400	15.2N 122.0E	LAND				30/41	53211		14.1N 123.0E	98440
28	181400	15.3N 122.4E	LAND				1021/	42707		16.3N 120.6E	98321
29	181410	15.3N 122.0E	LAND	POOR						15.2N 120.6E	98327
30	181435	15.3N 121.8E	LAND	FAIR						15.2N 120.6E	98327
31	181510	15.4N 121.6E	LAND	FAIR						15.2N 120.6E	98327
32	181535	15.5N 121.5E	LAND	FAIR						15.2N 120.6E	98327
33	181638	15.5N 121.1E	LAND	FAIR						15.2N 120.6E	98327
34	181828	15.6N 120.5E	LAND	GOOD						15.2N 120.6E	98327
35	181900	15.4N 120.6E	LAND				4////	52614		16.3N 120.6E	98321
36	182006	15.3N 120.1E	LAND				1021/	42610		16.3N 120.6E	98321
37	182030	15.3N 119.9E	LAND				1021/	42712		16.3N 120.6E	98321
38	182100	15.4N 119.8E	LAND				15///	42906		16.3N 120.6E	98321
39	182200	15.4N 119.7E	LAND				1020/	42704		16.3N 120.6E	98321
40	190000	15.4N 119.3E	LAND				2033/	62714		16.3N 120.6E	98321
41	190100	15.4N 119.0E	LAND				2023/	42705		16.3N 120.6E	98321
42	190200	15.4N 118.9E	LAND				2042/	42704		16.3N 120.6E	98321
43	190700	15.5N 118.3E	LAND				1061/	32994		16.3N 120.6E	98321
44	190800	15.8N 118.2E	LAND				1061/	43408		16.3N 120.6E	98321
45	190900	15.9N 118.1E	LAND				1061/	43204		16.3N 120.6E	98321
46	191000	15.9N 118.2E	LAND				1061/			16.3N 120.6E	98321
47	191200	16.1N 117.4E	LAND				1061/	42712		16.3N 120.6E	98321
48	200500	17.2N 114.0E	LAND				11184	73210		16.8N 112.3E	59981
49	200600	17.3N 113.9E	LAND				12294	52911		16.8N 112.3E	59981
50	200700	17.3N 113.8E	LAND				12274	52910		16.8N 112.3E	59981
51	200800	17.4N 113.6E	LAND				12274	53010		16.8N 112.3E	59981
52	201213	17.7N 112.9E	ACFT	GOOD					15 NM EYE	17.6N 114.4E	
53	201500	17.8N 111.8E	LAND				10183	52812		16.8N 112.3E	59981
54	201800	18.0N 111.0E	LAND				10173	52911		16.8N 112.3E	59981
55	201900	18.1N 110.8E	LAND				10173	52912		16.8N 112.3E	59981
56	202000	18.1N 110.4E	LAND				10173	52814		16.8N 112.3E	59981
57	202100	18.2N 110.2E	LAND				34362	52814		16.8N 112.3E	59981

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL STORM ELLIS
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST ERRORS						48 HOUR FORECAST ERRORS						72 HOUR FORECAST ERRORS					
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND
101400Z	6.1	159.0	10	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101406Z	6.6	158.0	10	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101412Z	7.1	157.1	10	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101418Z	7.6	156.1	15	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101500Z	8.1	155.4	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101506Z	8.5	154.7	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101512Z	8.8	154.0	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101518Z	9.3	153.3	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101600Z	10.1	152.8	35	9.9	152.9	35.	13.	0.	11.5	150.1	55.	59.	15.	12.8	145.3	75	343.	25.	13.6	140.1	100.	621.	60.					
101606Z	10.6	152.0	35	10.7	151.9	40.	8.	5.	12.8	148.6	60.	168.	15.	14.1	144.2	80	458.	30.	15.3	139.5	100.	715.	60.					
101612Z	10.8	151.5	35	11.3	151.2	40.	35.	5.	13.1	148.2	55.	199.	10.	14.1	144.3	70	460.	20.	15.2	139.9	95.	681.	55.					
101618Z	10.8	151.2	35	10.8	151.3	40.	6.	5.	11.7	149.9	55.	103.	10.	12.9	147.3	75	324.	30.	13.6	143.7	90.	464.	55.					
101700Z	10.8	150.8	40	10.9	150.9	45.	8.	5.	11.7	149.2	60.	150.	10.	12.6	146.3	80	351.	40.	12.9	142.5	95.	435.	65.					
101706Z	10.7	150.5	45	10.9	150.6	45.	13.	0.	11.5	148.7	65.	178.	15.	12.3	145.7	85	364.	45.	0.0	0.0	0.	-0.	0.					
101712Z	10.5	150.3	45	11.0	150.3	45.	30.	0.	11.7	148.2	65.	220.	15.	12.5	145.0	85	388.	45.	0.0	0.0	0.	-0.	0.					
101718Z	10.0	150.1	45	10.0	149.8	55.	18.	10.	10.7	148.8	80.	180.	35.	11.2	145.9	100	295.	65.	0.0	0.0	0.	-0.	0.					
101800Z	9.3	149.9	50	9.5	149.8	55.	13.	5.	10.3	148.6	80.	193.	40.	10.9	145.6	100	283.	70.	0.0	0.0	0.	-0.	0.					
101806Z	8.7	149.7	50	9.5	149.6	60.	49.	10.	9.6	147.9	80.	180.	40.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.					
101812Z	8.2	149.3	50	8.4	149.6	55.	21.	5.	8.6	146.7	65.	135.	25.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.					
101818Z	7.7	148.8	45	8.0	148.8	55.	18.	10.	8.6	145.5	70.	146.	35.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.					
101900Z	7.1	148.3	40	7.2	148.3	50.	6.	10.	6.4	144.8	60.	32.	30.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.					
101906Z	6.6	147.8	40	6.6	147.8	50.	0.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.					
101912Z	6.4	147.2	40	6.2	147.2	45.	12.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.					
101918Z	6.3	146.3	35	6.3	146.4	45.	6.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.					
102000Z	6.2	145.3	30	6.3	145.2	35.	8.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.					

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	16.	149.	363.	583.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	10.	117.	311.	430.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	6.	23.	41.	59.	0.	0.	0.	0.
AVG INTENSITY BIAS	6.	23.	41.	59.	0.	0.	0.	0.
NUMBER OF FORECASTS	17	13	9	5	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1046. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 7. KNOTS

TROPICAL STORM ELLIS
FIX POSITIONS FOR CYCLONE NO. 22

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	150000	8.2N 155.4E	PCN 6	T1.0/1.0	INIT OBS	PGTW
	2	150300	8.5N 155.1E	PCN 6			PGTW
*	3	151200	7.7N 152.8E	PCN 6			PGTW
	4	151600	8.7N 153.7E	PCN 6	T1.5/1.5	INIT OBS	PGTW
*	5	151800	8.1N 153.3E	PCN 6			PGTW
	6	152039	8.8N 153.3E	PCN 6	T2.0/2.0	INIT OBS	RPMK
	7	152100	9.3N 153.4E	PCN 6			PGTW
	8	152223	8.7N 154.2E	PCN 6	T1.5/1.5	INIT OBS	RPMK
	9	160000	9.9N 152.9E	PCN 4	T2.5/2.5 /D1.5/24HRS	EXP LLCC	PGTW
	10	160026	10.2N 152.9E	PCN 3	T3.0/3.0	INIT OBS EXP LLCC	RODN
	11	160300	10.4N 152.2E	PCN 4		EXP LLCC	PGTW
	12	160600	10.8N 152.1E	PCN 4		EXP LLCC	PGTW
	13	160900	10.8N 151.8E	PCN 6			PGTW
	14	161200	11.0N 151.6E	PCN 6			PGTW
	15	161600	11.1N 150.9E	PCN 6	T2.5/2.5-/D1.0/24HRS		PGTW
*	16	161644	11.6N 150.8E	PCN 4		EXP LLCC	RODN
	17	161800	11.3N 150.9E	PCN 6			PGTW
	18	162100	11.0N 150.8E	PCN 6			PGTW
	19	162201	10.9N 151.2E	PCN 6	T2.5/2.5 /W1.0/26HRS		RODN
	20	170000	10.3N 150.4E	PCN 6			PGTW
	21	170300	10.7N 150.7E	PCN 4	T3.0/3.0+/D0.5/24HRS	PART EXP LLCC	PGTW
	22	170600	10.5N 150.6E	PCN 6			PGTW
	23	170857	10.8N 151.5E	PCN 5			RPMK
	24	170900	10.7N 150.6E	PCN 6			PGTW
	25	171200	10.8N 150.4E	PCN 6			PGTW
	26	171600	10.2N 150.0E	PCN 6	T3.0/3.0+/D0.5/24HRS		PGTW
	27	171800	10.3N 149.9E	PCN 6			PGTW
	28	171956	10.0N 150.7E	PCN 6		ULCC FIX	PGTW
	29	172100	9.7N 150.7E	PCN 6		ULCC FIX	PGTW
	30	180000	9.4N 150.8E	PCN 6		ULCC FIX	PGTW
	31	180300	9.3N 149.5E	PCN 6	T3.5/3.5 /D0.5/24HRS		PGTW
	32	180519	9.3N 149.3E	PCN 6			PGTW
	33	180600	9.5N 149.5E	PCN 6			PGTW
	34	180836	8.6N 149.6E	PCN 6			PGTW
	35	181225	8.5N 149.6E	PCN 6			RODN
	36	181225	8.4N 149.6E	PCN 5			PGTW
	37	181622	8.1N 148.9E	PCN 5	T3.5/3.5 /D0.5/24HRS		PGTW
	38	181800	7.8N 148.6E	PCN 6			PGTW
	39	182100	7.7N 148.4E	PCN 6		ULCC FIX	PGTW
	40	182325	7.4N 148.5E	PCN 6			PGTW
	41	190300	7.7N 148.3E	PCN 6	T3.5/3.5 /S0.0/24HRS		PGTW
	42	190508	6.9N 148.1E	PCN 6			PGTW
	43	190600	6.8N 148.0E	PCN 6			PGTW
	44	190815	7.3N 147.6E	PCN 6			PGTW
	45	190932	7.0N 147.5E	PCN 5			PGTW
	46	191205	7.0N 147.3E	PCN 5			PGTW
	47	191611	7.4N 146.6E	PCN 6	T3.5/3.5 /S0.0/24HRS		PGTW
	48	191800	6.9N 146.5E	PCN 6			PGTW
	49	192030	6.7N 146.7E	PCN 6			PGTW
	50	192055	6.8N 146.4E	PCN 6			PGTW
	51	200000	6.2N 145.7E	PCN 6			PGTW
*	52	200300	7.0N 145.9E	PCN 6	T2.5/3.0+/W1.0/24HRS		PGTW
*	53	200457	7.6N 145.9E	PCN 6			PGTW
*	54	200600	7.9N 145.9E	PCN 6			PGTW
*	55	200908	8.0N 145.8E	PCN 6		ULCC FIX	PGTW
*	56	201200	8.1N 145.5E	PCN 6			PGTW
	57	202034	9.7N 140.8E	PCN 6		ULCC FIX	PGTW
	58	210000	10.4N 139.5E	PCN 6		ULCC FIX	PGTW
	59	210025	10.4N 139.2E	PCN 5	T2.5/2.5	INIT OBS	RODN
	60	210025	9.7N 139.6E	PCN 5		ULCC FIX	PGTW
	61	210300	10.2N 138.9E	PCN 6	T2.5/2.5 /S0.0/24HRS	ULCC FIX	PGTW

62	210600	10.6N 138.4E	PCN 6	ULCC FIX	PGTW
63	210900	11.5N 138.2E	PCN 6	ULCC FIX	PGTW
64	210915	11.5N 135.2E	PCN 6	ULCC FIX	PGTW

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN- DIAM/TATION	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	160458	10.7N 152.1E	1500FT		1000	45 040 15	170 35 070 50	2 2			+24 +25 +23 25	1
2	170532	10.7N 150.6E	1500FT		995	40 220 40	300 39 220 10	10 5	CIRCULAR	20	+26 +27 +23 28	3
3	170755	10.7N 150.5E	1500FT		997	45 170 25	270 44 120 12	8 2	CIRCULAR	15	+25 +27 +23 28	3
4	172200	9.4N 150.0E	1500FT		997	65 360 30	070 75 360 32	4 1			+26 +26 +22 28	5
5	172345	9.3N 149.8E	700MB	3075	999	60 240 30	170 53 120 40	4 1			+11 +14 + 4	5
6	180900	8.5N 150.1E	700MB	3071			100 38 360 36	10 10			+ 9 +11 +10	7
7	181159	8.3N 149.3E	700MB	3081	1000		150 49 750 51	8 8	ELLIPTICAL	60 40 010	+ 9 +15 + 6	7
8	182045	7.4N 148.5E	1500FT		997	45 350 40	320 51 230 19	7 3			+26 +27 +24 29	8
9	182323	7.2N 148.3E	1500FT		997	30 060 20	140 42 060 30	8 2			+25 +27 +24	8
10	190626	6.5N 147.9E	1500FT		998	45 340 50	060 42 350 34	4 2			+24 +27 +25	9
11	190858	6.4N 147.5E	700MB	3119	1002		160 38 080 20	2 4			+11 +13 + 9	9
12	192120	6.2N 145.5E	700MB	3153	1008	35 010 90	140 44 010 90	5 5			+10 +10 + 6	11
13	192350	6.2N 145.2E	1500FT		1007	10 140 60	190 27 140 18	5 10			+24 +26 +21 28	11
14	210307	8.9N 138.8E	1500FT		1007	15 060 50	170 15 160 30	5 10			+26 +26 +24 25	14

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	140000	6.5N 159.0E	010	060	91353 91348
2	141200	6.9N 157.0E	010	070	91348 91338 91353 91334
3	150000	7.9N 154.8E	020	170	91338 91334 91348 91353 91426 UYDO JJQL

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TYPHOON FAYE
BEST TRACK DATA

	BEST TRACK		WARNING	24 HOUR FORECAST ERRORS				48 HOUR FORECAST ERRORS				72 HOUR FORECAST ERRORS			
MO/DA/HR	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
102300Z	13.8	125.9	30	13.1	125.4	30.	34.	0.	13.4	122.8	25	108.	-20.	14.2	119.2	35	264.	0.	15.1	115.1	55.	310.	15.
102306Z	13.5	124.9	30	13.1	125.5	30.	42.	0.	13.5	123.0	25.	173.	-10.	14.3	119.2	35	337.	-5.	15.3	115.2	55.	336.	20.
102312Z	14.1	124.0	35	14.3	123.9	30.	13.	-5.	16.3	119.9	25.	42.	-5.	16.2	115.9	45	209.	5.	17.3	111.9	60.	516.	25.
102318Z	14.6	123.0	40	15.0	122.7	35.	30.	-5.	16.3	118.2	35.	125.	10.	16.4	114.0	50	313.	10.	19.1	109.9	55.	663.	15.
102400Z	15.1	122.2	45	15.6	122.0	45.	13.	0.	16.3	118.2	35.	145.	0.	16.7	114.5	50	298.	10.	19.1	111.6	60.	601.	15.
102406Z	15.8	121.2	35	15.5	121.5	34.	25.	-1.	16.2	117.8	35.	127.	-5.	17.1	113.9	55	358.	20.	19.6	110.8	60.	650.	10.
102412Z	16.7	120.5	20	16.1	120.7	20.	38.	0.	16.4	117.0	40.	145.	0.	17.8	113.6	55	414.	20.	20.4	111.0	60.	651.	10.
102418Z	17.6	119.9	25	17.3	120.0	25.	19.	0.	19.7	116.2	45.	199.	5.	20.7	112.6	55	538.	15.	20.9	107.9	45.	837.	-5.
102500Z	18.6	119.0	35	18.2	119.1	35.	25.	0.	19.8	116.7	50.	189.	10.	20.8	114.8	60	427.	15.	21.3	112.7	55.	582.	5.
102506Z	18.2	118.5	40	18.2	118.5	35.	0.	-5.	18.9	115.3	45.	268.	10.	19.8	113.3	45	509.	-5.	20.3	111.3	40.	666.	-15.
102512Z	18.0	118.9	40	18.3	118.9	40.	18.	0.	18.9	118.9	45.	112.	10.	18.6	117.2	45	304.	-5.	18.7	115.4	45.	458.	-15.
102518Z	18.0	119.2	40	18.3	119.2	40.	18.	0.	18.8	119.8	45.	145.	5.	18.3	117.5	45	304.	-5.	18.1	115.8	45.	471.	-20.
102600Z	18.1	119.5	40	18.0	119.5	35.	6.	-5.	18.0	119.5	35.	172.	-10.	17.8	117.8	40	309.	-10.	17.7	116.3	40.	470.	-35.
102606Z	18.5	120.0	35	18.6	120.2	45.	13.	10.	19.6	120.6	50.	97.	0.	20.3	119.2	50	223.	-5.	20.6	117.5	55.	388.	-25.
102612Z	18.8	120.8	35	18.6	120.9	35.	13.	0.	19.7	122.7	35.	81.	-15.	20.7	124.5	30	82.	-30.	21.8	126.2	30.	78.	-60.
102618Z	19.1	121.6	40	18.9	121.7	35.	13.	-5.	19.8	124.0	30.	76.	-20.	21.0	126.1	30	138.	-35.	22.5	128.1	30.	150.	-65.
102700Z	19.3	122.2	45	19.2	122.3	45.	8.	0.	20.6	125.0	45.	133.	-5.	21.7	127.2	40	191.	-35.	23.0	129.4	35.	188.	-65.
102706Z	19.4	122.3	50	19.5	122.6	50.	18.	0.	20.4	124.1	60.	70.	5.	21.4	125.9	50	85.	-30.	22.5	128.2	40.	108.	-55.
102712Z	19.4	122.5	50	19.6	122.8	50.	21.	0.	20.4	124.2	45.	58.	-15.	21.4	126.0	45	69.	-45.	22.7	128.7	40.	110.	-50.
102718Z	19.5	122.7	50	19.6	123.2	50.	29.	0.	20.3	124.7	45.	51.	-20.	21.3	126.5	45	86.	-50.	22.4	129.3	40.	147.	-45.
102800Z	19.6	122.9	50	19.5	122.8	50.	8.	0.	19.9	123.7	45.	45.	-30.	20.3	124.9	40	168.	-60.	21.2	126.8	40.	295.	-40.
102806Z	19.7	123.1	55	19.5	123.1	50.	18.	-5.	19.5	123.1	50.	126.	-30.	20.2	124.1	50	234.	-45.	21.4	125.2	45.	409.	-20.
102812Z	19.8	123.4	60	19.8	123.5	65.	6.	5.	20.2	124.3	75.	94.	-15.	20.9	125.3	80	225.	-10.	21.8	126.7	85.	420.	25.
102818Z	20.2	123.8	65	19.9	123.7	65.	19.	0.	20.4	124.7	75.	121.	-20.	21.2	125.6	80	261.	-5.	22.2	126.9	85.	490.	30.
102900Z	20.6	124.0	75	20.6	123.9	75.	6.	0.	22.1	124.1	60.	116.	-40.	24.0	124.8	65	275.	-15.	25.0	126.7	60.	519.	10.
102906Z	21.2	124.4	80	21.2	124.3	80.	6.	0.	25.8	125.7	70.	150.	-25.	29.4	130.4	65	211.	0.	32.1	139.0	55.	246.	10.
102912Z	21.7	124.8	90	21.6	124.9	90.	8.	0.	24.7	127.3	85.	56.	-5.	27.7	131.9	75	69.	15.	0.0	0.0	0.	-0.	0.
102918Z	22.3	125.4	95	22.2	125.3	90.	8.	-5.	25.2	127.8	85.	44.	0.	28.1	132.6	75	100.	20.	0.0	0.0	0.	-0.	0.
103000Z	22.9	126.0	100	22.9	126.0	100.	0.	0.	25.8	129.1	95.	36.	15.	28.6	133.5	80	140.	30.	0.0	0.0	0.	-0.	0.
103006Z	23.4	126.5	95	23.4	126.5	100.	0.	5.	25.8	129.2	90.	87.	25.	28.8	134.0	75	215.	30.	0.0	0.0	0.	-0.	0.
103012Z	24.1	127.4	90	24.1	127.4	90.	0.	0.	27.2	131.4	70.	60.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
103018Z	24.7	128.4	85	24.7	128.4	85.	0.	0.	27.7	133.4	70.	52.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
103100Z	25.4	129.6	80	25.4	129.7	85.	5.	5.	28.1	134.7	65.	70.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
103106Z	25.9	130.8	65	26.1	131.4	65.	35.	0.	29.1	138.0	45.	60.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
103112Z	26.6	132.3	60	26.7	132.8	60.	27.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
103118Z	27.1	134.1	55	27.0	134.0	55.	8.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
110100Z	27.6	135.9	50	27.5	136.0	50.	8.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
110106Z	28.1	138.0	45	28.1	138.1	45.	5.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	15.	104.	242.	414.	12.	106.	242.	414.
AVG RIGHT ANGLE ERROR	7.	58.	136.	231.	7.	57.	136.	231.
AVG INTENSITY MAGNITUDE ERROR	2.	13.	20.	27.	2.	13.	20.	27.
AVG INTENSITY BIAS	-0.	-4.	-7.	-13.	-0.	-5.	-7.	-13.
NUMBER OF FORECASTS	38	34	30	26	34	32	30	26

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1849. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 8. KNOTS

TYPHOON FAYE
FIX POSITIONS FOR CYCLONE NO. 23

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	221332	13.1N 125.4E	PCN 6	T1.5/1.5	INIT OBS	PGTW
2	230000	13.4N 125.0E	PCN 6			PGTW
3	230126	13.1N 125.4E	PCN 5			PGTW
4	230300	13.4N 124.9E	PCN 6			PGTW
5	230607	13.6N 125.2E	PCN 5			PGTW
6	230900	14.1N 124.1E	PCN 6			PGTW
7	231012	13.9N 124.3E	PCN 6			PGTW
8	231200	14.6N 124.1E	PCN 6			PGTW
9	231407	14.7N 123.3E	PCN 3			PGTW
10	231600	14.7N 123.3E	PCN 4	T2.5/2.5	INIT OBS	PGTW
11	231800	14.9N 122.5E	PCN 4			PGTW
12	231852	14.7N 122.7E	PCN 3			RPMK
13	232111	15.0N 121.9E	PCN 6			PGTW
14	232215	15.1N 121.7E	PCN 5			PGTW
15	240000	15.1N 121.7E	PCN 6	T2.5/2.5-/D1.0/26HRS		PGTW
16	240106	15.0N 122.0E	PCN 3			PGTW
17	240107	15.1N 121.3E	PCN 5			RPMK
18	240300	15.1N 121.7E	PCN 6			PGTW
19	240556	15.6N 121.6E	PCN 5			PGTW
20	240556	15.8N 122.1E	PCN 5	T2.0/2.0	INIT OBS	RODN
21	240556	15.6N 121.4E	PCN 5			RPMK
22	240951	16.3N 121.1E	PCN 6		ULCC FIX	PGTW
23	241200	16.4N 120.9E	PCN 6		ULCC FIX	PGTW
24	241346	17.1N 120.4E	PCN 5		ULCC FIX	PGTW
25	241600	17.5N 120.2E	PCN 6	T1.0/2.0+/W1.5/24HRS	ULCC FIX	PGTW
26	241841	17.5N 119.9E	PCN 6		ULCC FIX	PGTW
27	242100	18.4N 120.1E	PCN 6		ULCC FIX	PGTW
28	242231	17.7N 119.9E	PCN 6	T1.0/1.0	INIT OBS	RPMK
29	242331	18.6N 118.8E	PCN 3			RODN
30	242331	18.2N 119.5E	PCN 5			RPMK
31	250000	18.5N 118.8E	PCN 4		PART EXP LLCC	PGTW
32	250227	18.0N 118.9E	PCN 3	T2.5/2.5 /D0.5/22HRS		RODN
33	250300	17.7N 118.5E	PCN 4	T2.5/2.5 /S0.0/27HRS	PART IXP LLCC	PGTW
34	250545	17.7N 118.8E	PCN 3		PART EXP LLCC	PGTW
35	250545	17.7N 118.7E	PCN 5	T2.5/2.5	INIT OBS EXP LLCC	RKSO
36	251029	18.4N 118.6E	PCN 6		ULCC FIX	PGTW
37	251111	18.4N 119.8E	PCN 5		ULCC FIX	RPMK
38	251111	18.3N 119.3E	PCN 5		ULCC FIX	RODN
39	251507	18.2N 119.9E	PCN 5			RODN
* 40	251600	19.4N 120.1E	PCN 6	T3.0/3.0-/D2.0/24HRS	ULCC FIX	PGTW
41	251831	18.2N 119.8E	PCN 6		ULCC FIX	PGTW
42	252100	18.1N 119.5E	PCN 6			PGTW
43	252210	18.5N 119.2E	PCN 6			PGTW
* 44	252307	18.4N 120.6E	PCN 5			RKSO
45	260000	18.5N 119.4E	PCN 6			PGTW
* 46	260206	19.2N 121.8E	PCN 5	T2.5/2.5 /S0.0/24HRS		RODN
47	260300	18.5N 120.4E	PCN 6	T3.0/3.0 /D0.5/24HRS		PGTW
48	260534	18.1N 120.2E	PCN 5			PGTW
49	260534	18.2N 121.1E	PCN 5	T2.5/2.5 /S0.0/24HRS	EXP LLCC	RKSO

50	260900	18.9N	120.9E	PCN 6			PGTW
51	261004	18.8N	121.1E	PCN 6			PGTW
52	261050	18.8N	121.7E	PCN 5			RPMK
53	261200	18.8N	121.3E	PCN 6			PGTW
54	261447	18.9N	121.4E	PCN 5			RPMK
55	261600	18.9N	122.0E	PCN 6	T2.5/3.0+/W0.5/24HRS		PGTW
56	261820	18.9N	122.3E	PCN 5			RPMK
57	261820	19.0N	122.1E	PCN 5			PGTW
58	262100	19.0N	122.2E	PCN 6			PGTW
59	262148	19.0N	122.3E	PCN 5			PGTW
60	262243	19.0N	122.5E	PCN 5			PGTW
61	270000	19.0N	122.6E	PCN 6			PGTW
62	270146	19.1N	122.3E	PCN 6	T3.5/3.5 /D0.5/23HRS		PGTW
63	270300	19.2N	122.5E	PCN 6			PGTW
64	270523	19.2N	122.5E	PCN 4			PGTW
65	270600	19.4N	122.6E	PCN 4			PGTW
66	270900	19.6N	122.7E	PCN 4			PGTW
67	270940	19.5N	122.5E	PCN 4			PGTW
68	271028	19.6N	122.6E	PCN 3			PGTW
69	271200	19.6N	122.8E	PCN 4			PGTW
70	271427	19.0N	122.8E	PCN 3	T2.5/2.5 /S0.0/12HRS		RODN
71	271600	19.4N	123.0E	PCN 6	T3.0/3.0-/D0.5/24HRS		PGTW
72	271809	19.4N	123.3E	PCN 5			PGTW
73	271809	19.3N	123.0E	PCN 5		EXP LLCC	RKSO
74	272127	19.5N	123.6E	PCN 5			PGTW
75	272218	19.6N	123.5E	PCN 6			PGTW
76	280000	19.4N	123.2E	PCN 6			PGTW
77	280126	19.5N	123.0E	PCN 4	T3.5/3.5-/S0.0/24HRS	PSBL EYE	PGTW
78	280300	19.5N	123.1E	PCN 4			PGTW
79	280512	19.5N	123.0E	PCN 4			PGTW
80	280512	19.8N	123.2E	PCN 5	T3.5/3.5	INIT OBS	RPMK
81	280900	19.6N	123.7E	PCN 6			PGTW
82	281007	19.6N	123.8E	PCN 6			PGTW
83	281057	20.0N	124.0E	PCN 6			RODN
* 84	281200	19.7N	123.6E	PCN 6			PGTW
85	281406	20.0N	123.7E	PCN 4			PGTW
86	281600	20.0N	124.0E	PCN 6	T3.5/3.5 /D0.5/24HRS		PGTW
87	281758	20.0N	123.9E	PCN 6			RKSO
88	281800	20.0N	124.1E	PCN 6			PGTW
89	282100	20.2N	124.1E	PCN 6		ULCC FIX	PGTW
90	282335	20.7N	124.2E	PCN 3	T4.5/4.5	INIT OBS ULCC FIX	RODN
91	290000	20.5N	124.2E	PCN 4		ULCC FIX	PGTW
92	290106	20.8N	124.3E	PCN 3	T4.0/4.0-/D0.5/24HRS	ULCC FIX	PGTW
93	290300	20.9N	124.2E	PCN 4		ULCC FIX	PGTW
94	290600	21.2N	124.4E	PCN 4			PGTW
95	290900	21.0N	124.3E	PCN 6			PGTW
96	290946	21.1N	124.6E	PCN 4			PGTW
97	291033	21.5N	124.7E	PCN 3			RODN
98	291200	21.2N	124.8E	PCN 6			PGTW
99	291346	21.2N	125.0E	PCN 2		EYE 15NM	PGTW
100	291600	22.0N	125.1E	PCN 6	T4.5/4.5 /D1.0/24HRS		PGTW
101	291747	22.5N	125.5E	PCN 4		ILLDEFINED EYE	PGTW
102	291747	22.2N	125.8E	PCN 2		EYE 12 NM	RKSO
103	292100	22.6N	125.7E	PCN 2		EYE FIX	PGTW
104	292311	22.7N	126.2E	PCN 1	T4.5/4.5 /D0.5/24HRS	RAGGED EYE	RODN
105	292311	22.7N	126.1E	PCN 2		RAGGED EYE	RPMK
106	300000	22.8N	126.0E	PCN 2	T5.0/5.0-/D1.0/23HRS	EYE FIX	PGTW
107	300045	22.8N	125.9E	PCN 1		RAGGED EYE	PGTW
108	300300	23.3N	126.2E	PCN 4			PGTW
109	300451	23.3N	126.3E	PCN 1			PGTW
110	300600	23.6N	126.6E	PCN 4			PGTW
111	300633	23.5N	126.4E	PCN 3	T3.5/4.0 /W0.5/25HRS		RPMK
112	300900	23.8N	127.0E	PCN 6		ULCC FIX	PGTW
113	301008	23.5N	127.0E	PCN 6		ULCC FIX	PGTW
114	301008	23.8N	127.4E	PCN 5			RODN
115	301106	23.9N	127.6E	PCN 4			RPMK
116	301200	24.1N	127.7E	PCN 6		ULCC FIX	PGTW
117	301326	24.2N	127.6E	PCN 4		PSBL EYE	PGTW
118	301600	24.3N	127.6E	PCN 6	T5.0/5.0-/D0.5/24HRS	ULCC FIX	PGTW
119	301800	24.7N	128.1E	PCN 6		ULCC FIX	PGTW
120	301919	24.8N	128.0E	PCN 5			RKSO
121	302100	25.6N	128.9E	PCN 6			PGTW
122	302204	25.6N	129.8E	PCN 5	T5.0/5.0-/D0.5/23HRS		RODN
123	302247	25.6N	129.5E	PCN 5			PGTW
124	310000	25.1N	129.4E	PCN 6	T4.0/5.0 /W1.0/24HRS		PGTW
125	310025	25.2N	129.4E	PCN 5			PGTW
126	310300	25.4N	130.1E	PCN 6			PGTW
127	310440	25.3N	130.2E	PCN 3		EXP LLCC	PGTW
128	310600	25.6N	130.7E	PCN 4		EXP LLCC	PGTW
129	310900	25.5N	130.9E	PCN 6			PGTW
*130	311044	27.0N	133.6E	PCN 4			RPMK
131	311200	26.3N	132.4E	PCN 6			PGTW
132	311305	26.1N	133.1E	PCN 6			PGTW
133	311600	26.5N	133.2E	PCN 6	T3.5/4.0 /W1.5/24HRS		PGTW
134	311726	27.7N	134.4E	PCN 6			RODN
135	311726	26.7N	133.1E	PCN 6			PGTW
136	312100	27.1N	134.7E	PCN 6			PGTW
137	312143	27.7N	135.6E	PCN 5			RKSO
138	312222	27.1N	135.3E	PCN 5		EXP LLCC	PGTW
139	010005	27.2N	136.3E	PCN 3	T2.5/3.5 /W1.5/24HRS	EXP LLCC	PGTW
140	010300	27.5N	136.9E	PCN 4		EXP LLCC	PGTW
141	010429	27.6N	137.6E	PCN 4		EXP LLCC	PGTW
142	010600	27.7N	138.2E	PCN 4		EXP LLCC	PGTW
143	010919	28.0N	139.9E	PCN 6			PGTW
144	011245	28.3N	141.4E	PCN 6			PGTW

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN- DIAM/TATION	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	230100	12.9N 125.8E	1500FT		1004	35 090 10	140 27 070 60	6 5			+23 +25 + 28	2
2	232133	14.9N 122.2E	700MB	3035		25 050 40	170 46 050 31	5 2	CIRCULAR	20	+10 +12 + 5	3
3	240044	15.2N 122.1E	700MB	3041	995	30 020 50	120 56 030 18	5 3	CIRCULAR	30	+ 9 +13 + 8	3
4	242140	18.5N 119.4E	700MB	3067		45 350 63	080 30 350 63	5 3			+11 +13 + 8	4
5	242339	18.3N 119.1E	700MB	3057	1003	40 310 68	360 40 270 40	7 5			+12 +14 + 8	4
6	250605	17.9N 118.7E	1500FT		1001	40 050 64	150 47 050 64	10 1			+24 +24 + 28	5
7	250904	18.0N 118.9E	1500FT		1000	40 320 70	040 47 320 81	10 1			+23 +25 + 29	5
8	252058	18.1N 119.8E	700MB	3067	1001	20 310 145	070 35 330 44	10 3			+ 9 +11 +10	6
9	252345	18.0N 119.6E	1500FT		998	35 120 10	230 35 140 15	10 2			+24 +25 +23 27	6
10	262150	19.1N 122.5E	700MB	3056		45 080 30	130 48 090 65	4 2			+ 8 +12 + 9	8
11	270058	19.3N 122.4E	1500FT		996	55 170 17	250 52 170 17	7 1			+23 +25 +24	8
12	270615	19.5N 122.6E	700MB	3015	992	55 170 28	230 58 170 28	10 1			+21 +25 +23 27	9
13	270919	19.5N 122.5E	700MB	2977	988	30 010 100	090 57 360 55	5 2	ELLIPTICAL	25 15 030	+ 8 +11 + 8	9
14	272115	19.4N 123.2E	700MB	2989		35 090 120	340 47 260 32	10 2	CIRCULAR	30	+14 +15 +10	10
15	272351	19.5N 122.9E	700MB	3026	992	55 010 57	070 52 010 57	8 2	CIRCULAR	30	+10 +17 + 7	10

16	280523	19.5N	123.1E	700MB	2984			40	180	60	260	70	150	23	4	1	CIRCULAR	32			+10	+15	+ 9			11
17	280827	19.8N	123.4E	700MB	2959	985		70	300	10	290	72	190	9	4	1	CIRCULAR	30			+10	+14	+10			11
18	282109	20.5N	123.9E	700MB	2928			40	090	50	160	45	080	35	10	2	CIRCULAR	25			+ 9	+15	+ 8			12
19	290021	20.6N	123.9E	700MB	2937	979		80	030	8	300	66	270	15	5	1					+ 9	+17	+ 4			12
20	290613	21.3N	124.4E	700MB	2882			80	220	13	180	85	080	17	5	2	CIRCULAR	30			+13	+19	+ 7			13
21	290907	21.5N	124.6E	700MB	2859	972		90	100	7	250	90	180	7	10	2	CIRCULAR	20			+10	+19	+ 7			13
22	292111	22.7N	125.7E	700MB	2777			20	040	120	140	109	030	13	10	1	CIRCULAR	25			+10	+19	+ 9			14
23	300016	23.0N	125.9E	700MB	2797	963	110	230	6	240	100	180	8	10	1		CIRCULAR	25			+10	+21	+ 8			14
24	300507	23.4N	126.5E	700MB	2821	967	100	240	20	180	96	070	23	5	1		CIRCULAR	30			+12	+20	+ 9			15
25	300857	23.7N	126.9E	700MB	2841	969	60	320	15	270	85	260	24	5	1		CIRCULAR	20			+11	+22	+ 7			15
26	302135	25.0N	129.1E	700MB	3062		90	220	9	190	62	020	7	10	2		CIRCULAR	10			+12	+20	+			16
27	310020	25.2N	129.1E	700MB	3108	997	65	260	15	290	44	090	30	5	2						+14	+18	+			16
28	310611	26.0N	130.6E	1500FT		996	60	080	20	140	60	080	23	10	1						+	+25	+23		26	17
29	310823	26.0N	131.2E	1500FT		994	55	320	10	070	42	350	24	6	1						+	+26	+23		25	17
30	310240	27.6N	136.7E	1500FT		1003	55	150	30	290	54	140	35	5	1						+	+22	+20		26	19
31	310537	28.0N	137.9E	1500FT		1004	40	220	15	330	40	220	15	9	2						+	+23	+22		24	19

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION		RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR	TDOFF	COMMENTS	RADAR POSITION		SITE WMO NO.
1	231600	14.6N	123.4E	LAND				4////	4////		16.3N	120.6E	98321
2	231730	14.8N	123.4E	LAND				4////	53403		16.3N	120.6E	98321
3	231800	14.9N	123.3E	LAND				1060/	53012		16.3N	120.6E	98321
4	231800	14.7N	122.7E	LAND				11120	53217		14.1N	123.0E	98440
5	231830	14.9N	123.1E	LAND				1067/	52715		16.3N	120.6E	98321
6	231900	14.9N	122.9E	LAND				1079/	52716		16.3N	120.6E	98321
7	231900	14.9N	122.3E	LAND				21430	53218		14.1N	123.0E	98440
8	231930	14.9N	122.8E	LAND				1077/	52715		16.3N	120.6E	98321
9	232000	14.8N	122.7E	LAND				1071/	52612		16.3N	120.6E	98321
10	232030	14.8N	122.6E	LAND				1065/	52711		16.3N	120.6E	98321
11	232100	14.8N	122.5E	LAND				1061/	52612		16.3N	120.6E	98321
12	232100	14.6N	122.2E	LAND				21330	53021	EYE OPN SW	14.1N	123.0E	98440
13	232130	14.8N	122.6E	LAND				1065/	52711		16.3N	120.6E	98321
14	232200	14.8N	122.5E	LAND				1061/	5////	EYE 70 PCT CIR OPN SE	16.3N	120.6E	98321
15	232200	14.8N	122.2E	LAND				21230	53108	EYE OPN W	14.1N	123.0E	98440
16	232230	14.9N	122.4E	LAND				10561	52905	EYE 70 PCT CIR OPN SE	16.3N	120.6E	98321
17	232300	15.0N	122.3E	LAND				1163/	53210	100 PCT ELIP DIA 40/20	16.3N	120.6E	98321
18	232330	15.1N	122.3E	LAND				1067/	53211	EYE 80 PCT CIR OPN NE	16.3N	120.6E	98321
19	240000	15.0N	122.0E	LAND				21230	53211	EYE OPN NE	14.1N	123.0E	98440
20	240000	15.0N	122.0E	LAND				21230	53211	EYE OPN NW	10.3N	124.0E	98646
21	240030	15.2N	122.2E	LAND				1083/	53210	EYE 80 PCT CIR OPN NE	16.3N	120.6E	98321
22	240300	15.3N	121.9E	LAND				21420	53212	EYE ELIP OPN NW	14.1N	123.0E	98440
23	240300	15.6N	122.0E	LAND				1091/	53616	EYE 100 PCT CIR GOOD	16.3N	120.6E	98321
24	240330	15.6N	122.0E	LAND				1091/	53617		16.3N	120.6E	98321
25	240400	15.9N	122.0E	LAND				1091/	53620		16.3N	120.6E	98321
26	240430	16.0N	122.0E	LAND				1091/	53618		16.3N	120.6E	98321
27	240800	16.8N	122.1E	LAND				1041/	63619		16.3N	120.6E	98321
28	240830	17.1N	121.8E	LAND				1061/	53225		16.3N	120.6E	98321
29	241400	18.1N	121.1E	LAND				4////	63625		16.3N	120.6E	98321
30	250600	18.4N	118.7E	LAND				4////	4////		16.3N	120.6E	98321
31	260600	18.8N	120.1E	LAND				4////	70524		16.3N	120.6E	98321
32	260630	18.5N	120.6E	ACFT	FAIR						18.8N	119.9E	
33	260907	18.5N	120.7E	ACFT	FAIR						18.3N	119.5E	
34	290600	21.2N	124.3E	LAND				51913	40119		24.3N	124.2E	47918
35	290700	21.4N	124.3E	LAND				20883	50308		24.3N	124.2E	47918
36	290800	21.4N	124.4E	LAND				20913	50303		24.3N	124.2E	47918
37	290900	21.4N	124.5E	LAND				20814	70605		24.3N	124.2E	47918
38	291000	21.5N	124.7E	LAND				65/02	5////		24.8N	125.3E	47927
39	291000	21.5N	124.7E	LAND				21912	70707		24.3N	124.2E	47918
40	291100	21.6N	124.9E	LAND				65//4	56014		24.8N	125.3E	47927
41	291100	21.6N	124.8E	LAND				21912	70609		24.3N	124.2E	47918
42	291200	21.6N	124.9E	LAND				65//2	50000		24.8N	125.3E	47927
43	291200	21.6N	124.8E	LAND				21813	70607		24.3N	124.2E	47918
44	291300	21.7N	125.0E	LAND				65//2	54008		24.8N	125.3E	47927
45	291300	21.6N	125.0E	LAND				20814	70607		24.3N	124.2E	47918
46	291400	21.8N	125.1E	LAND							24.8N	125.3E	47927
47	291400	21.7N	125.1E	LAND				21914	70607		24.3N	124.2E	47918
48	291500	21.9N	125.2E	LAND				20874	50206		24.8N	125.3E	47927
49	291500	21.9N	125.0E	LAND				20624	70307		24.3N	124.2E	47918
50	291600	21.9N	125.2E	LAND				30813	50000		24.8N	125.3E	47927
51	291600	22.0N	125.1E	LAND				20815	70107		24.3N	124.2E	47918
52	291700	22.1N	125.4E	LAND				3//43	50514		24.8N	125.3E	47927
53	291700	22.1N	125.3E	LAND				21913	72008		24.3N	124.2E	47918
54	291800	22.2N	125.4E	LAND				21722	70509		24.3N	124.2E	47918
55	291800	22.2N	125.4E	LAND				3//13	50111		24.8N	125.3E	47927
56	291900	22.2N	125.4E	LAND	POOR		50			MOV 0420	24.8N	125.3E	47927
57	291900	22.3N	125.7E	LAND	POOR		50			MOV 0420	24.8N	125.3E	47927
58	291900	22.3N	125.5E	LAND				21914	50311		24.8N	125.3E	47927
59	291900	22.3N	125.5E	LAND				20813	70510		24.3N	124.2E	47918
60	292000	22.4N	125.7E	LAND				21813	70610		24.3N	124.2E	47918
61	292000	22.4N	125.7E	LAND				21814	50611		24.8N	125.3E	47927
62	292000	22.4N	125.7E	LAND	POOR		50			MOV 3610	24.8N	125.3E	47927
63	292100	22.6N	125.8E	LAND	POOR		50			MOV 0120	24.8N	125.3E	47927
64	292100	22.5N	125.7E	LAND				21913	50108		24.8N	125.3E	47927
65	292100	22.5N	125.8E	LAND				20823	70407		24.3N	124.2E	47918
66	292200	22.5N	125.8E	LAND				21813	70407		24.3N	124.2E	47918
67	292200	22.6N	125.8E	LAND				21813	50510		24.8N	125.3E	47927
68	292200	22.6N	125.8E	LAND	POOR		50			MOV 0910	24.8N	125.3E	47927
69	292300	22.7N	125.9E	LAND	POOR		50			MOV 0515	24.8N	125.3E	47927
70	292300	22.7N	125.9E	LAND				21873	50108		24.8N	125.3E	47927
71	292300	22.7N	125.9E	LAND				20813	70307		24.3N	124.2E	47918
72	300000	22.7N	125.9E	LAND				20813	70407		24.3N	124.2E	47918
73	300000	22.8N	126.0E	LAND				21914	50308		24.8N	125.3E	47927
74	300000	22.8N	126.0E	LAND	POOR		50			MOV 0320	24.8N	125.3E	47927
75	300100	23.0N	126.0E	LAND	GOOD		60			MOV 0320	24.8N	125.3E	47927
76	300100	22.9N	126.1E	LAND				11914	50311		24.8N	125.3E	47927
77	300100	22.8N	126.0E	LAND				21813	70306		24.3N	124.2E	47918
78	300200	22.9N	126.1E	LAND				22913	70306		24.3N	124.2E	47918
79	300200	23.0N	126.2E	LAND				11934	50608		24.8N	125.3E	47927
80	300200	23.0N	126.1E	LAND	GOOD		50			MOV 0320	24.8N	125.3E	47927
81	300300	23.2N	126.3E	LAND				6///1	/////		26.2N	127.8E	47937
82	300300	23.1N	126.1E	LAND				22912	70511		24.3N	124.2E	47918
83	300300	23.1N	126.3E	LAND	POOR		50			MOV 0315	24.8N	125.3E	47927
84	300300	23.1N	126.3E	LAND				25/43	50412		24.8N	125.3E	47927
85	300400	23.1N	126.3E	LAND				22912	70409		24.3N	124.2E	47918
86	300400	23.3N	126.4E	LAND				6///1	50408		26.2N	127.8E	47937
87	300400	23.2N	126.3E	LAND				22913	50108		24.8N	125.3E	47927
88	300500	23.3N	126.5E	LAND				6///1	60506		26.2N	127.8E	47937
89	300500	23.3N	126.5E	LAND				11913	50708		24.8N	125.3E	47927
90	300500	23.2N	126.5E	LAND				22913	70509		24.3N	124.2E	47918
91	300500	23.3N	126.5E	LAND	GOOD		50			MOV 0320	24.8N	125.3E	47927
92	300600	23.4N	126.7E	LAND	GOOD		50			MOV 0320	24.8N	125.3E	47927
93	300700	23.5N	126.8E	LAND				6///1	70608		26.2N	127.8E	47937
94	300700	23.5N	126.8E	LAND	POOR		50			MOV 0620	24.8N	125.3E	47927
95	300700	23.4N	126.8E	LAND				22913	70611		24.3N	124.2E	47918
96	300700	23.5N	126.8E	LAND				55/43	50711		24.8N	125.3E	47927
97	300800	23.5N	127.0E	LAND				6///1	70710		26.2N	127.8E	47937
98	300800	23.5N	127.0E	LAND	POOR		50			MOV 0620	24.8N	125.3E	47927
99	300800	23.5N	127.0E	LAND				65//3	50714		24.8N	125.3E	47927
100	300800	23.4N	127.0E	LAND				22812	70611		24.3N	124.2E	47918
101	300900	23.6N	127.1E	LAND				55//1	70711		26.2N	127.8E	47937
102	300900	23.7N	127.0E	LAND				3//72	53611		24.8N	125.3E	47927
103	300900	23.7N	127.2E	LAND	POOR		50			MOV 0320	24.8N	125.3E	47927
104	300900	23.5N	127.1E	LAND				21912	70608		24.3N	124.2E	47918
105	301000	23.7N	127.2E	LAND				55//1	70610		26.2N	127.8E	47937
106	301000	23.7N	127.4E	LAND				3//42	70612		24.3N	124.2E	47918
107	301000	23.7N	127.3E	LAND	POOR		50			MOV 0710	24.8N	125.3E	47927
108	301000	23.8N	127.3E	LAND				6///2	50616		24.8N	125.3E	47927
109	301100	23.9N	127.4E	LAND	POOR		50			MOV 0520	24.8N	125.3E	47927
110	301100	23.9N	127.3E	LAND				55//1	70409		26.2N	127.8E	47937
111	301100	23.9N	127.5E	LAND				3///2	50715		24.8N	125.3E	47927
112	301200	24.0N	127.6E	LAND	POOR		50			MOV 0620	24.8N	125.3E	47927
113	301235	24.0N	127.8E	LAND	POOR						26.4N	127.8E	47931
114	301335	24.2N	127.8E	LAND	POOR						26.4N	127.8E	47931
115	301400	24.2N	127.8E	LAND				3///1	50000		24.8N	125.3E	47927
116	301400	24.2N	127.7E	LAND				65//1	70509		26.2N	127.8E	47937
117	301400	24.3N	128.2E	LAND	POOR		50			MOV 0530	26.1N	127.7E	47937

118	301435	24.4N	128.0E	LAND	POOR					26.4N	127.8E	47931
119	301500	24.3N	127.9E	LAND			55//1	70511		26.2N	127.8E	47937
120	301500	24.4N	128.0E	LAND			3///1	50415		24.8N	125.3E	47927
121	301535	24.5N	128.0E	LAND	POOR					26.4N	127.8E	47931
122	301600	24.4N	128.4E	LAND	GOOD	45				26.3N	126.8E	47929
123	301635	24.5N	128.5E	LAND	POOR					26.4N	127.8E	47931
124	301700	24.5N	128.3E	LAND			65//1	70612		26.2N	127.8E	47937
125	301700	24.6N	128.4E	LAND			3///0	50522		24.8N	125.3E	47927
126	301735	24.6N	128.5E	LAND	POOR					26.4N	127.8E	47931
127	301800	24.6N	128.5E	LAND			65//1	70612		26.2N	127.8E	47937
128	301800	24.8N	128.6E	LAND	GOOD	45			MOV 0320	26.1N	127.7E	47937
129	301835	24.8N	128.8E	LAND	POOR					26.4N	127.8E	47931
130	301900	24.8N	128.9E	LAND	GOOD	45			MOV 0330	26.1N	127.7E	47937
131	302000	25.0N	129.1E	LAND			6///1	70518		26.2N	127.8E	47937
132	302100	25.2N	129.4E	LAND			6///1	70519		26.2N	127.8E	47937
133	302300	25.6N	129.7E	LAND			52341	50411		28.4N	129.5E	47909
*134	310000	25.5N	130.1E	LAND			65/40	50922		28.4N	129.5E	47909
135	310300	25.7N	130.7E	LAND			6//40	50605		28.4N	129.5E	47909
136	310400	25.8N	130.7E	LAND			6//40	50305		28.4N	129.5E	47909
137	310500	25.9N	130.7E	LAND			6//40	50208		28.4N	129.5E	47909
138	310600	25.9N	130.9E	LAND			6///0	50911		28.4N	129.5E	47909
139	310700	25.9N	131.0E	LAND			6///0	50805		28.4N	129.5E	47909

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL STORM GORDON
BEST TRACK DATA

	BEST TRACK			WARNING				24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS				ERRORS				ERRORS				ERRORS	
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
111918Z	6.8	108.1	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
112000Z	8.0	109.2	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
112006Z	8.2	110.2	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
112012Z	8.1	111.0	30	9.1	110.4	30.	70.	0.	10.6	109.7	40.	220.	5.	11.6	108.5	45.	275.	15.	12.0	107.3	25.	321.	-5.
112018Z	8.0	111.6	35	9.4	110.4	30.	110.	-5.	10.7	109.7	40.	218.	10.	11.7	108.5	45.	261.	15.	0.0	0.0	0.	-0.	0.
112100Z	8.0	112.1	35	8.2	112.0	30.	13.	-5.	9.2	113.0	35.	27.	5.	10.5	112.0	45.	61.	15.	11.2	110.5	50.	114.	15.
112106Z	8.1	112.3	35	8.7	112.5	35.	38.	0.	10.3	112.1	40.	82.	10.	11.0	110.7	45.	119.	15.	11.6	109.2	50.	189.	15.
112112Z	8.3	112.6	35	9.6	112.5	35.	78.	0.	11.0	110.8	40.	148.	10.	11.8	109.1	45.	220.	15.	12.4	107.2	30.	296.	-5.
112118Z	8.6	112.7	30	10.2	112.7	35.	96.	5.	11.6	111.0	45.	155.	15.	12.8	109.4	50.	228.	15.	13.9	108.2	30.	231.	-10.
112200Z	8.8	112.8	30	10.8	113.0	35.	121.	5.	12.6	111.8	40.	187.	10.	14.1	109.8	35.	250.	0.	16.4	109.0	30.	278.	-15.
112206Z	9.0	112.5	30	9.3	112.8	30.	25.	0.	10.5	112.9	25.	55.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
112212Z	9.1	112.4	30	9.3	112.8	30.	27.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
112218Z	9.3	112.2	30	9.3	112.8	25.	36.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
112300Z	9.5	112.2	30	9.3	112.3	25.	13.	-5.	10.0	111.6	20.	67.	-15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
112306Z	9.8	112.3	30	9.5	112.2	35.	19.	5.	10.2	110.8	40.	115.	5.	11.0	108.3	45.	136.	5.	0.0	0.0	0.	-0.	0.
112312Z	10.1	112.4	30	9.7	112.4	40.	24.	10.	10.5	111.8	45.	81.	10.	11.5	110.0	50.	75.	15.	0.0	0.0	0.	-0.	0.
112318Z	10.4	112.4	35	10.3	112.2	40.	13.	5.	11.4	110.7	50.	72.	10.	11.8	108.7	35.	72.	5.	0.0	0.0	0.	-0.	0.
112400Z	10.8	112.4	35	10.7	112.0	40.	24.	5.	12.1	110.7	50.	19.	5.	13.1	109.0	35.	47.	15.	0.0	0.0	0.	-0.	0.
112406Z	11.3	112.4	35	11.0	112.4	45.	18.	10.	12.4	111.7	50.	88.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
112412Z	11.8	112.2	35	11.7	112.4	45.	13.	10.	13.5	111.2	55.	118.	20.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
112418Z	12.1	111.7	40	11.8	112.3	45.	40.	5.	13.2	111.6	55.	164.	25.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
112500Z	12.2	111.0	45	12.1	111.6	40.	36.	-5.	13.2	110.3	50.	118.	30.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
112506Z	12.3	110.2	40	12.3	110.4	45.	12.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
112512Z	12.6	109.4	35	12.6	109.4	30.	0.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
112518Z	13.0	108.8	30	13.0	108.6	25.	12.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
112600Z	13.5	108.3	20	13.3	108.5	20.	17.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	37.	114.	159.	238.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	16.	51.	58.	80.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	4.	12.	12.	11.	0.	0.	0.	0.
AVG INTENSITY BIAS	1.	9.	12.	-1.	0.	0.	0.	0.
NUMBER OF FORECASTS	23	17	11	6	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 797. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 5. KNOTS

TROPICAL STORM GORDON
FIX POSITIONS FOR CYCLONE NO. 24

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	200205	7.8N 110.2E	PCN 5	T2.5/2.5	INIT OBS	RODN
	2	200208	9.3N 111.3E	PCN 6			KGWC
	3	200300	8.2N 109.4E	PCN 6	T2.0/2.0	INIT OBS	PGTW
	4	200600	8.4N 110.3E	PCN 6			PGTW
	5	200900	8.8N 110.5E	PCN 6			PGTW
*	6	201200	9.2N 110.5E	PCN 6			PGTW
	7	201445	8.8N 110.8E	PCN 6		ULAC 09.1N 110.1E	KGWC
*	8	201600	9.3N 110.5E	PCN 6	T2.0/2.0	INIT OBS	PGTW
*	9	201800	9.4N 110.4E	PCN 6			PGTW
*	10	201855	9.4N 110.8E	PCN 6		ULAC 09.6N 110.1E	KGWC
*	11	201855	9.8N 109.9E	PCN 5			RODN
*	12	202100	9.8N 110.3E	PCN 6			PGTW
	13	202303	8.0N 112.0E	PCN 4		ULAC 10.0N 110.3E	KGWC
	14	202303	8.0N 112.0E	PCN 4			RODN
	15	210000	8.0N 112.1E	PCN 4		EXP LLCC	PGTW
	16	210145	8.0N 112.2E	PCN 3	T2.5/2.5 /D0.5/24HRS		KGWC
	17	210145	8.0N 112.2E	PCN 3	T2.5/2.5 /D0.5/24HRS		RODN
	18	210300	8.6N 112.2E	PCN 4	T2.5/2.5 /D0.5/24HRS	PART EXP LLCC	PGTW
	19	210600	8.8N 112.5E	PCN 6			PGTW
*	20	210740	9.2N 113.1E	PCN 5			KGWC
*	21	210900	9.4N 112.6E	PCN 6			PGTW
*	22	211143	10.0N 113.7E	PCN 6		ULAC 10.1N 111.7E	KGWC
*	23	211200	9.8N 112.1E	PCN 6		ULAC 10.1N 111.0E	PGTW
*	24	211425	9.9N 113.2E	PCN 4		EXP LLCC	KGWC
*	25	211426	10.3N 112.7E	PCN 5			RODN
*	26	211600	10.4N 112.4E	PCN 6	T2.5/2.5 /D0.5/24HRS		PGTW
*	27	211800	10.2N 112.8E	PCN 6			PGTW
*	28	211844	10.3N 113.4E	PCN 6		ULCC 11.5N 111.9E	KGWC
*	29	211844	11.1N 112.6E	PCN 5			RODN
*	30	212242	10.6N 113.5E	PCN 6			KGWC
	31	220000	9.9N 112.6E	PCN 6		ULCC FIX	PGTW
	32	220300	9.1N 113.3E	PCN 6	T1.5/2.5+/W1.0/24HRS		PGTW
	33	220306	8.9N 113.5E	PCN 3	T2.5/2.5 /S0.0/25HRS	PART EXP LLCC ULAC 10.3N 113.	KGWC
	34	220600	9.0N 112.9E	PCN 6			PGTW
*	35	220730	9.3N 113.3E	PCN 5			KGWC
	36	220900	9.2N 112.8E	PCN 6			PGTW
*	37	221055	9.7N 114.5E	PCN 6			RODN
	38	221122	9.0N 113.1E	PCN 6		ULAC 08.9N 111.7E	KGWC
	39	221200	9.2N 112.5E	PCN 6			PGTW
*	40	221405	8.3N 113.4E	PCN 4		EXP LLCC	KGWC
	41	221600	9.0N 112.5E	PCN 6	T1.5/2.5 /W1.0/24HRS		PGTW
	42	221800	9.2N 112.6E	PCN 6			PGTW
*	43	221833	8.5N 113.1E	PCN 4		ULAC 08.8N 112.0E	KGWC
*	44	222220	8.6N 113.0E	PCN 6		ULAC 08.6N 111.2E	KGWC
*	45	222220	9.7N 110.8E	PCN 6			RODN
	46	230000	9.2N 112.1E	PCN 4		EXP LLCC	PGTW
	47	230245	9.0N 112.4E	PCN 5	T2.5/2.5 /S0.0/24HRS	ULAC 09.0N 111.3E	KGWC
	48	230246	9.2N 113.2E	PCN 6	T2.0/2.0	INIT OBS	RODN
	49	230300	8.9N 112.4E	PCN 6	T2.0/2.0 /D0.5/24HRS	EXP LLCC	PGTW
	50	230600	9.4N 112.6E	PCN 4		EXP LLCC	PGTW
	51	230719	9.5N 112.9E	PCN 3		EXP LLCC ULAC 09.9N 111.4E	KGWC
	52	230900	9.6N 112.8E	PCN 6			PGTW
	53	231031	10.7N 111.8E	PCN 6		ULCC FIX	RODN
	54	231100	10.1N 112.6E	PCN 4		EXP LLCC ULAC 11.0N 111.9E	KGWC
	55	231101	9.8N 112.7E	PCN 5		EXP LLCC	RODN
	56	231200	9.8N 112.6E	PCN 6		ULCC 10.7N 111.9E	PGTW
	57	231526	10.5N 112.1E	PCN 4	T2.5/2.5	INIT OBS EXP LLCC	KGWC
	58	231600	10.2N 112.5E	PCN 6		ULCC 11.2N 111.8E	PGTW
	59	231800	10.6N 112.4E	PCN 6	T2.5/2.5 /D1.0/26HRS	ULCC 11.6N 111.7E	PGTW

60	232100	10.7N 112.3E	PCN 6		EXP LLCC		PGTW
61	232159	10.6N 112.2E	PCN 4		EXP LLCC ULAC 11.0N 111.6E		KGWC
62	232200	10.6N 112.2E	PCN 4		EXP LLCC		PGTW
63	240000	10.8N 112.3E	PCN 4		EXP LLCC		PGTW
64	240225	10.8N 112.3E	PCN 3	T2.5/2.5 /S0.0/24HRS	EXP LLCC ULAC 11.3N 110.9E		KGWC
65	240225	10.8N 112.8E	PCN 3	T2.5/2.5 /D0.5/24HRS			RODN
66	240300	10.9N 112.4E	PCN 4	T2.5/2.5 /D0.5/24HRS	EXP LLCC		PGTW
67	240600	11.2N 112.8E	PCN 6				PGTW
68	240708	11.1N 112.9E	PCN 3		PART EXP LLCC ULAC 11.2N 111.		KGWC
69	240708	11.4N 112.2E	PCN 3				RODN
70	240900	11.5N 112.5E	PCN 6				PGTW
71	241039	11.7N 112.3E	PCN 3				RODN
72	241200	11.9N 112.0E	PCN 6		EXP LLCC		PGTW
73	241200	11.5N 112.3E	PCN 6		ULCC 12.0N 111.0E		PGTW
74	241506	11.5N 112.3E	PCN 5				RODN
75	241600	11.6N 112.2E	PCN 6	T2.5/2.5 /S0.0/22HRS			PGTW
76	241800	11.8N 112.2E	PCN 6		ULCC 12.2N 110.8E		PGTW
77	250000	12.2N 111.5E	PCN 4		EXP LLCC		PGTW
78	250205	11.3N 110.3E	PCN 5	T3.0/3.0 /D0.5/24HRS			RODN
79	250300	12.3N 110.6E	PCN 6	T3.0/3.0-/D0.5/24HRS			PGTW
80	250600	12.4N 110.2E	PCN 6				PGTW
81	250900	12.3N 109.8E	PCN 6		ULCC FIX		PGTW
82	251200	13.0N 108.6E	PCN 6		ULCC FIX		PGTW
* 83	251446	13.9N 108.0E	PCN 5		ULCC FIX		RODN
84	251943	12.3N 108.0E	PCN 5		ULCC FIX		RODN
85	252100	12.9N 108.8E	PCN 6				PGTW
86	260000	13.5N 108.9E	PCN 6				PGTW

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN- DIAM/TATION	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	220454	9.3N 112.5E	1500FT		1006	25 270 42	190 27 090 78	2 23			+24 +24 +24 26	1
2	230116	9.4N 112.4E	1500FT		1003	35 130 90	250 43 130 110	0 15			+23 +24 +22 27	2
3	240159	10.8N 112.4E	1500FT		1002	45 220 30	250 37 170 45	2 3			+26 +26 +26 26	3

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TYPHOON HOPE
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST						48 HOUR FORECAST						72 HOUR FORECAST					
							ERRORS						ERRORS						ERRORS					
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND
121700Z	9.2	140.0	20	0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.
121706Z	9.4	139.4	25	0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.
121712Z	9.7	138.8	25	0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.
121718Z	10.1	138.3	35	10.6	138.4	30.	31.	-5.	12.1	135.6	40.	71.	-20.	12.4	132.0	40.	184.	-45.	11.7	128.0	35.	176.	-55.			
121800Z	10.4	137.8	40	10.4	137.6	40.	12.	0.	11.0	135.1	50.	105.	-15.	11.5	132.3	60.	152.	-35.	11.6	129.2	60.	132.	-25.			
121806Z	10.7	137.3	50	10.6	137.0	50.	19.	0.	11.2	134.3	65.	139.	0.	11.5	131.2	70.	144.	-30.	11.9	127.1	70.	131.	-5.			
121812Z	11.2	136.9	55	10.9	136.9	55.	18.	0.	11.7	135.0	65.	108.	-10.	12.3	132.2	70.	99.	-30.	12.7	128.6	70.	109.	5.			
121818Z	11.6	136.7	60	11.3	136.3	60.	30.	0.	11.8	134.4	70.	112.	-15.	12.4	131.6	80.	113.	-10.	12.6	128.0	90.	147.	25.			
121900Z	12.1	136.5	65	12.0	136.5	65.	6.	0.	13.8	134.9	75.	76.	-20.	15.2	131.8	70.	173.	-15.	15.3	127.6	60.	105.	-5.			
121906Z	12.7	136.1	65	12.7	136.1	70.	0.	5.	15.0	134.0	75.	125.	-25.	15.9	130.7	65.	192.	-10.	16.3	126.5	50.	52.	-15.			
121912Z	13.4	135.6	75	13.3	135.8	75.	12.	0.	15.1	133.8	75.	168.	-25.	15.9	130.1	60.	207.	-5.	16.3	126.0	45.	30.	-20.			
121918Z	13.6	134.9	85	13.8	135.3	80.	26.	-5.	15.4	133.1	70.	197.	-20.	16.0	129.3	55.	198.	-10.	16.2	125.2	45.	89.	-20.			
122000Z	13.7	133.6	95	13.6	133.7	95.	8.	0.	14.0	130.1	90.	54.	5.	15.1	126.6	75.	46.	10.	17.4	124.2	65.	143.	-5.			
122006Z	13.6	132.4	100	13.6	132.5	100.	6.	0.	14.1	128.4	90.	21.	15.	15.7	125.0	75.	42.	10.	19.0	123.3	65.	222.	-10.			
122012Z	13.7	131.3	100	13.6	131.3	100.	6.	0.	14.1	127.1	85.	13.	20.	15.7	123.9	70.	120.	5.	19.4	123.7	60.	289.	-10.			
122018Z	13.7	130.2	90	13.8	130.2	95.	6.	5.	14.5	126.3	80.	6.	15.	16.4	123.2	70.	177.	5.	20.3	125.4	55.	292.	-5.			
122100Z	13.8	129.2	85	13.8	129.2	95.	0.	10.	14.8	125.4	80.	29.	15.	17.5	123.0	70.	209.	0.	20.7	126.1	55.	305.	5.			
122106Z	13.8	128.2	75	14.0	128.2	85.	12.	10.	15.2	124.7	70.	71.	5.	18.2	123.2	70.	230.	-5.	0.0	0.0	0.	-0.	0.			
122112Z	13.9	127.2	65	13.9	127.1	75.	6.	10.	15.0	123.5	60.	163.	-5.	18.0	123.2	50.	303.	-20.	0.0	0.0	0.	-0.	0.			
122118Z	14.4	126.3	65	14.0	126.2	75.	25.	10.	15.2	123.4	60.	204.	-5.	17.4	123.2	50.	405.	-10.	0.0	0.0	0.	-0.	0.			
122200Z	15.1	125.8	65	14.6	125.5	70.	35.	5.	15.8	122.7	55.	263.	-15.	16.3	120.2	35.	618.	-15.	0.0	0.0	0.	-0.	0.			
122206Z	15.9	125.7	65	15.8	125.2	70.	29.	5.	18.7	124.0	60.	182.	-15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
122212Z	16.7	125.7	65	16.7	125.4	65.	17.	0.	20.2	125.6	55.	192.	-15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
122218Z	17.4	126.1	65	17.5	125.6	65.	29.	0.	20.8	126.9	50.	232.	-10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
122300Z	18.1	126.6	70	18.1	126.7	75.	6.	5.	20.6	129.3	65.	167.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
122306Z	18.7	127.2	75	18.9	126.9	75.	21.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
122312Z	19.1	128.8	70	19.3	128.3	75.	31.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
122318Z	18.5	130.2	60	19.9	129.5	70.	93.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			
122400Z	18.2	130.8	50	18.1	130.8	50.	6.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.			

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	19.	123.	201.	159.	19.	123.	201.	159.
AVG RIGHT ANGLE ERROR	15.	83.	124.	102.	15.	83.	124.	102.
AVG INTENSITY MAGNITUDE ERROR	3.	14.	15.	15.	3.	14.	15.	15.
AVG INTENSITY BIAS	3.	-6.	-12.	-10.	3.	-6.	-12.	-10.
NUMBER OF FORECASTS	26	22	18	14	26	22	18	14

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1444. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 9. KNOTS

TYPHOON HOPE
FIX POSITIONS FOR CYCLONE NO. 25

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
*	1	162100	7.9N 138.3E	PCN 6	T1.0/1.0	INIT OBS	PGTW
	2	170123	9.3N 139.5E	PCN 6			PGTW
	3	170441	9.2N 140.4E	PCN 6	T2.0/2.0	INIT OBS	PGTW
	4	170600	9.6N 139.7E	PCN 6			PGTW
	5	170900	9.8N 139.2E	PCN 6			PGTW
	6	171200	10.2N 138.6E	PCN 6		ULCC 10.3N 137.6E	PGTW
	7	171600	10.8N 138.3E	PCN 6	T2.0/2.0-/D1.0/19HRS		PGTW
	8	172100	10.8N 137.7E	PCN 6			PGTW
	9	180000	10.5N 137.3E	PCN 6			PGTW
	10	180103	10.7N 137.9E	PCN 6	T2.0/2.0	INIT OBS	RPMK
	11	180300	10.5N 137.1E	PCN 6	T3.0/3.0 /D1.0/22HRS		PGTW
	12	180600	10.6N 137.0E	PCN 6			PGTW
	13	180900	10.8N 137.2E	PCN 6			PGTW
	14	181200	11.2N 137.1E	PCN 6			PGTW
	15	181344	11.0N 137.2E	PCN 6			PGTW
	16	181716	11.3N 136.5E	PCN 5	T4.0/4.0 /D2.0/25HRS		PGTW
	17	182100	11.4N 136.5E	PCN 6			PGTW
	18	190000	11.6N 136.8E	PCN 4			PGTW
	19	190300	12.4N 136.3E	PCN 2	T4.5/4.5-/D1.5/24HRS	BANDNG TYPE EYE	PGTW
	20	190600	12.8N 136.2E	PCN 2		BANDNG TYPE EYE	PGTW
	21	190601	12.8N 136.2E	PCN 3	T4.5/4.5	INIT OBS	RODN
	22	190900	12.8N 136.0E	PCN 4			PGTW
	23	191013	13.1N 135.8E	PCN 4			RPMK
	24	191200	13.2N 135.9E	PCN 2		DEVLPNG EYE	PGTW
	25	191323	14.2N 135.7E	PCN 5	T4.5/4.5	INIT OBS DEVLPNG EYE	RODN
	26	191600	13.7N 135.5E	PCN 6	T4.5/4.5 /D0.5/23HRS		PGTW
	27	191800	13.7N 135.3E	PCN 4			PGTW
	28	192100	13.7N 134.5E	PCN 4			PGTW
	29	192112	13.7N 134.1E	PCN 4		EYE	PGTW
	30	192112	14.1N 134.7E	PCN 4			RPMK
	31	200000	14.0N 133.5E	PCN 4		BANDNG EYE	PGTW
	32	200022	13.8N 133.6E	PCN 4		EYE 30NM	PGTW
	33	200022	14.0N 133.2E	PCN 2	T4.0/4.0	INIT OBS BANDNG EYE	RPMK
	34	200300	13.9N 133.0E	PCN 2	T5.0/5.0 /D0.5/24HRS	EYE 35NM	PGTW
	35	200600	13.8N 132.5E	PCN 2		RGD EYE	PGTW
	36	200900	13.7N 132.1E	PCN 4			PGTW
	37	200952	13.7N 131.5E	PCN 2		RGD EYE	PGTW
	38	201200	13.8N 131.3E	PCN 6			PGTW
	39	201303	13.8N 130.7E	PCN 6			PGTW
	40	201600	13.9N 130.5E	PCN 6	T4.5/4.5 /S0.0/24HRS		PGTW
	41	201836	14.1N 130.2E	PCN 4			PGTW
	42	201836	13.9N 130.0E	PCN 4		DVLPNG EYE	RODN
	43	202100	13.8N 130.6E	PCN 6			PGTW
	44	210000	13.4N 129.8E	PCN 6			PGTW
	45	210143	13.6N 128.4E	PCN 5			PGTW
	46	210300	13.8N 128.3E	PCN 6	T4.5/5.0 /W0.5/24HRS		PGTW
	47	210540	13.7N 127.9E	PCN 5			PGTW
	48	210600	13.8N 128.1E	PCN 6			PGTW
	49	210900	14.3N 127.9E	PCN 6			PGTW
	50	211200	14.1N 127.1E	PCN 6		ULCC FIX	PGTW
	51	211424	14.5N 126.5E	PCN 5			RPMK
	52	211600	14.5N 126.5E	PCN 6	T3.5/4.5 /W1.0/24HRS	ULCC FIX	PGTW
	53	211800	14.5N 126.4E	PCN 6		ULCC FIX	PGTW
	54	211826	14.4N 126.2E	PCN 6			RODN
	55	212100	14.6N 126.0E	PCN 6			PGTW
	56	212211	15.0N 125.7E	PCN 4	T3.0/4.0 /W1.0/21HRS		RPMK

57	220000	15.0N 125.9E	PCN 6					PGTW
58	220123	15.3N 125.9E	PCN 3					RPMK
59	220123	15.4N 125.9E	PCN 5	T3.5/3.5		INIT OBS		RODN
60	220300	15.6N 126.0E	PCN 6	T3.5/4.5 /W1.0/24HRS				PGTW
61	220529	15.9N 125.6E	PCN 5					RODN
62	220600	16.0N 126.0E	PCN 6					PGTW
63	220900	16.3N 125.9E	PCN 6					PGTW
64	221050	16.3N 125.9E	PCN 6					RPMK
65	221200	16.7N 125.6E	PCN 6					PGTW
66	221405	16.1N 126.1E	PCN 6					RPMK
67	221600	17.3N 125.9E	PCN 6	T3.0/4.0 /W0.5/24HRS				PGTW
68	221800	17.5N 125.8E	PCN 6					PGTW
69	221815	17.5N 125.3E	PCN 6					RODN
70	222100	17.8N 126.2E	PCN 6					PGTW
71	222149	17.9N 126.3E	PCN 4					RPMK
72	230000	18.2N 126.6E	PCN 6					PGTW
73	230103	18.2N 126.6E	PCN 3	T3.5/3.5-/D0.5/27HRS				RPMK
74	230300	18.5N 126.7E	PCN 6	T3.5/3.5-/S0.0/24HRS				PGTW
75	230518	18.8N 126.6E	PCN 3	T4.0/4.0-/D0.5/28HRS				RODN
76	230600	18.7N 126.9E	PCN 6					PGTW
77	230900	18.7N 127.5E	PCN 6					PGTW
78	231029	19.3N 127.3E	PCN 5	T3.5/3.5		INIT OBS ULCC FIX		RODN
79	231200	19.7N 128.0E	PCN 6					PGTW
80	231343	18.2N 128.9E	PCN 6			EXP LLCC		RPMK
* 81	231600	20.4N 129.3E	PCN 6	T2.5/3.5-/W0.5/24HRS		ULCC FIX		PGTW
* 82	231800	20.5N 130.2E	PCN 6					PGTW
* 83	231804	22.3N 132.0E	PCN 5			ULCC FIX		RODN
84	232128	18.7N 130.8E	PCN 4	T2.0/3.5 /W1.5/21HRS		EXP LLCC ULCC 22.0N 133.3E		RPMK
85	240000	17.8N 130.8E	PCN 4			EXP LLCC		PGTW
86	240042	18.0N 130.9E	PCN 3	T1.5/1.5		INIT OBS		RKSO
87	240300	18.0N 131.2E	PCN 4					PGTW
88	240600	17.9N 131.5E	PCN 4			EXP LLCC		PGTW
89	240900	17.6N 131.6E	PCN 4			EXP LLCC		PGTW
90	241200	17.6N 131.8E	PCN 6					PGTW

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN- DIAM/TATION	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	180003	10.3N 137.7E	1500FT		996	50 330 60	020 50 330 60	3 1			+25 +25 +25	1
2	180229	10.5N 137.5E	1500FT		992	40 200 35	300 36 200 35	4 1			+25 +26 +25	1
3	182100	11.7N 136.8E	700MB	2877	975	60 350 30	090 55 350 53	6 1	CIRCULAR	19	+12 +14 +12	2
4	182337	11.9N 136.5E	700MB	2881	976	70 290 25	260 67 180 75	7 3	CIRCULAR	25	+13 +13 +12	2
5	190653	12.8N 136.1E	700MB	2789	964	65 090 80	190 74 090 103	10 2	ELLIPTICAL	20 10 170	+13 +17 +12	3
6	190923	13.0N 135.9E	700MB	2789	964	55 270 90	320 58 270 65	10 2	ELLIPTICAL	25 20 030	+13 +14 +14	3
7	192123	13.6N 134.3E	700MB	2753		100 080 15	160 105 080 20	3 1	ELLIPTICAL	50 40 140	+ +20 +11	5
8	200022	13.6N 133.7E	700MB	2743	958	95 040 20	240 78 190 20	3 1	ELLIPTICAL	60 50 140	+12 +24 + 9	5
9	200602	13.5N 132.4E	700MB	2654	948	100 080 15	100 107 020 30	9 1	CIRCULAR	45	+12 +20 +12	6
10	200835	13.5N 131.9E	700MB	2684	950	90 170 15	350 86 270 43	8 1			+11 +21 + 9	6
11	202103	13.6N 129.6E	700MB	2753			060 108 310 30	10 3			+12 +15 +15	7
12	210604	13.8N 128.2E	700MB	2794		70 090 40	100 86 350 35	10 2			+21 +23 + 5	8
13	210842	13.8N 127.8E	700MB	2846	971	70 160 40	360 63 260 55	10 10			+15 +16 +12	8
14	222157	17.9N 122.6E	700MB	2896		45 030 90	140 66 030 50	6 5			+11 +16 +11	12
15	230029	17.9N 126.6E	700MB	2903	978	100 160 35	250 85 160 35	6 10			+11 +16 +11	12
16	230926	18.9N 128.2E	700MB	2993		80 250 50	360 60 250 50	10 4			+14 +17 + 8	13
17	232305	18.2N 130.7E	1500FT		999	70 350 110	350 35 240 15	12 20			+25 + +	14

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL STORM IRVING
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST						48 HOUR FORECAST						72 HOUR FORECAST					
						ERRORS						ERRORS						ERRORS						ERRORS
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	
121606Z	7.6	114.6	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
121612Z	7.5	114.9	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
121618Z	7.5	115.2	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
121700Z	7.6	115.5	35	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
121706Z	7.9	115.5	40	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
121712Z	8.0	115.2	45	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
121718Z	8.0	114.9	50	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
121800Z	7.8	114.6	55	7.9	114.7	60.	8.	5.	8.1	113.7	70.	32.	20.	8.5	112.1	75.	77.	30.	9.4	110.4	65.	127.	30.	
121806Z	7.6	114.4	60	7.9	114.5	60.	19.	0.	8.1	113.6	70.	27.	25.	8.5	112.0	75.	120.	30.	9.5	110.2	65.	154.	35.	
121812Z	7.3	114.3	55	8.0	113.9	60.	48.	5.	8.4	112.0	70.	27.	25.	9.1	109.7	70.	85.	30.	9.7	107.5	65.	127.	35.	
121818Z	7.2	113.9	55	8.0	113.7	60.	49.	5.	8.1	112.8	65.	83.	20.	8.6	110.5	55.	112.	20.	9.5	107.3	50.	167.	20.	
121900Z	7.6	113.5	50	7.5	113.5	50.	6.	0.	7.2	112.6	50.	148.	5.	7.4	111.4	45.	208.	10.	7.6	110.3	45.	277.	20.	
121906Z	8.3	113.2	45	7.7	113.4	45.	38.	0.	7.8	112.6	45.	170.	0.	7.9	111.8	40.	233.	10.	0.0	0.0	0.	-0.	0.	
121912Z	8.6	112.4	45	7.9	113.1	45.	59.	0.	8.1	111.9	40.	168.	0.	8.2	110.7	35.	211.	5.	0.0	0.0	0.	-0.	0.	
121918Z	8.8	111.6	45	8.0	112.6	45.	76.	0.	8.7	110.7	40.	120.	5.	9.4	109.0	35.	211.	5.	0.0	0.0	0.	-0.	0.	
122000Z	9.0	110.9	45	8.5	111.4	45.	42.	0.	9.5	109.2	45.	61.	10.	10.5	107.1	40.	273.	15.	0.0	0.0	0.	-0.	0.	
122006Z	9.2	110.1	45	9.3	109.7	45.	24.	0.	11.7	106.0	30.	233.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
122012Z	9.4	109.4	40	9.6	109.2	45.	17.	5.	11.3	105.8	30.	237.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
122018Z	9.4	108.8	35	9.7	108.5	40.	25.	5.	11.2	105.3	25.	275.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
122100Z	9.0	108.3	35	9.7	108.1	35.	44.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
122106Z	8.3	107.9	30	8.8	107.6	30.	35.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
122112Z	7.6	107.2	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
122118Z	6.8	106.6	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
122200Z	6.1	105.9	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	35.	132.	163.	170.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	18.	73.	41.	51.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	2.	10.	17.	28.	0.	0.	0.	0.
AVG INTENSITY BIAS	2.	9.	17.	28.	0.	0.	0.	0.
NUMBER OF FORECASTS	14	12	9	5	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 806. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 6. KNOTS

TROPICAL STORM IRVING
FIX POSITIONS FOR CYCLONE NO. 26

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	160600	7.6N 114.5E	PCN 6	T1.0/1.0	INIT OBS	PGTW
	2	160900	7.6N 114.6E	PCN 6			PGTW
	3	161200	7.4N 115.1E	PCN 6			PGTW
	4	161600	7.5N 114.7E	PCN 6	T1.5/1.5	INIT OBS	PGTW
	5	161800	7.6N 114.9E	PCN 6			PGTW
	6	162100	7.6N 115.3E	PCN 6			PGTW
	7	170000	7.6N 115.5E	PCN 6			PGTW
	8	170600	7.9N 115.1E	PCN 6	T2.5/2.5-/D1.5/24HRS		PGTW
	9	170900	7.8N 115.0E	PCN 6			RODN
	10	171056	7.8N 115.6E	PCN 3	T3.0/3.0	INIT OBS	PGTW
	11	171200	7.9N 115.2E	PCN 6			RODN
	12	171404	8.2N 115.5E	PCN 5		PART EXP LLCC	PGTW
	13	171600	8.1N 115.2E	PCN 6	T2.5/2.5-/D1.0/24HRS		RODN
	14	171909	7.9N 115.2E	PCN 5			PGTW
	15	172100	8.6N 114.6E	PCN 6			PGTW
	16	180000	8.1N 114.6E	PCN 6			PGTW
	17	180300	8.1N 114.3E	PCN 6	T3.0/3.0 /D0.5/21HRS		PGTW
	18	180600	8.1N 114.3E	PCN 6			PGTW
	19	180613	8.0N 114.2E	PCN 5	T3.5/3.5	INIT OBS	RODN
	20	180900	8.1N 114.1E	PCN 6			PGTW
	21	181200	8.0N 113.9E	PCN 6			PGTW
	22	181800	7.9N 113.8E	PCN 6	T3.0/3.0-/D0.5/26HRS		PGTW
*	23	181858	9.2N 113.8E	PCN 3	T3.0/3.0	INIT OBS	RODN
	24	182100	7.7N 113.5E	PCN 6			PGTW
	25	182314	8.1N 113.6E	PCN 6			RPMK
	26	190000	8.2N 113.6E	PCN 6			PGTW
	27	190300	8.2N 113.6E	PCN 6	T2.5/3.0 /W0.5/24HRS		PGTW
	28	190600	8.6N 113.3E	PCN 6			PGTW
	29	190900	8.7N 111.9E	PCN 6		ULCC FIX	PGTW
	30	191013	8.7N 113.2E	PCN 4			RPMK
	31	191200	8.8N 112.6E	PCN 6			PGTW
	32	191600	8.6N 112.0E	PCN 6	T2.5/3.0 /W0.5/22HRS		PGTW
	33	191800	8.6N 112.1E	PCN 6			PGTW
	34	191847	9.0N 112.1E	PCN 5	T2.5/3.0 /W0.5/24HRS		RODN
	35	192100	8.9N 111.4E	PCN 6			PGTW
	36	192253	9.0N 111.5E	PCN 4	T2.5/3.0 /W0.5/20HRS		RPMK
	37	200000	9.3N 111.4E	PCN 6			PGTW
	38	200204	9.0N 109.9E	PCN 5			RPMK
	39	200300	9.3N 110.3E	PCN 4	T3.0/3.0-/D0.5/24HRS		PGTW
	40	200600	9.5N 110.0E	PCN 6			PGTW
	41	200900	9.4N 109.8E	PCN 6			PGTW
	42	201133	9.3N 109.8E	PCN 5			RPMK
	43	201200	9.6N 109.3E	PCN 6			PGTW
	44	201444	9.1N 109.2E	PCN 5		PART EXP LLCC	RPMK
	45	201600	9.4N 109.2E	PCN 6	T2.5/2.5 /S0.0/24HRS		PGTW
	46	201800	9.4N 108.7E	PCN 6			PGTW
	47	202100	9.6N 108.8E	PCN 6			PGTW
	48	202232	9.3N 108.5E	PCN 4	T2.0/2.5 /W0.5/24HRS	PART EXP LLCC	RPMK
	49	210000	9.5N 108.8E	PCN 6			PGTW
	50	210300	8.1N 108.3E	PCN 4	T2.0/2.5 /W1.0/24HRS	EXP LLCC	PGTW
	51	210325	8.3N 108.1E	PCN 3		PART EXP LLCC	RPMK
	52	210600	7.8N 108.0E	PCN 4		EXP LLCC	PGTW
	53	210900	7.9N 107.9E	PCN 6		EXP LLCC	PGTW
	54	211200	7.4N 107.5E	PCN 6		EXP LLCC	PGTW
	55	211424	7.3N 106.1E	PCN 5			RPMK
	56	211600	6.8N 106.7E	PCN 6	T2.0/2.5 /W0.5/24HRS	EXP LLCC	PGTW
	57	211800	6.7N 106.5E	PCN 6		EXP LLCC	PGTW
	58	212100	6.5N 106.1E	PCN 6			PGTW
	59	220600	5.0N 104.8E	PCN 6	T0.0/1.0 /W2.0/27HRS	EXP LLCC	PGTW

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	700MB HGT	OBS MSLP	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DIR/VEL/BRG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN-TATION	EYE DIAM	EYE TEMP (C) OUT/ IN/ DP/SST	MSN NO.
1	180114	7.9N 114.6E	1500FT		994	60 060 14	150 70 060 14	2 2				+24 +27 +24	1
2	182116	7.2N 114.7E	700MB	3044			090 43 070 45	50 10				+14 +18 + 7	2
3	182321	7.5N 113.5E	700MB	3023		50 050 45	100 41 070 10	2 1				+ + +	2

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

2. NORTH INDIAN OCEAN CYCLONE DATA

TROPICAL CYCLONE 01B
BEST TRACK DATA

	BEST TRACK			WARNING			ERRORS			24 HOUR FORECAST			ERRORS			48 HOUR FORECAST			ERRORS			72 HOUR FORECAST			ERRORS		
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND	
0522182	16.2	87.8	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0523002	16.6	88.1	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0523062	17.1	88.4	35	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0523122	17.7	88.8	40	17.3	88.0	40.	52.	0.	18.7	88.6	55.	148.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0523182	18.3	89.3	45	17.8	88.9	45.	38.	0.	19.3	89.7	65.	143.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0524002	19.0	89.7	45	18.5	88.6	50.	69.	5.	20.3	89.5	70.	163.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0524062	19.7	90.0	50	19.8	90.0	50.	6.	0.	22.7	90.9	60.	82.	30.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0524122	20.5	90.4	55	20.5	90.2	55.	11.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0524182	21.4	90.9	60	21.0	90.4	60.	37.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0525002	22.5	91.2	60	22.4	91.2	60.	6.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0525062	23.9	91.6	30	23.2	91.4	40.	43.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	33.	134.	0.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	14.	29.	0.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	2.	11.	0.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	2.	11.	0.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	8	4	0	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 515. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 9. KNOTS

TROPICAL CYCLONE 01B
FIX POSITIONS FOR CYCLONE NO. 1

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION		ACCRY	DVORAK CODE	COMMENTS	SITE
1	211800	13.7N	89.1E	PCN 6	T1.5/1.5	INIT OBS	PGTW
2	220432	15.2N	89.6E	PCN 5		ULAC 15.5N 89.9E INIT OBS	KGWC
3	221712	15.5N	87.2E	PCN 6	T2.5/2.5	INIT OBS	KGWC
4	221800	16.9N	87.9E	PCN 6	T2.0/2.0 /D0.5/24HRS		PGTW
5	222106	16.6N	87.8E	PCN 6			KGWC
6	230110	16.6N	87.5E	PCN 6			KGWC
7	230442	16.9N	87.9E	PCN 5	T3.0/3.0 /D1.5/24HRS		KGWC
8	230600	16.9N	87.7E	PCN 6			PGTW
9	230809	17.2N	88.4E	PCN 5			KGWC
* 10	231200	17.5N	87.6E	PCN 6			PGTW
* 11	231209	17.6N	87.6E	PCN 6		ULAC 17.4N 087.2E	KGWC
* 12	231600	17.5N	87.5E	PCN 6		ULCC FIX	PGTW
13	231652	17.8N	89.7E	PCN 4	T3.0/3.0 /D0.5/24HRS	ULAC 16.8N 89.1E	KGWC
* 14	231800	17.5N	87.4E	PCN 6	T2.5/2.5 /D0.5/24HRS		PGTW
* 15	232100	18.2N	88.1E	PCN 6		ULCC FIX	PGTW
* 16	240000	18.5N	88.5E	PCN 6			PGTW
17	240049	19.4N	90.2E	PCN 6		ULAC 18.4N 89.3E	KGWC
18	240300	19.6N	90.2E	PCN 6			PGTW
19	240351	19.5N	89.6E	PCN 6	T3.0/3.0 /S0.0/24HRS		KGWC
20	240600	19.7N	90.0E	PCN 6			PGTW
21	240759	20.0N	90.1E	PCN 6		ULAC 19.1N 90.0E	KGWC
22	240900	19.9N	89.5E	PCN 6			PGTW
23	241148	20.3N	90.3E	PCN 6		ULAC FIX	KGWC
24	241200	20.1N	89.7E	PCN 6		ULCC 18.4N 90.0E	PGTW
25	241600	20.6N	90.9E	PCN 6			PGTW
26	241632	20.7N	90.0E	PCN 6	T3.5/3.5 /D0.5/24HRS	ULAC 21.0N 90.3E	KGWC
27	241800	20.9N	91.3E	PCN 6	T3.5/3.5-/D1.0/24HRS		PGTW
28	242044	22.3N	91.0E	PCN 6			KGWC
29	242100	21.1N	91.4E	PCN 6			PGTW
30	250000	22.9N	91.3E	PCN 6			PGTW
* 31	250028	21.2N	90.7E	PCN 6		ULAC 22.6N 091.4E	KGWC
32	250300	23.5N	91.3E	PCN 5			PGTW
33	250331	23.3N	91.4E	PCN 5			KGWC
34	250600	24.0N	91.6E	PCN 6			PGTW
35	250748	24.0N	92.3E	PCN 6			KGWC
36	251308	24.5N	93.7E	PCN 6			KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 02A
BEST TRACK DATA

	BEST TRACK			WARNING			ERRORS			24 HOUR FORECAST			ERRORS			48 HOUR FORECAST			ERRORS			72 HOUR FORECAST			ERRORS		
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND	
052806Z	15.1	67.4	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
052812Z	15.8	67.5	35	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
052818Z	16.5	67.6	40	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
052900Z	17.2	67.7	45	17.4	67.5	45.	17.	0.	20.9	67.9	65.	59.	15.	24.2	71.8	30.	205.	-10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
052906Z	17.9	67.8	45	18.7	67.9	50.	48.	5.	22.2	70.3	45.	135.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
052912Z	18.6	68.1	50	18.6	67.9	50.	11.	0.	21.3	68.8	60.	29.	15.	24.3	70.8	30.	112.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
052918Z	19.3	68.3	50	18.8	67.6	50.	50.	0.	21.1	68.1	60.	61.	20.	24.2	70.2	30.	67.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
053000Z	20.1	68.5	50	19.5	68.0	50.	46.	0.	22.0	68.8	60.	53.	20.	24.3	70.8	45.	77.	25.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
053006Z	20.8	68.4	45	20.8	68.3	50.	6.	5.	23.7	69.9	50.	81.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
053012Z	21.4	68.3	45	21.9	68.5	50.	32.	5.	24.6	70.0	30.	78.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
053018Z	22.1	68.3	40	22.3	68.5	45.	16.	5.	24.8	69.7	30.	45.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
053100Z	22.8	68.4	40	22.7	68.3	45.	8.	5.	24.7	69.4	35.	8.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
053106Z	23.3	68.5	35	23.5	68.4	45.	13.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
053112Z	23.9	68.8	30	24.0	68.4	35.	23.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
053118Z	24.4	69.0	25	24.6	68.8	30.	16.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
060100Z	24.8	69.5	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	24.	61.	115.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	14.	38.	0.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	4.	12.	10.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	4.	12.	5.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	12	9	4	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 609. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 7. KNOTS

TROPICAL CYCLONE 02A
FIX POSITIONS FOR CYCLONE NO. 2

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION		ACCRY	DVORAK CODE	COMMENTS	SITE
	1	260634	11.1N	64.6E	PCN 5	T1.5/1.5	INIT OBS	KGWC
	2	261733	12.0N	66.4E	PCN 6			KGWC
	3	270617	13.1N	69.0E	PCN 5	T1.0/1.5 /W0.5/24HRS		KGWC
	4	271712	14.6N	69.5E	PCN 6			KGWC
	5	280553	15.0N	67.1E	PCN 3	T2.0/2.0 /D1.0/24HRS	EXP LLCC ULAC 14.9N 66.0E	KGWC
	6	281345	16.0N	67.0E	PCN 4		EXP LLCC ULAC 15.2N 65.5E	KGWC
	7	281833	16.5N	67.8E	PCN 3	T3.0/3.0	INIT OBS ULAC 15.9N 62.6E	KGWC
*	8	282143	17.1N	67.6E	PCN 6			KGWC
*	9	290225	18.3N	68.4E	PCN 5			KGWC
	10	290533	17.9N	68.1E	PCN 5	T3.0/3.0 /D1.0/24HRS	ULAC 17.4N 67.5E	KGWC
	11	291029	18.4N	67.5E	PCN 5		ULAC 18.2N 66.5E	KGWC
	12	291324	18.3N	67.4E	PCN 6			KGWC
	13	291813	19.4N	68.6E	PCN 3	T3.0/3.0 /S0.0/24HRS	ULAC 19.0N 67.1E	KGWC
	14	292132	19.9N	68.8E	PCN 6			KGWC
	15	300205	20.5N	68.8E	PCN 5		ULAC 20.0N 67.7E	KGWC
	16	300512	21.4N	68.3E	PCN 5	T2.0/3.0 /W1.0/24HRS	ULAC 20.9N 67.4E	KGWC
	17	301018	21.3N	68.0E	PCN 5		ULAC 20.6N 65.5E	KGWC
	18	301444	21.6N	68.6E	PCN 5		ULAC 21.1N 66.8E	KGWC
	19	301753	22.0N	68.1E	PCN 3	T1.5/2.5 /W1.5/24HRS	EXP LLCC	KGWC
	20	302303	22.8N	68.7E	PCN 5			KGWC
	21	310143	23.3N	68.4E	PCN 5			KGWC
	22	310452	23.2N	68.3E	PCN 3	T1.0/2.0 /W1.0/24HRS	EXP LLCC	KGWC
	23	311423	24.1N	69.1E	PCN 6			KGWC
	24	311838	24.6N	68.7E	PCN 5			KGWC
	25	010432	24.9N	70.2E	PCN 5			KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 03B
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST ERRORS						48 HOUR FORECAST ERRORS						72 HOUR FORECAST ERRORS					
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	
100818Z	11.8	90.4	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
100900Z	12.8	90.8	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
100906Z	13.8	90.1	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
100912Z	14.2	88.6	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
100918Z	14.6	86.9	35	14.3	87.4	35.	34.	0.	15.9	83.8	50.	78.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
101000Z	15.1	85.7	40	14.9	85.6	40.	13.	0.	17.0	80.7	30.	160.	-20.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
101006Z	15.8	85.0	45	16.1	84.1	45.	55.	0.	18.8	79.6	25.	184.	-10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
101012Z	16.4	84.3	45	16.3	84.2	45.	8.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
101018Z	17.2	83.7	50	17.1	83.2	50.	29.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
101100Z	18.0	83.3	50	17.8	82.7	45.	36.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
101106Z	18.4	82.8	35	18.5	82.9	35.	8.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	26.	141.	0.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	20.	42.	0.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	1.	10.	0.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	-1.	-10.	0.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	7	3	0	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 667. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 11. KNOTS

TROPICAL CYCLONE 03B
FIX POSITIONS FOR CYCLONE NO. 3

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION		ACCRY	DVORAK CODE	COMMENTS	SITE
	1	081600	11.3N	91.5E	PCN 6	T1.0/1.0	INIT OBS ULCC FIX	PGTW
	2	081800	11.3N	91.3E	PCN 6		ULCC FIX	PGTW
*	3	090000	11.4N	90.2E	PCN 6			PGTW
*	4	090300	11.7N	88.9E	PCN 6			PGTW
	5	090429	13.6N	91.4E	PCN 5	T1.5/1.5	INIT OBS ULAC 13.5N 089.2E	KGWC
*	6	090600	11.9N	89.4E	PCN 6	T1.5/1.5	INIT OBS	PGTW
	7	090838	13.9N	89.9E	PCN 6		ULCC 13.8N 087.9E	KGWC
	8	090900	13.8N	88.8E	PCN 6		ULCC FIX	PGTW
	9	091200	13.7N	88.4E	PCN 6		ULCC FIX	PGTW
	10	091329	14.6N	88.4E	PCN 6		ULCC 14.2N 088.2E	KGWC
	11	091709	14.3N	87.1E	PCN 6	T2.5/2.5	INIT OBS ULAC 14.4N 086.8E	KGWC
	12	091800	14.3N	86.4E	PCN 6	T2.5/2.5 /D1.5/26HRS	ULCC FIX	PGTW
	13	092100	14.5N	86.7E	PCN 6			PGTW
	14	100027	16.0N	85.6E	PCN 6		ULAC 15.8N 085.0E	KGWC
	15	100409	15.8N	84.5E	PCN 5	T2.5/2.5 /D1.0/24HRS	ULAC 15.7N 084.6E	KGWC
	16	100827	16.2N	84.8E	PCN 3		PART EXP LLCC ULAC 16.3N 083.	KGWC
	17	101307	16.5N	84.1E	PCN 6		ULAC 16.2N 083.1E	KGWC
	18	101649	17.5N	83.2E	PCN 6	T3.5/3.5 /D1.0/24HRS	ULAC 16.4N 082.4E	KGWC
	19	110006	18.1N	83.4E	PCN 6		ULAC 18.6N 080.1E	KGWC
	20	110348	18.1N	82.9E	PCN 6		ULAC 18.6N 080.1E	KGWC
	21	110816	20.2N	79.1E	PCN 6			KGWC
	22	111246	20.8N	78.8E	PCN 3			KGWC
	23	111629	20.5N	78.2E	PCN 5			KGWC
	24	112101	20.8N	78.4E	PCN 5			KGWC

25	120126	22.0N	78.4E	PCN 5	KGWC
26	120509	22.3N	77.6E	PCN 5	KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 04B
BEST TRACK DATA

	BEST TRACK			WARNING		ERRORS			24 HOUR FORECAST		ERRORS			48 HOUR FORECAST		ERRORS			72 HOUR FORECAST		ERRORS		
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
101500Z	18.9	89.1	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101506Z	19.3	88.5	40	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101512Z	19.7	88.0	45	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101518Z	20.2	87.4	45	19.8	87.9	45.	37.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101600Z	20.6	86.8	50	20.5	86.9	50.	8.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101606Z	21.3	86.2	40	21.3	85.8	40.	22.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
101612Z	22.4	85.6	25	22.4	85.4	25.	6.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	18.	0.	0.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	8.	0.	0.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	0.	0.	0.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	0.	0.	0.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	4	0	0	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 296. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 8. KNOTS

TROPICAL CYCLONE 04B
FIX POSITIONS FOR CYCLONE NO. 4

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	090900	9.8N 116.2E	PCN 6		ULCC FIX	PGTW
	2	091200	9.4N 116.4E	PCN 6	T0.5/0.5	INIT OBS ULCC FIX	PGTW
	3	100000	9.8N 111.8E	PCN 6		ULCC FIX	PGTW
	4	100400	9.1N 109.6E	PCN 6		ULCC FIX	PGTW
	5	100600	10.8N 111.5E	PCN 6	T0.5/0.5	INIT OBS	PGTW
	6	100900	11.1N 111.4E	PCN 6			PGTW
	7	122100	13.9N 97.6E	PCN 6		ULCC FIX	PGTW
	8	130304	14.4N 96.5E	PCN 5	T1.5/1.5	INIT OBS	KGWC
	9	130754	15.3N 95.1E	PCN 5	T1.5/1.5	INIT OBS ULAC 14.8N 091.6E	KGWC
*	10	141200	17.5N 87.1E	PCN 6	T1.5/1.5	INIT OBS	PGTW
	11	141709	18.9N 89.1E	PCN 6	T1.0/1.5 /W0.5/25HRS		KGWC
*	12	141800	17.0N 86.2E	PCN 6			PGTW
	13	150408	19.4N 88.4E	PCN 5	T1.0/1.0 /S0.0/24HRS		KGWC
	14	151649	20.0N 87.2E	PCN 6	T2.5/2.5	INIT OBS ULAC 19.7N 086.7E	KGWC
	15	152018	20.2N 87.1E	PCN 6		ULAC 20.0N 086.5E	KGWC
	16	160001	21.1N 87.7E	PCN 6			KGWC
	17	160348	21.7N 85.8E	PCN 5			KGWC
	18	160904	21.9N 85.8E	PCN 5			KGWC
	19	161241	22.6N 85.5E	PCN 6		ULAC 22.7N 084.9E	KGWC
	20	161628	23.3N 85.0E	PCN 6			KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 05B
BEST TRACK DATA

	BEST TRACK			WARNING		ERRORS			24 HOUR FORECAST		ERRORS			48 HOUR FORECAST		ERRORS			72 HOUR FORECAST		ERRORS		
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
111306Z	12.0	81.9	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111312Z	12.1	82.5	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111318Z	12.1	83.1	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111400Z	12.0	83.9	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111406Z	11.8	84.7	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111412Z	11.8	85.5	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111418Z	12.0	86.2	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111500Z	12.5	86.4	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111506Z	12.8	85.9	35	12.9	86.4	35.	30.	0.	13.5	87.8	45.	244.	0.	14.2	88.9	50.	512.	-5.	0.0	0.0	0.	-0.	0.
111512Z	12.8	85.5	35	12.8	86.7	40.	70.	5.	13.4	88.1	50.	299.	-0.	14.1	89.0	55.	539.	10.	0.0	0.0	0.	-0.	0.
111518Z	12.7	85.0	35	12.8	85.1	40.	8.	5.	13.0	83.4	45.	85.	-5.	13.2	88.2	50.	224.	15.	0.0	0.0	0.	-0.	0.
111600Z	12.6	84.4	40	12.8	84.4	45.	12.	5.	13.1	81.8	55.	67.	5.	13.6	79.9	65.	200.	40.	0.0	0.0	0.	-0.	0.
111606Z	12.7	83.7	45	12.7	83.9	45.	12.	0.	12.8	81.8	60.	151.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111612Z	13.0	83.0	50	12.1	83.1	55.	54.	5.	11.8	80.6	65.	221.	20.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111618Z	13.4	82.0	50	12.6	83.2	55.	85.	5.	12.3	81.0	60.	243.	25.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111700Z	13.9	81.0	50	13.0	82.2	55.	88.	5.	13.8	79.7	60.	190.	35.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111706Z	14.7	80.1	55	13.8	80.8	55.	68.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111712Z	15.4	79.8	45	15.0	79.6	50.	27.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111718Z	16.2	79.9	35	15.8	79.4	35.	38.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111800Z	16.9	80.4	25	16.5	79.2	25.	73.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	47.	188.	369.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	16.	71.	109.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	3.	12.	18.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	3.	11.	15.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	12	8	4	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 843. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 7. KNOTS

TROPICAL CYCLONE 05B
FIX POSITIONS FOR CYCLONE NO. 5

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	130427	11.8N 81.6E	PCN 3	T1.5/1.5	INIT OBS EXP LLCC	KGWC
2	131708	11.8N 82.6E	PCN 6			KGWC
3	132153	12.8N 82.8E	PCN 6			KGWC
4	132351	12.3N 83.3E	PCN 6			KGWC
5	140407	11.8N 84.4E	PCN 3	T1.0/1.5 /W0.5/24HRS	EXP LLCC	KGWC
6	140856	11.8N 85.3E	PCN 3		EXP LLCC	KGWC
7	141231	11.6N 85.7E	PCN 6			KGWC
8	141647	11.9N 86.0E	PCN 6			KGWC
9	142142	12.3N 86.3E	PCN 5		ULAC 14.1N 086.7E	KGWC
10	150111	12.7N 86.4E	PCN 5		ULAC 13.4N 086.7E	KGWC
11	150347	12.8N 86.2E	PCN 5	T2.5/2.5 /D1.5/24HRS	ULAC 13.1N 086.3E	KGWC
12	150846	12.6N 86.5E	PCN 5			KGWC
13	150846	12.6N 86.3E	PCN 5	T2.5/2.5 /D1.0/24HRS		FJDG
14	151209	12.2N 86.1E	PCN 6			KGWC
15	151627	12.8N 85.1E	PCN 6	T2.5/2.5	INIT OBS	KGWC
16	152131	12.4N 84.1E	PCN 6			KGWC
17	160050	12.7N 84.4E	PCN 6		ULAC 12.0N 085.6E	KGWC
18	160326	12.5N 83.9E	PCN 6	T3.0/3.0 /D0.5/24HRS	ULAC 11.9N 085.1E	KGWC
19	160829	12.0N 82.9E	PCN 5			FJDG
20	160835	12.4N 84.0E	PCN 5		ULAC 12.5N 084.3E	KGWC
21	161329	12.9N 83.6E	PCN 5		ULAC 12.5N 084.3E	KGWC
22	161607	13.2N 83.0E	PCN 6	T3.0/3.0 /D0.5/24HRS	ULAC 12.2N 084.0E	KGWC
23	162120	13.6N 81.6E	PCN 6		ULAC 12.8N 082.5E	KGWC
24	170028	13.8N 80.6E	PCN 6		ULAC 13.2N 081.8E	KGWC
25	170447	14.5N 81.0E	PCN 5	T4.0/4.0 /D1.0/24HRS	ULAC 14.9N 081.5E	KGWC
26	170824	15.2N 79.9E	PCN 5		ULAC 15.2N 080.5E	KGWC
27	171308	15.4N 79.7E	PCN 6		ULAC 15.4N 079.8E	KGWC
28	171728	16.5N 79.6E	PCN 5			KGWC
29	172107	16.4N 79.5E	PCN 5			KGWC
30	180007	17.1N 81.0E	PCN 5		ULAC PSBL 17.0N 082.1E	KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 06B
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS				ERRORS				ERRORS	
MO/DA/HR	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
120906Z	4.2 90.0	20	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
120912Z	4.5 90.3	20	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
120918Z	4.8 90.5	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121000Z	5.2 90.6	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121006Z	5.5 90.7	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121012Z	6.0 90.7	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121018Z	6.7 90.4	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121100Z	7.2 89.8	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121106Z	7.7 89.0	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121112Z	8.5 87.8	35	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121118Z	9.3 86.5	40	9.3 86.3	40.	12.	0.	12.0 81.1	55.	126.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121200Z	9.9 85.6	40	10.3 85.2	40.	34.	0.	13.6 80.1	55.	155.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121206Z	10.4 84.7	45	10.7 84.3	45.	30.	0.	13.5 79.7	45.	130.	-5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121212Z	10.9 84.0	45	10.5 83.5	45.	38.	0.	13.5 79.4	45.	99.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121218Z	11.6 83.2	50	11.4 82.6	50.	37.	0.	14.2 78.4	30.	116.	-15.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121300Z	12.3 82.4	50	12.4 82.1	50.	19.	0.	14.9 78.8	25.	53.	-15.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121306Z	12.8 81.8	50	12.8 81.6	50.	12.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121312Z	13.6 81.1	45	13.5 80.8	50.	18.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121318Z	14.2 80.4	45	14.1 80.2	45.	13.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121400Z	14.8 79.7	40	14.8 79.9	45.	12.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
121406Z	15.5 79.0	30	15.4 79.0	35.	6.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	21.	113.	0.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	16.	57.	0.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	1.	8.	0.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	1.	-4.	0.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	11	6	0	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1025. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 9. KNOTS

TROPICAL CYCLONE 06B
FIX POSITIONS FOR CYCLONE NO. 6

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	080801	4.0N 87.1E	PCN 5	T1.5/1.5	INIT OBS	FJDG
2	090406	4.2N 89.9E	PCN 5	T1.5/1.5	INIT OBS ULAC 03.7N 090.4E	KGWC
3	090600	4.6N 90.3E	PCN 6	T1.0/1.0	INIT OBS ULCC FIX	PGTW
4	091200	4.3N 90.8E	PCN 6		ULCC FIX	PGTW
5	091600	4.5N 90.1E	PCN 6	T1.0/1.0	INIT OBS	PGTW
6	091646	3.9N 90.5E	PCN 6		ULCC 04.0N 089.7E	KGWC
7	091800	4.9N 90.0E	PCN 6			PGTW
8	092035	4.5N 91.3E	PCN 6		ULCC 04.9N 091.3E	KGWC
9	092100	4.3N 90.7E	PCN 6			PGTW
10	100000	4.6N 90.7E	PCN 6			PGTW
11	100045	5.2N 90.8E	PCN 5		ULAC 05.0N 091.2E	KGWC
12	100300	5.2N 90.7E	PCN 6	T2.0/2.0 /D1.0/20HRS		PGTW
13	100345	5.5N 90.2E	PCN 5	T2.5/2.5 /D1.0/24HRS	ULAC 05.2N 090.7E	KGWC
14	100600	5.4N 90.8E	PCN 6			PGTW
15	100900	5.7N 90.7E	PCN 6			PGTW

* 16	100921	5.9N	89.0E	PCN 6		ULAC 05.6N 089.7E		KGWC
17	101143	5.4N	90.4E	PCN 6		ULAC 05.3N 089.6E		KGWC
18	101200	5.9N	90.6E	PCN 6				PGTW
19	101600	6.2N	90.5E	PCN 6	T2.0/2.0 /D1.0/24HRS			PGTW
20	101626	6.3N	90.8E	PCN 6	T2.5/2.5	INIT OBS ULAC 05.6N 090.4E		KGWC
21	101800	6.5N	90.4E	PCN 6				PGTW
22	102024	6.9N	90.6E	PCN 6		ULAC 06.3N 090.3E		KGWC
23	102100	6.5N	90.2E	PCN 6				PGTW
24	110000	6.6N	89.4E	PCN 6				PGTW
25	110023	7.7N	90.2E	PCN 5		ULAC 06.8N 090.0E		KGWC
26	110300	7.2N	89.2E	PCN 6				PGTW
27	110325	7.9N	89.5E	PCN 5	T2.0/2.5 /W0.5/24HRS	ULAC 07.1N 089.4E		KGWC
28	110600	7.7N	89.3E	PCN 6	T2.0/2.0 /S0.0/27HRS			PGTW
29	110900	7.8N	88.3E	PCN 6				PGTW
30	110902	8.5N	89.0E	PCN 5	T3.5/3.5+/D2.0/27HRS			FJDG
31	110910	8.2N	88.4E	PCN 3		PART EXP LLCC ULAC 07.9N 088.		KGWC
32	111200	8.3N	87.5E	PCN 6		ULCC FIX		PGTW
33	111303	8.9N	87.4E	PCN 5		ULAC 08.2N 087.1E		KGWC
34	111600	8.9N	86.8E	PCN 6	T2.5/2.5 /D0.5/24HRS			PGTW
35	111605	9.4N	86.7E	PCN 5	T3.0/3.0 /D0.5/24HRS	ULAC 08.8N 086.4E		KGWC
36	111800	8.9N	86.4E	PCN 6		ULCC FIX		PGTW
* 37	112156	10.8N	85.6E	PCN 6		ULAC 10.5N 084.7E		KGWC
38	120000	9.5N	85.2E	PCN 6				PGTW
39	120002	10.3N	85.3E	PCN 5		ULAC 09.6N 085.1E		KGWC
40	120446	10.0N	84.9E	PCN 5	T3.0/3.0 /D1.0/25HRS	ULAC 09.3N 084.5E		KGWC
41	120600	10.0N	85.0E	PCN 6				PGTW
42	120808	11.5N	84.5E	PCN 5	T3.5/3.5 /S0.0/24HRS			FJDG
43	120859	10.4N	84.0E	PCN 5		ULAC 10.0N 083.9E		KGWC
44	120900	9.8N	84.2E	PCN 6				PGTW
45	121200	10.4N	84.1E	PCN 6		ULCC FIX		PGTW
46	121242	11.4N	84.0E	PCN 5		ULAC 11.1N 083.7E		KGWC
47	121600	10.9N	83.2E	PCN 6		ULCC FIX		PGTW
48	121727	11.9N	83.7E	PCN 5	T2.5/3.0 /W0.5/24HRS	ULAC 11.0N 083.6E		KGWC
49	122145	12.4N	83.0E	PCN 6		ULAC 11.3N 082.5E		KGWC
50	130122	12.3N	82.3E	PCN 6				KGWC
51	130426	12.6N	82.0E	PCN 5	T3.0/3.0 /W0.0/24HRS			KGWC
52	130848	13.1N	81.6E	PCN 6		ULAC 13.9N 081.6E		KGWC
53	130849	12.5N	81.0E	PCN 5				FJDG
54	131221	13.8N	81.3E	PCN 6		ULAC 13.4N 080.6E		KGWC
55	131706	14.1N	80.6E	PCN 5	T3.0/3.0 /D0.5/24HRS	ULAC 14.0N 080.7E		KGWC
56	132134	14.6N	80.5E	PCN 6		ULAC 15.0N 080.3E		KGWC
57	140405	14.8N	78.8E	PCN 5				KGWC
58	140838	15.6N	79.0E	PCN 5				FJDG

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

3. SOUTH PACIFIC and SOUTH INDIAN OCEAN CYCLONE DATA

TROPICAL CYCLONE 01S
BEST TRACK DATA

	BEST TRACK			WARNING		ERRORS			24 HOUR FORECAST		ERRORS			48 HOUR FORECAST		ERRORS			72 HOUR FORECAST		ERRORS		
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
110906Z	7.8	80.9	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
110918Z	8.6	78.8	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111006Z	9.1	76.6	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111018Z	9.4	74.2	35	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111106Z	9.9	71.9	45	10.0	72.1	35.	13.	-10.	10.3	67.7	50.	53.	5.	10.3	63.5	65.	190.	25.	0.0	0.0	0.	-0.	0.
111118Z	10.4	69.7	45	10.5	68.8	40.	53.	-5.	11.2	63.4	55.	75.	10.	11.8	59.3	70.	130.	35.	0.0	0.0	0.	-0.	0.
111206Z	11.1	67.3	45	11.2	67.7	50.	84.	5.	12.6	63.7	60.	159.	20.	13.9	59.9	75.	263.	45.	0.0	0.0	0.	-0.	0.
111218Z	11.6	64.6	45	12.0	65.8	60.	74.	15.	13.4	61.7	80.	234.	45.	15.8	58.5	95.	282.	65.	0.0	0.0	0.	-0.	0.
111306Z	12.3	61.0	40	12.0	61.7	45.	45.	5.	13.7	59.3	35.	60.	5.	16.0	51.9	30.	34.	0.	0.0	0.0	0.	-0.	0.
111318Z	13.3	57.7	35	13.1	58.1	40.	26.	5.	15.3	52.9	30.	50.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111406Z	14.2	55.4	30	14.5	54.9	35.	34.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111418Z	15.0	53.7	30	16.7	51.8	25.	150.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111506Z	15.7	52.4	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111518Z	16.8	51.4	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111606Z	17.8	50.6	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111618Z	18.6	49.9	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
111706Z	19.1	49.2	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	53.	105.	180.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	18.	38.	78.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	7.	14.	34.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	2.	14.	34.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	8	6	5	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 2026. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 11. KNOTS

TROPICAL CYCLONE 01S
FIX POSITIONS FOR CYCLONE NO. 1

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION		ACCRY	DVORAK CODE	COMMENTS	SITE
	1	050600	6.4S	85.0E	PCN 5	T1.5/1.5	INIT OBS	PGTW
	2	080427	6.1S	84.8E	PCN 5	T1.0/1.0	INIT OBS	KGWC
	3	081707	5.9S	81.7E	PCN 5		ULAC 06.6S 080.7E	KGWC
	4	090407	6.9S	81.2E	PCN 6	T2.0/2.0 /D1.0/24HRS	EXP LLCC ULAC 08.1S 080.5E	KGWC
	5	091647	8.9S	78.5E	PCN 5		ULAC 09.5S 078.5E	KGWC
*	6	092203	10.1S	76.6E	PCN 5			FJDG
	7	100041	8.3S	77.3E	PCN 6		ULAC 08.5S 077.0E	KGWC
	8	100528	8.5S	76.7E	PCN 4	T2.0/2.0 /S0.0/25HRS	ULAC 09.7S 076.2E	KGWC
*	9	101048	10.4S	74.5E	PCN 5	T2.0/2.0	INIT OBS	FJDG
	10	101321	9.3S	75.4E	PCN 5			KGWC
*	11	101627	9.6S	73.3E	PCN 5		ULAC 10.2S 073.9E	KGWC
	12	102332	9.2S	73.4E	PCN 6			KGWC
	13	110201	9.7S	72.8E	PCN 6			KGWC
	14	110211	10.0S	72.5E	PCN 5			FJDG
	15	110508	9.4S	72.0E	PCN 6	T4.0/4.0+/D2.0/24HRS		KGWC
	16	111035	10.7S	70.8E	PCN 5	T3.0/3.0 /D1.0/24HRS		FJDG
	17	111035	10.0S	70.1E	PCN 5			KGWC
	18	111300	10.4S	69.9E	PCN 5			KGWC
	19	111748	10.6S	69.8E	PCN 5			KGWC
	20	112320	11.0S	69.0E	PCN 5	T2.5/2.5 /D0.1/24HRS		FJDG
	21	120140	11.2S	68.4E	PCN 5			KGWC
	22	120629	11.6S	68.0E	PCN 5	T2.5/3.5 /W1.5/24HRS		KGWC
	23	121204	12.0S	66.5E	PCN 5	T4.0/4.0		FJDG
	24	121204	11.9S	66.2E	PCN 5			KGWC
	25	121420	11.3S	66.4E	PCN 6			KGWC
	26	121728	11.6S	65.1E	PCN 6			KGWC
	27	122307	11.5S	63.3E	PCN 5			KGWC
	28	122308	11.7S	63.4E	PCN 5	T2.5/2.5 /D1.0/24HRS		FJDG
	29	130300	12.0S	62.7E	PCN 6			KGWC
	30	130608	12.8S	61.7E	PCN 6	T2.0/2.5 /W0.5/24HRS	ULAC 11.8S 063.1E	KGWC
*	31	131152	11.6S	61.8E	PCN 5	T1.5/1.5		FJDG
	32	131152	13.2S	59.4E	PCN 4		ULAC 11.0S 060.1E	KGWC
	33	131359	13.2S	58.6E	PCN 4		ULAC 11.9S 060.5E	KGWC
	34	140239	14.1S	55.7E	PCN 6		ULAC 13.1S 057.3E	KGWC
	35	140730	14.5S	55.7E	PCN 5	T1.5/2.0 /W0.5/25HRS	ULAC 12.9S 056.5E	KGWC
*	36	141829	17.5S	51.0E	PCN 6		ULAC 15.1S 052.6E	KGWC
	37	150709	15.6S	51.6E	PCN 3	T1.5/1.5 /S0.0/25HRS	EXP LLCC	KGWC
	38	151809	17.5S	51.1E	PCN 6			KGWC
	39	160649	18.3S	50.9E	PCN 3	T2.0/2.0 /D0.5/24HRS	EXP LLCC ULAC 19.8S 051.2E	KGWC
	40	161930	18.0S	49.8E	PCN 6			KGWC
	41	170629	19.3S	49.2E	PCN 3	T0.5/1.5 /W1.5/24HRS	EXP LLCC	KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 02S
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS				ERRORS				ERRORS	
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
120206Z	10.8	82.1	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.
120218Z	12.0	81.0	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.
120306Z	13.2	79.4	40	13.6	80.2	35.	48.	-5.	14.8	79.2	45.	232.	-5.	17.1	78.0	55.	328.	0.	0.0	0.	-0.	0.
120318Z	14.4	77.2	45	15.0	77.0	50.	38.	5.	17.3	73.9	80.	99.	25.	19.0	71.0	90.	96.	35.	0.0	0.	-0.	0.
120406Z	14.9	75.2	50	15.3	75.2	60.	24.	10.	16.5	71.6	80.	42.	25.	17.2	67.9	90.	142.	45.	0.0	0.	-0.	0.
120418Z	15.7	73.5	55	15.9	73.2	65.	30.	10.	16.0	69.1	80.	146.	25.	17.1	65.1	90.	250.	50.	0.0	0.	-0.	0.
120506Z	16.7	72.3	55	15.8	72.1	55.	55.	0.	16.8	68.5	65.	128.	20.	18.2	65.0	75.	171.	45.	0.0	0.	-0.	0.
120518Z	17.5	71.1	55	17.5	71.0	55.	6.	0.	19.5	68.0	60.	64.	20.	21.2	64.8	65.	78.	40.	0.0	0.	-0.	0.
120606Z	18.3	70.1	45	18.6	70.2	50.	19.	5.	20.1	68.9	40.	81.	10.	21.9	67.7	30.	208.	10.	0.0	0.	-0.	0.
120618Z	19.0	69.0	40	19.3	69.2	45.	21.	5.	21.2	67.6	35.	115.	10.	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.
120706Z	19.8	67.5	30	19.9	67.3	35.	13.	5.	21.2	63.8	20.	37.	0.	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.
120718Z	20.3	65.8	25	20.4	65.1	25.	40.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.
120806Z	20.7	64.2	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	29.	105.	181.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	22.	76.	121.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	5.	16.	32.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	4.	14.	32.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	10	9	7	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1208. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 8. KNOTS

TROPICAL CYCLONE 02S
FIX POSITIONS FOR CYCLONE NO. 2

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION		ACCRY	DVORAK CODE	COMMENTS	SITE
1	280428	6.0S	90.3E	PCN 5	T1.0/1.0	INIT OBS ULAC 06.8S 089.5E	KGWC
2	281200	7.6S	88.4E	PCN 6	T1.5/1.5	INIT OBS	PGTW
3	281527	7.1S	89.9E	PCN 6		ULAC 08.0S 088.8E	KGWC
4	281600	8.2S	89.2E	PCN 6			PGTW
5	281800	8.1S	90.6E	PCN 6			PGTW
6	290300	7.5S	88.6E	PCN 6	T1.5/1.5	INIT OBS ULCC FIX	PGTW
7	290408	6.7S	89.5E	PCN 5	T1.5/1.5 /D0.5/24HRS		KGWC
8	290600	7.2S	88.7E	PCN 6		ULCC FIX	PGTW
9	291648	7.6S	90.0E	PCN 5	T1.5/1.5	INIT OBS	KGWC
10	300347	8.1S	89.3E	PCN 5	T1.5/1.5 /S0.0/24HRS		KGWC
11	301628	8.1S	84.7E	PCN 6			KGWC
12	010300	9.3S	82.6E	PCN 6	T1.5/1.5	INIT OBS ULCC FIX	PGTW
13	010509	9.8S	82.8E	PCN 6	T2.5/2.5 /D1.0/25HRS	ULAC 09.8S 081.6E	KGWC
14	010600	9.7S	81.7E	PCN 6		ULCC FIX	PGTW
15	010900	9.5S	81.6E	PCN 6			PGTW
16	011240	9.9S	83.1E	PCN 6		ULAC 10.5S 079.8E	KGWC
17	011600	10.4S	81.6E	PCN 6	T1.5/1.5	INIT OBS	PGTW
18	011608	9.5S	82.5E	PCN 6		ULAC 10.3S 081.0E	KGWC
19	012100	10.6S	81.3E	PCN 6		ULCC FIX	PGTW
20	012233	11.7S	82.0E	PCN 5	T2.0/2.0	INIT OBS	FJDG
21	020000	10.8S	81.5E	PCN 6			PGTW
22	020120	10.2S	82.9E	PCN 6		ULAC 09.9S 081.2E	KGWC
23	020448	10.5S	82.1E	PCN 6	T2.0/2.5 /W0.5/24HRS	ULAC 11.3S 080.3E	KGWC
24	021117	12.0S	81.5E	PCN 5	T2.5/2.5 /W0.5/24HRS		FJDG
25	021200	12.0S	81.3E	PCN 6		ULCC FIX	PGTW
26	021219	11.2S	82.2E	PCN 6		ULAC 10.8S 080.0E	KGWC
27	021547	11.8S	81.0E	PCN 6		ULAC 11.8S 081.9E	KGWC
28	021600	12.1S	81.1E	PCN 6	T1.0/1.5+/W0.5/24HRS		PGTW
29	021800	12.2S	80.9E	PCN 6		ULCC FIX	PGTW
30	030000	12.8S	80.6E	PCN 6			PGTW
31	030059	12.1S	80.6E	PCN 6		ULAC 12.1S 078.8E	KGWC
* 32	030140	13.6S	81.8E	PCN 5	T2.5/2.5 /D0.5/14HRS		FJDG
33	030428	12.6S	80.1E	PCN 6	T2.5/2.5 /D0.5/24HRS	ULAC 13.8S 079.7E	KGWC
34	031104	13.5S	78.6E	PCN 5			KGWC
35	031105	13.6S	78.6E	PCN 3	T4.0/4.0+/D1.5/11HRS		FJDG
36	031339	14.7S	77.9E	PCN 5		ULAC 14.8S 078.3E	KGWC
37	031709	14.7S	77.1E	PCN 5			KGWC
38	032207	14.9S	76.1E	PCN 6		ULAC 15.1S 076.2E	KGWC
39	032208	15.2S	76.9E	PCN 5			FJDG
40	040219	14.7S	75.7E	PCN 6		ULAC 14.0S 076.0E	KGWC
41	040549	15.0S	75.4E	PCN 6	T3.0/3.0 /D0.5/25HRS		KGWC
42	041052	15.2S	74.1E	PCN 5			KGWC
* 43	041052	16.5S	73.8E	PCN 5	T2.5/2.5 /S0.0/24HRS		FJDG
44	041318	15.0S	74.2E	PCN 6		ULAC 16.0S 073.5E	KGWC
45	041648	14.9S	73.7E	PCN 4	T3.0/3.0	INIT OBS EXP LLCC	KGWC
46	042337	15.4S	73.5E	PCN 6		ULAC 16.4S 073.0E	KGWC
47	050158	16.8S	72.7E	PCN 2		EYE FIX ULAC 16.9S 073.0E	KGWC
48	050237	17.4S	73.0E	PCN 4	T3.5/3.5 /S0.0/16HRS		FJDG
49	050529	17.0S	73.0E	PCN 6	T3.5/3.5 /D0.5/24HRS		KGWC
50	051039	17.9S	71.9E	PCN 6			KGWC
51	051628	17.3S	71.0E	PCN 6		ULAC 17.9S 071.2E	KGWC
52	060137	17.8S	70.9E	PCN 6		EXP LLCC ULAC 19.4S 071.3E	KGWC
* 53	060213	19.8S	72.0E	PCN 3	T2.5/2.5 /S0.0/14HRS		FJDG
54	060509	18.2S	70.4E	PCN 4	T2.0/3.0 /W1.5/24HRS	EXP LLCC ULAC 20.0S 071.7E	KGWC
55	061235	18.7S	69.5E	PCN 4		EXP LLCC	KGWC
56	061451	19.2S	70.0E	PCN 5	T2.0/2.5-/W0.5/11HRS		FJDG
57	061749	18.8S	69.0E	PCN 4		EXP LLCC	KGWC
58	070115	19.3S	67.5E	PCN 4		EXP LLCC	KGWC
59	070630	19.6S	67.6E	PCN 4	T0.5/1.5 /W1.5/25HRS	EXP LLCC	KGWC
60	071355	20.1S	66.0E	PCN 4		EXP LLCC	KGWC
61	071729	20.1S	65.5E	PCN 4		EXP LLCC	KGWC
62	080235	20.8S	64.4E	PCN 3		EXP LLCC	KGWC
63	080610	20.4S	64.3E	PCN 3		EXP LLCC	KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 03S
BEST TRACK DATA

	BEST TRACK			WARNING			ERRORS			24 HOUR FORECAST			ERRORS			48 HOUR FORECAST			ERRORS			72 HOUR FORECAST			ERRORS		
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND	
120806Z	8.4	98.5	20	0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.	
120818Z	9.7	100.6	20	0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.	
120906Z	10.8	102.8	25	0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.	
120918Z	11.9	103.7	30	0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.	
121006Z	13.0	105.1	35	12.5	104.8	35.	35.	0.		13.7	107.2	55.	192.	10.		14.8	109.5	65.	468.	25.		0.0	0.0	0.	-0.	0.	
121018Z	14.1	106.8	45	14.1	106.8	45.	0.	0.		15.5	110.2	65.	204.	20.		16.8	113.3	35.	388.	60.		0.0	0.0	0.	-0.	0.	
121106Z	15.9	109.6	45	15.3	109.3	45.	40.	0.		18.0	114.3	55.	141.	15.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.	
121118Z	18.0	112.6	45	18.1	112.2	45.	24.	0.		22.4	117.7	30.	57.	5.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.	
121206Z	20.0	115.6	40	20.4	115.3	45.	29.	5.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.	
121218Z	21.5	118.0	25	22.6	117.9	20.	66.	-5.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.		0.0	0.0	0.	-0.	0.	

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	32.	148.	428.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	19.	46.	67.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	2.	13.	43.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	0.	13.	43.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	6	4	2	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1375. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 13. KNOTS

TROPICAL CYCLONE 03S
FIX POSITIONS FOR CYCLONE NO. 3

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	080000	7.9S 97.9E	PCN 6		ULCC FIX	PGTW
	2	080300	8.4S 98.2E	PCN 6	T1.0/1.0	INIT OBS ULCC FIX	PGTW
	3	080600	8.7S 98.2E	PCN 6		ULCC FIX	PGTW
	4	081200	9.6S 99.7E	PCN 6			PGTW
	5	081600	9.7S 100.0E	PCN 6			PGTW
	6	081800	9.6S 100.1E	PCN 6	T1.0/1.0	INIT OBS	PGTW
	7	090000	10.3S 100.9E	PCN 6		ULCC FIX	PGTW
	8	090300	10.6S 101.8E	PCN 6		ULCC FIX	PGTW
*	9	090408	10.7S 103.7E	PCN 5	T1.0/1.0	INIT OBS ULAC 10.3S 102.8E	KGWC
	10	090600	10.8S 102.7E	PCN 6	T1.5/1.5 /D0.5/27HRS	ULCC FIX	PGTW
	11	090900	11.4S 102.8E	PCN 6		ULCC FIX	PGTW
	12	091200	11.2S 103.3E	PCN 6		ULCC FIX	PGTW
*	13	091507	11.3S 105.1E	PCN 6		ULAC 10.7S 103.8E	KGWC
	14	091800	11.9S 103.8E	PCN 6	T2.0/2.0 /D1.0/24HRS	ULCC FIX	PGTW
	15	092100	12.5S 104.2E	PCN 6		ULCC FIX	PGTW
	16	100000	12.6S 104.0E	PCN 6			PGTW
	17	100300	12.5S 104.1E	PCN 6	T2.5/2.5 /D1.0/21HRS		PGTW
	18	100348	12.5S 105.4E	PCN 5	T2.5/2.5 /D1.5/24HRS	ULAC 12.2S 105.6E	KGWC
	19	100600	12.6S 104.5E	PCN 6		ULCC FIX	PGTW
	20	100900	12.8S 105.2E	PCN 6		ULCC FIX	PGTW
*	21	100937	13.7S 104.3E	PCN 5		ULAC 14.4S 105.2E	KGWC
	22	101110	13.9S 105.9E	PCN 6		ULAC 13.0S 105.6E	KGWC
	23	101200	13.5S 106.4E	PCN 6		ULCC FIX	PGTW
	24	101447	14.1S 106.7E	PCN 5	T3.0/3.0	INIT OBS ULAC 13.4S 106.3E	KGWC
	25	101600	13.8S 106.7E	PCN 6	T3.0/3.0 /D1.0/22HRS	ULCC FIX	PGTW
	26	101800	13.8S 107.0E	PCN 6		ULCC FIX	PGTW
	27	102039	14.0S 108.0E	PCN 6		ULAC 13.2S 107.6E	KGWC
	28	102100	14.1S 107.4E	PCN 6		ULCC FIX	PGTW
	29	102350	14.8S 108.5E	PCN 6			KGWC
	30	110000	14.1S 107.7E	PCN 6		ULCC FIX	PGTW
	31	110328	15.4S 109.5E	PCN 6	T3.5/3.5 /D1.0/24HRS		KGWC
	32	110600	15.7S 109.2E	PCN 6	T2.5/2.5 /S0.0/27HRS		PGTW
	33	110900	16.6S 109.9E	PCN 6			PGTW
	34	110924	16.7S 109.8E	PCN 6			KGWC
	35	111049	16.7S 111.3E	PCN 6			KGWC
	36	111200	16.9S 110.6E	PCN 6		ULCC FIX	PGTW
	37	111427	17.8S 112.5E	PCN 6	T2.5/3.5 /W0.5/24HRS		KGWC
	38	111600	17.4S 111.3E	PCN 6	T3.0/3.0+/S0.0/24HRS	ULCC FIX	PGTW
	39	111800	18.1S 112.0E	PCN 6		ULCC FIX	PGTW
	40	112027	19.2S 113.6E	PCN 6		ULAC 18.5S 111.0E	KGWC
	41	112100	18.9S 112.9E	PCN 6		ULCC FIX	PGTW
	42	112329	18.8S 114.0E	PCN 3		ULAC 19.6S 115.1E	KGWC
	43	120000	19.3S 113.9E	PCN 6			PGTW
	44	120300	19.7S 115.0E	PCN 6			PGTW
	45	120307	19.4S 114.8E	PCN 3	T2.5/3.5 /W1.0/24HRS	ULAC 22.0S 116.9E	KGWC
	46	120900	20.2S 116.9E	PCN 6			PGTW
	47	121200	20.9S 117.4E	PCN 6			PGTW
	48	130000	21.7S 118.9E	PCN 4			PGTW

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	121800	22.6S 117.9E	020	130	94312 94300

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 04P
BEST TRACK DATA

	BEST TRACK		WARNING				24 HOUR FORECAST					48 HOUR FORECAST					72 HOUR FORECAST				
						ERRORS					ERRORS					ERRORS					ERRORS
MO/DA/HR	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND		POSIT	WIND	DST	WIND		POSIT	WIND	DST	WIND	
1208062	10.1 131.7	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.		0.0 0.0	0	-0.	0.		0.0 0.0	0.	-0.	0.	
1208182	10.3 130.5	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.		0.0 0.0	0	-0.	0.		0.0 0.0	0.	-0.	0.	
1209062	11.1 130.3	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.		0.0 0.0	0	-0.	0.		0.0 0.0	0.	-0.	0.	
1209182	11.5 131.1	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.		0.0 0.0	0.	-0.	0.		0.0 0.0	0.	-0.	0.	
1210062	11.5 132.2	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.		0.0 0.0	0.	-0.	0.		0.0 0.0	0.	-0.	0.	
1210182	11.7 133.3	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.		0.0 0.0	0.	-0.	0.		0.0 0.0	0.	-0.	0.	
1211062	12.8 135.7	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.		0.0 0.0	0.	-0.	0.		0.0 0.0	0.	-0.	0.	
1211182	13.8 138.6	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.		0.0 0.0	0.	-0.	0.		0.0 0.0	0.	-0.	0.	
1212062	14.3 139.2	35	14.1 139.7	35.	31.	0.	14.8 143.3	25.	296.	0.		0.0 0.0	0.	-0.	0.		0.0 0.0	0.	-0.	0.	
1212182	15.0 138.6	30	14.2 139.1	30.	56.	0.	15.2 139.8	40.	189.	20.		0.0 0.0	0.	-0.	0.		0.0 0.0	0.	-0.	0.	
1213062	15.8 138.4	25	15.7 138.9	30.	29.	5.	0.0 0.0	0.	-0.	0.		0.0 0.0	0.	-0.	0.		0.0 0.0	0.	-0.	0.	
1213182	16.7 138.2	20	16.4 138.5	20.	25.	0.	0.0 0.0	0.	-0.	0.		0.0 0.0	0.	-0.	0.		0.0 0.0	0.	-0.	0.	

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	35.	209.	0.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	19.	152.	0.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	1.	10.	0.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	1.	10.	0.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	4	2	0	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 845. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 6. KNOTS

TROPICAL CYCLONE 04P
FIX POSITIONS FOR CYCLONE NO. 4

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	070126	9.3S 135.2E	PCN 6	T1.0/1.0	INIT OBS ULAC 09.2S 134.7E	KGWC
2	070600	10.0S 133.3E	PCN 6	T0.0/0.0	INIT OBS	PGTW
3	071406	9.9S 131.7E	PCN 6		ULAC 10.0S 132.4E	KGWC
4	071800	9.8S 131.5E	PCN 6			PGTW
5	080000	10.2S 131.6E	PCN 6		ULCC FIX	PGTW
6	080105	10.5S 129.2E	PCN 5	T1.5/1.5 /D0.5/24HRS		KGWC
7	080300	10.3S 131.8E	PCN 6	T1.0/1.0-/D1.0/21HRS	ULCC FIX	PGTW
8	081200	10.3S 131.5E	PCN 6			PGTW
9	081600	10.4S 131.6E	PCN 6	T2.0/2.0	INIT OBS	PGTW
10	081800	10.5S 131.4E	PCN 6			PGTW
11	090000	10.8S 131.0E	PCN 6		ULCC FIX	PGTW
12	090045	10.8S 130.5E	PCN 5	T2.5/2.5 /D1.0/24HRS	ULAC 11.9S 132.5E	KGWC
13	090300	10.9S 130.1E	PCN 6	T1.5/1.5 /D0.5/24HRS	ULCC FIX	PGTW
14	091200	10.8S 131.1E	PCN 6	T1.5/2.0 /W0.5/26HRS	ULCC FIX	PGTW
* 15	091326	10.7S 129.4E	PCN 5			KGWC
16	100000	11.0S 132.5E	PCN 6			PGTW
17	100206	11.2S 132.5E	PCN 5	T2.5/2.5 /S0.0/25HRS	ULAC 11.3S 134.1E	KGWC
18	100300	11.1S 132.6E	PCN 6	T2.0/2.0 /D0.5/24HRS		PGTW
19	100929	11.0S 131.8E	PCN 5			KGWC
20	101306	11.1S 132.8E	PCN 6	T2.0/2.0	INIT OBS ULAC 12.0S 134.6E	KGWC
* 21	101600	11.6S 131.4E	PCN 6	T1.0/1.5 /W0.5/24HRS		PGTW
22	101857	11.0S 133.1E	PCN 6			KGWC
* 23	102209	11.2S 133.0E	PCN 6			KGWC
* 24	110000	12.6S 136.1E	PCN 6			PGTW
25	110146	12.9S 134.9E	PCN 5			KGWC
26	111200	13.5S 137.6E	PCN 6		ULCC FIX	PGTW
27	111245	12.9S 137.0E	PCN 6			KGWC
28	111600	13.6S 138.2E	PCN 6	T2.0/2.0-/D1.0/24HRS	ULCC FIX	PGTW
29	111845	13.8S 139.7E	PCN 6			KGWC
30	112148	14.0S 139.7E	PCN 6		ULAC 14.0S 140.3E	KGWC
31	120000	14.2S 139.6E	PCN 6			PGTW
32	120126	13.7S 138.7E	PCN 5	T3.0/3.0	INIT OBS ULAC 13.3S 139.1E	KGWC
33	120300	14.0S 139.1E	PCN 6	T2.0/2.0	INIT OBS	PGTW
34	120846	13.9S 139.2E	PCN 6			KGWC
35	120900	13.9S 139.6E	PCN 6		ULCC FIX	PGTW
36	121200	14.1S 140.0E	PCN 6		ULCC FIX	PGTW
37	121225	13.8S 138.2E	PCN 6	T2.5/2.5	INIT OBS ULAC 12.9S 139.3E	KGWC
38	121600	13.9S 138.2E	PCN 6	T1.5/2.0+/W0.5/24HRS	ULCC FIX	PGTW
39	121800	14.1S 138.1E	PCN 6			PGTW
* 40	121832	12.6S 138.0E	PCN 6		ULAC 12.6S 139.1E	KGWC
41	122100	14.1S 137.3E	PCN 6		ULCC FIX	PGTW
* 42	122126	14.8S 135.4E	PCN 6		EXP LLCC ULAC 12.0S 130.4E	KGWC
43	130000	14.9S 138.8E	PCN 6			PGTW
44	130106	15.3S 137.5E	PCN 5	T2.5/3.0 /W0.5/24HRS	ULAC 15.8S 140.8E	KGWC
* 45	130300	14.3S 138.5E	PCN 6	T1.5/2.0 /W0.5/24HRS		PGTW
46	130600	16.3S 138.9E	PCN 6			PGTW
* 47	130717	17.4S 136.2E	PCN 6		ULAC 18.4S 136.5E	KGWC
* 48	130825	15.3S 135.3E	PCN 6			KGWC
49	130900	16.1S 138.9E	PCN 6			PGTW
* 50	131308	16.8S 136.8E	PCN 6			KGWC
51	140045	18.0S 137.3E	PCN 5			KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 05S
BEST TRACK DATA

	BEST TRACK			WARNING		ERRORS			24 HOUR FORECAST		ERRORS			48 HOUR FORECAST		ERRORS			72 HOUR FORECAST		ERRORS		
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
122212Z	17.5	122.9	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
122300Z	17.6	121.7	30	17.6	121.8	40.	6.	10.	18.5	120.2	55.	64.	5.	19.7	118.0	65.	132.	-5.	0.0	0.0	0.	-0.	0.
122312Z	17.7	120.7	40	18.2	120.6	50.	31.	10.	19.4	118.4	60.	108.	0.	20.8	115.7	70.	207.	-5.	0.0	0.0	0.	-0.	0.
122400Z	17.6	119.6	50	17.9	119.8	55.	21.	5.	18.3	117.8	65.	48.	-5.	19.5	115.6	75.	130.	0.	0.0	0.0	0.	-0.	0.
122412Z	17.6	118.5	60	17.7	118.3	75.	13.	15.	18.1	115.7	100.	104.	25.	18.7	113.2	110.	263.	45.	0.0	0.0	0.	-0.	0.
122500Z	17.5	117.8	70	17.6	117.5	80.	18.	10.	18.1	115.2	100.	132.	25.	19.4	112.7	100.	333.	50.	0.0	0.0	0.	-0.	0.
122512Z	17.8	117.5	75	17.8	116.6	80.	51.	-5.	18.8	114.7	75.	178.	10.	19.9	112.9	65.	381.	35.	0.0	0.0	0.	-0.	0.
122600Z	18.3	117.5	75	18.5	117.3	70.	17.	-5.	19.8	117.8	65.	53.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
122612Z	19.3	117.8	65	19.2	117.8	65.	6.	0.	20.4	119.0	50.	66.	20.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
122700Z	20.4	118.5	50	20.1	118.7	60.	21.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
122712Z	21.4	119.5	30	21.6	118.9	30.	36.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	22.	94.	241.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	19.	66.	180.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	7.	13.	23.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	6.	12.	20.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	10	8	6	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 569. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 5. KNOTS

TROPICAL CYCLONE 5S
FIX POSITIONS FOR CYCLONE NO. 5

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	220600	17.2S 123.0E	PCN 6			PGTW
2	220900	17.5S 122.8E	PCN 6			PGTW
3	221600	17.7S 122.6E	PCN 6			PGTW
4	221800	17.4S 122.6E	PCN 6			PGTW
5	230000	17.3S 121.6E	PCN 6	T2.0/2.0	INIT OBS ULCC 17.4S 122.4E	PGTW
6	230248	17.3S 121.8E	PCN 5	T1.5/1.5	INIT OBS ULAC 17.3S 121.3E	KGWC
7	230300	17.5S 121.2E	PCN 6			PGTW
8	230600	17.6S 121.0E	PCN 6		ULCC 17.7S 120.9E	PGTW
9	230835	17.7S 120.8E	PCN 5		ULAC 17.8S 120.6E	KGWC
10	230900	18.0S 120.8E	PCN 6			PGTW
11	231200	17.9S 120.7E	PCN 6			PGTW
12	231347	17.7S 120.4E	PCN 5			KGWC
13	231937	17.4S 120.4E	PCN 6			KGWC
14	232237	18.0S 120.6E	PCN 5			KGWC
15	240000	17.7S 119.8E	PCN 6			PGTW
16	240227	17.6S 119.3E	PCN 5	T2.5/2.5 /D1.0/24HRS		KGWC
17	240300	17.6S 119.2E	PCN 6	T3.5/3.5 /D1.5/27HRS		PGTW
18	240600	17.5S 119.0E	PCN 2		EYE FIX	PGTW
19	240822	17.3S 118.7E	PCN 5			KGWC
20	240900	17.7S 118.6E	PCN 4			PGTW
21	241200	17.8S 118.3E	PCN 4			PGTW
22	241326	17.6S 118.3E	PCN 6	T3.0/3.0	INIT OBS	KGWC
23	241600	17.8S 118.3E	PCN 4	T4.0/4.0	INIT OBS	PGTW
24	241800	18.0S 118.1E	PCN 6			PGTW
25	241925	17.6S 118.1E	PCN 5			KGWC
26	242100	17.6S 117.9E	PCN 6			PGTW
27	242215	17.7S 117.5E	PCN 1		EYE FIX	KGWC
28	250000	17.4S 117.6E	PCN 2		EYE FIX	PGTW
29	250207	17.4S 117.6E	PCN 1	T4.0/4.0 /D1.5/24HRS		KGWC
30	250300	17.4S 117.4E	PCN 2	T4.5/4.5 /D1.0/24HRS	EYE DIA 24NM	PGTW
31	250600	17.6S 117.1E	PCN 2		EYE FIX	PGTW
32	250810	17.5S 117.1E	PCN 5			KGWC
33	250900	17.8S 116.9E	PCN 4			PGTW
34	251200	18.1S 116.9E	PCN 4			PGTW
35	251448	17.9S 117.6E	PCN 6	T2.5/3.0 /W1.0/25HRS		KGWC
36	251600	18.2S 116.9E	PCN 6	T4.5/4.5-/D0.5/24HRS		PGTW
37	251800	18.2S 117.1E	PCN 6			PGTW
38	251912	18.1S 117.2E	PCN 6			KGWC
39	252100	18.5S 116.7E	PCN 6			PGTW
40	252335	18.3S 117.9E	PCN 2		EYE DIA 18NM	KGWC
41	260000	18.3S 117.4E	PCN 2		EYE DIA 10NM ULCC FIX	PGTW
42	260300	18.7S 117.6E	PCN 2	T4.5/4.5 /S0.0/24HRS	EYE DIA 06NM	PGTW
43	260328	18.7S 117.9E	PCN 5	T3.5/4.0 /W0.5/25HRS		KGWC
44	260600	18.9S 117.5E	PCN 4			PGTW
45	260757	19.1S 117.5E	PCN 5			KGWC
46	260900	19.2S 117.4E	PCN 4		ULCC FIX	PGTW
47	261034	19.3S 117.5E	PCN 5			KGWC
48	261055	17.8S 117.2E	PCN 5			KGWC
49	261200	19.3S 118.0E	PCN 4		ULCC FIX	PGTW
50	261427	19.6S 118.1E	PCN 6	T2.0/2.5 /W0.5/24HRS		KGWC
51	261600	19.7S 118.4E	PCN 6	T3.5/4.5 /W1.0/24HRS	ULCC FIX	PGTW
52	261800	19.9S 118.3E	PCN 6		ULCC FIX	PGTW
53	261900	20.0S 118.1E	PCN 6			KGWC
54	262100	19.9S 118.7E	PCN 6		ULCC FIX	PGTW
55	262314	20.3S 119.5E	PCN 6			KGWC
56	270000	20.3S 118.4E	PCN 6			PGTW
57	270300	20.5S 118.2E	PCN 4		EXP LLCC	PGTW
58	270308	20.7S 118.7E	PCN 5			KGWC
59	270600	20.9S 118.5E	PCN 4		EXP LLCC	PGTW
60	270744	21.8S 119.3E	PCN 5			KGWC
61	270900	21.2S 118.6E	PCN 4		EXP LLCC	PGTW
62	271013	21.6S 118.8E	PCN 5			KGWC
63	271200	21.4S 118.9E	PCN 4		EXP LLCC	PGTW
64	272100	21.0S 120.2E	PCN 4		EXP LLCC	PGTW

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR TDDFF	COMMENTS	RADAR POSITION	SITE WMO NO.
1	232200	17.5S 119.9E	LAND						17.9S 122.6E	94203
2	240400	17.6S 119.1E	LAND				1/4// /2707		20.4S 118.6E	94312
3	241000	17.6S 118.5E	LAND				31111 /2705		20.4S 118.6E	94312
4	241600	17.6S 118.1E	LAND				2/8// /2704		20.4S 118.6E	94312
5	242200	17.4S 117.6E	LAND				2//// /2904		20.4S 118.6E	94312
6	260100	18.6S 117.3E	LAND				2//// /1504		20.4S 118.6E	94312
7	260800	19.3S 117.5E	LAND				1/3// /1710		20.4S 118.6E	94312
8	261600	19.5S 117.7E	LAND				1/9// //405		20.4S 118.6E	94312

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	240600	17.6S 118.8E	060	010	94207

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 06P
BEST TRACK DATA

	BEST TRACK		WARNING				24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
					ERRORS				ERRORS				ERRORS				ERRORS	
MO/DA/HR	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
1226122	8.4 178.6	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
1227002	8.0 180.0	40	8.4 179.9	40.	25.	0.	8.6 181.9	55.	199.	15.	9.0 183.9	65.	235.	40.	0.0 0.0	0.	-0.	0.
1227122	9.7 180.5	45	9.1 180.8	40.	40.	-5.	10.0 182.0	30.	186.	-5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
1228002	11.8 181.0	40	10.7 181.1	35.	66.	-5.	12.6 182.3	25.	19.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
1228122	13.1 181.9	35	11.7 181.5	35.	87.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
1229002	12.7 182.6	25	12.7 182.5	30.	6.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	45.	135.	235.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	26.	90.	206.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	3.	7.	40.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	-1.	3.	40.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	5	3	1	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 464. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 8. KNOTS

TROPICAL CYCLONE 06P
FIX POSITIONS FOR CYCLONE NO. 6

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	260000	8.8S 177.9E	PCN 6	T1.0/1.0	INIT OBS	PGTW
2	260300	9.0S 177.9E	PCN 6			PGTW
3	260600	9.1S 178.1E	PCN 6		ULCC FIX	PGTW
4	260900	9.0S 177.9E	PCN 6		ULCC FIX	PGTW
5	261200	8.7S 178.6E	PCN 6		ULCC FIX	PGTW
6	261600	8.7S 178.9E	PCN 6		ULCC FIX	PGTW
7	261800	8.1S 179.1E	PCN 6	T2.5/2.5	INIT OBS ULCC FIX	PGTW
8	262100	8.1S 179.4E	PCN 6			PGTW
9	262200	8.1S 179.8W	PCN 6	T1.5/1.5	INIT OBS ULAC 07.8S 179.4E	KGWC
10	270000	8.3S 179.9E	PCN 6	T3.0/3.0 /D2.0/24HRS		PGTW
11	270300	8.6S 179.8W	PCN 4			PGTW
12	270600	8.8S 179.7W	PCN 6		ULCC FIX 07.7S 179.9E	PGTW
13	270600	8.2S 179.8W	PCN 6		ULAC 07.8S 179.8E	KGWC
* 14	270900	7.5S 179.7W	PCN 6		ULCC FIX	PGTW
* 15	271000	7.5S 179.6W	PCN 6		ULAC 07.1S 180.0E	KGWC
* 16	271200	7.5S 179.7W	PCN 6			PGTW
* 17	272100	9.9S 179.7W	PCN 6		ULCC FIX	PGTW
* 18	272100	9.5S 179.8W	PCN 5	T1.5/1.5 /S0.0/24HRS		KGWC
19	280000	12.2S 179.0W	PCN 4	T3.0/3.0 /S0.0/24HRS	EXP LLCC	PGTW
20	280300	12.8S 178.6W	PCN 4		EXP LLCC	PGTW
21	280600	13.2S 178.7W	PCN 4		ULCC 11.7S 178.7W	PGTW
* 22	280900	11.8S 178.8W	PCN 6		ULCC FIX	PGTW
* 23	281000	11.7S 178.1W	PCN 6			KGWC
* 24	281200	11.6S 178.3W	PCN 6		ULCC FIX	PGTW
25	282300	12.7S 177.8W	PCN 6	T0.0/1.0 /W1.5/26HRS		KGWC

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	261200	8.4S 178.9E	045	010	WMO 91643
2	261800	8.8S 178.8E	035	030	WMO 91643

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 07P
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
					ERRORS			ERRORS				ERRORS				ERRORS			
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
122518Z	12.7	145..	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
122606Z	13.8	147.8	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
122618Z	15.2	150.5	35	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
122706Z	16.6	152.8	50	16.1	152.9	45.	31.	-5	18.6	157.7	65.	104.	0.	21.4	161.6	80.	255.	40.	0.0	0.0	0.	-0.	0.
122718Z	18.4	155.3	65	18.2	154.2	50.	64.	-15.	21.4	158.0	70.	167.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
122806Z	20.3	158.1	65	19.5	156.4	60.	107.	-5.	22.2	160.7	75.	255.	35.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
122818Z	22.1	160.9	55	22.0	161.0	55.	8.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
122906Z	25.0	164.2	40	25.0	164.1	40.	5.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	43.	176.	259.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	22.	48.	57.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	5.	17.	40.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	-5.	17.	40.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	5	3	1	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1322. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 16. KNOTS

TROPICAL CYCLONE 07P
FIX POSITIONS FOR CYCLONE NO. 7

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	251200	12.1S 143.8E	PCN 6			PGTW
	2	251600	12.3S 144.3E	PCN 6			PGTW
	3	251800	12.6S 144.6E	PCN 6	T1.5/1.5	INIT OBS	PGTW
	4	252100	13.0S 145.4E	PCN 6			PGTW
	5	260000	13.0S 146.6E	PCN 6		ULCC FIX	PGTW
*	6	260005	12.0S 148.0E	PCN 5	T1.0/1.0	INIT OBS ULAC 13.3S 149.4E	KGWC
	7	260300	13.3S 146.7E	PCN 6	T1.5/1.5	INIT OBS	PGTW
	8	260600	13.9S 147.2E	PCN 6		ULCC 15.1S 148.7E	PGTW
*	9	260853	13.0S 147.8E	PCN 6		ULAC 14.1S 148.4E	KGWC
	10	260900	14.8S 148.7E	PCN 6		ULCC FIX	PGTW
	11	261200	15.0S 149.0E	PCN 6		ULCC FIX	PGTW
*	12	261246	13.0S 148.5E	PCN 6			KGWC
	13	261600	15.1S 149.9E	PCN 6		ULCC FIX	PGTW
	14	261718	14.3S 149.9E	PCN 6		ULAC 17.0S 151.6E	KGWC
	15	261800	16.1S 150.4E	PCN 6	T2.5/2.5 /D1.0/24HRS	ULCC FIX	PGTW
	16	261952	14.9S 150.5E	PCN 5		ULAC 17.2S 151.2E	KGWC
*	17	262100	15.0S 149.0E	PCN 6		ULCC FIX	PGTW
	18	262345	15.5S 151.6E	PCN 5	T2.5/2.5 /D1.5/24HRS	ULAC 16.9S 151.2E	KGWC
	19	270000	16.0S 150.6E	PCN 6		ULCC FIX	PGTW
	20	270300	15.9S 152.4E	PCN 4	T3.0/3.0 /D1.5/24HRS		PGTW
	21	270600	16.1S 152.8E	PCN 6			PGTW
	22	270832	17.4S 152.9E	PCN 6		ULAC 17.4S 152.3E	KGWC
	23	270900	16.6S 153.2E	PCN 6		ULCC FIX	PGTW
	24	271200	17.5S 153.0E	PCN 6		ULCC FIX	PGTW
	25	271226	17.1S 153.3E	PCN 6	T3.0/3.0	INIT OBS ULAC 17.3S 153.0S	KGWC
	26	271705	17.9S 154.3E	PCN 6		ULAC 18.5S 153.7E	KGWC
	27	271800	18.1S 154.3E	PCN 6	T3.5/3.5 /D1.0/24HRS	ULCC FIX	PGTW
	28	272100	18.5S 155.1E	PCN 6			PGTW
	29	272325	18.8S 155.8E	PCN 6	T3.5/3.5 /D1.0/24HRS		KGWC
	30	280000	18.9S 156.2E	PCN 6		ULCC FIX	PGTW
	31	280300	18.9S 156.4E	PCN 6	T4.0/4.0 /D1.0/24HRS		PGTW
	32	280600	19.5S 157.7E	PCN 6		ULCC FIX	PGTW
	33	280810	21.3S 158.4E	PCN 6			PGTW
	34	280900	20.7S 159.3E	PCN 6		ULCC FIX	PGTW
	35	281024	21.9S 159.1E	PCN 6	T2.5/3.0 /W0.5/22HRS		KGWC
	36	281200	21.3S 160.3E	PCN 6		ULCC FIX	PGTW
*	37	281600	22.5S 162.4E	PCN 6	T3.5/3.5-/S0.0/22HRS	ULCC FIX	PGTW
*	38	281653	23.4S 162.3E	PCN 6			KGWC
*	39	281800	23.2S 163.1E	PCN 6		ULCC FIX	PGTW
	40	282305	22.6S 161.8E	PCN 4	T2.0/3.0 /W1.5/24HRS		KGWC
	41	290749	25.9S 164.8E	PCN 6			PGTW
	42	291004	27.3S 161.7E	PCN 6			KGWC
	43	300026	31.2S 161.9E	PCN 3		EXP LLCC	KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 08P
BEST TRACK DATA

	BEST TRACK			WARNING		ERRORS			24 HOUR FORECAST		ERRORS			48 HOUR FORECAST		ERRORS			72 HOUR FORECAST		ERRORS	
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
122612Z	11.4	165.0	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
122700Z	12.1	166.4	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
122712Z	13.7	167.3	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
122800Z	15.4	168.3	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
122812Z	17.2	169.6	40	17.1	169.2	40.	24.	0.	21.5	171.5	60.	170.	20.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
122900Z	18.9	171.7	45	18.9	171.5	45.	11.	0.	23.8	174.4	40.	220.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
122912Z	20.2	174.2	40	20.4	173.9	45.	21.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
123000Z	21.2	177.2	25	21.4	176.6	30.	36.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	23.	195.	0.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	20.	167.	0.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	3.	18.	0.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	3.	18.	0.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	4	2	0	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 948. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 11. KNOTS

TROPICAL CYCLONE 08P
FIX POSITIONS FOR CYCLONE NO. 8

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	260000	11.0S 164.2E	PCN 6	T0.0/0.0	INIT OBS	PGTW
	2	260300	11.2S 164.0E	PCN 6			PGTW
	3	260600	11.2S 165.4E	PCN 6		ULCC FIX	PGTW
	4	260900	11.4S 165.5E	PCN 6		ULCC FIX	PGTW
	5	261200	11.3S 164.8E	PCN 6		ULCC FIX	PGTW
*	6	261600	10.9S 163.7E	PCN 6		ULCC FIX	PGTW
	7	261800	11.5S 165.1E	PCN 6	T1.0/1.0	INIT OBS ULCC FIX	PGTW
	8	262100	12.1S 166.0E	PCN 6		ULCC FIX	PGTW
	9	262345	11.9S 166.6E	PCN 5	T1.5/1.5	INIT OBS ULAC 12.6S 166.4E	KGWC
	10	270000	11.6S 166.4E	PCN 6	T2.0/2.0 /D2.0/24HRS	ULCC FIX	PGTW
	11	270300	12.4S 166.7E	PCN 6		ULCC FIX	PGTW
	12	270600	12.7S 167.0E	PCN 6			PGTW
	13	270900	13.0S 167.2E	PCN 6		ULCC FIX	PGTW
	14	271044	13.6S 166.4E	PCN 6		ULAC 13.4S 166.6E	KGWC
	15	271200	13.3S 167.3E	PCN 6			PGTW
	16	271800	14.9S 167.8E	PCN 6			PGTW
	17	271930	14.9S 168.6E	PCN 6		ULAC 14.8S 167.9E	KGWC
	18	272100	14.9S 167.8E	PCN 6			PGTW
	19	272325	15.8S 168.9E	PCN 6	T1.5/1.5 /S0.0/24HRS	ULAC 15.0S 168.3E	KGWC
	20	280000	15.7S 168.3E	PCN 6	T2.5/2.5-/D0.5/24HRS		PGTW
	21	280300	15.5S 168.6E	PCN 6		ULCC FIX	PGTW
	22	280408	15.8S 168.8E	PCN 6			KGWC
	23	280600	15.9S 168.9E	PCN 6		ULCC FIX	PGTW
	24	280629	15.9S 168.4E	PCN 6			KGWC
	25	280900	16.9S 169.0E	PCN 6		ULCC FIX	PGTW
*	26	281024	17.3S 167.9E	PCN 6		ULAC 17.4S 168.4E	KGWC
	27	281200	17.2S 169.4E	PCN 6		ULCC FIX	PGTW
	28	281600	17.6S 169.6E	PCN 6	T3.0/3.0	INIT OBS ULCC FIX	PGTW
	29	281653	18.5S 169.7E	PCN 6		ULAC 18.9S 170.3E	KGWC
	30	281800	17.8S 170.1E	PCN 6		ULCC FIX	PGTW
	31	281909	18.0S 171.7E	PCN 5		ULAC 18.6S 171.6E	KGWC
	32	282100	18.4S 171.2E	PCN 6		ULCC FIX	PGTW
	33	282305	18.4S 172.0E	PCN 6	T3.0/3.0 /D1.5/24HRS	ULAC 18.8S 171.5E	KGWC
	34	290000	19.2S 172.3E	PCN 6	T3.0/3.0-/D0.5/24HRS		PGTW
	35	290300	19.7S 172.7E	PCN 6			PGTW
	36	290600	19.6S 173.3E	PCN 6			PGTW
	37	290608	19.8S 173.3E	PCN 6		ULAC 19.4S 167.7E	KGWC
	38	290900	19.9S 173.3E	PCN 6			PGTW
	39	291004	20.2S 173.4E	PCN 6	T3.0/3.0	INIT OBS	KGWC
	40	291200	20.2S 173.8E	PCN 6		ULCC FIX	PGTW
	41	291600	20.5S 174.6E	PCN 6		ULCC 21.1S 174.9E	PGTW
	42	291640	20.1S 174.8E	PCN 6			KGWC
	43	291800	20.8S 175.0E	PCN 6	T1.5/2.5 /W1.5/26HRS		PGTW
	44	291848	20.6S 175.6E	PCN 6		ULAC 21.5S 175.4E	KGWC
	45	292244	21.0S 177.0E	PCN 4	T2.5/3.0 /W0.5/24HRS	EXP LLCC	KGWC
	46	300944	19.7S 179.2W	PCN 6			KGWC
	47	302224	18.4S 177.5W	PCN 4		EXP LLCC	KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 09P
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST ERRORS						48 HOUR FORECAST ERRORS						72 HOUR FORECAST ERRORS					
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND
011000Z	11.4	184.1	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011012Z	12.0	184.7	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011100Z	13.2	185.0	35	12.4	184.6	35.	53.	0.	14.4	183.8	45.	158.	0.	16.8	184.0	55	183.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011112Z	14.7	185.3	40	14.4	184.8	40.	34.	0.	16.7	184.5	45.	108.	-5.	19.1	186.8	55	40.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011200Z	16.2	185.8	45	16.1	186.0	40.	13.	-5.	17.9	186.4	40.	31.	-5.	18.9	188.0	35.	95.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011212Z	17.2	186.3	50	17.5	186.5	50.	21.	0.	18.5	187.0	45.	41.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011300Z	18.1	186.9	45	16.4	187.2	40.	103.	-5.	17.7	189.0	30.	156.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011312Z	19.0	187.5	40	19.8	186.0	35.	98.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011400Z	20.3	188.8	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	54.	99.	106.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	37.	62.	57.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	3.	3.	10.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	-3.	-1.	10.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	6	5	3	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 612. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 6. KNOTS

TROPICAL CYCLONE 09P
FIX POSITIONS FOR CYCLONE NO. 9

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	092015	11.5S 177.0W				PHNL
	2	092225	11.2S 176.2W	PCN 6	T1.5/1.5	INIT OBS ULAC 11.5S 175.7W	KGWC
	3	100215	11.9S 175.5W				PHNL
	4	100924	11.1S 174.9W	PCN 6		ULAC 11.6S 174.2W	KGWC
	5	102204	12.2S 175.2W	PCN 6	T2.5/2.5 /D1.0/24HRS	ULAC 12.9S 175.1W	KGWC
	6	110903	14.1S 175.2W	PCN 6			KGWC
	7	111743	15.5S 174.6W	PCN 6			KGWC
	8	112144	15.8S 174.0W	PCN 6	T3.5/3.5 /D1.0/24HRS		KGWC
	9	120215	16.5S 174.2W				PHNL
	10	120614	16.8S 173.9W	PCN 6			KGWC
	11	120827	17.0S 174.0W				PHNL
*	12	122020	16.0S 175.0W				PHNL
	13	122124	17.6S 173.4W	PCN 4	T2.5/2.5 /W1.0/24HRS	EXP LLCC ULAC 16.0S 172.8W	KGWC
	14	130215	18.0S 172.7W				PHNL
	15	130553	18.3S 172.5W	PCN 6		EXP LLCC	KGWC
*	16	131004	19.5S 174.1W	PCN 6		EXP LLCC	KGWC
	17	131833	19.5S 172.0W	PCN 6	T3.0/3.0 /D0.5/21HRS		KGWC
	18	132045	19.5S 171.5W				PHNL
	19	132104	19.9S 172.1W	PCN 4	T1.5/2.5 /W1.5/24HRS		KGWC
	20	140944	22.3S 168.2W	PCN 4			KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 10S
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST ERRORS						48 HOUR FORECAST ERRORS						72 HOUR FORECAST ERRORS					
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND
011006Z	10.9	65.7	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011018Z	11.4	64.4	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011106Z	12.0	62.9	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011118Z	12.7	61.2	35	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011206Z	13.8	59.7	45	13.5	59.5	40.	21.	-5.	16.3	55.3	70.	92.	10.	20.1	52.8	80.	161.	25.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011218Z	15.0	58.3	55	14.9	57.8	50.	30.	-5.	17.7	54.2	75.	88.	10.	21.9	53.7	85.	164.	35.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011306Z	16.2	56.9	60	16.5	57.4	60.	34.	0.	19.6	55.0	80.	78.	25.	22.4	56.2	80.	210.	30.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011318Z	17.4	55.7	65	17.8	55.7	65.	24.	0.	20.6	53.5	75.	93.	25.	22.3	52.3	45.	114.	-10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011406Z	18.3	54.9	55	19.2	54.1	65.	71.	10.	22.2	51.7	55.	182.	5.	24.4	50.4	40.	244.	-15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011418Z	18.8	54.2	50	19.0	54.2	50.	12.	0.	20.7	52.7	40.	39.	-15.	22.4	50.9	30.	200.	-25.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011506Z	19.8	53.7	50	20.0	53.5	45.	16.	-5.	21.5	52.3	35.	79.	-20.	23.4	50.7	25.	283.	-30.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011518Z	20.7	53.4	55	20.7	53.1	55.	17.	0.	22.6	52.0	35.	141.	-20.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011606Z	21.7	53.7	55	21.2	52.6	55.	68.	0.	23.0	51.5	50.	235.	-5.	24.8	50.8	45.	325.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011618Z	22.2	54.5	55	21.7	54.6	40.	31.	-15.	22.9	58.3	30.	134.	-25.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011706Z	22.4	55.7	55	22.7	57.1	45.	80.	-10.	24.3	61.5	30.	387.	-10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011718Z	21.8	56.2	55	22.1	56.3	55.	19.	0.	22.9	56.1	55.	131.	20.	25.1	55.1	50.	208.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011806Z	21.3	55.3	40	22.0	55.0	50.	45.	10.	22.0	55.0	50.	66.	15.	24.1	57.1	35.	239.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011818Z	21.3	54.5	35	21.7	54.7	45.	26.	10.	22.7	54.5	40.	74.	0.	24.3	54.5	30.	93.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011906Z	21.6	53.9	35	21.4	53.4	45.	30.	10.	21.5	51.2	35.	135.	-5.	21.6	49.0	25.	335.	-10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011918Z	22.0	53.4	40	22.1	51.7	40.	95.	0.	22.5	49.7	30.	205.	-5.	22.7	48.4	25.	388.	-10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
012006Z	23.1	52.9	40	22.1	53.2	40.	62.	0.	22.3	51.8	35.	224.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
012018Z	24.4	52.8	35	23.5	52.4	35.	58.	0.	24.7	52.0	35.	177.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
012106Z	25.9	52.9	35	24.7	54.0	35.	94.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
012118Z	27.4	53.3	35	27.4	53.0	30.	16.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	42.	142.	228.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	27.	85.	110.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	4.	12.	17.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	-0.	0.	-0.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	20	18	13	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1692. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 6. KNOTS

TROPICAL CYCLONE 10S
FIX POSITIONS FOR CYCLONE NO. 10

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION		ACCRY	DVORAK CODE	COMMENTS	SITE
1	100510	11.0S	66.0E	PCN 6	T1.0/1.0	INIT OBS	KGWC
2	110631	11.8S	63.3E	PCN 6	T2.0/2.0 /D1.0/25HRS		KGWC
* 3	111730	12.9S	60.1E	PCN 6		ULAC 13.1S 61.0E	KGWC
4	120201	14.8S	59.7E	PCN 6			KGWC
5	120611	14.1S	59.6E	PCN 6	T3.5/3.5 /D1.5/24HRS		KGWC
* 6	121115	15.0S	60.9E	PCN 5	T3.5/3.5	INIT OBS	FJDG
7	121441	15.1S	58.8E	PCN 6		ULAC 15.4S 058.4E	KGWC
8	121852	15.0S	58.4E	PCN 6	T3.5/3.5	ULAC 15.1S 058.3E	KGWC
9	122355	15.7S	57.8E	PCN 6			KGWC
10	130321	15.9S	57.8E	PCN 6			KGWC
11	130551	16.2S	56.9E	PCN 6	T3.5/3.5 /S0.0/24HRS	EYE FIX	KGWC
12	131240	16.8S	56.0E	PCN 2		EYE FIX	KGWC
13	131420	17.2S	56.0E	PCN 2			KGWC
14	131831	17.1S	55.5E	PCN 6	T4.0/4.0 /D0.5/24HRS		KGWC
15	140300	18.2S	55.5E	PCN 6			KGWC
16	140712	18.6S	54.9E	PCN 6	T2.5/3.5 /W1.0/24HRS	EXP LLCC ULAC 18.9S 055.2E	KGWC
17	141058	19.0S	55.0E	PCN 5	T3.5/3.5 /D0.5/24HRS		FJDG
18	141358	19.4S	54.0E	PCN 6		ULAC 19.5S 053.3E	KGWC
19	141811	19.3S	53.9E	PCN 6		ULAC 19.0S 053.9E	KGWC
20	150238	19.8S	54.1E	PCN 6			KGWC
21	150652	20.0S	53.7E	PCN 5	T3.0/3.0 /D0.5/24HRS		KGWC
22	151047	20.8S	53.2E	PCN 5	T3.5/3.5 /D0.5/24HRS		FJDG
23	151215	19.9S	53.4E	PCN 6		ULAC 20.0S 053.0E	KGWC
24	151337	20.1S	53.2E	PCN 6		ULAC 20.2S 053.0E	KGWC
25	151751	20.1S	53.8E	PCN 6	T3.5/3.5 /D0.5/24HRS	ULAC 21.0S 052.7E	KGWC
* 26	160217	20.7S	54.5E	PCN 6		ULAC 20.9S 53.9E	KGWC
27	160632	20.9S	53.7E	PCN 5	T3.0/3.0 /S0.0/24HRS	ULAC 21.6S 053.7E	KGWC
28	161036	22.3S	53.5E	PCN 5	T3.0/3.0 /D0.5/24HRS		FJDG
29	161202	21.4S	54.7E	PCN 6			KGWC
30	161457	22.0S	54.7E	PCN 6			KGWC
31	161731	21.8S	55.4E	PCN 6	T3.5/3.5 /S0.0/24HRS		KGWC
32	170337	22.2S	56.6E	PCN 5			KGWC
33	170611	22.3S	56.2E	PCN 5	T4.5/4.5 /D1.5/24HRS		KGWC
* 34	171026	23.0S	57.1E	PCN 5	T3.0/3.0 /S0.0/24HRS		FJDG
35	171150	21.9S	56.3E	PCN 6			KGWC
36	171436	21.7S	56.3E	PCN 6			KGWC
37	171825	22.1S	56.5E	PCN 6	T4.5/4.5 /D1.0/25HRS		KGWC
38	180316	20.7S	54.9E	PCN 5		EXP LLCC	KGWC
39	180733	20.9S	55.4E	PCN 5	T2.5/3.5 /W2.0/25HRS	EXP LLCC ULAC 23.2S 054.6E	KGWC
40	181015	21.0S	56.0E	PCN 5	T2.5/3.5 /W2.0/25HRS		FJDG
41	181415	21.5S	54.5E	PCN 4		EXP LLCC ULAC 22.4S 054.5E	KGWC
* 42	181832	22.2S	54.3E	PCN 4		EXP LLCC	KGWC
43	190022	21.8S	53.7E	PCN 4		EXP LLCC	KGWC
44	190255	21.5S	53.5E	PCN 4		EXP LLCC ULAC 23.2S 054.3E	KGWC
45	190712	22.2S	53.5E	PCN 4	T2.0/2.5 /W0.5/24HRS	ULAC 22.2S 054.8E	KGWC
* 46	191306	22.4S	51.8E	PCN 4			KGWC
47	191811	22.0S	53.2E	PCN 4			KGWC
48	200233	22.2S	53.4E	PCN 4		ULAC 23.8S 054.7E	KGWC
49	200652	23.5S	53.1E	PCN 3	T2.5/2.5 /D0.5/24HRS	ULAC 25.0S 052.8E	KGWC
50	201254	24.0S	52.7E	PCN 3		ULAC 24.7S 052.2E	KGWC
51	201751	24.2S	53.5E	PCN 4	T2.0/2.5 /W0.5/12HRS	ULAC 24.5S 051.8E	KGWC
* 52	210353	24.8S	54.5E	PCN 6		ULAC 25.5S 52.8E	KGWC
53	210632	25.9S	53.4E	PCN 3	T0.5/1.5 /W2.0/24HRS		KGWC
54	211452	26.8S	52.4E	PCN 3			KGWC
55	211731	27.1S	54.1E	PCN 6	T2.5/2.5 /D0.5/24HRS	ULAC 26.5S 053.7E	KGWC
56	220332	29.0S	56.0E	PCN 4			KGWC

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION		INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	180600	21.4S	55.2E	050	025	61980 61984

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 11P
BEST TRACK DATA

	BEST TRACK			WARNING		ERRORS			24 HOUR FORECAST		ERRORS			48 HOUR FORECAST		ERRORS			72 HOUR FORECAST		ERRORS		
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
011200Z	15.9	161.1	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
011212Z	15.6	161.6	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
011300Z	15.6	162.2	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
011312Z	15.5	163.0	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
011400Z	15.5	163.8	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
011412Z	15.4	165.0	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0	-0.	0.	0.0	0.0	0.	-0.	0.
011500Z	15.4	166.1	40	16.3	166.2	45.	54.	5.	18.0	169.1	65.	132.	5.	21.3	172.8	45.	279.	-45.	0.0	0.0	0.	-0.	0.
011512Z	15.5	167.8	50	15.5	167.6	55.	12.	5.	16.6	170.2	75.	94.	0.	18.9	173.6	60.	255.	-40.	0.0	0.0	0.	-0.	0.
011600Z	15.9	169.8	60	15.8	169.2	55.	35.	-5.	17.5	172.2	75.	131.	-15.	19.8	175.5	65.	451.	-25.	0.0	0.0	0.	-0.	0.
011612Z	16.3	171.8	75	16.3	171.3	65.	29.	-10.	18.6	174.7	85.	190.	-15.	20.9	177.7	70.	656.	-5.	0.0	0.0	0.	-0.	0.
011700Z	16.9	174.4	90	16.9	174.6	85.	11.	-5.	19.3	180.3	90.	186.	0.	22.3	185.8	70.	556.	10.	0.0	0.0	0.	-0.	0.
011712Z	18.1	178.0	100	18.0	177.9	90.	8.	-10.	20.7	184.6	70.	278.	-5.	23.7	191.2	55.	661.	10.	0.0	0.0	0.	-0.	0.
011800Z	20.0	183.5	90	20.0	182.5	75.	56.	-15.	24.0	190.5	50.	285.	-10.	27.5	198.7	35.	710.	5.	0.0	0.0	0.	-0.	0.
011812Z	21.9	189.4	75	21.8	189.0	90.	23.	15.	23.5	194.0	75.	526.	30.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011900Z	24.1	195.7	60	23.7	195.0	60.	45.	0.	29.3	206.4	30.	333.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
011912Z	27.4	202.7	45	27.2	202.5	40.	16.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
012000Z	33.6	210.5	30	33.7	211.5	30.	50.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	31.	239.	510.	0.	29.	228.	476.	0.
AVG RIGHT ANGLE ERROR	22.	58.	145.	0.	22.	59.	148.	0.
AVG INTENSITY MAGNITUDE ERROR	7.	9.	20.	0.	8.	10.	23.	0.
AVG INTENSITY BIAS	-2.	-1.	-13.	0.	-3.	-1.	-16.	0.
NUMBER OF FORECASTS	11	9	7	0	10	8	6	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 3030. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 16. KNOTS

TROPICAL CYCLONE 11P
FIX POSITIONS FOR CYCLONE NO. 11

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	110617	14.3S 152.8E	PCN 5	T1.0/1.0	INIT OBS	KGWC
2	112326	15.4S 161.3E	PCN 6	T2.0/2.0 /D1.0/17HRS	ULAC 14.6S 161.3E	KGWC
3	121025	15.2S 161.3E	PCN 6		ULAC 15.3S 164.1E	KGWC
* 4	121200	15.8S 163.4E	PCN 6			PGTW
5	121600	15.6S 162.5E	PCN 6		ULCC FIX	PGTW
6	122100	15.3S 162.4E	PCN 6			PGTW
7	122305	15.5S 162.2E	PCN 6	T2.0/2.0 /S0.0/24HRS		KGWC
8	130000	15.6S 162.6E	PCN 6	T1.0/1.0	INIT OBS	PGTW
9	130600	15.5S 162.0E	PCN 6			PGTW
* 10	131146	17.2S 162.8E	PCN 6		ULAC 16.3S 163.1E	KGWC
* 11	131600	16.4S 162.5E	PCN 6	T1.5/1.5		PGTW
12	132245	15.9S 163.3E	PCN 6	T2.0/2.0 /S0.0/24HRS		KGWC
* 13	140000	15.7S 161.8E	PCN 6	T2.0/2.0 /D1.0/24HRS		PGTW
* 14	140300	15.8S 162.1E	PCN 6			PGTW
* 15	140713	16.9S 162.5E	PCN 6			KGWC
16	140900	14.9S 163.8E	PCN 6			PGTW
17	141125	15.8S 163.9E	PCN 6		ULAC 15.0S 164.6E	KGWC
18	141200	15.5S 165.0E	PCN 6			PGTW
19	141600	15.9S 165.4E	PCN 6	T2.5/2.5 /D1.0/24HRS		PGTW
20	141642	15.8S 164.7E	PCN 6		ULAC 15.6S 165.7E	KGWC
21	141800	16.1S 165.8E	PCN 6			PGTW
* 22	141953	14.2S 167.8E	PCN 6		ULAC 13.5S 167.8E	KGWC
23	142100	16.1S 165.6E	PCN 6			PGTW
24	150000	16.2S 166.2E	PCN 6	T3.0/3.0 /D1.0/24HRS		PGTW
25	150006	14.7S 166.4E	PCN 6	T3.5/3.5 /D1.5/25HRS		KGWC
* 26	150300	16.5S 166.9E	PCN 6			PGTW
27	150600	15.2S 166.7E	PCN 6		ULCC 15.2S 167.5E	PGTW
* 28	150652	14.2S 167.6E	PCN 6			KGWC
29	150900	14.9S 168.0E	PCN 6		ULCC FIX	PGTW
30	151105	14.8S 168.1E	PCN 6	T3.5/3.5	INIT OBS	KGWC
31	151200	14.7S 168.5E	PCN 6			PGTW
32	151630	15.8S 167.3E	PCN 6		ULAC 15.7S 167.3E	KGWC
33	151800	15.4S 168.6E	PCN 6	T3.5/3.5 /D1.0/26HRS		PGTW
34	151932	16.1S 169.0E	PCN 6			KGWC
35	152346	15.9S 169.7E	PCN 5	T3.5/3.5 /S0.0/24HRS		KGWC
36	160000	15.7S 169.1E	PCN 6	T4.0/4.0-/D1.0/24HRS		PGTW
37	160300	16.0S 169.8E	PCN 6		ULCC FIX	PGTW
* 38	160600	16.3S 170.0E	PCN 6		ULCC FIX	PGTW
39	160630	16.4S 170.6E	PCN 6		ULAC 17.0S 169.4E	KGWC
40	160900	16.0S 170.3E	PCN 6		ULCC FIX	PGTW
41	161045	16.4S 171.5E	PCN 6	T4.5/4.5 /D1.0/24HRS		KGWC
42	161200	16.2S 170.9E	PCN 6		ULCC FIX	PGTW
43	161600	16.1S 171.0E	PCN 6	T3.5/3.5 /S0.0/22HRS		PGTW
44	161617	16.4S 172.8E	PCN 6		EYE FIX	KGWC
45	161910	16.5S 172.7E	PCN 6			KGWC
46	162326	17.0S 174.3E	PCN 2	T5.5/5.5 /D2.0/24HRS	EYE FIX	KGWC
47	170000	16.9S 174.6E	PCN 2			PGTW
48	170300	17.3S 175.4E	PCN 2	T5.0/5.0-/D1.0/27HRS		PGTW
49	170600	17.5S 176.3E	PCN 4			PGTW
50	170609	17.5S 176.1E	PCN 2			KGWC
51	171025	18.3S 178.0E	PCN 2	T5.5/5.5 /D1.0/24HRS	EYE FIX	KGWC
52	171200	17.8S 178.0E	PCN 4			PGTW
* 53	171605	18.7S 178.8W	PCN 6			KGWC
54	171849	19.4S 178.6W	PCN 2			KGWC
55	172305	20.2S 177.0W	PCN 2	T4.0/5.0 /W1.5/24HRS		KGWC
56	180548	21.0S 172.9W	PCN 6		ULAC 21.2S 172.6W	KGWC
* 57	180823	21.8S 171.0W	PCN 6	T3.5/5.0 /W2.0/22HRS	ULAC 22.1S 170.4W	KGWC
58	182104	23.1S 165.9W	PCN 4	T2.0/3.0 /W2.0/22HRS		KGWC
59	190803	26.2S 159.3W	PCN 4		EXP LLCC	KGWC
60	191625	29.5S 154.1W	PCN 6			KGWC
61	192044	32.3S 151.6W	PCN 6		EXP LLCC	KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 12S
BEST TRACK DATA

	BEST TRACK			WARNING		24 HOUR FORECAST ERRORS						48 HOUR FORECAST ERRORS						72 HOUR FORECAST ERRORS					
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	
01120621	10.8	84.7	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
01121821	11.7	86.0	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
01130621	12.6	86.8	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
01131821	13.5	86.5	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
01140621	14.0	86.2	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
01141821	14.6	85.8	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
01150621	14.9	85.4	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
01151821	15.5	84.8	35	16.4	85.1	35.	57.	0.	17.1	82.9	55.	104.	20.	17.8	79.6	70.	165.	45.	0.0	0.0	0.	-0.	0.
01160621	16.2	83.2	35	16.8	84.0	35.	58.	0.	17.5	81.5	45.	158.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
01161821	17.3	81.1	35	16.5	81.0	35.	48.	0.	16.6	76.1	30.	153.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
01170621	18.4	78.9	30	17.8	79.1	30.	38.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
01171821	19.0	77.0	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	50.	138.	165.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	47.	33.	22.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	0.	13.	45.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	0.	13.	45.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	4	3	1	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 874. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 7. KNOTS

TROPICAL CYCLONE 12S
FIX POSITIONS FOR CYCLONE NO. 12

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION		ACCRY	DVORAK CODE	COMMENTS	SITE
*	1	140531	14.0S	83.6E	PCN 4	T1.5/1.5 /S0.0/25HRS		KGWC
	2	141600	13.9S	85.0E	PCN 6	T1.5/1.5	INIT OBS	PGTW
	3	141630	14.5S	85.8E	PCN 6		ULAC 13.2S 085.7E	KGWC
	4	141800	13.8S	85.4E	PCN 6			PGTW
	5	142100	14.5S	85.2E	PCN 6			PGTW
	6	150000	14.2S	86.2E	PCN 6		ULCC FIX	PGTW
	7	150300	13.8S	86.2E	PCN 6	T2.0/2.0	INIT OBS ULCC FIX	PGTW
*	8	150510	14.8S	87.0E	PCN 6	T2.5/2.5 /D1.0/24HRS	ULAC 13.8S 086.0E	KGWC
	9	150600	13.8S	85.5E	PCN 6		ULCC 14.2S 085.9E	PGTW
*	10	151033	16.1S	86.2E	PCN 6		ULAC 14.8S 085.7E	KGWC
*	11	151156	16.3S	86.2E	PCN 6			KGWC
	12	151200	15.0S	85.5E	PCN 6	T2.5/2.5 /D1.0/20HRS	ULCC FIX	PGTW
	13	151609	15.6S	85.2E	PCN 6	T2.5/2.5	INIT OBS	KGWC
	14	151800	15.0S	84.7E	PCN 6			PGTW
	15	160036	15.9S	84.0E	PCN 6		ULAC 16.2S 085.0E	KGWC
	16	160450	15.8S	83.4E	PCN 4	T2.0/2.5 /W0.5/24HRS	ULAC 17.6S 086.8E	KGWC
	17	160600	16.1S	83.0E	PCN 6	T1.5/2.0 /W0.5/27HRS	EXP LLCC	PGTW
	18	160854	16.2S	82.7E	PCN 5	T2.5/2.5 /D0.5/24HRS	EXP LLCC	FJDG
	19	161020	16.4S	82.6E	PCN 4		ULAC 17.5S 082.3E	KGWC
	20	161316	16.7S	81.7E	PCN 4			KGWC
	21	161731	16.3S	81.0E	PCN 6		EXP LLCC	KGWC
	22	162305	17.8S	80.3E	PCN 4			KGWC
	23	170156	18.4S	80.1E	PCN 4			KGWC
	24	170430	18.5S	79.1E	PCN 4	T3.0/3.0 /D1.0/24HRS		KGWC
	25	171150	18.7S	77.5E	PCN 4		EXP LLCC	KGWC
	26	171254	18.7S	77.6E	PCN 4		EXP LLCC	KGWC
	27	171710	18.7S	77.3E	PCN 4		EXP LLCC	KGWC
	28	180551	20.0S	75.9E	PCN 4	T0.5/1.5 /W2.5/24HRS		KGWC
	29	190531	20.3S	68.8E	PCN 4	T0.5/0.5 /S0.0/24HRS		KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 13P
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST ERRORS						48 HOUR FORECAST ERRORS						72 HOUR FORECAST ERRORS					
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND
011400Z	16.4	150.9	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
011412Z	16.5	151.9	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
011500Z	16.6	152.9	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
011512Z	16.3	154.5	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
011600Z	16.1	156.1	35	16.1	155.7	35.	23.	0.	16.4	158.6	50.	171.	-15.	16.8	161.8	65.	359.	-15.	0.0	0.0	0.	-0.	0.	
011612Z	16.0	158.7	50	16.1	158.3	50.	24.	0.	16.4	162.6	70.	185.	-5.	17.8	167.0	80.	267.	-10.	0.0	0.0	0.	-0.	0.	
011700Z	15.8	161.5	65	15.9	161.5	65.	6.	0.	16.3	167.4	90.	51.	10.	17.6	173.5	105.	114.	0.	0.0	0.0	0.	-0.	0.	
011712Z	15.6	164.6	75	15.6	164.5	75.	6.	0.	16.0	171.1	105.	8.	15.	17.4	177.7	100.	143.	15.	0.0	0.0	0.	-0.	0.	
011800Z	15.6	167.9	80	15.8	167.9	80.	0.	0.	16.5	174.9	105.	89.	0.	18.8	182.9	90.	121.	20.	0.0	0.0	0.	-0.	0.	
011812Z	15.9	171.2	90	15.9	171.1	90.	6.	0.	17.5	178.5	100.	98.	15.	20.7	186.7	75.	143.	35.	0.0	0.0	0.	-0.	0.	
011900Z	16.8	175.3	105	16.9	175.1	100.	13.	-5.	20.1	183.6	80.	82.	20.	24.3	193.0	50.	208.	20.	0.0	0.0	0.	-0.	0.	
011912Z	18.1	180.1	85	18.3	179.9	90.	17.	5.	22.3	189.7	65.	123.	25.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
012000Z	19.5	184.9	60	19.5	185.0	80.	6.	20.	24.0	195.5	50.	257.	20.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
012012Z	20.3	189.2	40	20.8	189.3	60.	31.	20.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
012100Z	20.9	192.3	30	22.0	191.0	55.	98.	25.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	21.	105.	193.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	17.	43.	58.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	7.	14.	16.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	6.	9.	9.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	11	9	7	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 2414. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 14. KNOTS

TROPICAL CYCLONE 13P
FIX POSITIONS FOR CYCLONE NO. 13

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION		ACCRY	DVORAK CODE	COMMENTS	SITE
	1	130047	16.5S	150.0E	PCN 6	T1.0/1.0	INIT OBS	KGWC
	2	131800	16.2S	152.1E	PCN 6	T1.0/1.0	INIT OBS ULCC FIX	PGTW
	3	140000	16.5S	151.9E	PCN 6	T1.0/1.0	INIT OBS	PGTW
	4	140026	16.6S	151.5E	PCN 6	T2.5/2.5 /D1.5/24HRS		KGWC
	5	140300	16.6S	151.7E	PCN 6		ULCC FIX	PGTW
	6	140600	16.5S	151.0E	PCN 6			PGTW
	7	140713	16.5S	151.7E	PCN 6			KGWC
	8	140900	16.5S	151.2E	PCN 6			PGTW
	9	141125	16.9S	152.8E	PCN 6	T1.5/1.5	INIT OBS	KGWC
	10	141600	17.0S	152.6E	PCN 6			PGTW
	11	141800	17.2S	152.9E	PCN 6	T1.0/1.0 /S0.0/24HRS		PGTW
	12	141824	16.8S	151.5E	PCN 6			KGWC
*	13	141953	17.5S	156.0E	PCN 6			KGWC
	14	142100	17.1S	153.1E	PCN 6			PGTW
	15	150000	16.4S	152.4E	PCN 6	T1.0/1.0 /S0.0/24HRS		PGTW
	16	150006	16.2S	152.5E	PCN 5	T1.5/2.5 /W1.0/24HRS	ULAC 16.6S 153.0E	KGWC
	17	150300	16.5S	152.8E	PCN 6			PGTW

18	150600	16.5S	153.0E	PCN 6		ULCC 16.2S 153.5E		PGTW
19	150833	16.5S	154.1E	PCN 6				KGWC
20	150900	16.1S	154.1E	PCN 6		ULCC FIX		PGTW
21	151105	16.2S	154.0E	PCN 5	T1.5/1.5 /S0.0/24HRS	ULAC 16.4S 154.0E		KGWC
22	151200	16.0S	154.8E	PCN 6		ULCC FIX		PGTW
23	151800	16.3S	155.4E	PCN 6	T2.0/2.0 /D1.0/24HRS			PGTW
24	151812	15.8S	155.3E	PCN 6		ULAC 16.2S 154.5E		KGWC
25	151932	15.6S	155.1E	PCN 6		ULAC 15.8S 154.6E		KGWC
26	152346	15.9S	156.1E	PCN 5	T3.0/3.0 /D1.5/24HRS			KGWC
27	160000	16.3S	155.7E	PCN 6	T2.5/2.5 /D1.5/24HRS			PGTW
28	160300	16.2S	156.2E	PCN 6				PGTW
29	160600	16.1S	157.0E	PCN 6		ULCC FIX		PGTW
30	160812	16.0S	158.2E	PCN 6		ULAC 16.3S 158.3E		KGWC
31	160900	16.2S	157.7E	PCN 6		ULCC FIX		PGTW
32	161045	16.1S	157.0E	PCN 6	T3.5/3.5	INIT OBS		KGWC
33	161200	16.1S	158.1E	PCN 6		ULCC FIX		PGTW
34	161600	15.8S	158.9E	PCN 6	T3.0/3.0 /D1.0/22HRS	ULCC FIX		PGTW
35	161759	16.0S	160.1E	PCN 6				KGWC
36	161910	15.7S	161.0E	PCN 6				KGWC
37	162326	15.7S	161.4E	PCN 2	T4.0/4.0 /D1.0/24HRS	EYE FIX		KGWC
38	170000	15.8S	161.5E	PCN 2				PGTW
39	170300	15.8S	162.2E	PCN 2	T4.0/4.0 /D1.5/27HRS			PGTW
40	170600	15.7S	163.0E	PCN 2		EYE FIX		PGTW
41	171025	15.4S	163.9E	PCN 2	T5.0/5.0 /D1.5/24HRS	EYE FIX		KGWC
42	171200	15.5S	164.5E	PCN 2		EYE FIX		PGTW
43	171605	15.4S	165.5E	PCN 2		EYE FIX		KGWC
44	171800	15.5S	166.1E	PCN 2	T4.5/4.5 /D1.5/26HRS	EYE FIX		PGTW
45	171849	15.6S	166.4E	PCN 2		EYE FIX		KGWC
46	172100	15.4S	166.9E	PCN 4				PGTW
47	172305	15.7S	167.5E	PCN 2	T4.5/4.5 /D0.5/24HRS	EYE FIX		KGWC
48	180000	15.6S	167.9E	PCN 4		ULCC FIX		PGTW
49	180300	15.7S	168.5E	PCN 2	T4.5/4.5 /D0.5/24HRS			PGTW
50	180600	15.8S	169.4E	PCN 2		EYE FIX		PGTW
51	180729	15.8S	170.1E	PCN 2		EYE FIX		KGWC

TROPICAL CYCLONE 14P
BEST TRACK DATA

	BEST TRACK				WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS				ERRORS				ERRORS				ERRORS	
MO/DA/HR	POSIT		WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
011618Z	14.8	146.3	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
011706Z	14.8	149.0	45	14.8 148.6	40.	23.	-5.	14.9 153.5	70.	63.	-10.	15.2 158.8	90.	64.	-10.	0.0 0.0	0.	-0.	0.
011718Z	14.8	151.8	65	14.8 151.8	65.	0.	0.	15.2 157.8	95.	99.	5.	15.9 164.3	105.	172.	15.	0.0 0.0	0.	-0.	0.
011806Z	15.5	154.4	80	15.4 154.5	80.	8.	0.	16.8 160.6	105.	132.	5.	18.7 168.0	105.	209.	30.	0.0 0.0	0.	-0.	0.
011818Z	16.0	156.3	90	16.0 156.3	90.	0.	0.	17.1 161.0	115.	38.	25.	18.9 167.9	100.	46.	45.	0.0 0.0	0.	-0.	0.
011906Z	16.2	158.4	100	16.4 158.3	105.	13.	5.	17.8 162.9	115.	119.	40.	20.3 169.6	115.	125.	75.	0.0 0.0	0.	-0.	0.
011918Z	16.6	161.4	90	16.5 161.3	95.	8.	5.	17.6 167.4	80.	71.	25.	19.9 173.3	70.	104.	45.	0.0 0.0	0.	-0.	0.
012006Z	17.0	164.8	75	17.3 165.0	70.	21.	-5.	20.1 173.3	50.	105.	10.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
012018Z	18.3	168.4	55	18.1 168.6	60.	17.	5.	22.0 177.1	45.	156.	20.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
012106Z	21.0	171.7	40	20.6 172.5	45.	51.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
012118Z	21.3	174.4	25	22.9 176.1	30.	135.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	28.	98.	120.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	14.	42.	55.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	4.	18.	37.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	2.	15.	33.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	10	8	6	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1701. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 14. KNOTS

TROPICAL CYCLONE 14P
FIX POSITIONS FOR CYCLONE NO. 14

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION		ACCRY	DVORAK CODE	COMMENTS	SITE
1	150300	13.3S	140.9E	PCN 6	T1.5/1.5	INIT OBS	PGTW
2	151200	13.4S	142.5E	PCN 6		ULCC FIX	PGTW
3	151600	13.8S	142.9E	PCN 6			PGTW
4	151800	13.8S	142.9E	PCN 6			PGTW
5	160900	15.5S	144.1E	PCN 6			PGTW
6	170000	14.6S	147.3E	PCN 6			PGTW
7	170300	14.8S	148.0E	PCN 6	T3.0/3.0	INIT OBS	PGTW
8	170600	14.8S	149.1E	PCN 2			PGTW
9	170644	14.4S	149.1E	PCN 5			KGWC
10	170750	15.2S	149.6E	PCN 5	T2.5/2.5 /D1.0/12HRS	ULAC 14.6 149.0E	KGWC
11	171200	14.8S	150.6E	PCN 6			PGTW
12	171206	13.9S	150.6E	PCN 6	T3.0/3.0	INIT OBS	KGWC
13	171747	14.8S	151.9E	PCN 1		EYE FIX	KGWC
14	171800	14.8S	151.7E	PCN 2	T4.0/4.0	INIT OBS EYE FIX	PGTW
15	172031	15.0S	152.4E	PCN 2		EYE FIX	KGWC
16	172100	14.9S	152.4E	PCN 2			PGTW
17	180000	15.0S	153.1E	PCN 2	T4.5/4.5 /D1.5/21HRS		PGTW
18	180047	15.1S	152.9E	PCN 1	T4.5/4.5 /D2.0/20HRS	EYE FIX	KGWC
19	180300	15.4S	153.7E	PCN 2			PGTW
20	180600	15.5S	154.4E	PCN 2		EYE FIX	PGTW
21	180729	15.7S	154.4E	PCN 2		EYE FIX	KGWC
22	180900	15.7S	155.0E	PCN 2		EYE FIX	PGTW
23	181146	15.8S	155.1E	PCN 2	T4.5/4.5 /D1.5/24HRS	EYE FIX	KGWC
24	181200	15.8S	155.3E	PCN 2		EYE FIX	PGTW
25	181600	16.0S	155.9E	PCN 2			PGTW
26	181734	16.0S	156.4E	PCN 2		EYE FIX	KGWC
27	181800	16.0S	156.3E	PCN 2	T5.0/5.0 /D1.0/24HRS		PGTW
28	182009	16.1S	156.5E	PCN 2		EYE FIX	KGWC
29	182160	16.1S	156.7E	PCN 2			PGTW
30	190000	16.2S	157.2E	PCN 4	T5.5/5.5 /D1.0/24HRS		PGTW
31	190027	16.1S	157.3E	PCN 1	T5.5/5.5 /D1.0/24HRS	EYE FIX	KGWC
32	190300	16.2S	157.6E	PCN 4			PGTW
33	190600	16.2S	158.3E	PCN 2		EYE FIX	PGTW
34	190708	15.9S	158.5E	PCN 2		EYE FIX	KGWC
35	190900	16.3S	159.0E	PCN 2		EYE FIX	PGTW
36	191126	16.3S	159.5E	PCN 2	T5.0/5.0 /D0.5/24HRS		KGWC
37	191200	16.3S	159.7E	PCN 2		EYE FIX	PGTW

38	191600	16.5S	161.0E	PCN 2			PGTW
39	191721	16.9S	161.8E	PCN 4			KGWC
40	191800	16.7S	161.4E	PCN 4	T4.5/5.0 /W0.5/24HRS		PGTW
41	191948	16.8S	162.4E	PCN 4			KGWC
42	192100	16.7S	162.6E	PCN 4			PGTW
43	200000	17.4S	163.8E	PCN 6	T3.5/4.5 /W2.0/24HRS		PGTW
44	200006	17.1S	163.5E	PCN 4		ULAC 17.8S 163.8E	KGWC
45	200300	17.0S	164.2E	PCN 4		EXP LLCC	PGTW
46	200600	16.9S	164.9E	PCN 4		EXP LLCC	PGTW
47	200647	17.2S	165.0E	PCN 6		ULAC 18.5S 165.8E	KGWC
48	200900	17.0S	165.4E	PCN 6			PGTW
49	201105	17.5S	166.1E	PCN 6	T3.5/4.5 /W1.5/24HRS		KGWC
50	201200	17.2S	166.3E	PCN 6			PGTW
51	201600	17.9S	167.3E	PCN 6	T2.5/3.5+/W2.0/22HRS		PGTW
52	201709	18.3S	168.4E	PCN 6			KGWC
* 53	201927	18.6S	170.0E	PCN 6			KGWC
* 54	202346	19.4S	172.7E	PCN 6	T2.5/3.5 /W1.0/24HRS		KGWC
55	210000	19.7S	170.2E	PCN 6	T1.5/2.5 /W2.0/24HRS		PGTW
56	210300	20.2S	171.3E	PCN 6			PGTW
57	210600	20.5S	172.3E	PCN 6			PGTW
58	210625	20.0S	171.6E	PCN 4		EXP LLCC	KGWC
59	210900	20.9S	173.2E	PCN 6			PGTW
60	211045	20.5S	172.2E	PCN 4		EXP LLCC	KGWC
* 61	211800	23.0S	176.0E	PCN 6	T0.0/0.5 /W2.5/26HRS		PGTW
62	211905	21.0S	174.3E	PCN 4		EXP LLCC	KGWC
63	212326	21.6S	175.2E	PCN 4	T0.5/1.5 /W2.0/24HRS	EXP LLCC	KGWC
64	220000	21.7S	176.0E	PCN 6	T0.5/1.0 /W1.0/24HRS	EXP LLCC	PGTW
65	220300	21.9S	176.1E	PCN 4			PGTW

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 15S
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST ERRORS					48 HOUR FORECAST ERRORS					72 HOUR FORECAST ERRORS				
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	
012600Z	12.7	68.3	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
012612Z	14.0	67.3	35	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
012700Z	15.0	66.7	40	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
012712Z	15.9	66.3	45	16.0	66.6	35.	18.	-10.	18.0	65.2	55.	63.	-10.	20.1	63.3	60.	95.	-10.	0.0	0.0	0.	-0.	0.
012800Z	16.7	66.2	55	16.2	66.5	50.	35.	-5.	17.6	65.0	65.	58.	-5.	19.4	63.5	70.	85.	5.	0.0	0.0	0.	-0.	0.
012812Z	17.4	66.1	65	16.6	65.7	55.	53.	-10.	17.6	64.2	65.	93.	-5.	19.1	62.3	70.	84.	15.	0.0	0.0	0.	-0.	0.
012900Z	18.3	65.7	70	18.4	65.8	70.	8.	0.	20.4	64.9	65.	82.	0.	23.3	64.9	55.	245.	10.	0.0	0.0	0.	-0.	0.
012912Z	19.1	64.6	70	19.3	65.2	60.	36.	-10.	21.7	64.5	55.	143.	0.	24.7	64.5	45.	211.	10.	0.0	0.0	0.	-0.	0.
013000Z	19.8	63.6	65	20.0	63.2	60.	26.	-5.	22.7	61.0	55.	33.	10.	25.5	60.6	45.	212.	15.	0.0	0.0	0.	-0.	0.
013012Z	20.5	62.3	55	20.3	62.2	50.	13.	-5.	22.3	60.4	40.	187.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
013100Z	22.3	60.6	45	21.5	60.9	45.	51.	0.	24.0	59.4	30.	322.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
013112Z	25.4	60.7	35	25.6	60.7	35.	12.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
020100Z	28.7	62.3	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	28.	122.	145.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	16.	59.	90.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	5.	4.	11.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	-5.	-1.	8.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	9	8	6	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1154. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 8. KNOTS

TROPICAL CYCLONE 15S
FIX POSITIONS FOR CYCLONE NO. 15

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION		ACCRY	DVORAK CODE	COMMENTS	SITE
	1	251751	11.9S	68.8E	PCN 6	T1.0/1.0	INIT OBS	KGWC
	2	260632	13.4S	68.0E	PCN 5	T2.5/2.5 /D1.5/24HRS		KGWC
	3	261138	14.0S	67.4E	PCN 6		ULAC 13.9S 068.1E	KGWC
	4	261306	14.0S	66.8E	PCN 6		ULAC 14.0S 067.8E	KGWC
	5	261731	14.5S	66.7E	PCN 6		ULAC 15.2S 068.2E	KGWC
*	6	270612	15.9S	67.4E	PCN 6	T3.0/3.0 /D0.5/24HRS	ULAC 15.9S 067.5E	KGWC
*	7	271020	16.2S	68.0E	PCN 5	T2.5/2.5 /D1.0/24HRS		FJDG
	8	271426	16.4S	66.2E	PCN 6			KGWC
	9	271711	16.1S	65.6E	PCN 6	T3.5/3.5	INIT OBS ULAC 15.9S 065.2E	KGWC
	10	280010	16.6S	66.2E	PCN 6		ULAC 16.5S 065.5E	KGWC
	11	280306	16.4S	65.9E	PCN 6			KGWC
	12	280551	16.3S	65.8E	PCN 6	T3.5/3.5 /D0.5/24HRS	ULAC 16.5S 065.3E	KGWC
*	13	281009	16.5S	64.6E	PCN 5	T3.5/3.5 /D0.5/24HRS		FJDG
	14	281113	16.7S	66.5E	PCN 6			KGWC
	15	281405	17.4S	66.1E	PCN 4			KGWC
	16	281605	17.8S	66.1E	PCN 6	T4.5/4.5 /D1.0/24HRS		KGWC
	17	282358	18.1S	66.0E	PCN 4			KGWC
	18	290245	18.4S	65.6E	PCN 6		ULAC 19.0S 064.3E	KGWC
	19	290531	18.5S	64.7E	PCN 6	T3.0/3.5 /W0.5/24HRS	ULAC 19.4S 064.8E	KGWC
	20	290958	19.4S	65.0E	PCN 5	T4.0/4.0 /D0.5/24HRS		FJDG
	21	291243	19.4S	63.7E	PCN 6			KGWC
	22	291343	19.6S	63.9E	PCN 6		RGD EYE OPN N	KGWC
	23	291812	19.6S	63.6E	PCN 6	T4.5/4.5 /S0.0/25HRS		KGWC
	24	292345	20.6S	63.5E	PCN 6			KGWC
	25	300223	20.6S	63.4E	PCN 6		ULAC 20.5S 062.9E	KGWC
	26	300652	20.0S	62.6E	PCN 5	T3.0/3.5 /S0.0/25HRS	ULAC 21.2S 063.0E	KGWC
	27	301322	20.1S	62.7E	PCN 6		ULAC 20.1S 062.7E	KGWC
	28	301751	21.1S	61.2E	PCN 4	T2.5/3.5 /W1.0/24HRS	EXP LLCC ULAC 23.4S 062.6E	KGWC
	29	302333	21.9S	60.6E	PCN 4		EXP LLCC	KGWC
	30	310202	22.5S	60.3E	PCN 4		EXP LLCC	KGWC
	31	310632	23.7S	60.8E	PCN 3	T1.0/2.0 /W2.0/24HRS	EXP LLCC	KGWC
	32	311100	26.0S	62.8E			EXP LLCC	NPOC
	33	311731	26.9S	61.0E	PCN 3		ULAC 27.8S 061.7E	KGWC
	34	010612	30.7S	63.9E	PCN 4	T1.5/1.5 /D0.5/24HRS	EXP LLCC ULAC 31.7S 066.1E	KGWC
	35	011711	34.4S	67.0E	PCN 5		ULAC 36.0S 070.4E	KGWC
	36	020552	36.2S	74.5E	PCN 6	T0.0/1.0 /W1.5/24HRS		KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

HURRICANE 16P
BEST TRACK DATA

	BEST TRACK		WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
					ERRORS				ERRORS				ERRORS				ERRORS
MO/DA/HR	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
0124122	15.0 203.4	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0125002	15.9 202.7	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0125122	16.8 201.7	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0126002	17.7 200.3	35	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0126122	19.4 198.4	35	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0127002	20.7 196.3	35	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0127122	22.1 194.1	45	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0128002	23.8 191.7	60	23.4 192.3	55.	41.	-5.	29.0 187.5	80.	30.	5.	37.0 189.0	70.	226.	20.	0.0 0.0	0.	-0.	0.
0128122	25.8 189.2	75	25.8 189.2	60.	0.	-15.	34.7 188.3	40.	229.	-25.	40.8 190.8	30.	493.	-5.	0.0 0.0	0.	-0.	0.
0129002	28.5 187.6	75	28.5 188.0	65.	21.	-10.	32.9 186.9	50.	271.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0129122	30.9 187.8	65	30.8 189.1	65.	67.	0.	35.8 195.1	40.	215.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0130002	34.2 192.1	50	34.7 192.1	30.	30.	-20.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0130122	36.2 199.5	35	37.3 198.2	40.	91.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	42.	187.	359.	0.	42.	187.	359.	0.
AVG RIGHT ANGLE ERROR	23.	71.	305.	0.	23.	71.	305.	0.
AVG INTENSITY MAGNITUDE ERROR	9.	9.	13.	0.	9.	9.	13.	0.
AVG INTENSITY BIAS	-8.	-4.	8.	0.	-8.	-4.	8.	0.
NUMBER OF FORECASTS	6	4	2	0	6	4	2	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 2035. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 14. KNOTS

HURRICANE 16P
FIX POSITIONS FOR CYCLONE NO. 16

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	232104	14.2S 157.1W	PCN 6	T1.0/1.0	INIT OBS ULAC 12.5S 156.9W	KGWC
	2	240044	15.5S 156.4W	PCN 3	T2.0/2.0 /D1.0/24HRS	ULAC 14.5S 157.0W	KGWC
	3	852023	17.2S 159.2W	PCN 4	T2.5/2.5 /D0.5/24HRS		KGWC
	4	260439	18.1S 160.4W	PCN 4	T2.5/2.5 /D0.5/24HRS	ULAC 17.9S 160.2W	KGWC
*	5	260904	19.0S 162.2W	PCN 4		ULAC 18.2S 161.5W	KGWC
	6	262005	20.3S 162.0W				PHNL
	7	262145	20.1S 162.7W	PCN 6	T2.0/2.5 /W0.5/24HRS	ULAC 20.5S 162.5W	KGWC
	8	270215	20.5S 163.5W				PHNL
	9	272124	23.4S 166.7W	PCN 2	T3.5/3.5 /D1.5/24HRS		KGWC
	10	280215	24.6S 169.1W				PHNL
	11	280243	24.3S 168.9W	PCN 2	T3.5/3.5 /D1.5/24HRS	EYE FIX	KGWC
	12	280538	25.1S 169.7W	PCN 2		EYE FIX	KGWC
	13	280823	25.2S 170.5W	PCN 2	T4.5/4.5 /D2.0/47HRS	EYE FIX	KGWC
	14	281528	26.5S 171.5W	PCN 2		EYE FIX	KGWC
	15	281818	27.1S 171.6W	PCN 2		EYE FIX	KGWC
	16	282246	28.1S 172.1W	PCN 1	T3.0/4.0 /W0.5/25HRS		KGWC
	17	282300	28.4S 173.0W				NPOC
	18	290230	29.0S 172.5W				PHNL
	19	290517	29.5S 172.4W	PCN 2		EYE FIX	KGWC
	20	290945	30.6S 173.7W	PCN 4	T3.5/4.0 /W1.0/24HRS		KGWC
	21	291515	32.0S 170.5W	PCN 4		EXP LLCC	KGWC
	22	292225	33.8S 168.7W	PCN 3	T3.0/4.0 /S0.0/24HRS	ULAC 34.0S 167.6W	KGWC
	23	300455	35.5S 164.9W	PCN 6		ULAC 35.0S 163.8W	KGWC
	24	300743	35.7S 163.0W	PCN 6	T1.5/2.5 /W1.5/24HRS	ULAC 35.4S 162.1W	KGWC
*	25	301200	35.0S 168.0W				NPOC
	26	302204	37.0S 154.5W	PCN 6			KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 17S
BEST TRACK DATA

	BEST TRACK		WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
					ERRORS				ERRORS				ERRORS				ERRORS
MO/DA/HR	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
0129002	18.1 120.6	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0129122	18.3 119.1	35	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0130002	18.2 118.0	45	18.3 118.1	35.	8.	-10.	19.3 115.5	45.	104.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0130122	18.5 117.1	55	18.4 116.8	50.	18.	-5.	19.6 114.8	55.	200.	20.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0131002	20.3 117.0	45	20.0 116.5	50.	33.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0131122	22.3 116.9	35	22.2 116.7	50.	13.	15.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	18.	152.	0.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	19.	104.	0.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	9.	10.	0.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	1.	10.	0.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	4	2	0	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 432. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 7. KNOTS

TROPICAL CYCLONE 17S
FIX POSITIONS FOR CYCLONE NO. 17

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	290208	18.2S 120.0E	PCN 5	T1.5/1.5	INIT OBS ULAC 17.8S 118.1E	KGWC
2	290737	18.7S 119.8E	PCN 5		ULAC 18.4S 117.5E	KGWC
3	291021	18.7S 119.5E	PCN 5		ULAC 18.9S 118.5E	KGWC
4	291307	18.6S 118.9E	PCN 6		ULAC 18.0S 118.2E	KGWC
5	292021	17.7S 118.5E	PCN 6			KGWC
6	292301	18.0S 118.2E	PCN 5			KGWC
7	300148	18.4S 117.8E	PCN 1	T3.5/3.5 /D2.0/24HRS		KGWC
8	300300	20.8S 116.9E	PCN 6	T4.0/4.0	INIT OBS	PHIK
9	300906	18.4S 117.0E	PCN 1		RGD EYE	KGWC
10	300959	18.4S 117.1E	PCN 1		RGD EYE	KGWC
11	301429	18.9S 117.4E	PCN 4	T3.5/3.5	INIT OBS	KGWC
12	302009	19.6S 117.3E	PCN 6			KGWC
13	302239	20.1S 117.1E	PCN 6			KGWC
14	310309	21.1S 117.1E	PCN 1		EYE DIA .6 NM	KGWC
15	310958	22.0S 116.7E	PCN 3			KGWC
16	311200	22.2S 116.8E	PCN 6			PHIK
17	311408	22.8S 117.1E	PCN 4			KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 18P
BEST TRACK DATA

	BEST TRACK			WARNING		24 HOUR FORECAST ERRORS			48 HOUR FORECAST ERRORS			72 HOUR FORECAST ERRORS					
MO/DA/HR	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
020200Z	11.6 156.7	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
020212Z	13.5 156.0	35	12.5 156.0	35.	60.	0.	12.6 152.7	60.	109.	25.	14.8 150.2	75.	178.	40.	0.0 0.0	0.	-0.	0.
020300Z	14.4 153.8	35	13.9 154.2	40.	38.	5.	14.2 151.6	45.	97.	10.	16.0 149.5	50.	258.	15.	0.0 0.0	0.	-0.	0.
020312Z	14.2 151.8	35	14.1 152.0	45.	13.	10.	15.2 149.2	50.	146.	15.	16.8 147.0	50.	249.	15.	0.0 0.0	0.	-0.	0.
020400Z	13.5 150.1	35	14.2 150.4	40.	45.	5.	15.2 147.7	50.	146.	15.	16.5 144.7	35.	191.	5.	0.0 0.0	0.	-0.	0.
020412Z	13.4 147.5	35	13.9 148.0	35.	42.	0.	14.8 144.2	30.	95.	-5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
020500Z	13.6 145.8	35	13.4 144.8	35.	60.	0.	13.6 140.9	35.	158.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
020512Z	13.3 144.7	35	13.5 143.0	30.	100.	-5.	14.1 138.9	50.	270.	25.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
020600Z	13.5 143.6	30	13.3 142.2	30.	83.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
020612Z	14.7 143.5	25	14.7 143.6	25.	6.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	50.	146.	219.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	32.	124.	142.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	3.	14.	19.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	2.	13.	19.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	9	7	4	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 941. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 9. KNOTS

TROPICAL CYCLONE 18P
FIX POSITIONS FOR CYCLONE NO. 18

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
	1	311800	15.3S 161.8E	PCN 5			PHIK
	2	011800	15.3S 160.8E	PCN 6			PHIK
*	3	012306	12.8S 156.2E	PCN 6	T1.0/1.0	INIT OBS ULAC 13.2S 160.2E	KGWC
*	4	020000	13.2S 160.2E	PCN 6			PHIK
*	5	020300	12.7S 158.6E	PCN 6	T3.0/3.0	INIT OBS	PHIK
	6	020714	12.3S 156.0E	PCN 6		ULAC 13.4S 156.2E	KGWC
	7	020900	13.0S 156.9E	PCN 4			RODN
	8	021146	13.3S 155.8E	PCN 6		ULAC 14.2S 155.5E	KGWC
*	9	021200	14.8S 155.8E	PCN 6			PHIK
	10	021749	13.8S 155.8E	PCN 6		ULAC 14.2S 154.7E	KGWC
	11	021800	14.4S 155.1E	PCN 6			PHIK
	12	021954	13.9S 154.2E	PCN 6		ULAC 13.7S 155.0E	KGWC
	13	030000	14.2S 154.5E	PCN 6			PHIK
	14	030027	14.0S 153.9E	PCN 5	T2.5/2.5 /D1.5/25HRS	ULAC 14.2S 154.4E	KGWC
*	15	030300	14.5S 154.6E	PCN 6	T2.0/2.0 /W1.0/24HRS		PHIK
	16	030730	14.2S 151.5E	PCN 4	T2.5/2.5	INIT OBS	RODN
	17	030834	13.7S 152.7E	PCN 6		ULAC 14.0S 153.2E	KGWC
	18	031126	13.8S 152.0E	PCN 6	T2.5/2.5	INIT OBS ULAC 13.4S 152.8E	KGWC
*	19	031200	14.8S 153.7E	PCN 6			PHIK
	20	031600	14.2S 150.7E	PCN 6	T2.0/2.0	INIT OBS ULCC FIX	PGTW
	21	031600	14.3S 150.8E	PCN 6			RPMK
	22	031736	13.9S 150.8E	PCN 6		ULAC 13.0S 150.1E	KGWC
*	23	031800	14.7S 153.1E	PCN 6			PHIK
	24	031800	13.9S 150.5E	PCN 6		ULCC FIX	PGTW
	25	032100	14.5S 151.1E	PCN 6			RPMK
	26	032114	13.5S 150.6E	PCN 6		ULAC 14.0S 151.1E	KGWC
	27	040000	13.8S 150.2E	PCN 6			PGTW
	28	040007	13.0S 149.6E	PCN 5	T2.5/2.5 /S0.0/24HRS	ULAC 12.9S 151.5E	KGWC
	29	040300	13.0S 149.8E	PCN 6	T2.5/2.5	INIT OBS	PGTW
	30	040600	12.8S 149.3E	PCN 6			PGTW
	31	040813	13.1S 147.7E	PCN 6		ULAC 12.0S 149.7E	KGWC
	32	040900	13.4S 148.1E	PCN 6			PGTW
	33	041200	13.4S 147.6E	PCN 6			PGTW
	34	041247	13.7S 146.8E	PCN 5	T2.0/2.5 /W0.5/24HRS	ULAC 14.5S 148.0E	KGWC
	35	041724	14.4S 146.2E	PCN 6		ULAC 13.4S 147.5E	KGWC
*	36	042053	12.4S 145.2E	PCN 6			KGWC
	37	042100	14.0S 145.8E	PCN 6		ULCC FIX	PGTW
	38	050128	13.8S 146.1E	PCN 5	T3.0/3.0 /D0.5/25HRS		KGWC
	39	050300	13.4S 145.1E	PCN 6	T2.5/2.5+/S0.0/24HRS		PGTW
	40	050752	12.9S 146.4E	PCN 6			KGWC
	41	051200	13.6S 144.9E	PCN 6		ULCC FIX	PGTW

42	051227	13.0S	144.5E	PCN 4			KGWC
43	051600	13.4S	144.1E	PCN 6	T1.5/1.5	INIT OBS ULCC FIX	PGTW
44	051800	13.2S	143.7E	PCN 6		ULCC FIX	PGTW
45	051853	12.8S	143.5E	PCN 6		ULAC 13.5S 143.6E	KGWC
46	052032	13.1S	144.0E	PCN 6		ULAC 13.0S 143.7E	KGWC
47	060000	13.3S	143.7E	PCN 6			PGTW
* 48	060108	14.8S	140.9E	PCN 5			KGWC
49	060300	14.1S	143.6E	PCN 6	T1.5/1.5	INIT OBS	PGTW
50	060600	14.7S	143.5E	PCN 6			PGTW
* 51	060738	15.1S	140.3E	PCN 5			KGWC
52	060900	14.6S	143.5E	PCN 6			PGTW
* 53	060912	15.2S	145.3E	PCN 6		EXP LLCC	KGWC
54	061200	14.8S	143.2E	PCN 6			PGTW
55	061207	14.8S	144.2E	PCN 6		ULAC 14.2S 137.6E	KGWC
56	061841	14.9S	145.1E	PCN 6		ULAC 15.1S 145.7E	KGWC
57	062011	15.2S	145.3E	PCN 5		ULAC 15.3S 146.0E	KGWC
58	070047	14.8S	145.8E	PCN 5	T1.0/1.0 /S0.0/24HRS	ULAC 15.3S 148.8E	KGWC
59	071147	15.4S	145.8E	PCN 5			KGWC
60	080027	14.5S	149.1E	PCN 5		ULAC 14.0S 149.5E	KGWC
61	080600	14.0S	148.8E	PCN 6		ULCC FIX	PGTW
62	081126	13.8S	149.2E	PCN 6			KGWC
63	090007	15.0S	152.6E	PCN 5	T1.5/1.5 /D0.5/24HRS	ULAC 14.3S 151.7E	KGWC
64	090300	14.7S	149.8E	PCN 6	T1.5/1.5	INIT OBS	PGTW
65	091106	15.5S	156.0E	PCN 5			KGWC
66	092342	16.1S	152.7E	PCN 5	T0.5/1.5 /W1.0/24HRS		KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPPESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 19S
BEST TRACK DATA

	BEST TRACK		WARNING		24 HOUR FORECAST ERRORS			48 HOUR FORECAST ERRORS			72 HOUR FORECAST ERRORS		
MO/DA/HR	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	DST	WIND	POSIT	DST	WIND	POSIT	DST	WIND
020506Z	12.3 70.1	30 0.0	0.0	0.	-0.	0.	0.0	-0.	0.	0.0	-0.	0.	0.0	-0.	0.
020518Z	13.4 68.9	35 13.1	68.3	35.	39.	0.	13.8	65.1	50.	107.	20.	14.9	62.0	60.	148.	30.	0.0	0.0	0.	-0.	0.
020606Z	14.4 67.4	30 13.9	66.5	40.	60.	10.	15.3	62.8	60.	68.	35.	16.3	59.6	75.	122.	40.	0.0	0.0	0.	-0.	0.
020618Z	15.4 65.9	30 15.9	64.9	35.	65.	5.	18.3	61.5	45.	131.	15.	20.3	59.0	50.	307.	10.	0.0	0.0	0.	-0.	0.
020706Z	14.9 63.9	25 15.5	64.4	35.	46.	10.	16.8	62.5	25.	288.	-10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
020718Z	16.5 60.2	30 16.0	62.3	30.	125.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
020806Z	16.6 57.5	35 0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
020818Z	16.5 55.4	40 16.9	56.0	35.	42.	-5.	17.9	50.7	40.	11.	-10.	20.0	48.7	30.	173.	10.	0.0	0.0	0.	-0.	0.
020906Z	16.7 53.1	50 17.0	53.8	40.	44.	-10.	18.7	49.8	35.	97.	5.	20.3	48.6	25.	264.	10.	0.0	0.0	0.	-0.	0.
020918Z	17.9 50.5	50 18.5	50.3	50.	38.	0.	21.5	48.5	35.	209.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
021006Z	18.8 48.1	30 18.5	50.3	35.	126.	5.	19.2	49.5	30.	306.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
021018Z	19.1 45.8	20 19.9	46.1	30.	51.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
021106Z	19.1 44.1	15 0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	64.	152.	201.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	37.	67.	91.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	6.	16.	20.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	3.	11.	20.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	10	8	5	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1612. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 11. KNOTS

TROPICAL CYCLONE 19S
FIX POSITIONS FOR CYCLONE NO. 19

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION		ACCRY	DVORAK CODE	COMMENTS	SITE
1	041752	13.2S	68.8E	PCN 6	T1.5/1.5	INIT OBS ULAC 13.7S 070.5E	KGWC
2	050157	13.6S	68.7E	PCN 6			KGWC
3	050632	12.8S	70.1E	PCN 3	T2.0/2.0 /D0.5/12HRS	EXP LLCC	KGWC
4	051114	12.5S	69.3E	PCN 4		EXP LLCC	KGWC
5	051256	12.9S	69.1E	PCN 4		EXP LLCC	KGWC
6	051731	13.0S	68.8E	PCN 4		EXP LLCC	KGWC
7	052359	13.4S	67.3E	PCN 6			KGWC
8	060612	14.8S	67.5E	PCN 5	T1.5/1.5 /S0.0/24HRS	EXP LLCC	KGWC
* 9	061014	14.8S	64.0E	PCN 5	T2.5/2.5 /D1.0/24HRS		FJDG
* 10	061102	16.2S	67.6E	PCN 4		EXP LLCC	KGWC
11	061416	15.8S	66.3E	PCN 4		EXP LLCC	KGWC
12	061711	15.5S	65.5E	PCN 4		EXP LLCC ULAC 14.5S 062.1E	KGWC
13	062346	15.9S	65.4E	PCN 3		EXP LLCC	KGWC
14	070256	14.4S	64.2E	PCN 3		EXP LLCC	KGWC
15	070552	14.7S	64.0E	PCN 4	T1.5/1.5 /S0.0/24HRS	EXP LLCC	KGWC
* 16	071003	14.3S	60.0E	PCN 5	T2.5/2.5 /S0.0/24HRS		FJDG
17	071231	15.5S	61.9E	PCN 4		EXP LLCC	KGWC
18	071355	15.8S	61.2E	PCN 4		EXP LLCC ULAC 15.0S 059.5E	KGWC
19	071832	16.5S	60.6E	PCN 4		EXP LLCC ULAC 15.1S 058.4E	KGWC
20	080235	16.4S	57.4E	PCN 6		ULAC 16.0S 056.9E	KGWC
* 21	080713	16.1S	55.7E	PCN 5	T2.5/2.5 /D1.0/25HRS	ULAC 16.3S 055.7E	KGWC
22	081812	15.7S	53.0E	PCN 6	T3.0/3.0	INIT OBS ULAC 16.1S 052.0E	KGWC
* 23	090103	17.0S	52.0E	PCN 5			KGWC
* 24	090355	17.5S	51.3E	PCN 6		ULAC 17.8S 051.8E	KGWC
* 25	090653	18.4S	51.1E	PCN 5	T3.5/3.5 /D1.0/24HRS	ULAC 18.2S 051.1E	KGWC
* 26	091123	17.5S	55.4E	PCN 5			FJDG
27	091206	17.4S	51.8E	PCN 6			KGWC
28	091453	18.4S	50.9E	PCN 5			KGWC
29	091752	18.4S	49.7E	PCN 5	T4.0/4.0 /D1.0/24HRS		KGWC
* 30	100334	17.8S	50.3E	PCN 6		ULAC 16.0S 050.1E	KGWC
31	100632	19.1S	47.8E	PCN 6			KGWC
* 32	101113	17.7S	45.0E	PCN 5			FJDG
33	101335	19.4S	46.2E	PCN 5			KGWC
34	101425	19.6S	45.7E	PCN 6			KGWC
35	101913	19.1S	44.9E	PCN 6			KGWC
36	110753	19.4S	43.9E	PCN 5	T0.5/0.5+	INIT OBS	KGWC

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION		INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	081800	16.9S	56.0E	035	090	61976 61995 SHIP
2	090000	16.8S	55.3E	040	070	61976 61995 61984
3	090600	17.0S	53.8E	035	080	61976 61995 61984

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 20S
BEST TRACK DATA

	BEST TRACK			WARNING		24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS				ERRORS				ERRORS			
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
021018Z	14.5	127.2	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
021106Z	14.5	126.0	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
021118Z	14.7	124.3	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
021206Z	15.1	122.6	35	15.1	122.2	35.	23.	0.	16.2	118.0	45.	13.	-10.	17.8	115.1	55.	234.	0.	0.0	0.0	0.	-0.	0.
021218Z	15.9	120.4	45	16.0	120.7	45.	18.	0.	17.7	116.9	65.	140.	10.	19.7	113.2	70.	333.	15.	0.0	0.0	0.	-0.	0.
021306Z	16.3	117.8	55	16.6	117.6	55.	21.	0.	18.8	113.2	75.	139.	20.	21.0	109.1	95.	314.	45.	0.0	0.0	0.	-0.	0.
021318Z	16.9	114.6	55	16.8	114.6	55.	6.	0.	18.8	108.7	55.	74.	0.	21.3	104.3	50.	255.	10.	0.0	0.0	0.	-0.	0.
021406Z	17.8	111.0	55	18.0	110.8	50.	17.	-5.	20.5	104.5	40.	66.	-10.	22.7	99.9	35.	317.	0.	0.0	0.0	0.	-0.	0.
021418Z	18.8	107.4	55	19.2	107.5	65.	25.	10.	22.5	102.3	55.	201.	15.	25.8	99.9	45.	578.	15.	0.0	0.0	0.	-0.	0.
021506Z	19.7	103.7	50	19.5	103.8	60.	15.	10.	23.3	97.6	45.	230.	10.	25.9	94.2	35.	483.	10.	0.0	0.0	0.	-0.	0.
021518Z	20.0	99.9	40	20.5	101.5	45.	95.	5.	23.0	98.1	35.	389.	5.	26.1	95.3	25.	566.	5.	0.0	0.0	0.	-0.	0.
021606Z	18.7	96.2	35	18.5	96.0	40.	17.	5.	19.7	89.1	35.	91.	10.	23.8	84.8	30.	291.	10.	0.0	0.0	0.	-0.	0.
021618Z	18.5	93.1	30	18.3	93.1	35.	12.	5.	20.4	87.4	30.	80.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
021706Z	18.7	90.3	25	18.5	90.5	30.	17.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
021718Z	19.3	88.2	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
021806Z	19.1	86.1	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	24.	142.	375.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	17.	89.	229.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	4.	10.	12.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	3.	6.	12.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	11	10	9	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 2408. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 13. KNOTS

TROPICAL CYCLONE 20S
FIX POSITIONS FOR CYCLONE NO. 20

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION		ACCRY	DVORAK CODE	COMMENTS	SITE
	1	101800	14.5S	127.3E	PCN 6			PGTW
	2	102100	14.5S	126.8E	PCN 6			PGTW
	3	110000	14.3S	126.6E	PCN 6		ULCC 14.4S 126.2E	PGTW
	4	110249	14.0S	126.4E	PCN 3		EXP LLCC	KGWC
	5	110300	14.1S	125.9E	PCN 6		ULCC FIX	PGTW
	6	110600	14.8S	126.2E	PCN 4		EXP LLCC ULCC 13.9S 125.6E	PGTW
	7	110817	14.3S	125.3E	PCN 6			KGWC
	8	110900	15.3S	126.0E	PCN 6		ULCC 13.9S 125.2E	PGTW
	9	110907	14.2S	125.2E	PCN 6			KGWC
	10	111200	14.5S	125.5E	PCN 6			PGTW
	11	111348	14.6S	124.6E	PCN 6		ULAC 13.9S 123.6E	KGWC
	12	111600	14.3S	124.9E	PCN 6	T2.0/2.0	INIT OBS	PGTW
	13	111800	14.4S	124.6E	PCN 6			PGTW
	14	111920	15.2S	124.2E	PCN 6		ULAC 13.6S 124.3E	KGWC
	15	112100	14.4S	124.2E	PCN 6			PGTW
	16	112147	15.0S	123.6E	PCN 5		ULAC 12.8S 123.4E	KGWC
	17	120000	15.1S	123.2E	PCN 6			PGTW
	18	120229	14.9S	122.4E	PCN 5	T1.5/1.5	INIT OBS ULAC 13.7S 122.2E	KGWC
	19	120300	15.0S	123.0E	PCN 6	T2.0/2.0	INIT OBS	PGTW
	20	120600	15.0S	122.4E	PCN 6			PGTW
	21	120804	15.2S	121.4E	PCN 5		ULAC 15.5S 122.5E	KGWC
	22	120900	15.2S	122.0E	PCN 6			PGTW
	23	121027	15.2S	121.8E	PCN 6		ULAC 15.9S 122.5E	KGWC
	24	121200	15.4S	121.6E	PCN 6			PGTW
*	25	121328	16.6S	120.6E	PCN 6	T2.5/2.5	INIT OBS ULCC 15.5S 121.1E	KGWC
	26	121600	15.8S	121.0E	PCN 6	T3.0/3.0 /D1.0/24HRS		PGTW
	27	121800	15.8S	120.8E	PCN 6			PGTW
	28	121907	16.8S	119.9E	PCN 6		ULAC 15.3S 121.0E	KGWC
	29	122100	16.0S	120.1E	PCN 6			PGTW
	30	122307	16.4S	119.0E	PCN 6		ULAC 15.3S 119.9E	KGWC
	31	130000	16.0S	119.2E	PCN 6		ULCC FIX	PGTW
	32	130209	16.1S	118.9E	PCN 5	T2.5/2.5 /D1.0/24HRS		KGWC
	33	130300	16.0S	118.3E	PCN 6	T3.5/3.5 /D1.5/24HRS	ULCC FIX	PGTW
	34	130600	16.3S	117.6E	PCN 6		ULCC FIX	PGTW
	35	130752	16.4S	117.4E	PCN 5			KGWC
	36	130900	16.5S	116.8E	PCN 6		ULCC FIX	PGTW
	37	131006	16.3S	116.5E	PCN 2		EYE FIX	KGWC
	38	131200	16.6S	116.1E	PCN 6		ULCC FIX	PGTW
	39	131449	16.5S	115.5E	PCN 6	T3.0/3.0 /D0.5/25HRS		KGWC
	40	131600	16.7S	115.1E	PCN 6	T3.0/3.0 /S0.0/24HRS		PGTW
	41	131800	16.9S	114.6E	PCN 6			PGTW
	42	132036	16.7S	113.4E	PCN 6			KGWC
	43	132246	17.2S	112.5E	PCN 5			KGWC
	44	140000	17.4S	112.6E	PCN 6		ULCC FIX	PGTW
	45	140300	17.8S	111.5E	PCN 6	T3.0/3.5 /W0.5/24HRS		PGTW
	46	140330	17.6S	111.9E	PCN 5	T3.5/3.5 /D0.5/25HRS		KGWC
	47	140600	18.0S	110.6E	PCN 6			PGTW
	48	140900	18.2S	110.0E	PCN 6		ULCC FIX	PGTW
	49	140921	18.1S	109.6E	PCN 5			KGWC
	50	141126	17.8S	109.3E	PCN 6			KGWC
	51	141200	18.5S	109.3E	PCN 6			PGTW
	52	141429	18.8S	108.5E	PCN 6	T4.0/4.0 /D1.0/24HRS		KGWC
	53	142024	19.9S	107.1E	PCN 6			KGWC
	54	150000	19.1S	105.4E	PCN 6			PGTW

55	150006	19.3S	105.7E	PCN 6				KGWC
56	150300	19.2S	104.4E	PCN 6	T3.0/3.0 /S0.0/24HRS			PGTW
57	150310	19.5S	104.8E	PCN 5	T3.5/3.5 /S0.0/24HRS			KGWC
58	150600	19.4S	103.6E	PCN 6				PGTW
59	150837	21.0S	101.7E	PCN 5	T1.5/1.5	INIT OBS		FJDG
60	150900	19.7S	103.1E	PCN 6				PGTW
61	150908	20.1S	103.2E	PCN 5				KGWC
* 62	151200	20.0S	103.2E	PCN 6				PGTW
63	151550	20.5S	100.5E	PCN 6	T2.5/3.5 /W1.5/25HRS			KGWC
* 64	151600	20.5S	102.0E	PCN 6	T1.5/1.5	INIT OBS		PGTW
* 65	151800	20.2S	101.7E	PCN 6				PGTW
* 66	152011	21.1S	100.0E	PCN 6				KGWC
67	152153	19.5S	98.4E	PCN 6		EXP LLCC		KGWC
68	152315	18.8S	97.9E	PCN 4		EXP LLCC		KGWC
69	160300	18.7S	97.0E	PCN 4	T2.0/3.0 /W1.0/24HRS			PGTW
70	160431	18.6S	96.8E	PCN 4	T0.0/1.0 /W2.5/25HRS	EXP LLCC		KGWC
71	160600	18.5S	96.1E	PCN 4				PGTW
72	160819	18.5S	95.5E	PCN 5	T1.0/1.5 /W0.5/24HRS			FJDG
73	160900	18.4S	95.2E	PCN 6				PGTW
74	161038	18.5S	94.5E	PCN 4		EXP LLCC		KGWC
75	161200	18.4S	94.8E	PCN 6		EXP LLCC		PGTW
76	161225	18.4S	95.0E	PCN 4		EXP LLCC		KGWC
77	161530	18.3S	93.8E	PCN 4		EXP LLCC		KGWC
78	161600	18.3S	93.7E	PCN 4	T1.5/1.5	INIT OBS EXP LLCC		PGTW
79	162140	18.5S	93.0E	PCN 4		EXP LLCC		KGWC
80	170105	18.6S	92.0E	PCN 4		EXP LLCC		KGWC
81	170300	18.9S	91.1E	PCN 6				PGTW
82	170411	18.3S	91.2E	PCN 4	T1.5/1.5 /D1.5/24HRS	EXP LLCC		KGWC
83	170600	19.1S	90.4E	PCN 6	T0.5/1.0 /W1.5/24HRS			PGTW
84	170815	18.5S	90.4E	PCN 5	T0.5/1.0 /W0.5/24HRS			FJDG
85	171510	19.8S	89.4E	PCN 6				KGWC
86	180350	18.7S	86.6E	PCN 6	T0.0/1.0 /W1.5/24HRS	EXP LLCC		KGWC
87	180947	19.2S	84.9E	PCN 5	T0.0/0.5 /D0.5/24HRS	EXP LLCC		FJDG

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 21S
BEST TRACK DATA

	BEST TRACK				WARNING		24 HOUR FORECAST ERRORS			48 HOUR FORECAST ERRORS			72 HOUR FORECAST ERRORS		
MO/DA/HR	POSIT		WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
021312Z	15.0	44.1	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
021400Z	15.0	45.1	35	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
021412Z	14.9	46.1	40	15.0 45.8	40.	18.	0.	14.9 46.7	40.	106.	-5.	14.7 47.5	35.	171.	-10.	0.0 0.0	0.	-0.	0.
021500Z	14.3	46.2	40	14.8 46.8	40.	46.	0.	14.6 48.5	30.	209.	-20.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
021512Z	13.5	45.6	45	14.1 46.3	40.	54.	-5.	14.1 46.3	40.	115.	-5.	13.8 47.0	40.	83.	5.	0.0 0.0	0.	-0.	0.
021600Z	12.7	45.5	50	13.5 44.8	40.	43.	-10.	11.2 43.9	45.	179.	5.	10.2 43.2	45.	321.	10.	0.0 0.0	0.	-0.	0.
021612Z	12.2	46.1	45	12.9 45.6	40.	29.	-5.	10.9 45.2	45.	166.	10.	10.0 44.7	45.	295.	15.	0.0 0.0	0.	-0.	0.
021700Z	12.1	46.8	40	12.1 46.1	45.	41.	5.	11.4 46.6	45.	124.	10.	10.5 47.5	40.	232.	20.	0.0 0.0	0.	-0.	0.
021712Z	12.5	47.5	35	12.3 47.5	40.	12.	5.	11.7 48.6	40.	125.	10.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
021800Z	13.1	47.8	35	13.2 47.8	35.	54.	0.	12.0 48.6	30.	140.	10.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
021812Z	13.7	48.0	30	13.3 48.3	35.	30.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
021900Z	14.3	48.2	20	14.3 48.2	25.	0.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	33.	145.	220.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	19.	65.	129.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	4.	9.	12.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	0.	2.	8.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	10	8	5	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 511. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 4. KNOTS

TROPICAL CYCLONE 21S
BEST TRACK DATA

	BEST TRACK				WARNING		24 HOUR FORECAST ERRORS			48 HOUR FORECAST ERRORS			72 HOUR FORECAST ERRORS		
MO/DA/HR	POSIT		WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
021406Z	15.0	45.6	40	14.8 46.2	40.	37.	0.	14.6 48.1	30.	135.	-15.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
021418Z	14.6	46.3	40	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
021506Z	13.9	45.9	45	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
021518Z	13.1	45.5	50	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
021606Z	12.4	45.8	45	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	37.	135.	0.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	5.	105.	0.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	0.	15.	0.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	0.	-15.	0.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	1	1	0	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 194. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 4. KNOTS

TROPICAL CYCLONE 21S
FIX POSITIONS FOR CYCLONE NO. 21

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION		ACCRY	DVORAK CODE	COMMENTS	SITE
1	130713	15.0S	43.6E	PCN 5	T1.5/1.5	INIT OBS	KGWC
2	131258	14.8S	44.6E	PCN 5			KGWC
3	131510	15.0S	44.6E	PCN 5			KGWC
4	131812	15.1S	43.7E	PCN 6			KGWC
5	140000	15.1S	45.8E	PCN 4		EXP LLCC	KGWC
6	140350	14.8S	46.1E	PCN 6		ULAC 14.8S 045.5E	KGWC
7	140653	15.2S	45.1E	PCN 5	T2.5/2.5 /D1.0/24HRS	ULAC 14.9S 045.1E	KGWC
8	141245	14.8S	45.7E	PCN 5			KGWC
9	141448	14.4S	46.3E	PCN 5			KGWC
10	141933	15.2S	46.5E	PCN 6	T2.5/2.5	INIT OBS ULAC 14.9S 046.5E	KGWC

11	150130	14.7S	46.3E	PCN 6				
12	150329	14.3S	46.3E	PCN 3			ULAC 14.8S 046.1E	KGWC
13	150632	13.8S	45.7E	PCN 4	T3.0/3.0 /D0.5/24HRS		EXP LLCC ULAC 14.2S 046.2E	KGWC
14	151232	13.5S	45.6E	PCN 6				KGWC
15	151427	13.4S	45.0E	PCN 5				KGWC
16	151853	12.4S	46.6E	PCN 4	T3.0/3.5 /W0.5/24HRS		EXP LLCC	KGWC
17	151913	13.1S	45.5E	PCN 5	T3.5/3.5 /D1.0/24HRS		ULAC 13.2S 045.7E	KGWC
18	160114	12.6S	45.6E	PCN 6			ULAC 11.8S 043.7E	KGWC
19	160307	12.5S	45.5E	PCN 5			ULAC 12.2S 044.3E	KGWC
20	160745	12.5S	45.9E	PCN 3	T2.5/3.0 /W0.5/25HRS		EXP LLCC ULAC 11.5S 042.5E	KGWC
21	161547	12.3S	46.6E	PCN 4			EXP LLCC ULAC 13.9S 044.8E	KGWC
22	170104	12.4S	47.4E	PCN 4				KGWC
23	170246	12.0S	47.0E	PCN 4			EXP LLCC	KGWC
24	170733	12.4S	47.3E	PCN 5	T2.5/2.5 /S0.0/24HRS			KGWC
25	171526	12.4S	47.0E	PCN 6				KGWC
* 26	171832	13.2S	46.2E	PCN 6	T2.0/2.5 /W0.5/24HRS			KGWC
* 27	180052	13.1S	46.6E	PCN 6				KGWC
28	180406	13.1S	48.1E	PCN 6				KGWC
29	180713	13.4S	48.0E	PCN 5	T1.5/2.5 /W1.0/24HRS			KGWC
* 30	181127	14.4S	52.7E	PCN 5	T2.0/2.0		INIT OBS	FJDG
31	181505	13.8S	47.9E	PCN 6				KGWC
32	181812	14.0S	48.0E	PCN 6				KGWC

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION		INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
* 1	180000	12.1S	47.7E	035	045	61968

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 22S
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS			ERRORS			ERRORS			
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
0213062	12.1	101.2	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0213182	12.8	99.7	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0214062	13.3	100.8	40	13.0	100.2	35.	39.	-5.	13.8	97.7	50.	290.	10.	14.9	93.7	65.	659.	20.	0.0	0.0	0.	-0.	0.
0214182	13.1	101.6	40	14.4	99.4	40.	150.	0.	17.5	98.8	45.	392.	0.	21.2	100.3	35.	476.	-15.	0.0	0.0	0.	-0.	0.
0215062	13.0	102.6	40	13.1	100.1	40.	146.	0.	13.7	99.3	35.	332.	-10.	14.0	98.5	35.	351.	-10.	0.0	0.0	0.	-0.	0.
0215182	13.1	103.8	45	14.0	100.9	40.	178.	-5.	14.7	101.4	35.	238.	-15.	15.4	101.8	35.	113.	-10.	0.0	0.0	0.	-0.	0.
0216062	13.9	105.0	45	13.8	105.1	45.	8.	0.	16.0	106.7	55.	144.	10.	18.2	104.9	45.	175.	0.	0.0	0.0	0.	-0.	0.
0216182	15.6	105.5	50	14.8	106.3	50.	48.	0.	17.3	106.4	60.	192.	15.	18.9	104.0	65.	188.	20.	0.0	0.0	0.	-0.	0.
0217062	16.0	104.2	45	15.9	104.5	45.	18.	0.	17.9	101.2	45.	44.	0.	19.0	96.4	40.	203.	0.	0.0	0.0	0.	-0.	0.
0217182	16.8	103.1	45	17.2	103.2	45.	25.	0.	18.7	101.3	40.	35.	-5.	20.1	98.2	40.	67.	0.	0.0	0.0	0.	-0.	0.
0218062	17.6	101.9	45	17.9	101.2	45.	44.	0.	19.6	98.3	40.	91.	0.	20.8	96.1	35.	132.	-5.	0.0	0.0	0.	-0.	0.
0218182	18.6	100.7	45	18.5	100.5	45.	13.	0.	20.5	98.5	35.	41.	-5.	22.6	96.7	30.	56.	-5.	0.0	0.0	0.	-0.	0.
0219062	19.7	99.9	40	19.5	99.6	45.	21.	5.	21.1	98.2	35.	42.	-5.	22.8	97.1	35.	239.	5.	0.0	0.0	0.	-0.	0.
0219182	20.7	99.2	40	20.6	99.7	40.	29.	0.	22.7	100.9	35.	253.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0220062	21.8	98.2	40	21.8	98.8	40.	33.	0.	24.1	98.3	30.	236.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0220182	23.5	96.4	35	23.7	97.2	30.	46.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0221062	26.0	94.5	30	25.8	94.6	30.	13.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	54.	179.	242.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	26.	94.	130.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	1.	6.	8.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	-1.	-0.	0.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	15	13	11	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1416. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 7. KNOTS

TROPICAL CYCLONE 22S
FIX POSITIONS FOR CYCLONE NO. 22

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION		ACCRY	DVORAK CODE		COMMENTS	SITE
1	130000	11.4S	102.6E	PCN 6			ULCC FIX	PGTW
2	130300	11.5S	101.4E	PCN 6	T1.5/1.5		INIT OBS ULCC FIX	PGTW
3	130900	12.1S	101.1E	PCN 6			ULCC FIX	PGTW
4	131200	12.2S	100.2E	PCN 6			ULCC FIX	PGTW
5	131449	12.7S	99.9E	PCN 6	T1.5/1.5		INIT OBS ULAC 12.2S 099.7E	KGWC
6	131600	12.5S	99.4E	PCN 6	T1.5/1.5		INIT OBS	PGTW
7	131800	12.7S	98.8E	PCN 6				PGTW
8	132036	12.9S	98.8E	PCN 6				KGWC
9	140000	13.3S	101.1E	PCN 6				PGTW
10	140027	12.5S	99.8E	PCN 6			ULAC 12.5S 100.6E	KGWC
11	140300	13.3S	100.9E	PCN 6	T3.0/3.0 /D1.5/24HRS		ULCC FIX	PGTW
12	140330	12.6S	100.0E	PCN 5	T1.5/1.5		INIT OBS ULAC 12.7S 100.1E	KGWC
13	140600	13.6S	101.2E	PCN 6				PGTW
14	140900	14.0S	101.3E	PCN 6				PGTW
* 15	140921	12.5S	99.7E	PCN 5				KGWC
* 16	141126	13.2S	99.6E	PCN 6				KGWC
* 17	141429	13.9S	99.9E	PCN 6				KGWC
* 18	142024	13.6S	99.8E	PCN 6				KGWC
19	150000	12.2S	102.1E	PCN 6				PGTW
* 20	150906	13.4S	100.0E	PCN 6				KGWC
21	150300	12.8S	102.4E	PCN 4	T2.5/3.0 /W0.5/24HRS		EXP LLCC	PGTW
* 22	150310	13.1S	100.0E	PCN 5	T1.0/1.5 /W0.5/24HRS		ULAC 12.6S 100.4E	KGWC
23	150600	13.0S	102.6E	PCN 4			EXP LLCC	PGTW
24	150900	12.9S	102.4E	PCN 6				PGTW
* 25	150908	12.5S	99.9E	PCN 5				KGWC
26	151200	12.9S	103.0E	PCN 6				PGTW
* 27	151550	13.8S	102.0E	PCN 6	T2.5/2.5		ULAC 12.7S 103.3E	KGWC
28	151600	13.0S	103.6E	PCN 6	T3.0/3.0		INIT OBS	PGTW
29	151800	13.1S	103.9E	PCN 6				PGTW
30	15201)	13.0S	103.6E	PCN 6				KGWC
31	152100	13.3S	104.1E	PCN 6				PGTW

32	152153	13.5S	103.6E	PCN 6				KGWC
33	152315	12.9S	103.5E	PCN 6				KGWC
34	160249	13.6S	105.0E	PCN 5	T2.5/2.5 /D1.5/24HRS			KGWC
35	160300	13.7S	104.9E	PCN 6	T3.0/3.0 /D0.5/24HRS			PGTW
36	160600	14.1S	105.2E	PCN 6				PGTW
* 37	160819	14.5S	103.7E	PCN 5	T2.5/2.5	INIT OBS		FJDG
38	160856	14.0S	104.5E	PCN 6				KGWC
39	160900	14.5S	105.3E	PCN 6				PGTW
40	161200	14.6S	105.8E	PCN 6				PGTW
41	161530	15.5S	104.4E	PCN 6	T3.0/3.0 /D0.5/24HRS	ULAC 15.3S 105.1E		KGWC
42	161600	15.5S	106.1E	PCN 6	T3.0/3.0 /S0.0/24HRS			PGTW
43	162140	16.2S	105.0E	PCN 6		ULAC 15.9S 103.7E		KGWC
44	162323	16.2S	104.7E	PCN 6				KGWC
45	170000	15.6S	104.5E	PCN 6				PGTW
46	170300	15.9S	104.0E	PCN 6	T2.5/3.0 /W0.5/24HRS			PGTW
47	170411	15.6S	104.7E	PCN 4	T2.5/2.5 /S0.0/25HRS	ULAC 15.0S 104.7E		KGWC
48	170600	15.8S	103.6E	PCN 6				PGTW
49	170815	16.5S	103.5E	PCN 5				FJDG
50	170843	15.8S	103.7E	PCN 5		ULAC 16.0S 103.8E		KGWC
51	170900	15.9S	103.2E	PCN 6		ULCC FIX		PGTW
52	171023	16.2S	103.5E	PCN 6				KGWC
53	171200	16.5S	102.8E	PCN 6				PGTW
54	171510	17.1S	103.8E	PCN 6	T3.0/3.0 /S0.0/25HRS			KGWC
55	171600	17.1S	103.0E	PCN 6	T2.5/3.0 /W0.5/24HRS			PGTW
56	171800	17.3S	103.6E	PCN 6				PGTW
57	172304	17.3S	102.4E	PCN 6				KGWC
58	180000	17.5S	102.4E	PCN 6				PGTW
59	180300	17.6S	101.9E	PCN 6	T3.0/3.0 /D0.5/24HRS			PGTW
60	180350	17.4S	102.6E	PCN 6	T3.5/3.5 /D1.0/24HRS			KGWC
61	180600	17.8S	101.2E	PCN 6				PGTW
62	180900	17.6S	100.8E	PCN 6				PGTW
63	181013	17.9S	101.6E	PCN 2				KGWC
64	181142	17.8S	101.8E	PCN 2				KGWC
65	181200	17.6S	100.7E	PCN 6				PGTW
66	181449	18.6S	101.6E	PCN 6	T3.0/3.0 /S0.0/24HRS	ULAC 18.1S 100.9E		KGWC
67	181600	18.2S	100.8E	PCN 6	T2.5/2.5 /S0.0/24HRS			PGTW
68	181800	18.6S	100.7E	PCN 6				PGTW
69	182100	18.9S	100.6E	PCN 6				PGTW
70	190022	19.3S	101.3E	PCN 6		ULAC 19.2S 100.9E		KGWC
71	190300	19.6S	99.8E	PCN 6	T3.0/3.0 /S0.0/24HRS			PGTW
72	190330	19.0S	100.6E	PCN 5	T2.0/3.0 /W1.5/24HRS	ULAC 19.5S 101.3E		KGWC
73	190600	19.6S	99.5E	PCN 6				PGTW
74	190753	19.0S	100.0E	PCN 5		ULAC 19.6S 100.2E		KGWC
75	191121	19.3S	99.7E	PCN 6		ULAC 20.1S 099.0E		KGWC
76	191200	20.0S	99.5E	PCN 6				PGTW
77	191600	20.7S	99.7E	PCN 6	T2.5/2.5 /S0.0/24HRS			PGTW
78	191800	20.7S	99.8E	PCN 6				PGTW
79	191856	20.9S	99.7E	PCN 6				KGWC
80	192100	21.0S	99.5E	PCN 6				PGTW
81	200000	21.0S	99.1E	PCN 6				PGTW
82	200001	20.6S	98.4E	PCN 4				KGWC
83	200300	21.3S	98.1E	PCN 6	T2.5/3.0 /W0.5/24HRS			PGTW
84	200310	21.0S	98.1E	PCN 3	T2.0/2.0 /S0.0/24HRS	EXP LLCC		KGWC
85	200600	21.7S	97.3E	PCN 6				PGTW
86	200742	21.9S	98.2E	PCN 3		EXP LLCC		KGWC
* 87	201100	23.3S	97.0E	PCN 4		EXP LLCC		KGWC
88	201550	23.4S	96.6E	PCN 6				KGWC
89	202340	24.4S	95.6E	PCN 4		EXP LLCC		KGWC
90	210300	25.2S	94.7E	PCN 6	T2.0/2.5 /W0.5/24HRS			PGTW
91	210431	25.6S	95.1E	PCN 4	T0.5/1.5 /W1.5/24HRS	EXP LLCC		KGWC
92	210600	25.6S	94.2E	PCN 6				PGTW

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 23S BEST TRACK DATA

	BEST TRACK			WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
MO/DA/HR	POSIT		WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
021300Z	18.2	60.1	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
021312Z	18.9	59.1	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
021400Z	17.8	58.5	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
021412Z	16.4	58.0	35	16.8 58.5	35.	37.	0.	17.2 59.6	55.	172.	15.	18.0 58.4	65.	182.	20.	0.0 0.0	0.	-0.	0.
021500Z	16.0	57.3	35	15.0 56.5	40.	76.	5.	14.7 54.9	50.	168.	10.	14.6 53.2	65.	171.	20.	0.0 0.0	0.	-0.	0.
021512Z	16.2	56.8	40	16.0 56.5	40.	99.	0.	17.1 57.9	35.	133.	-10.	16.9 56.6	35.	105.	-10.	0.0 0.0	0.	-0.	0.
021600Z	16.3	56.2	40	16.8 56.8	40.	46.	0.	17.2 55.1	35.	45.	-10.	17.5 53.3	35.	70.	-10.	0.0 0.0	0.	-0.	0.
021612Z	16.4	55.7	45	16.3 55.7	45.	6.	0.	16.4 53.5	50.	76.	5.	16.9 51.9	50.	86.	10.	0.0 0.0	0.	-0.	0.
021700Z	16.5	55.4	45	16.0 54.3	45.	70.	0.	16.0 52.2	50.	123.	5.	16.3 50.2	50.	154.	10.	0.0 0.0	0.	-0.	0.
021712Z	16.6	54.8	45	16.5 55.5	40.	41.	-5.	16.5 54.6	50.	71.	10.	16.5 53.3	50.	76.	10.	0.0 0.0	0.	-0.	0.
021800Z	16.7	54.2	45	17.1 54.6	35.	33.	-10.	17.5 53.4	30.	50.	-10.	17.9 52.2	25.	34.	-20.	0.0 0.0	0.	-0.	0.
021812Z	16.8	53.4	40	17.8 53.6	40.	61.	0.	18.9 52.3	35.	102.	-5.	20.0 51.8	35.	93.	-15.	0.0 0.0	0.	-0.	0.
021900Z	16.9	52.8	40	18.2 52.8	35.	78.	-5.	19.1 51.4	35.	92.	-10.	20.3 50.0	30.	48.	-25.	0.0 0.0	0.	-0.	0.
021912Z	17.2	52.2	40	17.3 52.8	35.	35.	-5.	17.8 50.9	30.	42.	-20.	19.2 49.4	30.	98.	-30.	0.0 0.0	0.	-0.	0.
022000Z	17.6	51.7	45	16.4 51.7	40.	72.	-5.	16.7 50.4	35.	174.	-20.	17.8 49.9	35.	234.	-30.	0.0 0.0	0.	-0.	0.
022012Z	18.5	50.8	50	17.2 51.2	40.	81.	-10.	17.7 50.4	35.	181.	-25.	18.2 49.7	35.	256.	-25.	0.0 0.0	0.	-0.	0.
022100Z	19.6	50.4	55	19.0 50.3	50.	36.	-5.	20.1 49.5	45.	102.	-20.	20.9 49.1	35.	156.	-20.	0.0 0.0	0.	-0.	0.
022112Z	20.7	50.1	60	20.8 50.4	45.	18.	-15.	22.4 50.4	40.	6.	-20.	23.6 50.3	35.	68.	-15.	0.0 0.0	0.	-0.	0.
022200Z	21.7	50.1	65	21.6 50.2	70.	8.	5.	23.2 49.9	65.	58.	10.	24.4 49.8	50.	151.	5.	0.0 0.0	0.	-0.	0.
022212Z	22.4	50.5	60	22.8 50.4	70.	25.	10.	24.6 50.6	65.	92.	15.	26.2 50.8	55.	157.	15.	0.0 0.0	0.	-0.	0.
022300Z	22.9	50.9	55	23.1 50.5	55.	25.	0.	24.7 50.9	45.	100.	0.	26.2 51.3	40.	101.	5.	0.0 0.0	0.	-0.	0.
022312Z	23.3	51.5	50	23.7 51.2	45.	29.	-5.	25.2 51.8	35.	77.	-5.	26.6 52.6	30.	28.	0.	0.0 0.0	0.	-0.	0.
022400Z	23.9	52.5	45	23.5 51.9	45.	41.	0.	24.3 52.8	35.	54.	0.	25.3 53.7	30.	102.	0.	0.0 0.0	0.	-0.	0.
022412Z	24.4	52.9	40	24.5 53.2	40.	17.	0.	25.7 54.6	35.	93.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
022500Z	25.2	52.8	35	25.4 54.1	40.	72.	5.	27.2 55.7	35.	102.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
022512Z	26.3	53.0	30	25.6 53.3	30.	45.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
022600Z	27.0	53.8	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	46.	94.	119.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	31.	53.	58.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	4.	11.	15.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	-2.	-3.	-5.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	23	22	20	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1298. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 4. KNOTS

TROPICAL CYCLONE 23S
FIX POSITIONS FOR CYCLONE NO. 23

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	120552	16.3S 62.9E	PCN 6	T1.5/1.5	INIT OBS	KGWC
2	121832	17.5S 60.4E	PCN 6			KGWC
3	130013	18.2S 59.9E	PCN 6		ULAC 18.1S 059.3E	KGWC
4	130713	19.1S 59.0E	PCN 5	T1.0/1.5 /W0.5/24HRS		KGWC
5	131258	18.4S 59.3E	PCN 5			KGWC
6	131328	18.2S 59.8E	PCN 6			KGWC
* 7	131812	19.3S 59.8E	PCN 6			KGWC
8	140000	18.7S 58.6E	PCN 6			KGWC
9	140209	17.9S 59.0E	PCN 6			KGWC
10	140653	16.2S 57.7E	PCN 5	T1.5/1.5 /D0.5/25HRS		KGWC
* 11	141030	15.5S 56.0E	PCN 5	T1.0/1.0	INIT OBS	FJDG
12	141245	15.4S 58.1E	PCN 5		ULAC 15.1S 057.2E	KGWC
13	141448	15.3S 57.7E	PCN 6			KGWC
14	141752	15.7S 57.3E	PCN 6	T2.5/2.5	INIT OBS	KGWC
15	142348	16.0S 56.9E	PCN 6		ULAC 15.0S 056.6E	KGWC
16	150329	16.2S 57.8E	PCN 6			KGWC
17	150632	15.9S 57.9E	PCN 4	T1.5/1.5 /S0.0/24HRS	EXP LLCC	KGWC
18	151019	16.1S 57.9E	PCN 5	T1.5/1.5 /W0.5/24HRS		FJDG
19	151230	16.3S 57.5E	PCN 6		ULAC 15.9S 057.8E	KGWC
20	151427	16.5S 56.5E	PCN 6			KGWC
21	151730	16.5S 56.0E	PCN 6	T2.5/2.5 /S0.0/24HRS		KGWC
22	152335	15.9S 55.8E	PCN 6		ULAC 15.6S 055.5E	KGWC
23	160515	16.0S 55.9E	PCN 5		ULAC 15.6S 055.7E	KGWC
24	160612	15.8S 55.7E	PCN 6	T3.0/3.0 /D1.5/24HRS	ULAC 15.2S 055.6E	KGWC
* 25	161008	15.2S 54.0E	PCN 5			FJDG
* 26	161220	15.4S 54.8E	PCN 6		ULAC 15.3S 055.2E	KGWC
* 27	161406	15.3S 54.6E	PCN 6			KGWC
28	161853	16.7S 55.3E	PCN 6	T2.5/2.5 /S0.0/25HRS		KGWC
29	162322	16.9S 55.6E	PCN 6			KGWC
30	170246	16.3S 56.0E	PCN 4		EXP LLCC	KGWC
31	170733	16.7S 55.7E	PCN 5	T2.0/3.0 /W1.0/24HRS		KGWC
32	171207	16.9S 55.6E	PCN 6		ULAC 16.7S 053.7E	KGWC
* 33	171832	17.5S 55.0E	PCN 4	T1.5/2.5 /W1.0/24HRS	EXP LLCC ULAC 17.0S 052.0E	KGWC
* 34	180052	17.7S 54.6E	PCN 4		EXP LLCC ULAC 16.9S 051.9E	KGWC
* 35	180225	18.0S 53.9E	PCN 6			KGWC
36	180713	17.6S 53.7E	PCN 5	T1.5/2.0 /W0.5/24HRS	ULAC 16.0S 051.8E	KGWC
* 37	181505	17.9S 53.1E	PCN 5		ULAC 15.6S 052.1E	KGWC
38	181812	16.2S 52.9E	PCN 6	T2.5/2.5 /D1.0/24HRS	ULAC 15.3S 050.4E	KGWC
39	182231	17.4S 52.5E	PCN 6		ULAC 15.9S 052.4E	KGWC
40	190345	16.9S 52.8E	PCN 6		ULAC 15.3S 051.7E	KGWC
41	190653	16.9S 52.8E	PCN 5		ULAC 16.0S 052.3E	KGWC
42	191117	16.9S 52.3E	PCN 5		ULAC 16.9S 052.0E	KGWC
* 43	191117	15.8S 52.2E	PCN 5	T2.0/2.0 /S0.0/24HRS		FJDG
* 44	191443	16.3S 52.2E	PCN 1		EYE FIX ULAC 16.4S 052.6E	KGWC
* 45	191752	16.9S 52.5E	PCN 6	T3.0/3.0 /D0.5/24HRS	ULAC 16.2S 052.2E	KGWC
46	200324	17.4S 52.2E	PCN 6			KGWC
47	200633	17.8S 51.9E	PCN 6	T2.5/2.5 /S0.0/24HRS	ULAC 18.3S 052.3E	KGWC
48	201106	18.9S 50.6E	PCN 5			KGWC
49	201108	18.1S 51.7E	PCN 5	T2.5/2.5 /S0.0/24HRS		FJDG
50	201423	18.5S 50.5E	PCN 6			KGWC
51	201913	19.3S 50.2E	PCN 6	T3.5/3.5 /D0.5/25HRS		KGWC
52	202210	20.0S 51.0E	PCN 6			KGWC
53	210302	20.8S 50.5E	PCN 6			KGWC
54	210754	20.6S 50.8E	PCN 5	T3.0/3.0 /D0.5/25HRS		KGWC
55	211056	21.4S 50.1E	PCN 4		EYE FIX	KGWC
56	211058	20.4S 49.5E	PCN 5			FJDG
57	211401	21.4S 48.8E	PCN 4		EYE FIX	KGWC
58	211853	21.3S 50.0E	PCN 5	T4.5/4.5 /D1.0/24HRS	EYE FIX	KGWC
59	220241	21.8S 50.1E	PCN 6			KGWC
60	220733	22.6S 50.8E	PCN 5	T3.0/3.0 /S0.0/24HRS		KGWC
61	221045	22.6S 50.7E	PCN 6			KGWC
62	221521	22.5S 52.2E	PCN 6		ULAC 22.5S 052.2E	KGWC
63	221833	22.1S 50.9E	PCN 6	T2.5/3.5 /W2.0/24HRS	EXP LLCC ULAC 22.5S 053.0E	KGWC
* 64	222148	21.8S 53.1E	PCN 6		ULAC 22.7S 054.2E	KGWC
65	230410	22.4S 50.6E	PCN 5		ULAC 23.8S 051.8E	KGWC
66	230713	22.8S 51.3E	PCN 5	T2.5/3.0 /W0.5/24HRS	ULAC 23.0S 051.5E	KGWC
* 67	231034	22.7S 52.4E	PCN 6		ULAC 24.0S 052.1E	KGWC
68	231500	23.0S 51.6E	PCN 5		ULAC 24.0S 052.2E	KGWC
69	231812	23.2S 52.5E	PCN 6	T3.0/3.0 /D0.5/24HRS	ULAC 24.6S 052.2E	KGWC
70	232320	23.4S 53.2E	PCN 6		ULAC 24.5S 052.6E	KGWC
71	240340	24.3S 52.6E	PCN 6			KGWC
72	240653	24.3S 53.0E	PCN 5	T2.5/2.5 /S0.0/24HRS	ULAC 24.6S 054.3E	KGWC
73	241023	24.4S 53.2E	PCN 6		ULAC 24.8S 054.6E	KGWC
74	241024	24.6S 53.0E	PCN 5	T2.5/2.5	INIT OBS	FJDG
75	241438	24.3S 53.8E	PCN 6			KGWC
* 76	241752	25.4S 54.6E	PCN 6			KGWC
* 77	242127	26.1S 53.9E	PCN 6		ULAC 27.0S 055.6E	KGWC
78	250319	25.2S 53.0E	PCN 3		EXP LLCC	KGWC
79	250633	25.4S 52.8E	PCN 3	T1.0/2.0 /W1.5/24HRS	EXP LLCC	KGWC
80	251155	25.6S 52.6E	PCN 3		EXP LLCC	KGWC
81	251732	25.9S 53.0E	PCN 4		EXP LLCC	KGWC
* 82	260612	26.6S 53.8E	PCN 6	T2.0/2.0 /D1.0/24HRS		KGWC
83	261712	27.5S 55.0E	PCN 6			KGWC
84	270734	30.3S 54.2E	PCN 6	T1.0/2.0 /W1.0/25HRS		KGWC
85	271833	30.7S 53.2E	PCN 4			KGWC
86	280713	32.6S 53.1E	PCN 3		EXP LLCC	KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 24S
BEST TRACK DATA

	BEST TRACK			WARNING		24 HOUR FORECAST					48 HOUR FORECAST					72 HOUR FORECAST				
						ERRORS					ERRORS					ERRORS				
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
021812Z	11.9	75.7	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
021900Z	12.8	77.6	35	14.0	73.4	35.	255.	0.	16.3	70.0	55.	627.	25.	17.7	67.0	70.1	124.	45.	0.0	0.0	0.	-0.	0.
021812Z	13.8	79.1	35	13.4	79.4	35.	30.	0.	16.8	80.4	45.	167.	20.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
022000Z	15.2	80.8	30	15.4	80.4	35.	26.	5.	18.3	79.2	35.	427.	10.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
022012Z	17.0	83.3	25	16.7	81.1	30.	128.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
022100Z	18.6	86.7	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	110.	407.	1124.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	76.	239.	613.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	3.	18.	45.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	3.	18.	45.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	4	3	1	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 756. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 13. KNOTS

TROPICAL CYCLONE 24S
FIX POSITIONS FOR CYCLONE NO. 24

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION		ACCRY	DVORAK CODE	COMMENTS	SITE
	1	170552	13.0S	73.6E	PCN 6	T1.5/1.5	INIT OBS	KGWC
	2	170958	12.7S	71.3E	PCN 5	T1.5/1.5	INIT OBS	KGWC
	3	171651	12.2S	70.0E	PCN 6		ULAC 11.9S 089.8E	KGWC
	4	180532	12.3S	75.3E	PCN 4	T2.5/2.5 /D1.0/24HRS	ULAC 11.5S 073.2E	KGWC
	5	180947	11.5S	76.2E	PCN 5	T2.0/2.0 /D0.5/24HRS		KGWC
	6	181155	11.9S	75.6E	PCN 4		ULAC 12.2S 073.4E	KGWC
	7	181323	11.8S	75.9E	PCN 6		ULAC 12.1S 073.8E	KGWC
*	8	181631	13.8S	74.2E	PCN 6	T2.6/2.6	INIT OBS ULAC 12.0S 74.9E	KGWC
	9	190204	13.4S	77.4E	PCN 4		ULAC 13.3S 074.6E	KGWC
*	10	190511	13.7S	73.1E	PCN 6	T3.5/3.5 /D1.0/24HRS	ULAC 13.4S 74.0E	KGWC
*	11	190935	13.9S	79.9E	PCN 4		ULAC 12.4S 71.7E	KGWC
	12	190935	13.5S	79.2E	PCN 5	T3.5/3.5 /D1.5/24HRS		KGWC
*	13	191302	14.4S	80.3E	PCN 4		EXP LLCC ULAC 13.6S 71.8E	KGWC
	14	191611	15.0S	79.9E	PCN 4	T1.5/2.5 /W1.0/27HRS	EXP LLCC	KGWC
	15	200142	15.2S	80.5E	PCN 4		EXP LLCC	KGWC
	16	200451	16.4S	81.8E	PCN 4	T0.5/1.5 /W2.5/24HRS	EXP LLCC	KGWC
	17	200924	16.3S	82.5E	PCN 4		EXP LLCC	KGWC
*	18	200925	15.2S	81.2E	PCN 5	T1.5/2.5 /W1.5/24HRS		KGWC
	19	201241	15.6S	83.8E	PCN 4		EXP LLCC	FJDG
	20	201550	18.4S	84.9E	PCN 6			KGWC
	21	210431	18.7S	88.2E	PCN 6	T0.5/1.0 /W0.5/24HRS		KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 25S
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST						48 HOUR FORECAST						72 HOUR FORECAST					
							ERRORS						ERRORS						ERRORS					
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	
021606Z	12.7	124.3	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
021618Z	13.5	122.3	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
021706Z	13.9	120.8	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
021718Z	14.1	119.1	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
021806Z	14.5	117.9	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
021818Z	15.1	116.9	35	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
021906Z	15.3	115.6	45	15.4	115.3	40.	18.	-5.	16.5	112.6	55.	62.	-10.	18.6	110.0	65.	170.	0.	0.0	0.0	0.	-0.	0.	
021918Z	15.4	114.0	55	15.3	113.7	45.	18.	-10.	15.9	110.6	55.	12.	-20.	17.2	106.7	65.	49.	5.	0.0	0.0	0.	-0.	0.	
022006Z	15.5	112.3	65	15.9	112.1	65.	27.	0.	17.1	109.1	75.	68.	10.	18.7	106.2	85.	149.	30.	0.0	0.0	0.	-0.	0.	
022018Z	15.7	110.6	75	16.0	110.4	75.	21.	0.	17.5	107.0	90.	72.	30.	19.5	102.4	75.	98.	20.	0.0	0.0	0.	-0.	0.	
022106Z	16.0	108.8	65	16.0	108.9	70.	6.	5.	17.0	105.4	65.	63.	10.	18.6	101.8	55.	54.	0.	0.0	0.0	0.	-0.	0.	
022118Z	16.4	106.5	60	16.5	106.5	60.	6.	0.	17.9	101.1	55.	91.	0.	19.9	97.3	45.	135.	-10.	0.0	0.0	0.	-0.	0.	
022206Z	17.0	104.3	55	17.0	104.4	55.	6.	0.	18.6	100.1	50.	75.	-5.	20.8	95.3	45.	176.	-10.	0.0	0.0	0.	-0.	0.	
022218Z	17.9	102.7	55	18.0	102.2	55.	29.	0.	20.3	97.8	45.	99.	-10.	23.2	94.7	40.	116.	-10.	0.0	0.0	0.	-0.	0.	
022306Z	19.3	101.2	55	19.6	101.9	55.	21.	0.	22.0	97.8	45.	57.	-10.	24.5	94.5	40.	129.	-10.	0.0	0.0	0.	-0.	0.	
022318Z	21.0	99.4	55	21.3	99.2	50.	21.	-5.	24.8	95.7	40.	6.	-10.	28.2	93.2	30.	174.	-15.	0.0	0.0	0.	-0.	0.	
022406Z	22.9	97.5	55	22.8	97.0	55.	28.	0.	26.3	93.4	45.	121.	-5.	30.6	91.3	40.	367.	-5.	0.0	0.0	0.	-0.	0.	
022418Z	24.9	95.7	50	24.8	95.7	50.	6.	0.	28.6	92.4	45.	197.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
022506Z	27.4	95.3	50	27.4	95.7	55.	21.	5.	32.0	98.8	45.	113.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
022518Z	30.0	95.8	45	29.3	95.8	45.	42.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	
022606Z	33.6	97.6	45	33.8	98.0	45.	23.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	20.	80.	152.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	14.	66.	113.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	2.	9.	10.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	-1.	-2.	-0.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	15	13	11	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 2422. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 10. KNOTS

TROPICAL CYCLONE 25S
FIX POSITIONS FOR CYCLONE NO. 25

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION		ACCRY	DVORAK CODE	COMMENTS	SITE
	1	170000	14.3S	121.5E	PCN 6	T1.0/1.0	INIT OBS	PGTW
	2	170229	14.4S	121.3E	PCN 6	T1.5/1.5	INIT OBS ULAC 12.8S 121.1E	KGWC
*	3	170843	14.0S	118.7E	PCN 5			KGWC
	4	170900	14.4S	119.4E	PCN 6			PGTW
	5	171022	13.0S	120.5E	PCN 6		ULAC 14.1S 117.4E	KGWC
	6	171200	13.5S	119.9E	PCN 6			PGTW
	7	171328	13.9S	119.3E	PCN 6		ULAC 13.3S 118.5E	KGWC
	8	171600	13.8S	119.5E	PCN 6	T1.0/1.0	INIT OBS	PGTW
	9	17180v	14.0S	119.4E	PCN 6			PGTW
	10	171946	14.0S	119.4E	PCN 6		ULAC 13.5S 118.5E	KGWC
	11	172302	14.7S	118.1E	PCN 6		ULAC 15.4S 116.3E	KGWC
*	12	180000	15.2S	117.4E	PCN 6			PGTW
	13	180209	13.9S	118.2E	PCN 5	T1.5/1.5 /S0.0/24HRS		KGWC
*	14	180300	15.4S	116.7E	PCN 6	T1.0/1.0 /S0.0/27HRS		PGTW
	15	180831	14.8S	117.8E	PCN 6			KGWC

16	181001	14.5S	117.5E	PCN	6	ULAC 14.4S 116.3E	KGWC
* 17	181200	15.6S	115.8E	PCN	6		PGTW
18	181449	15.4S	117.9E	PCN	6	ULAC 14.0S 115.9E	KGWC
* 19	181600	15.6S	115.6E	PCN	6	T2.0/2.0 /D1.0/24HRS	PGTW
* 20	181800	15.3S	115.3E	PCN	6		PGTW
* 21	182100	15.8S	114.8E	PCN	6		PGTW
22	182241	15.3S	116.8E	PCN	6	ULAC 14.5S 117.2E	KGWC
23	190000	14.9S	116.2E	PCN	6		PGTW
24	190300	15.1S	115.7E	PCN	6	T3.0/3.0 /D2.0/24HRS	PGTW
25	190330	14.9S	116.8E	PCN	5	T3.5/3.5 /D2.0/25HRS	KGWC
26	190600	15.1S	115.2E	PCN	6	ULAC 15.4S 113.9E	PGTW
27	190611	15.0S	115.1E	PCN	5		KGWC
28	190900	15.3S	115.0E	PCN	4	ULAC 14.1S 114.9E	PGTW
* 29	190939	14.9S	113.9E	PCN	6		KGWC
30	191200	15.3S	114.3E	PCN	6	ULAC 14.5S 114.2E	PGTW
* 31	191429	17.1S	113.3E	PCN	6	T3.5/3.5	KGWC
32	191600	15.3S	114.0E	PCN	6	INIT OBS ULAC 16.5S 113.8E	PGTW
33	191800	15.3S	113.8E	PCN	6	T3.5/3.5 /D1.5/24HRS	PGTW
* 34	191856	16.8S	112.8E	PCN	6		KGWC
35	192100	15.2S	113.1E	PCN	6	ULAC 15.0S 112.6E	PGTW
36	192220	14.8S	112.5E	PCN	6		KGWC
37	200000	15.5S	112.4E	PCN	6		PGTW
38	200300	16.0S	113.0E	PCN	6	T4.0/4.0-/D1.0/24HRS	PGTW
39	200310	14.8S	112.7E	PCN	5	T3.5/3.5 /S0.0/24HRS	KGWC
40	200600	15.8S	112.2E	PCN	6		PGTW
41	200742	15.1S	112.0E	PCN	5		KGWC
42	200900	15.8S	111.7E	PCN	6	ULCC FIX	PGTW
43	201100	16.0S	111.3E	PCN	6	ULAC 16.3S 112.0E	KGWC
44	201200	16.1S	111.3E	PCN	6		PGTW
45	201600	15.9S	110.8E	PCN	6	T4.5/4.5 /D1.0/24HRS	PGTW
46	201800	15.9S	110.4E	PCN	6		PGTW
* 47	201846	17.0S	111.1E	PCN	6		KGWC
48	202100	15.7S	110.0E	PCN	6		PGTW
49	202340	16.0S	110.2E	PCN	6	ULAC 16.8S 110.2E	KGWC
50	210000	16.0S	109.7E	PCN	6	ULCC FIX	PGTW
51	210249	16.0S	109.9E	PCN	5	T3.0/3.5 /W0.5/24HRS	KGWC
52	210300	15.7S	109.1E	PCN	6	T3.5/4.0 /W0.5/24HRS	PGTW
53	210600	16.1S	108.9E	PCN	6	ULCC FIX	PGTW
54	210731	16.0S	108.9E	PCN	5	ULCC FIX	KGWC
55	210900	16.2S	108.3E	PCN	6		PGTW
56	211038	15.8S	108.1E	PCN	6	ULCC FIX	KGWC
57	211200	16.2S	107.7E	PCN	6		PGTW
58	211530	16.9S	107.0E	PCN	6	T3.5/3.5 /S0.0/48HRS	KGWC
59	211600	16.1S	106.7E	PCN	6	T3.0/3.5 /W1.5/24HRS	PGTW
60	211800	16.3S	106.1E	PCN	6	ULAC 16.6S 107.5E	PGTW
61	211835	16.6S	106.5E	PCN	6	ULCC FIX	PGTW
62	212100	16.1S	105.6E	PCN	6	ULCC FIX	KGWC
63	212349	17.0S	105.4E	PCN	5		PGTW
64	220000	16.0S	105.2E	PCN	6	ULCC FIX	KGWC
65	220229	17.3S	105.2E	PCN	6	T3.5/3.5 /D0.5/24HRS	PGTW
66	220300	16.8S	104.8E	PCN	6	T3.5/3.5 /S0.0/24HRS	PGTW
67	220600	17.1S	104.4E	PCN	6	ULCC FIX	KGWC
68	220721	17.5S	103.4E	PCN	6	ULCC FIX	PGTW
69	220900	17.0S	103.5E	PCN	6	ULAC 17.3S 103.5E	KGWC
70	221017	17.4S	104.1E	PCN	6	ULCC FIX	PGTW
71	221200	17.0S	102.9E	PCN	6	ULAC 17.4S 102.7E	KGWC
72	221510	18.4S	103.0E	PCN	6	T3.0/3.5 /W0.5/24HRS	PGTW
73	221600	17.3S	102.2E	PCN	6	T3.0/3.5 /S0.0/24HRS	PGTW
74	221800	17.4S	101.6E	PCN	6	ULCC FIX	KGWC
75	221824	18.8S	103.2E	PCN	6	ULAC 18.0S 102.3E	PGTW
* 76	222100	17.8S	101.0E	PCN	6	ULCC FIX	PGTW
77	230000	18.7S	102.6E	PCN	4	EXP LLCC	KGWC
78	230039	19.0S	102.4E	PCN	4	EXP LLCC	PGTW
79	230300	18.9S	101.8E	PCN	4	EXP LLCC	KGWC
80	230350	19.0S	101.9E	PCN	3	T2.5/3.5 /W1.0/24HRS	PGTW
81	230600	19.3S	101.4E	PCN	4	T2.5/3.5 /W1.0/25HRS	KGWC
82	230710	19.4S	101.6E	PCN	5	EXP LLCC	PGTW
83	230900	19.5S	100.9E	PCN	6	EXP LLCC ULAC 18.6S 101.7E	KGWC
84	231137	20.5S	100.1E	PCN	6	EXP LLCC	PGTW
85	231200	19.8S	100.2E	PCN	6		KGWC
86	231449	21.1S	99.4E	PCN	6	T2.5/3.0 /W0.5/24HRS	PGTW
87	231800	20.6S	99.1E	PCN	6	ULAC 20.4S 099.0E	KGWC
88	231955	21.1S	99.8E	PCN	6	EXP LLCC	PGTW
89	240000	22.0S	98.1E	PCN	4	EXP LLCC	KGWC
90	240017	22.3S	98.6E	PCN	2		PGTW
91	240300	22.6S	97.5E	PCN	6	T3.5/3.5 /D1.0/24HRS	KGWC
92	240330	22.5S	97.8E	PCN	5	T3.5/3.5 /D1.0/24HRS	PGTW
93	240600	23.0S	96.9E	PCN	6		KGWC
94	240841	23.2S	96.9E	PCN	6		KGWC
95	240841	23.2S	96.8E	PCN	5	T3.5/3.5	FJDG
96	240900	23.3S	96.7E	PCN	6	INIT OBS	PGTW
97	241116	23.7S	96.5E	PCN	6		KGWC
98	241200	23.4S	95.9E	PCN	6	ULCC FIX	PGTW
99	241429	24.6S	96.2E	PCN	6	T2.5/2.5 /S0.0/24HRS	KGWC
100	241600	24.5S	95.7E	PCN	6	ULCC FIX	PGTW
101	241800	24.7S	95.4E	PCN	6	ULCC FIX	PGTW
102	241945	25.1S	96.4E	PCN	6	ULAC 25.9S 095.5E	KGWC
103	242100	25.1S	94.9E	PCN	6	ULCC FIX	PGTW
104	242356	25.7S	95.7E	PCN	6	ULAC 25.9S 095.5E	KGWC
105	250000	26.0S	95.4E	PCN	6	ULCC FIX	PGTW
106	250300	26.6S	95.5E	PCN	6	T3.5/3.5 /S0.0/24HRS	PGTW
107	250451	26.7S	96.0E	PCN	4	T2.5/3.5 /W1.0/25HRS	KGWC
108	250600	27.4S	95.3E	PCN	6	ULCC FIX	PGTW
109	250830	27.5S	95.5E	PCN	4	EXP LLCC	KGWC
110	250900	28.2S	95.5E	PCN	6	ULCC FIX	PGTW
111	251055	28.2S	95.2E	PCN	4	EXP LLCC	KGWC
112	251200	28.6S	94.7E	PCN	6	ULCC FIX	PGTW
113	251550	28.7S	95.3E	PCN	6	T2.0/2.5 /W0.5/25HRS	KGWC
*114	251800	29.0S	94.4E	PCN	6		PGTW
115	251934	30.0S	95.8E	PCN	6		KGWC
116	252336	31.3S	96.0E	PCN	6		KGWC
117	260431	33.5S	97.7E	PCN	6	T1.5/2.5 /W0.5/24HRS	KGWC
118	260600	34.2S	97.7E	PCN	6	T2.5/3.0 /W1.0/27HRS	PGTW
119	261033	35.4S	98.2E	PCN	6		KGWC
120	261530	36.0S	99.6E	PCN	6	EXP LLCC	KGWC
121	270411	37.5S	102.8E	PCN	4	EXP LLCC	KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 26P
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS				ERRORS				ERRORS	
MO/DA/HR	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
021906Z	12.8 145.2	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
021918Z	14.1 145.9	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
022006Z	15.5 146.7	35	15.2 146.7	40.	18.	5.	17.8 149.6	60.	164.	20.	20.5 150.7	70.	188.	40.	0.0 0.0	0.	-0.	0.
022018Z	17.7 148.0	45	17.4 147.5	45.	34.	0.	21.4 150.0	55.	70.	20.	24.1 152.9	50.	61.	25.	0.0 0.0	0.	-0.	0.
022106Z	20.4 149.5	40	20.3 149.5	40.	6.	0.	24.8 153.0	35.	100.	5.	28.3 155.0	30.	271.	10.	0.0 0.0	0.	-0.	0.
022118Z	22.3 150.8	35	23.4 151.6	35.	79.	0.	28.5 155.5	25.	282.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
022206Z	23.4 152.0	30	23.3 151.7	35.	18.	5.	24.8 153.2	30.	167.	10.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
022218Z	24.0 154.0	25	24.4 153.6	25.	32.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
022306Z	23.9 156.1	20	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	31.	157.	173.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	16.	86.	110.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	2.	11.	25.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	2.	11.	25.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	6	5	3	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 978. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 10. KNOTS

TROPICAL CYCLONE 26P
FIX POSITIONS FOR CYCLONE NO. 26

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	170048	12.1S 137.8E	PCN 5	T1.5/1.5	INIT OBS	KGWC
2	171328	15.0S 138.0E	PCN 6		ULAC 15.1S 136.8E	KGWC
3	190300	12.4S 145.2E	PCN 6	T1.0/1.0	INIT OBS	PGTW
4	190600	12.7S 145.3E	PCN 6			PGTW
5	191600	13.9S 145.5E	PCN 6			PGTW
6	191800	14.3S 145.9E	PCN 6		INIT OBS	PGTW
7	192100	14.3S 146.3E	PCN 6			PGTW
8	200000	14.4S 146.4E	PCN 6	T2.5/2.5 /D1.5/21HRS		PGTW
9	200128	14.6S 146.9E	PCN 6	T2.5/2.5	INIT OBS	KGWC
10	200300	14.9S 146.6E	PCN 4		ULCC FIX	PGTW
11	200418	14.8S 146.5E	PCN 6			KGWC
12	200600	15.5S 146.5E	PCN 4		ULCC FIX	PGTW
13	200900	16.0S 146.9E	PCN 4		ULCC FIX	PGTW
14	201200	16.4S 147.3E	PCN 6			PGTW
15	201227	16.8S 147.4E	PCN 6	T2.5/2.5	INIT OBS ULAC 16.8S 147.0E	KGWC
16	201600	17.2S 147.4E	PCN 6	T3.0/3.0 /D1.5/22HRS		PGTW
17	201704	17.0S 147.5E	PCN 6			KGWC
18	201800	17.5S 147.5E	PCN 6			PGTW
19	202017	18.3S 148.5E	PCN 2			KGWC
20	202100	17.9S 148.0E	PCN 6			PGTW
21	210000	18.5S 148.3E	PCN 6		ULCC FIX	PGTW
22	210108	19.3S 148.9E	PCN 5	T2.5/2.5 /S0.0/24HRS		KGWC
23	210300	19.5S 149.0E	PCN 6	T2.5/2.5-/S0.0/24HRS	ULCC FIX	PGTW
24	210407	19.9S 149.2E	PCN 6			KGWC
25	210600	20.3S 149.5E	PCN 6		ULCC FIX	PGTW
26	210900	21.4S 150.2E	PCN 6		ULCC FIX	PGTW
27	211200	22.4S 150.7E	PCN 6		ULCC FIX	PGTW
* 28	211207	23.1S 151.5E	PCN 6	T2.5/2.5 /S0.0/24HRS		KGWC
* 29	211511	23.3S 152.6E	PCN 6			KGWC
* 30	211600	24.6S 151.9E	PCN 6			PGTW
* 31	211800	25.2S 152.7E	PCN 6			PGTW
32	211956	23.2S 151.2E	PCN 6			KGWC
33	220000	23.1S 151.1E	PCN 4		EXP LLCC	PGTW
34	220048	23.2S 151.3E	PCN 3	T1.0/2.0 /W1.5/24HRS	EXP LLCC	KGWC
35	220300	23.2S 151.4E	PCN 4	T1.0/2.0 /W1.5/24HRS		PGTW
36	220600	23.5S 151.9E	PCN 4			PGTW
37	220836	24.3S 152.4E	PCN 4		EXP LLCC	KGWC
38	221200	23.5S 153.2E	PCN 6		EXP LLCC	PGTW
39	221600	24.0S 153.7E	PCN 6	T0.0/0.0	INIT OBS EXP LLCC	PGTW
40	221642	24.1S 153.0E	PCN 6			KGWC
41	222116	24.9S 154.3E	PCN 4		EXP LLCC	KGWC
42	230028	23.8S 155.1E	PCN 3	T0.0/1.0 /W1.0/24HRS	EXP LLCC	KGWC
43	230300	23.7S 155.6E	PCN 4	T0.0/1.0 /W1.0/24HRS	EXP LLCC	PGTW
44	230600	23.9S 156.2E	PCN 4		EXP LLCC	PGTW
45	240300	23.9S 158.7E	PCN 4	T0.0/0.0 /S0.0/24HRS	EXP LLCC	PGTW
46	250000	22.2S 160.9E	PCN 4		EXP LLCC	PGTW

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 27P
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS				ERRORS				ERRORS	
MO/DA/HR	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
030406Z	16.7 170.7	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
030418Z	17.6 172.0	35	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
030506Z	19.5 173.3	35	19.7 172.9	35.	26.	0.	23.1 175.4	45.	72.	0.	26.7 179.3	35.	130.	-20.	0.0 0.0	0.	-0.	0.
030518Z	21.4 174.9	40	21.8 175.3	35.	33.	-5.	25.7 178.7	45.	91.	-5.	29.9 181.3	35.	234.	-15.	0.0 0.0	0.	-0.	0.
030606Z	23.1 176.7	45	24.5 176.5	45.	85.	0.	29.7 179.7	35.	288.	-20.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
030618Z	24.2 179.0	50	25.8 178.2	45.	105.	-5.	30.1 180.8	35.	253.	-15.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
030706Z	25.0 180.8	55	26.6 180.1	50.	103.	-5.	30.0 182.4	45.	171.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
030718Z	26.1 182.3	50	26.2 182.9	50.	33.	0.	30.2 186.2	40.	346.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
030806Z	29.4 185.6	45	28.4 185.5	45.	60.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
030818Z	34.3 191.0	40	35.1 191.5	40.	54.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	68.	203.	182.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	56.	131.	159.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	2.	7.	18.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	-2.	-7.	-18.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	8	6	2	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1539. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 14. KNOTS

TROPICAL CYCLONE 27P
FIX POSITIONS FOR CYCLONE NO. 27

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	020900	14.6S 172.0E	PCN 6	T1.0/1.0	INIT OBS	PGTW
2	021600	14.4S 169.4E	PCN 6		ULCC FIX	PGTW
3	022327	16.6S 171.4E	PCN 4	T1.5/1.5	INIT OBS EXP LLCC	KGWC
4	030000	17.6S 170.9E	PCN 4	T1.5/1.5	INIT OBS EXP LLCC	PGTW
5	030300	17.4S 170.7E	PCN 4		EXP LLCC	PGTW
6	030401	15.8S 170.6E	PCN 5			KGWC
7	030600	16.7S 170.7E	PCN 6			PGTW
8	030706	15.8S 169.3E	PCN 6			KGWC
9	030900	16.8S 170.6E	PCN 6			PGTW
10	031026	15.8S 169.1E	PCN 6		ULAC 16.9S 172.9E	KGWC
11	031505	15.8S 168.8E	PCN 6		ULAC 17.0S 172.0E	KGWC
12	031946	16.2S 169.4E	PCN 6		ULAC 16.8S 171.5E	KGWC
13	032307	16.8S 170.4E	PCN 5	T2.5/2.5 /D1.0/24HRS		KGWC
14	040000	17.2S 169.3E	PCN 6	T1.5/1.5 /S0.0/24HRS		PGTW
15	040300	17.5S 168.5E	PCN 6			PGTW
* 16	040600	17.2S 168.9E	PCN 6		ULCC 16.9S 171.4E	PGTW
17	040900	16.8S 171.2E	PCN 6		ULCC FIX	PGTW
18	041006	16.1S 171.3E	PCN 6	T2.5/2.5	INIT OBS ULAC 15.8S 171.3E	KGWC
19	041600	16.8S 171.6E	PCN 6		ULCC FIX	PGTW
20	042246	18.1S 172.7E	PCN 5	T3.0/3.0 /D0.5/24HRS	ULAC 18.5S 172.5E	KGWC
21	050000	19.1S 172.5E	PCN 6	T2.5/2.5 /D1.0/24HRS	ULCC FIX	PGTW
22	050300	19.3S 172.7E	PCN 6		ULCC FIX	PGTW
23	050600	19.8S 173.4E	PCN 6		ULCC FIX	PGTW
24	050623	20.3S 173.6E	PCN 6			KGWC
25	050945	20.7S 174.3E	PCN 6	T2.5/2.5 /S0.0/24HRS		KGWC
* 26	051443	19.8S 173.9E	PCN 6			KGWC
27	051800	21.6S 175.6E	PCN 6	T2.0/2.0	INIT OBS	PGTW
28	051903	20.6S 174.6E	PCN 6		ULAC 20.6S 174.9E	KGWC
29	052226	21.7S 175.4E	PCN 6	T3.0/3.0 /S0.0/24HRS	ULAC 21.8S 176.3E	KGWC
30	060000	22.8S 175.8E	PCN 6	T3.0/3.0 /D0.5/24HRS		PGTW
31	060300	23.9S 176.2E	PCN 6			PGTW
* 32	060329	21.7S 176.5E	PCN 6			KGWC
* 33	060600	24.7S 176.5E	PCN 6		ULCC 23.5S 178.0E	PGTW
* 34	060602	22.3S 176.6E	PCN 6		ULAC 23.5S 176.9E	KGWC
* 35	060900	25.3S 176.9E	PCN 6		ULCC 23.9S 177.6E	PGTW
36	060925	22.8S 177.1E	PCN 6	T3.5/3.5 /D1.0/24HRS		KGWC
37	061200	24.0S 178.2E	PCN 6		ULCC FIX	PGTW
38	061432	23.3S 178.4E	PCN 4		RGD EYE DIA 1 DEG	KGWC
39	061600	24.3S 179.0E	PCN 6	T2.5/2.5-/D0.5/22HRS	ULCC FIX	PGTW
40	062100	24.3S 179.6E	PCN 6		ULCC FIX	PGTW
41	062206	24.3S 179.4W	PCN 5	T3.5/3.5 /D0.5/24HRS	ULAC 24.7S 180.0E	KGWC
42	070000	25.0S 180.0E	PCN 4	T3.5/3.5-/D0.5/24HRS		PGTW
43	070318	24.3S 179.8E	PCN 6		ULAC 16.9S 172.9E	KGWC
44	070400	24.6S 180.0E	PCN 6		ULCC FIX	PGTW
45	070540	24.3S 179.8W	PCN 6			KGWC
46	070600	24.5S 179.8W	PCN 6		ULCC FIX	PGTW
47	070900	24.6S 179.0W	PCN 6		ULCC FIX	PGTW
48	070905	24.4S 179.1W	PCN 6	T3.5/3.5 /S0.0/24HRS	ULAC 24.9S 179.4W	KGWC
49	071200	25.2S 178.4W	PCN 6		ULCC FIX	PGTW
50	071422	25.4S 177.8W	PCN 6			KGWC
51	071821	26.2S 177.2W	PCN 6			KGWC
52	072146	26.9S 176.4W	PCN 6	T2.5/3.5 /W1.0/24HRS		KGWC
53	080307	28.9S 176.2W	PCN 6			KGWC
54	080519	28.8S 174.7W	PCN 6		ULAC 28.8S 173.7W	KGWC
55	080845	30.9S 172.5W	PCN 6	T3.0/3.5 /W0.5/24HRS	ULAC 30.2S 172.4W	KGWC
56	081411	32.0S 171.3W	PCN 6			KGWC
57	081759	35.1S 168.5W	PCN 6			KGWC
58	082125	36.0S 167.0W	PCN 4	T0.0/1.5 /W2.5/24HRS	EXP LLCC	KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 28S
BEST TRACK DATA

	BEST TRACK			WARNING		24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS				ERRORS				ERRORS			
MO/DA/HR	POSIT		WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
0306122	11.5	93.5	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0307002	12.1	91.8	45	12.0 90.8	35.	59.	-10.	13.6 86.7	45.	111.	-30.	14.8 84.5	55.	71.	-50.	0.0 0.0	0.	-0.	0.
0307122	12.9	90.2	55	12.7 90.8	45.	37.	-10.	14.6 87.3	55.	59.	-40.	16.3 84.4	65.	67.	-45.	0.0 0.0	0.	-0.	0.
0308002	13.6	88.6	75	13.9 88.1	60.	34.	-15.	15.2 84.3	70.	93.	-35.	15.6 80.3	90.	238.	-25.	0.0 0.0	0.	-0.	0.
0308122	13.7	86.9	95	13.9 86.6	65.	21.	-30.	14.2 82.6	85.	142.	-25.	14.6 78.6	95.	375.	-20.	0.0 0.0	0.	-0.	0.
0309002	14.3	85.6	105	13.7 85.0	90.	50.	-15.	14.0 80.9	100.	251.	-15.	14.5 76.8	115.	518.	-10.	0.0 0.0	0.	-0.	0.
0309122	15.3	84.9	110	15.2 84.9	105.	6.	-5.	16.2 82.9	125.	122.	10.	16.9 79.6	125.	353.	35.	0.0 0.0	0.	-0.	0.
0310002	16.6	84.3	115	16.3 84.1	120.	21.	5.	18.0 81.5	125.	181.	20.	18.7 77.8	125.	457.	50.	0.0 0.0	0.	-0.	0.
0310122	17.8	84.2	115	17.6 84.3	125.	13.	10.	19.6 84.3	125.	41.	35.	21.6 84.3	115.	106.	50.	0.0 0.0	0.	-0.	0.
0311002	19.0	84.5	105	19.4 85.2	120.	46.	15.	22.3 87.3	100.	135.	25.	25.5 89.9	100.	252.	45.	0.0 0.0	0.	-0.	0.
0311122	19.8	85.0	90	19.8 85.0	90.	0.	0.	21.3 85.9	70.	21.	-5.	23.1 86.7	60.	65.	10.	0.0 0.0	0.	-0.	0.
0312002	20.7	85.6	75	20.6 85.5	70.	8.	-5.	22.3 86.6	50.	13.	-5.	24.1 87.5	40.	89.	-5.	0.0 0.0	0.	-0.	0.
0312122	21.5	86.2	65	20.9 86.0	55.	38.	-10.	22.3 87.3	45.	77.	-5.	23.9 89.1	35.	189.	-5.	0.0 0.0	0.	-0.	0.
0313002	22.4	86.8	55	22.3 86.6	55.	13.	0.	24.4 87.6	45.	82.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0313122	23.5	87.8	50	24.0 88.0	50.	38.	0.	26.9 90.7	40.	76.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0314002	24.4	89.1	45	24.9 88.9	45.	32.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
0314122	26.0	91.7	40	26.3 91.5	40.	21.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	27.	101.	232.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	16.	68.	161.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	8.	18.	29.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	-4.	-4.	4.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	16	14	12	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1389. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 7. KNOTS

TROPICAL CYCLONE 28S
FIX POSITIONS FOR CYCLONE NO. 28

SATELLITE FIXES

	FIX NO.	TIME (Z)	FIX POSITION		ACCRY	DVORAK CODE	COMMENTS	SITE
	1	040411	10.6S	98.8E	PCN 6	T1.5/1.5	INIT OBS	KGWC
	2	041510	10.5S	99.2E	PCN 6		ULAC 12.0S 098.0E	KGWC
	3	060330	11.3S	95.1E	PCN 6	T3.0/3.0 /D0.5/24HRS		KGWC
	4	060600	11.2S	94.3E	PCN 6	T1.5/1.5	INIT OBS	PGTW
	5	060828	11.4S	93.1E	PCN 5	T2.5/2.5 /D1.0/24HRS		FJDG
	6	061450	10.3S	97.3E	PCN 6	T2.5/2.5	INIT OBS	KGWC
	7	061600	11.2S	92.2E	PCN 6	T2.0/2.0	INIT OBS ULCC FIX	PGTW
	8	061611	12.0S	93.4E	PCN 6	T3.0/3.0 /D0.5/25HRS	ULAC 12.3S 092.4E	KGWC
	9	061800	11.5S	91.9E	PCN 6		ULCC FIX	PGTW
	10	062100	11.8S	91.6E	PCN 6		ULCC FIX	PGTW
	11	062346	11.9S	91.8E	PCN 6			KGWC
	12	070400	12.7S	91.8E	PCN 6	T3.0/3.0 /D1.5/22HRS		PGTW
	13	070451	12.0S	91.5E	PCN 6	T3.5/3.5 /D0.5/25HRS		KGWC
	14	070600	12.6S	91.7E	PCN 6		ULCC 12.1S 091.0E	PGTW
*	15	070818	10.7S	90.2E	PCN 5	T3.0/3.0 /D0.5/24HRS		FJDG
	16	070824	12.2S	91.0E	PCN 6		ULAC 12.4S 091.0E	KGWC
	17	070900	12.5S	91.2E	PCN 6		ULCC FIX	PGTW
	18	071200	12.8S	90.9E	PCN 6		ULCC FIX	PGTW
	19	071226	12.9S	90.7E	PCN 6			KGWC
	20	071551	13.4S	89.7E	PCN 2	T4.5/4.5 /D1.5/24HRS	EYE FIX	KGWC
	21	071600	13.1S	89.7E	PCN 6		ULCC FIX	PGTW
	22	071800	13.4S	89.4E	PCN 6		ULCC FIX	PGTW
	23	071928	13.8S	89.5E	PCN 4		EYE FIX	KGWC
	24	072100	13.6S	88.7E	PCN 6		ULCC FIX	PGTW
	25	080000	13.6S	87.5E	PCN 6			PGTW
	26	080106	13.4S	88.6E	PCN 2		EYE FIX	KGWC
	27	080400	13.5S	87.0E	PCN 2			PGTW
	28	080431	13.5S	87.9E	PCN 2	T4.0/4.0 /D0.5/24HRS	EYE FIX	KGWC
	29	080814	13.5S	87.5E	PCN 2		EYE FIX	KGWC
	30	080814	13.1S	86.2E	PCN 5	T4.5/4.5 /D1.0/24HRS		FJDG
	31	080900	13.5S	86.7E	PCN 6			PGTW
	32	081200	13.8S	86.4E	PCN 6			PGTW
*	33	081205	12.9S	87.0E	PCN 4		EYE FIX	KGWC
	34	081530	13.6S	86.4E	PCN 2	T5.5/5.5 /D1.0/25HRS	EYE FIX	KGWC
	35	081600	14.0S	86.1E	PCN 6			PGTW
	36	081800	14.0S	85.5E	PCN 6			PGTW
	37	082059	14.3S	86.0E	PCN 6		EYE FIX	KGWC
	38	082100	13.8S	85.3E	PCN 6			PGTW
	39	090000	13.8S	84.7E	PCN 6			PGTW
	40	090045	14.5S	85.5E	PCN 2		EYE DIA .5 DEG	KGWC
	41	090400	14.5S	85.2E	PCN 2			PGTW
	42	090411	14.6S	85.8E	PCN 2	T5.0/5.0 /D1.0/24HRS	EYE DIA .7 DEG	KGWC
	43	090600	14.7S	85.1E	PCN 2			PGTW
	44	090803	14.7S	85.3E	PCN 2		EYE DIA .6 DEG	KGWC
	45	090945	15.1S	84.9E	PCN 1	T5.0/5.0 /D0.5/24HRS	EYE FIX	FJDG
	46	091143	15.1S	85.0E	PCN 2		EYE DIA .7 DEG	KGWC
	47	091200	15.4S	85.0E	PCN 2		EYE FIX	PGTW
	48	091651	15.6S	84.9E	PCN 2	T6.5/6.5 /D1.0/25HRS	EYE DIA 3/4 DEG	KGWC
	49	092048	16.5S	84.6E	PCN 2		EYE DIA 1/2 DEG	KGWC
	50	092100	16.2S	84.6E	PCN 2		EYE FIX	PGTW
	51	100000	16.7S	84.4E	PCN 2			PGTW
	52	100023	16.7S	84.9E	PCN 2		EYE DIA .6 DEG	KGWC
	53	100400	17.0S	84.1E	PCN 2			PGTW
	54	100532	17.1S	84.8E	PCN 2	T6.5/6.5 /D1.5/25HRS		KGWC
	55	100600	17.1S	84.0E	PCN 2			PGTW
	56	100900	17.4S	83.9E	PCN 6			PGTW
	57	100934	17.6S	84.4E	PCN 2			KGWC
	58	100934	17.2S	84.2E	PCN 1	T6.0/6.0 /D1.0/24HRS	EYE FIX	FJDG
	59	101302	17.9S	84.9E	PCN 2			KGWC
	60	101600	18.5S	84.6E	PCN 6			PGTW
	61	101631	18.4S	84.8E	PCN 6	T5.5/6.5 /W1.0/24HRS		KGWC
	62	101800	18.6S	84.7E	PCN 6			PGTW
	63	102038	18.8S	84.1E	PCN 6			KGWC
	64	102100	18.9S	84.7E	PCN 2		EYE FIX	PGTW
	65	110000	19.4S	85.3E	PCN 4			PGTW
	66	110144	19.3S	84.4E	PCN 6			KGWC
	67	110400	19.8S	85.0E	PCN 6		ULCC FIX	PGTW
	68	110512	19.3S	84.7E	PCN 6	T4.0/5.0 /W2.5/24HRS		KGWC
	69	110600	19.7S	85.5E	PCN 6		ULCC FIX	PGTW
	70	110900	19.9S	85.5E	PCN 6		ULCC FIX	PGTW
	71	110923	19.4S	85.1E	PCN 6			KGWC
	72	111200	20.2S	86.1E	PCN 6			PGTW
	73	111242	19.5S	85.1E	PCN 6		ULAC 21.2S 086.2E	KGWC
	74	111600	21.3S	86.3E	PCN 6		ULCC FIX	PGTW
	75	111611	20.1S	85.5E	PCN 4	T3.0/4.0 /W2.5/24HRS	EXP LLCC ULAC 22.3S 086.9E	KGWC
	76	111800	22.1S	86.4E	PCN 6		ULCC FIX	PGTW
	77	112027	20.4S	85.5E	PCN 4		EXP LLCC	KGWC
	78	120122	20.3S	85.5E	PCN 4		EXP LLCC	KGWC
	79	120400	20.3S	84.7E	PCN 6		EXP LLCC	PGTW
	80	120452	20.5S	85.7E	PCN 4	T2.0/3.0 /W2.0/24HRS		KGWC
	81	120600	20.9S	84.6E	PCN 6	T2.5/2.5	INIT OBS	PGTW
	82	121221	20.8S	85.9E	PCN 6			KGWC
	83	121550	21.7S	86.0E	PCN 6	T3.0/3.0 /S0.0/24HRS	ULAC 17.0S 087.1E	KGWC
	84	122016	22.2S	86.6E	PCN 6		ULAC 22.6S 086.9E	KGWC
	85	130101	22.6S	87.2E	PCN 4		EXP LLCC ULAC 22.8S 087.3E	KGWC
	86	130300	22.1S	85.5E				PGTW
	87	130431	23.3S	87.5E	PCN 4	T2.5/2.5 /D0.5/24HRS	EXP LLCC ULAC 23.3S 088.0E	KGWC
	88	130902	23.9S	87.9E	PCN 6		ULAC 23.9S 087.2E	KGWC
	89	131200	23.5S	87.4E	PCN 6		ULAC 24.0S 088.0E	KGWC
	90	131530	23.8S	88.2E	PCN 6	T2.5/3.0 /W0.5/24HRS	ULAC 24.5S 088.9E	KGWC
	91	132005	24.1S	89.2E	PCN 6		ULAC 25.4S 090.8E	KGWC
	92	140040	24.4S	89.3E	PCN 4		EXP LLCC ULAC 26.3S 091.4E	KGWC
	93	140411	25.0S	90.5E	PCN 4	T1.5/2.5 /W1.0/24HRS	EXP LLCC	KGWC
	94	140852	26.0S	91.0E	PCN 5	T1.5/1.5 /W1.0/24HRS		FJDG
	95	141138	25.6S	91.6E	PCN 4		EXP LLCC ULAC 27.2S 093.3E	KGWC
	96	141510	26.0S	93.0E	PCN 4	T1.5/2.5 /W1.0/24HRS	EXP LLCC	KGWC
	97	141954	26.4S	94.5E	PCN 4		EXP LLCC	KGWC
	98	150351	26.7S	95.6E	PCN 3		EXP LLCC	KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 29S
BEST TRACK DATA

	BEST TRACK			WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
MO/DA/HR	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
030806Z	12.4 117.7	35	11.9 117.0	40.	51.	5.	13.7 116.1	65.	280.	10.	15.3 115.0	30.	565.	35.	0.0 0.0	0.	-0.	0.
030818Z	13.6 119.2	45	12.8 118.0	45.	85.	0.	14.9 118.6	65.	266.	10.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
030906Z	15.6 120.5	55	16.0 120.8	55.	30.	0.	21.7 122.6	30.	108.	-15.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
030918Z	18.8 121.7	55	18.5 121.7	50.	18.	-5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
031006Z	20.1 123.5	45	20.2 123.7	45.	13.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	39.	218.	565.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	*23.	99.	235.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	2.	12.	35.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	0.	2.	35.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	5	3	1	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 579. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 12. KNOTS

TROPICAL CYCLONE 29S
FIX POSITIONS FOR CYCLONE NO. 29

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	080000	12.0S 117.1E	PCN 6			PGTW
2	080250	12.0S 118.9E	PCN 5	T1.0/1.0	INIT OBS	KGWC
3	080400	11.7S 117.4E	PCN 6	T3.0/3.0	INIT OBS	PGTW
4	080600	11.9S 116.8E	PCN 6			PGTW
5	080632	13.1S 118.5E	PCN 5		ULAC 12.7S 117.3E	KGWC
6	081023	12.8S 118.5E	PCN 5		ULAC 13.1S 116.8E	KGWC
7	081200	11.9S 118.4E	PCN 6			PGTW
8	081349	13.3S 118.8E	PCN 5	T2.5/2.5	INIT OBS ULAC 13.0S 117.9E	KGWC
9	081735	13.7S 119.3E	PCN 5		ULAC 13.8S 118.7E	KGWC
10	081800	12.6S 118.9E	PCN 6	T3.0/3.0	INIT OBS	PGTW
11	082100	13.2S 119.5E	PCN 6			PGTW
12	082303	14.0S 120.2E	PCN 5		ULAC 13.9S 119.5E	KGWC
13	090000	14.4S 119.9E	PCN 6			PGTW
14	090230	14.7S 120.4E	PCN 5	T2.5/2.5 /D1.5/24HRS	ULAC 15.0S 120.4E	KGWC
15	090400	15.4S 120.4E	PCN 6	T3.5/3.5-/D0.5/24HRS		PGTW
16	090600	16.1S 120.5E	PCN 6			PGTW
17	090900	16.8S 120.8E	PCN 6			PGTW
18	091002	17.4S 120.8E	PCN 5			KGWC
19	091200	17.5S 121.1E	PCN 6			PGTW
20	091329	17.7S 121.0E	PCN 5	T3.5/3.5 /D1.0/24HRS		KGWC
21	091600	18.1S 121.5E	PCN 6			PGTW
22	091724	18.3S 122.5E	PCN 6			KGWC
23	092100	18.8S 122.0E	PCN 6			PGTW
24	092242	19.2S 123.0E	PCN 5			KGWC
25	100000	19.3S 122.3E	PCN 6			PGTW
26	100209	19.5S 123.1E	PCN 5			KGWC
27	100400	19.6S 123.0E	PCN 6			PGTW
28	100600	20.0S 123.5E	PCN 6			PGTW
29	101308	22.7S 125.2E	PCN 5		ULAC 23.9S 123.8E	KGWC
30	110149	24.4S 126.7E	PCN 5			KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 30P
BEST TRACK DATA

	BEST TRACK			WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
MO/DA/HR	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
031200Z	14.7 170.4	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
031212Z	14.9 167.9	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
031300Z	14.1 166.1	40	14.4 165.9	40.	21.	0.	14.5 162.4	55.	176.	-5.	15.0 160.0	65.	460.	-35.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
031312Z	13.3 165.0	50	12.9 164.9	45.	25.	-5.	12.0 162.3	55.	212.	-25.	12.9 160.0	65.	550.	-55.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
031400Z	12.5 164.6	60	13.0 164.6	55.	30.	-5.	12.4 163.5	75.	224.	-25.	12.0 161.5	90.	646.	-40.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
031412Z	11.8 165.9	80	11.4 165.6	65.	30.	-15.	10.0 168.3	90.	180.	-30.	10.0 171.6	110.	432.	-25.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
031500Z	12.1 167.3	100	11.7 167.4	80.	25.	-20.	11.8 170.7	110.	177.	-20.	12.4 173.8	125.	461.	15.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
031512Z	12.8 169.4	120	12.8 169.4	110.	0.	-10.	14.8 173.0	130.	150.	-5.	19.1 175.1	130.	385.	40.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
031600Z	14.3 172.3	130	14.2 172.3	125.	6.	-5.	18.3 177.4	135.	60.	25.	22.6 182.4	120.	400.	50.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
031612Z	16.4 175.0	135	16.3 175.1	140.	8.	5.	21.8 180.7	110.	163.	20.	28.8 186.5	80.	245.	30.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
031700Z	19.3 177.3	110	19.1 177.4	125.	13.	15.	26.2 182.4	95.	189.	25.	34.7 186.4	70.	115.	35.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
031712Z	24.2 179.3	90	23.6 179.2	115.	36.	25.	32.5 183.2	75.	66.	25.	0.0 0.0	0.	0.	-0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
031800Z	29.2 181.3	70	30.5 182.9	85.	114.	15.	34.9 191.6	50.	164.	15.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
031812Z	32.5 184.5	50	33.0 185.0	55.	39.	5.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
031900Z	35.7 188.4	35	35.5 187.9	35.	27.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	29.	160.	410.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	18.	94.	184.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	10.	20.	36.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	0.	0.	2.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	13	11	9	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 2469. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 15. KNOTS

TROPICAL CYCLONE 30P
FIX POSITIONS FOR CYCLONE NO. 30

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	102226	16.6S 174.9E	PCN 1	T1.5/1.5		KGWC
2	111107	17.5S 172.8E	PCN 6	T1.5/1.5	INIT OBS	KGWC
3	111800	14.7S 171.8E	PCN 6	T1.5/1.5	INIT OBS	PGTW
4	112100	14.5S 171.7E	PCN 6			PGTW
5	112346	15.1S 170.8E	PCN 6	T2.0/2.0 /D0.5/25HRS		KGWC
6	120000	13.9S 170.6E	PCN 6		ULCC FIX	PGTW
7	120400	14.7S 169.5E	PCN 6	T1.5/1.5	INIT OBS	PGTW
8	120600	15.3S 169.0E	PCN 6		ULCC 15.1S 168.3E	PGTW
9	120900	14.9S 168.2E	PCN 6		ULCC FIX	PGTW
10	121046	14.9S 169.2E	PCN 6			KGWC
11	121200	15.0S 168.1E	PCN 6	T2.0/2.0 /D0.5/18HRS	ULCC FIX	PGTW
12	121510	14.8S 167.1E	PCN 6			KGWC
13	121600	14.7S 167.6E	PCN 6			PGTW
14	121800	14.7S 167.2E	PCN 6			PGTW
15	121957	14.5S 166.7E	PCN 5			KGWC
16	122100	14.6S 166.4E	PCN 6			PGTW
17	122326	14.0S 166.5E	PCN 6	T3.0/3.0 /D1.0/24HRS		KGWC
18	130000	14.2S 165.9E	PCN 6	T3.0/3.0-/D1.5/20HRS	ULCC FIX	PGTW
19	130300	13.7S 165.4E	PCN 6		ULCC FIX	PGTW
20	130600	13.3S 165.1E	PCN 6			PGTW
21	130656	13.5S 166.1E	PCN 6		ULAC 13.4S 164.8E	KGWC
22	130900	13.3S 164.8E	PCN 6			PGTW
23	131025	12.9S 164.9E	PCN 6	T3.0/3.0	INIT OBS ULAC 12.4S 164.7E	KGWC
24	131200	12.9S 164.5E	PCN 6	T2.0/2.0 /S0.0/24HRS		PGTW
25	131459	13.1S 164.7E	PCN 6		ULAC 13.2S 165.0E	KGWC
26	131600	13.3S 164.7E	PCN 6			PGTW
27	131936	13.0S 164.8E	PCN 6		ULAC 12.6S 164.8E	KGWC
28	132100	13.3S 164.9E	PCN 6			PGTW
29	132306	12.6S 164.7E	PCN 6	T4.0/4.0 /D1.0/24HRS	ULAC 12.3S 164.6E	KGWC
30	140000	12.7S 164.5E	PCN 6		ULCC FIX	PGTW
31	140300	12.4S 165.2E	PCN 6	T4.0/4.0 /D1.0/27HRS		PGTW
32	140345	12.4S 164.9E	PCN 6		ULAC 12.4S 164.8E	KGWC
33	140600	12.0S 165.4E	PCN 6			PGTW
34	140643	12.5S 164.2E	PCN 6		ULAC 12.1S 164.2E	KGWC
35	140900	11.8S 165.7E	PCN 6			PGTW
36	141200	11.2S 166.0E	PCN 6	T4.5/4.5 /D2.5/24HRS		PGTW
37	141448	12.1S 166.3E	PCN 6		ULAC 11.8S 166.9E	KGWC
38	141600	12.2S 166.6E	PCN 6			PGTW
39	141800	12.3S 166.7E	PCN 6			PGTW
40	141914	11.9S 166.5E	PCN 2		EYE DIA 16 NM	KGWC
41	142100	12.2S 167.0E	PCN 2		EYE FIX	PGTW
42	142247	12.0S 167.0E	PCN 1	T5.5/5.5 /D1.5/24HRS		KGWC
43	150000	12.2S 167.4E	PCN 2		EYE FIX	PGTW
44	150300	12.4S 167.8E	PCN 2	T5.5/5.5 /D1.5/24HRS	EYE FIX	PGTW
45	150600	12.4S 168.3E	PCN 2			PGTW
46	150613	12.2S 167.8E	PCN 2		EYE FIX	KGWC
47	150900	12.6S 168.3E	PCN 2			PGTW
48	151127	12.7S 169.1E	PCN 2	T6.5/6.5 /D3.5/49HRS	EYE DIA .2 DEG	KGWC
49	151200	12.8S 169.5E	PCN 2	T6.0/6.0 /D1.5/25HRS		PGTW
50	151427	13.1S 170.4E	PCN 2	T5.5/5.5 /D1.5/24HRS	EYE DIA 12 NM	KGWC
51	151600	13.4S 170.5E	PCN 2		EYE DIA 40 NM	PGTW
52	151800	13.6S 170.9E	PCN 2		EYE FIX	PGTW
53	151853	13.7S 171.1E	PCN 2		EYE DIA 15 NM	KGWC
54	152226	14.1S 172.1E	PCN 2	T6.5/6.5 /D1.0/24HRS	EYE DIA .2 DEG	KGWC
55	160000	14.3S 172.3E	PCN 2		EYE FIX	PGTW
56	160300	14.9S 172.9E	PCN 2	T6.5/6.5 /D1.0/24HRS	EYE FIX	PGTW
57	160323	14.8S 172.6E	PCN 2		EYE DIA .2 DEG	KGWC
58	160552	15.2S 173.5E	PCN 2		EYE FIX	KGWC
59	160600	15.1S 173.8E	PCN 2			PGTW
60	160900	15.7S 174.5E	PCN 2			PGTW
61	160925	15.7S 174.0E	PCN 2		EYE DIA .2 DEG	KGWC
62	161107	16.2S 174.8E	PCN 2	T6.5/6.5 /S0.0/24HRS	EYE FIX	KGWC
63	161200	16.4S 175.1E	PCN 2	T7.0/7.0-/D1.0/24HRS		PGTW
64	161427	16.8S 175.5E	PCN 2		EYE FIX	KGWC
65	161600	17.4S 175.8E	PCN 2		EYE FIX	PGTW
66	161800	17.8S 176.1E	PCN 2		EYE FIX	PGTW
67	161832	17.9S 176.3E	PCN 2		EYE DIA 12 NM	KGWC
68	162100	18.4S 176.7E	PCN 2			PGTW
69	162206	18.6S 176.8E	PCN 2	T6.0/6.5 /W0.5/24HRS	EYE DIA 12 NM	KGWC
70	170000	19.3S 177.4E	PCN 2			PGTW
71	170300	20.5S 178.1E	PCN 6			PGTW
72	170312	20.8S 177.6E	PCN 6			KGWC
73	170530	21.5S 178.0E	PCN 6			KGWC
74	170600	21.5S 178.4E	PCN 2	T5.5/6.5 /W1.0/27HRS	EYE FIX	PGTW
75	170900	22.8S 178.7E	PCN 2		EYE FIX	PGTW
76	170905	23.0S 178.3E	PCN 6	T5.0/6.0 /W1.5/22HRS		KGWC
77	171200	24.1S 179.4E	PCN 6	T5.0/6.0 /W2.0/24HRS		PGTW
78	171416	25.6S 179.6E	PCN 6			KGWC
79	171600	27.0S 179.9W	PCN 6			PGTW
80	171800	27.7S 179.4W	PCN 6			PGTW
81	171811	27.9S 179.8E	PCN 6			KGWC
* 82	172100	29.3S 178.2W	PCN 6			PGTW
83	172146	28.9S 179.7W	PCN 6	T3.5/4.5 /W2.5/24HRS	ULAC 29.3S 178.8W	KGWC
84	180000	28.9S 178.3W	PCN 4		EXP LLCC	PGTW
85	180300	30.5S 177.5W	PCN 4	T3.0/4.0 /W2.5/21HRS	EXP LLCC	PGTW
86	180301	30.7S 178.0W	PCN 6			KGWC
87	180509	31.7S 177.3W	PCN 6			KGWC
88	180845	31.7S 175.7W	PCN 6	T2.5/3.5 /W2.5/24HRS		KGWC
89	181405	32.9S 174.4W	PCN 6			KGWC
90	182125	34.6S 173.1W	PCN 6			KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 31P
BEST TRACK DATA

	BEST TRACK			WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
0319062	13.7	138.3	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0319182	14.1	139.1	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0320062	14.2	139.8	40	14.0	139.7	35.	13.	-5.	14.5	140.7	45.	118.	-15.	15.3	141.4	55.	186.	-35.	0.0	0.0	0.	-0.	0.
0320182	13.8	139.5	50	14.3	140.2	40.	51.	-10.	15.0	140.8	50.	164.	-25.	16.1	140.4	55.	189.	-50.	0.0	0.0	0.	-0.	0.
0321062	13.6	138.9	60	13.7	139.4	60.	30.	0.	13.2	138.3	75.	34.	-15.	13.0	136.7	75.	169.	-45.	0.0	0.0	0.	-0.	0.
0321182	13.3	138.6	75	13.6	138.2	65.	29.	-10.	14.0	136.4	70.	148.	-35.	14.5	134.8	50.	166.	-60.	0.0	0.0	0.	-0.	0.
0322062	13.5	138.8	90	13.5	138.5	90.	18.	0.	13.7	137.9	110.	97.	-10.	14.3	137.0	120.	67.	20.	0.0	0.0	0.	-0.	0.
0322182	14.5	138.9	105	14.5	138.9	100.	0.	-5.	16.5	139.1	110.	113.	0.	18.2	139.8	90.	312.	20.	0.0	0.0	0.	-0.	0.
0323062	15.2	138.5	120	15.3	138.6	115.	8.	-5.	17.3	138.4	85.	162.	-15.	19.3	138.8	45.	366.	-5.	0.0	0.0	0.	-0.	0.
0323182	15.4	137.5	110	15.5	137.5	110.	6.	0.	16.3	135.6	75.	78.	5.	17.2	133.8	50.	168.	20.	0.0	0.0	0.	-0.	0.
0324062	15.3	136.5	100	15.6	136.5	100.	18.	0.	16.1	134.5	50.	84.	0.	17.2	132.8	30.	186.	10.	0.0	0.0	0.	-0.	0.
0324182	15.0	135.5	70	15.0	135.0	70.	29.	0.	14.6	132.1	30.	88.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0325062	14.7	134.6	50	14.6	134.2	45.	24.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0325182	14.4	133.6	30	14.5	133.5	30.	8.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0326062	14.1	132.8	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0330182	14.0	124.0	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0331062	14.2	121.1	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0331182	15.1	117.6	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0401062	15.5	114.5	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0401182	15.6	112.4	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0402062	15.6	111.2	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0402182	15.6	109.5	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0403062	15.4	107.4	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
0403182	15.2	104.5	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	20.	109.	194.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	9.	68.	132.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	3.	12.	29.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	-3.	-11.	-14.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	12	10	9	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 2306. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 8. KNOTS

TROPICAL CYCLONE 31P
FIX POSITIONS FOR CYCLONE NO. 31

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	180600	12.5S 139.3E	PCN 6	T1.0/1.0	INIT OBS	PGTW
2	181800	13.2S 138.9E	PCN 6	T0.5/0.5	INIT OBS ULCC FIX	PGTW
3	190000	13.5S 138.8E	PCN 6			PGTW
4	190048	13.6S 137.2E	PCN 5	T1.5/1.5	INIT OBS ULAC 13.5S 137.0E	KGWC
5	190300	13.7S 138.0E	PCN 6			PGTW
6	190600	13.7S 139.0E	PCN 6	T2.0/2.0 /D1.0/24HRS		PGTW
7	190900	13.8S 139.5E	PCN 6			PGTW
8	191200	14.1S 138.8E	PCN 6			PGTW
* 9	191329	14.2S 137.5E	PCN 6		ULAC 14.7S 138.3E	KGWC
10	191600	13.9S 138.7E	PCN 6	T2.0/2.0 /D1.5/22HRS		PGTW
* 11	191718	14.3S 137.5E	PCN 6		ULAC 14.9S 138.1E	KGWC
12	191800	13.7S 139.0E	PCN 6			PGTW
* 13	192051	14.4S 137.8E	PCN 6		ULAC 14.8S 137.6E	KGWC
14	200000	13.8S 139.7E	PCN 6			PGTW
15	200028	14.7S 138.5E	PCN 5	T2.5/2.5 /D1.0/24HRS		KGWC
16	200300	14.3S 139.3E	PCN 6	T2.5/2.5 /D0.5/22HRS		PGTW
17	200600	13.9S 139.7E	PCN 6			PGTW
18	200604	14.1S 139.7E	PCN 5			KGWC
19	200900	13.8S 140.1E	PCN 6			PGTW
20	200931	14.1S 139.6E	PCN 6			KGWC
21	201200	13.9S 140.4E	PCN 6			PGTW
22	201309	13.9S 139.2E	PCN 6	T2.5/2.5	INIT OBS ULAC 13.6S 140.5E	KGWC
23	201600	14.1S 140.3E	PCN 6	T3.0/3.0-/D1.0/24HRS		PGTW
24	201708	14.0S 138.7E	PCN 6		ULAC 13.6S 139.9E	KGWC
25	201800	14.4S 140.1E	PCN 6			PGTW
26	202100	14.3S 139.2E	PCN 6			PGTW
27	202211	14.0S 138.9E	PCN 3			KGWC
28	210000	13.9S 138.6E	PCN 6		ULCC FIX	PGTW
29	210149	13.4S 139.3E	PCN 5	T3.5/3.5 /D1.0/25HRS	ULAC 13.2S 138.7E	KGWC
30	210300	13.5S 139.0E	PCN 6	T3.5/3.0 /D1.0/24HRS	ULCC FIX	PGTW
31	210600	13.4S 139.0E	PCN 6			PGTW
32	210900	13.5S 138.6E	PCN 6			PGTW
33	210909	13.7S 138.8E	PCN 6		ULAC 13.6S 138.1E	KGWC
34	211200	13.4S 138.5E	PCN 6			PGTW
35	211248	13.7S 138.7E	PCN 6	T4.5/4.5 /D2.0/24HRS	ULAC 13.5S 138.7E	KGWC
36	211600	13.7S 138.4E	PCN 2	T4.0/4.0 /D1.0/24HRS		PGTW
37	211657	13.2S 138.6E	PCN 2			KGWC
38	211800	13.7S 138.2E	PCN 6			PGTW
39	212150	13.2S 138.7E	PCN 5			KGWC
40	220000	13.4S 138.7E	PCN 2			PGTW
41	220129	13.3S 138.9E	PCN 1	T5.0/5.0 /D1.5/24HRS	EYE FIX	KGWC
42	220300	13.4S 138.9E	PCN 2	T5.0/5.0 /D1.5/24HRS	EYE DIA .5 DEG	PGTW
43	220600	13.7S 138.8E	PCN 2		EYE FIX	PGTW
44	220848	13.5S 138.5E	PCN 2		EYE DIA 24 NM	KGWC
45	220900	13.7S 138.8E	PCN 2		EYE FIX	PGTW
46	221200	14.0S 138.9E	PCN 2		EYE FIX	PGTW
47	221228	13.9S 138.8E	PCN 2	T6.5/6.5 /D2.0/24HRS	EYE DIA 18 NM	KGWC
48	221600	14.4S 138.9E	PCN 2	T5.5/5.5 /D1.5/24HRS	EYE FIX	PGTW
49	221646	14.2S 138.9E	PCN 2		EYE FIX	KGWC
50	221800	14.5S 138.9E	PCN 2			PGTW
51	222100	14.7S 138.8E	PCN 2		EYE FIX	PGTW
52	222128	14.6S 139.1E	PCN 1		EYE FIX	KGWC
53	230000	14.8S 138.8E	PCN 2			PGTW
54	230109	14.7S 138.8E	PCN 1	T4.5/5.0 /W0.5/24HRS		KGWC
55	230300	15.1S 138.6E	PCN 2	T6.0/6.0-/D1.0/24HRS		PGTW
56	230600	15.2S 138.5E	PCN 2			PGTW
57	230827	15.2S 137.9E	PCN 2		EYE DIA 18 NM	KGWC
58	230900	15.7S 138.3E	PCN 4			PGTW
59	231200	15.7S 137.8E	PCN 6			PGTW

* 60	231208	15.4S	137.2E	PCN 2	T5.0/6.0 /W1.5/24HRS	EYE FIX		KGWC
61	231600	15.7S	137.6E	PCN 4	T6.0/6.0-/D0.5/24HRS			PGTW
62	231635	15.5S	137.9E	PCN 2		EYE FIX		KGWC
63	231800	15.5S	137.5E	PCN 4				PGTW
64	232100	15.5S	137.2E	PCN 6				PGTW
65	232107	15.5S	137.5E	PCN 2				KGWC
66	240000	15.6S	137.0E	PCN 2				PGTW
67	240048	15.7S	136.9E	PCN 1	T4.0/4.5 /W0.5/24HRS	EYE FIX		KGWC
68	240600	15.4S	136.4E	PCN 4	T4.5/5.5 /W1.5/26HRS			PGTW
69	240900	15.2S	136.1E	PCN 4				PGTW
70	240947	15.4S	136.0E	PCN 2		EYE FIX		KGWC
71	241200	15.2S	135.8E	PCN 6				PGTW
72	241329	15.1S	135.4E	PCN 6		ULAC 15.2S 135.7E		KGWC
73	241624	15.0S	135.5E	PCN 6		ULAC 15.3S 136.0E		KGWC
74	242046	14.9S	133.7E	PCN 6		ULAC 15.8S 134.7E		KGWC
75	250000	14.8S	134.6E	PCN 6				PGTW
76	250209	14.4S	134.9E	PCN 5				KGWC
77	250510	14.3S	134.5E	PCN 5				KGWC
78	250600	15.0S	134.2E	PCN 6				PGTW
79	250900	15.4S	134.8E	PCN 6		ULCC FIX		PGTW
80	250926	14.5S	134.2E	PCN 6				KGWC
81	251200	14.8S	134.2E	PCN 6				PGTW
82	251309	14.5S	134.1E	PCN 5				KGWC
83	251600	14.5S	133.5E	PCN 6				PGTW
84	251756	14.5S	133.7E	PCN 5		ULAC 15.3S 134.6E		KGWC
85	251800	14.4S	133.3E	PCN 6				PGTW
86	260000	14.1S	133.4E	PCN 6				PGTW
87	260600	14.1S	133.0E	PCN 6				PGTW
88	310300	13.4S	121.8E	PCN 6	T1.0/1.0	INIT OBS		PGTW
89	310600	13.3S	121.5E	PCN 6				PGTW
* 90	010000	14.8S	117.7E	PCN 6	T2.0/2.0+/D1.0/21HRS			PGTW
91	010310	14.9S	115.7E	PCN 5	T1.5/1.5	INIT OBS ULAC 15.5S 114.6E		KGWC
* 92	010600	15.8S	113.1E	PCN 6		ULCC FIX		PGTW
* 93	010900	16.4S	112.9E	PCN 6		ULCC FIX		PGTW
94	011019	15.0S	113.2E	PCN 6		ULAC 15.3S 111.3E		KGWC
* 95	011200	16.7S	112.3E	PCN 6	T2.0/2.0	INIT OBS ULCC FIX		PGTW
96	011410	14.7S	113.0E	PCN 5		ULAC 14.9S 110.0E		KGWC
97	011800	16.2S	111.7E	PCN 6				PGTW
98	011822	15.0S	112.6E	PCN 6				KGWC
99	012100	15.2S	112.2E	PCN 6				PGTW
100	012300	14.9S	112.2E	PCN 3				KGWC
101	020000	14.8S	112.2E	PCN 6	T2.0/2.0 /S0.0/24HRS			PGTW
102	020250	15.8S	112.0E	PCN 5	T1.5/1.5 /S0.0/24HRS			KGWC
103	020300	15.2S	110.5E	PCN 6				PGTW
104	020600	15.5S	110.2E	PCN 6				PGTW
105	020900	15.6S	110.2E	PCN 6		ULCC 19.0S 111.7E		PGTW
*106	020958	18.2S	112.0E	PCN 6		ULAC 18.3S 112.1E		KGWC
107	021200	15.9S	110.4E	PCN 6	T1.5/2.0 /W0.5/24HRS	ULCC 19.4S 112.4E		PGTW
*108	021349	19.2S	112.0E	PCN 5				KGWC
109	021600	16.4S	110.3E	PCN 6		ULCC 16.2S 110.8E		PGTW
110	021800	15.5S	110.0E	PCN 6				PGTW
*111	022100	15.9S	110.1E	PCN 6				PGTW
112	022238	15.0S	109.3E	PCN 6		ULAC 15.5S 109.8E		KGWC
113	030230	15.3S	108.8E	PCN 5	T1.5/1.5 /S0.0/24HRS	ULAC 16.6S 109.2E		KGWC
114	030300	15.7S	108.9E	PCN 6				PGTW
115	031510	15.2S	104.9E	PCN 3		EXP LLCC		KGWC
116	040351	14.7S	103.0E	PCN 6	T0.5/1.5 /W1.0/24HRS	EXP LLCC		KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 32P
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
					ERRORS			ERRORS				ERRORS				ERRORS		
MO/DA/HR	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
032812Z	13.4 150.4	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
032900Z	13.7 149.4	35	13.7 148.7	35.	41.	0.	14.3 146.6	60.	51.	5.	15.3 144.9	55.	93.	-5.	0.0 0.0	0.	-0.	0.
032912Z	13.8 148.3	45	13.6 147.7	45.	37.	0.	14.7 145.3	65.	79.	5.	15.7 143.5	45.	123.	-10.	0.0 0.0	0.	-0.	0.
033000Z	13.8 147.3	55	14.0 147.0	60.	21.	5.	14.8 145.0	65.	62.	5.	15.7 143.7	35.	105.	-10.	0.0 0.0	0.	-0.	0.
033012Z	13.8 146.3	60	13.9 146.0	60.	18.	0.	14.1 143.9	65.	29.	10.	14.6 142.5	35.	13.	5.	0.0 0.0	0.	-0.	0.
033100Z	13.8 145.3	60	13.9 144.5	65.	47.	5.	13.9 144.5	55.	70.	10.	13.9 143.3	40.	103.	20.	0.0 0.0	0.	-0.	0.
033112Z	13.8 144.3	55	13.9 144.3	65.	6.	10.	13.9 143.1	40.	42.	10.	14.2 141.5	35.	63.	15.	0.0 0.0	0.	-0.	0.
040100Z	14.0 143.3	45	13.8 143.3	55.	12.	10.	13.8 141.7	30.	60.	10.	13.8 140.6	45.	72.	20.	0.0 0.0	0.	-0.	0.
040112Z	14.4 142.6	30	14.0 142.3	35.	30.	-5.	14.2 140.2	35.	59.	15.	14.5 138.1	45.	55.	20.	0.0 0.0	0.	-0.	0.
040200Z	14.8 141.8	20	14.0 140.6	30.	85.	10.	14.2 138.2	50.	83.	25.	14.4 135.7	55.	110.	30.	0.0 0.0	0.	-0.	0.
040212Z	15.0 140.8	20	15.0 140.7	20.	6.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
040300Z	14.5 139.6	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
040312Z	13.8 138.7	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
040400Z	13.3 137.2	25	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
040412Z	13.3 135.1	20	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	30.	60.	82.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	16.	34.	58.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	5.	11.	15.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	4.	11.	9.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	10	9	9	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 935. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 6. KNOTS

TROPICAL CYCLONE 32P
FIX POSITIONS FOR CYCLONE NO. 32

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	271800	12.4S 151.4E	PCN 6	T1.0/1.0	INIT OBS ULCC FIX	PGTW
2	272100	13.0S 151.5E	PCN 6			PGTW
3	280000	13.8S 151.5E	PCN 6	T1.0/1.0	INIT OBS	PGTW
4	280109	12.9S 150.9E	PCN 5	T2.0/2.0	INIT OBS	KGWC
5	280300	14.0S 151.7E	PCN 6			PGTW
6	280600	11.3S 152.6E	PCN 6		ULCC FIX	PGTW
7	280822	12.9S 150.0E	PCN 6			KGWC
8	280900	11.9S 152.4E	PCN 6		ULCC FIX	PGTW
* 9	281200	12.4S 152.0E	PCN 6		ULCC FIX	PGTW

10	281208	13.4S	150.5E	PCN 6	T2.5/2.5	INIT OBS ULAC 13.0S 150.0E		KGWC
11	281541	13.5S	150.1E	PCN 6		ULAC 13.0S 149.6E		KGWC
12	281800	13.3S	149.1E	PCN 6	T2.0/2.0 /D1.0/24HRS			PGTW
13	282100	13.8S	149.0E	PCN 6				PGTW
* 14	282102	12.5S	150.2E	PCN 6		ULAC 11.7S 149.3E		KGWC
15	290000	13.3S	148.6E	PCN 6	T2.5/2.5 /D1.5/24HRS	ULCC 14.2S 149.0E		PGTW
16	290048	13.0S	149.2E	PCN 5	T2.5/2.5 /D1.0/24HRS			KGWC
17	290300	13.5S	148.9E	PCN 6		ULCC 13.9S 149.1E		PGTW
18	290427	13.4S	149.2E	PCN 6		ULAC 13.2S 147.9E		KGWC
19	290600	13.4S	148.5E	PCN 6		ULCC 13.7S 148.7E		PGTW
20	290801	13.7S	148.9E	PCN 6		ULAC 13.9S 148.0E		KGWC
21	290900	13.5S	148.1E	PCN 6				PGTW
* 22	291148	14.8S	148.8E	PCN 6	T3.0/3.0 /D0.5/24HRS	ULAC 13.8S 147.7E		KGWC
23	291200	13.9S	147.8E	PCN 6	T3.0/3.0 /D1.0/18HRS			PGTW
* 24	291530	14.2S	149.2E	PCN 6				KGWC
25	291600	13.8S	147.6E	PCN 6				PGTW
26	291800	14.1S	147.5E	PCN 6				PGTW
* 27	292041	14.4S	148.6E	PCN 6		ULAC 13.8S 147.5E		KGWC
28	292100	14.0S	147.3E	PCN 6				PGTW
29	300000	13.9S	147.1E	PCN 6	T3.5/3.5-/D1.0/24HRS			PGTW
30	300028	13.9S	146.7E	PCN 5	T3.5/3.5 /D1.0/24HRS	ULAC 13.6S 146.9E		KGWC
31	300300	13.9S	146.9E	PCN 6				PGTW
32	300600	13.7S	146.5E	PCN 6				PGTW
* 33	300739	12.9S	145.6E	PCN 6		ULAC 13.1S 146.3E		KGWC
34	300900	13.7S	146.2E	PCN 6				PGTW
35	301127	13.0S	145.8E	PCN 6	T3.5/3.5 /D0.5/24HRS			KGWC
36	301200	13.7S	145.9E	PCN 6	T3.5/3.5-/D0.5/24HRS			PGTW
37	301600	13.9S	145.7E	PCN 6		ULCC FIX		PGTW
38	301702	13.1S	146.4E	PCN 6				KGWC
39	301800	14.0S	145.6E	PCN 6		ULCC FIX		PGTW
40	302019	13.1S	146.2E	PCN 6				KGWC
41	302100	13.9S	145.6E	PCN 6		ULCC FIX		PGTW
42	310000	14.0S	145.5E	PCN 6	T4.0/4.0-/D0.5/24HRS			PGTW
* 43	310008	12.7S	146.1E	PCN 5	T3.5/3.5 /S0.0/24HRS	ULAC 13.5S 150.0E		KGWC
44	310300	14.1S	145.1E	PCN 6				PGTW
45	310600	13.8S	144.8E	PCN 6				PGTW
46	310859	13.1S	145.4E	PCN 6		ULAC 12.8S 144.8E		KGWC
47	310900	13.7S	144.6E	PCN 6				PGTW
48	311200	13.8S	144.3E	PCN 6	T3.5/3.5-/S0.0/24HRS	ULCC FIX		PGTW
* 49	311248	13.2S	145.4E	PCN 6	T3.5/3.5 /S0.0/25HRS			KGWC
50	311600	13.8S	143.9E	PCN 6		ULCC FIX		PGTW
51	311651	13.2S	144.2E	PCN 6		ULAC 11.8S 143.4E		KGWC
52	311800	13.7S	143.7E	PCN 6		ULCC FIX		PGTW
53	312100	13.9S	143.3E	PCN 6		ULCC FIX		PGTW
54	312139	12.9S	143.4E	PCN 6				KGWC
55	010000	13.5S	143.0E	PCN 6				PGTW
56	010129	13.7S	142.6E	PCN 5				KGWC
* 57	010300	13.4S	142.0E	PCN 6		ULCC FIX		PGTW
* 58	010600	13.2S	140.3E	PCN 6		ULCC FIX		PGTW
* 59	010838	14.4S	140.4E	PCN 6		ULAC FIX		KGWC
* 60	010900	13.2S	139.2E	PCN 6		ULCC FIX		PGTW
* 61	011228	15.3S	140.4E	PCN 6		ULAC FIX		KGWC
62	011640	14.3S	141.2E	PCN 6		ULAC FIX		KGWC
* 63	012100	14.4S	140.8E	PCN 6				PGTW
* 64	012118	15.2S	143.9E	PCN 6				KGWC
* 65	020000	13.9S	140.3E	PCN 6	T2.0/2.0	SCNDRY LLCC 15.8S 142.3E		PGTW
* 66	020109	15.7S	142.9E	PCN 5				KGWC
* 67	020300	14.2S	143.9E	PCN 6				PGTW
* 68	020600	14.3S	139.1E	PCN 6		ULCC FIX		PGTW
69	020817	15.5S	141.0E	PCN 6		ULAC 15.0S 141.5E		KGWC
70	021200	15.5S	141.5E	PCN 6	T0.0/0.0	INIT OBS		PGTW
71	021208	15.1S	140.7E	PCN 5				KGWC
72	021600	15.2S	140.4E	PCN 6				PGTW
73	021800	15.0S	140.2E	PCN 6				PGTW
74	022100	14.6S	139.6E	PCN 6				PGTW
75	030000	14.4S	139.7E	PCN 6	T2.0/2.0 /S0.0/24HRS			PGTW
* 76	030048	13.8S	140.7E	PCN 5	T1.5/1.5	INIT OBS		KGWC
77	030300	14.2S	139.5E	PCN 6				PGTW
78	030600	14.0S	139.1E	PCN 6				PGTW
79	030900	13.8S	139.1E	PCN 6	T1.5/1.5 /D1.5/24HRS			PGTW
80	031200	13.8S	139.1E	PCN 6				PGTW
81	031329	13.4S	138.8E	PCN 5				KGWC
82	040000	13.4S	137.6E	PCN 6	T2.0/2.0-/S0.0/24HRS			PGTW
83	040028	13.1S	136.6E	PCN 5	T1.5/1.5 /S0.0/24HRS			KGWC
84	040600	13.5S	137.1E	PCN 6				PGTW
85	041309	13.3S	134.3E	PCN 5				KGWC
86	050149	13.4S	134.2E	PCN 3		EXP LLCC		KGWC

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	011100	14.0S 142.3E	025	045	91184

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 33S
BEST TRACK DATA

	BEST TRACK			WARNING			24 HOUR FORECAST ERRORS						48 HOUR FORECAST ERRORS						72 HOUR FORECAST ERRORS					
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND		POSIT		WIND	DST	WIND
041012Z	11.5	72.8	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041100Z	11.9	71.2	35	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041112Z	12.8	69.9	45	11.6	69.9	35.	72.	-10.	11.8	67.1	55.	199.	-20.	12.2	64.3	65.	319.	-35.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041200Z	13.9	68.8	60	13.0	69.2	50.	59.	-10.	14.3	66.7	70.	160.	-20.	15.6	64.0	85.	163.	-25.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041212Z	15.1	67.4	75	15.0	67.4	65.	6.	-10.	17.8	65.0	90.	65.	-10.	19.9	63.8	80.	60.	-20.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041300Z	16.6	65.3	90	16.7	65.8	75.	29.	-15.	20.0	63.6	80.	110.	-30.	24.0	63.1	70.	344.	-20.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041312Z	17.5	63.9	100	17.5	63.6	95.	17.	-5.	20.1	60.5	100.	195.	0.	23.7	59.9	90.	421.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041400Z	18.2	63.2	110	18.3	62.7	105.	29.	-5.	20.3	60.6	90.	243.	0.	23.6	60.2	70.	379.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041412Z	18.9	63.7	100	19.1	63.1	115.	36.	15.	21.4	62.5	95.	239.	20.	25.0	62.8	80.	553.	40.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041500Z	18.4	64.4	90	19.0	64.1	100.	40.	10.	19.9	65.7	80.	319.	25.	21.9	68.5	60.	759.	30.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041512Z	17.5	63.4	75	17.6	63.9	80.	29.	5.	19.0	63.3	60.	307.	20.	20.2	64.5	45.	627.	15.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041600Z	17.3	60.8	55	17.4	61.0	50.	13.	-5.	17.4	56.6	30.	78.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041612Z	16.7	58.5	40	17.0	58.2	40.	25.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041700Z	16.1	56.6	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041712Z	15.3	54.8	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041800Z	14.7	52.8	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041812Z	15.4	50.4	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041900Z	17.2	50.8	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	32.	192.	403.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	21.	110.	243.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	8.	15.	24.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	-3.	-2.	2.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	11	10	9	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1769. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 9. KNOTS

TROPICAL CYCLONE 33S
FIX POSITIONS FOR CYCLONE NO. 33

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	100512	11.4S 73.2E	PCN 6	T1.0/1.0	INIT OBS ULAC 11.7S 074.2E	KGWC
2	100857	11.4S 72.2E	PCN 6	T1.5/1.5	INIT OBS	FJDG
3	101753	12.1S 72.1E	PCN 6	T2.5/2.5	INIT OBS ULAC 12.0S 071.7E	KGWC
4	102151	11.6S 72.0E	PCN 6		ULAC 11.5S 071.5E	KGWC
* 5	110233	11.6S 72.2E	PCN 6			KGWC
6	110452	11.7S 70.7E	PCN 5	T2.5/2.5 /D1.5/25HRS		KGWC
7	111037	12.1S 69.9E	PCN 6			KGWC
8	111038	12.5S 69.8E	PCN 5	T3.0/3.0 /D1.5/24HRS		FJDG
9	111332	12.5S 68.9E	PCN 6			KGWC
10	111733	13.4S 69.5E	PCN 6	T3.5/3.5 /D1.0/24HRS		KGWC
11	112140	13.7S 69.1E	PCN 6			KGWC
12	120212	14.0S 68.9E	PCN 2			KGWC
13	120613	14.5S 68.4E	PCN 1	T4.0/4.0 /D1.5/25HRS	EYE FIX	KGWC
14	121026	15.1S 67.4E	PCN 2		EYE FIX	KGWC
15	121027	15.0S 67.4E	PCN 6	T3.5/3.5 /D0.5/24HRS		FJDG
16	121311	15.4S 67.1E	PCN 2		EYE FIX	KGWC
17	121712	15.6S 66.6E	PCN 2	T5.0/5.0 /D1.5/24HRS	EYE FIX	KGWC
18	122130	16.4S 66.3E	PCN 6			KGWC
19	130151	16.7S 65.2E	PCN 2			KGWC
20	130553	17.0S 64.8E	PCN 2	T5.5/5.5 /D1.5/24HRS	EYE DIA 12 NM	KGWC
21	131015	17.2S 64.1E	PCN 2		EYE DIA 12 NM	KGWC
22	131016	17.3S 63.8E	PCN 6	T5.0/5.0 /D1.5/24HRS	EYE FIX	FJDG
23	131431	17.7S 63.7E	PCN 2		EYE FIX	KGWC
24	131652	17.7S 63.4E	PCN 2	T6.0/6.0 /D1.0/24HRS	EYE FIX	KGWC
25	132119	18.1S 62.9E	PCN 2		EYE FIX	KGWC
26	140311	18.2S 63.5E	PCN 2		EYE FIX	KGWC
27	140533	18.5S 63.5E	PCN 2	T6.0/6.0 /D0.5/24HRS	EYE DIA 15 NM	KGWC
28	141004	18.9S 63.4E	PCN 2		EYE DIA 15 NM OPN SW	KGWC
29	141005	19.0S 64.0E	PCN 5	T5.5/5.5 /D1.0/24HRS		FJDG
30	141409	18.8S 63.4E	PCN 6		ULAC 18.9S 063.7E	KGWC
31	141813	18.8S 63.8E	PCN 6	T4.5/5.5 /W1.5/24HRS		KGWC
32	142108	18.8S 64.2E	PCN 6		ULAC 19.1S 064.9E	KGWC
33	150250	18.2S 64.5E	PCN 5		ULAC 18.6S 064.3E	KGWC
34	150654	17.9S 64.4E	PCN 5	T4.0/5.0 /W2.0/24HRS	ULAC 18.4S 064.7E	KGWC
35	150954	17.5S 64.0E	PCN 6		ULAC 18.1S 064.5E	KGWC
* 36	150954	18.7S 63.5E	PCN 5	T4.5/4.5 /W1.5/24HRS		FJDG
37	151348	17.5S 63.1E	PCN 6		ULAC 17.4S 064.6E	KGWC
38	151753	17.7S 62.0E	PCN 6	T2.0/3.0 /W2.5/24HRS		KGWC
39	160228	17.3S 60.5E	PCN 4		EXP LLCC	KGWC
40	160633	17.0S 58.9E	PCN 3	T2.0/3.0 /W2.0/24HRS	EXP LLCC	KGWC
41	161125	16.9S 58.7E	PCN 3		EXP LLCC	KGWC
42	161733	16.5S 59.2E	PCN 4		EXP LLCC	KGWC
43	170613	15.8S 56.1E	PCN 3	T1.0/2.0 /W1.0/23HRS	EXP LLCC	KGWC
44	171854	15.1S 54.0E	PCN 6	T2.5/2.5	INIT OBS	KGWC
45	172218	14.4S 53.9E	PCN 6		ULAC 13.9S 054.4E	KGWC
46	180327	14.6S 52.0E	PCN 5			KGWC
47	180734	14.8S 51.6E	PCN 5	T1.5/1.5 /D0.5		KGWC
48	181103	15.2S 50.4E	PCN 5			KGWC
49	181426	15.7S 50.3E	PCN 6			KGWC
50	181833	16.4S 50.2E	PCN 5			KGWC
51	190714	17.9S 51.6E	PCN 5			KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 34S
BEST TRACK DATA

	BEST TRACK		WARNING		24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
					ERRORS				ERRORS				ERRORS			
MO/DA/HR	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
04110GZ	10.5 135.8	30	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
04111GZ	10.5 134.0	35	10.5 133.7	35.	18.	0.	11.0 129.8	50.	107.	5.	12.5 125.2	70.	280.	35.	0.0 0.0	0.	-0.	0.
04120GZ	11.0 132.5	45	10.8 132.6	45.	13.	0.	11.5 129.7	55.	88.	15.	13.2 126.0	65.	183.	35.	0.0 0.0	0.	-0.	0.
04121GZ	12.0 131.3	45	11.8 130.9	55.	26.	10.	14.1 128.1	65.	101.	30.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
04130GZ	12.8 130.4	40	13.2 130.1	45.	30.	5.	15.8 128.1	40.	115.	10.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
04131GZ	13.8 129.8	35	14.8 129.9	45.	60.	10.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.
04140GZ	14.1 129.0	30	14.0 129.5	30.	30.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.	0.0 0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	30.	102.	231.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	18.	94.	0.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	4.	15.	35.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	4.	15.	35.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	6	4	2	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 483. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 7. KNOTS

TROPICAL CYCLONE 34S
FIX POSITIONS FOR CYCLONE NO. 34

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	090600	9.8S 143.9E	PCN 6	T1.0/1.0	INIT OBS	PGTW
2	091200	11.2S 143.4E	PCN 6			PGTW
3	092100	10.8S 143.4E	PCN 6			PGTW
4	100600	11.1S 142.0E	PCN 6	T1.0/1.0 /S0.0/24HRS		PGTW
5	101600	10.6S 137.3E	PCN 6			PGTW
6	101800	10.9S 137.4E	PCN 6	T1.5/1.5	INIT OBS	PGTW
7	102100	10.5S 136.5E	PCN 6			PGTW
8	110000	10.1S 136.1E	PCN 6			PGTW
9	110129	10.9S 136.0E	PCN 5	T1.5/1.5	INIT OBS ULAC 10.6S 135.7E	KGWC
10	110300	10.6S 135.6E	PCN 6	T2.0/2.0 /D1.0/21HRS		PGTW
11	110600	10.7S 135.5E	PCN 6			PGTW
12	110828	10.3S 135.0E	PCN 6		ULAC 10.1S 134.7E	KGWC
13	110900	10.5S 135.1E	PCN 6			PGTW
14	111200	10.5S 134.7E	PCN 6			PGTW
15	111228	10.3S 133.3E	PCN 6	T2.5/2.5	INIT OBS	KGWC
16	111600	10.5S 134.3E	PCN 6	T2.5/2.5 /D1.0/22HRS		PGTW
17	111634	10.7S 133.8E	PCN 6			KGWC
18	111800	10.7S 134.1E	PCN 6			PGTW
19	112100	10.6S 133.8E	PCN 6			PGTW
20	112108	10.3S 133.6E	PCN 6			KGWC
21	120000	10.4S 133.4E	PCN 6		ULCC FIX	PGTW
22	120109	10.3S 133.2E	PCN 5	T3.0/3.0 /D1.5/24HRS		KGWC
23	120300	10.8S 132.9E	PCN 6	T3.0/3.0-/D1.0/24HRS		PGTW
24	120520	10.9S 133.0E	PCN 5			KGWC
25	120600	11.0S 132.5E	PCN 6		ULCC FIX	PGTW
26	120900	11.3S 132.1E	PCN 6		ULCC FIX	PGTW
27	120948	11.6S 132.8E	PCN 6			KGWC
28	121200	11.1S 131.7E	PCN 6			PGTW
* 29	121349	11.6S 132.8E	PCN 6			KGWC
30	121600	11.5S 131.3E	PCN 6			PGTW
31	121800	12.2S 130.8E	PCN 6	T3.5/3.5-/D1.0/26HRS		PGTW
32	121805	12.0S 131.6E	PCN 5			KGWC
33	122100	12.6S 130.7E	PCN 6			PGTW
34	122228	12.8S 131.0E	PCN 5			KGWC
35	130000	12.5S 130.6E	PCN 6		ULCC FIX	PGTW
36	130049	12.8S 130.3E	PCN 5			KGWC
37	130300	13.2S 130.5E	PCN 6		ULCC FIX	PGTW
38	130509	13.3S 130.3E	PCN 5			KGWC
39	130600	13.5S 130.0E	PCN 6		ULCC FIX	PGTW
40	130900	13.7S 130.4E	PCN 6		ULCC FIX	PGTW
41	130927	13.7S 130.2E	PCN 5			KGWC
42	131200	13.7S 130.0E	PCN 6		ULCC FIX	PGTW
43	131329	14.2S 130.7E	PCN 5		ULAC 14.9S 130.8E	KGWC
44	131600	14.4S 129.5E	PCN 6			PGTW
* 45	131755	14.8S 130.3E	PCN 5		ULCC 14.4S 129.8E	KGWC
46	131800	14.8S 129.7E	PCN 6			PGTW
* 47	132100	15.0S 129.8E	PCN 6			PGTW
* 48	132207	15.2S 130.3E	PCN 5			KGWC
* 49	140000	15.3S 129.8E	PCN 6		ULCC FIX	PGTW
* 50	140210	15.6S 131.0E	PCN 5			KGWC
51	140300	14.0S 129.4E	PCN 6		ULCC 15.5S 129.8E	PGTW
52	140600	14.0S 129.2E	PCN 4	T0.0/0.0	INIT OBS EXP LLCC	PGTW
53	150000	14.1S 127.5E	PCN 6	T0.0/0.0 /S0.0/18HRS	EXP LLCC	PGTW

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIAM	RADOB-CODE ASWAR TDDFF	COMMENTS	RADAR POSITION	SITE WMO NO.
1	121200	11.8S 138.9E	LAND				40//0 42408		12.4S 130.8E	94120
2	121400	11.6S 131.7E	LAND				4///0 62087		12.4S 130.8E	94120
3	122300	12.5S 130.4E	LAND				45150 52613		12.4S 130.8E	94120
4	130200	12.6S 130.4E	LAND				5///2 52304		12.4S 130.8E	94120
5	130400	12.7S 130.0E	LAND				4//32 52412		12.4S 130.8E	94120
6	130800	12.8S 130.2E	LAND				45/// 71204		12.4S 130.8E	94120
7	131000	13.2S 129.8E	LAND				40/// 62110		12.4S 130.8E	94120
8	131400	13.5S 129.8E	LAND				45//2 72009		12.4S 130.8E	94120

SYNOPTIC FIXES

FIX NO.	TIME (Z)	FIX POSITION	INTENSITY ESTIMATE	NEAREST DATA (NM)	COMMENTS
1	140000	14.0S 129.5E	035	020	WMO 94111

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

TROPICAL CYCLONE 35S
BEST TRACK DATA

	BEST TRACK			WARNING			ERRORS		24 HOUR FORECAST			ERRORS		48 HOUR FORECAST			ERRORS		72 HOUR FORECAST			ERRORS	
MO/DA/HR	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
041206Z	8.8	100.3	35	9.0	100.6	35.	21.	0.	10.1	96.2	55.	177.	5.	11.7	92.5	70.	517.	5.	0.0	0.0	0.	-0.	0.
041218Z	9.2	99.0	45	9.2	98.5	45.	30.	0.	10.3	94.6	65.	339.	5.	12.2	91.1	80.	705.	10.	0.0	0.0	0.	-0.	0.
041306Z	10.1	99.2	50	9.5	99.4	55.	38.	5.	10.0	98.5	65.	211.	0.	11.1	96.8	80.	572.	20.	0.0	0.0	0.	-0.	0.
041318Z	11.1	100.3	60	10.9	99.9	65.	26.	5.	12.4	100.5	75.	182.	5.	13.9	99.1	85.	518.	30.	0.0	0.0	0.	-0.	0.
041406Z	12.2	101.3	65	11.8	101.3	65.	24.	0.	14.2	103.1	75.	160.	15.	17.3	103.7	85.	314.	35.	0.0	0.0	0.	-0.	0.
041418Z	14.2	103.0	70	14.0	102.8	70.	17.	0.	17.2	105.5	90.	104.	35.	20.0	108.5	100.	105.	60.	0.0	0.0	0.	-0.	0.
041506Z	15.5	105.5	60	15.3	105.3	70.	17.	10.	17.7	109.8	70.	75.	20.	19.6	113.5	75.	162.	45.	0.0	0.0	0.	-0.	0.
041518Z	17.4	107.3	55	17.0	107.3	50.	24.	-5.	20.1	110.2	40.	60.	0.	23.4	112.8	30.	335.	0.	0.0	0.0	0.	-0.	0.
041606Z	18.7	109.0	50	19.2	109.5	45.	41.	-5.	23.5	112.8	35.	309.	5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041618Z	19.1	110.1	40	19.6	110.2	35.	31.	-5.	20.7	111.9	25.	167.	-5.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041706Z	18.7	110.8	30	19.3	110.9	30.	36.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041718Z	18.2	110.6	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041806Z	17.8	110.3	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.
041818Z	17.5	110.0	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	WRNG	24-HR	48-HR	72-HR	WRNG	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	28.	178.	404.	0.	0.	0.	0.	0.
AVG RIGHT ANGLE ERROR	21.	119.	237.	0.	0.	0.	0.	0.
AVG INTENSITY MAGNITUDE ERROR	3.	10.	26.	0.	0.	0.	0.	0.
AVG INTENSITY BIAS	0.	9.	26.	0.	0.	0.	0.	0.
NUMBER OF FORECASTS	11	10	8	0	0	0	0	0

DISTANCE TRAVELED BY TROPICAL CYCLONE IS 1111. NM

AVERAGE SPEED OF TROPICAL CYCLONE IS 7. KNOTS

TROPICAL CYCLONE 35S
FIX POSITIONS FOR CYCLONE NO. 35

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	COMMENTS	SITE
1	101200	8.8S 109.3E	PCN 6	T1.0/1.0	INIT OBS	PGTW
2	101600	8.6S 107.2E	PCN 6			PGTW
3	101800	8.5S 106.9E	PCN 6			PGTW
4	102100	9.0S 106.3E	PCN 6			PGTW
5	111800	9.2S 105.7E	PCN 6	T1.5/1.5 /D0.5/30HRS		PGTW
6	112100	9.9S 104.9E	PCN 6			PGTW
7	120250	9.2S 101.2E	PCN 5	T1.5/1.5	INIT OBS ULAC 09.3S 101.9E	KGWC
8	120300	8.7S 100.9E	PCN 6	T2.5/2.5	INIT OBS ULCC FIX	PGTW
9	120600	8.8S 100.3E	PCN 6		ULCC FIX	PGTW
10	120702	8.6S 101.2E	PCN 5		ULAC 09.2S 102.1E	KGWC
11	120900	9.0S 99.9E	PCN 6		ULCC FIX	PGTW
12	121129	9.0S 99.8E	PCN 6		ULAC 09.4S 099.5E	KGWC
13	121200	9.0S 99.4E	PCN 6			PGTW
14	121531	9.0S 99.9E	PCN 6	T3.0/3.0	INIT OBS ULAC 09.2S 099.5E	KGWC
15	121600	9.0S 99.0E	PCN 6			PGTW
16	121803	9.0S 98.7E	PCN 6	T3.0/3.0 /D1.5/24HRS		PGTW
17	121947	9.2S 99.6E	PCN 6		ULAC 09.3S 099.2E	KGWC
18	122100	9.3S 98.6E	PCN 6			PGTW
19	130000	9.3S 99.3E	PCN 6			PGTW
20	130009	9.5S 99.3E	PCN 6		ULAC 09.6S 098.8E	KGWC
21	130300	9.5S 99.5E	PCN 6	T3.5/3.5-/D1.0/24HRS	ULCC FIX	PGTW
22	130411	10.2S 99.6E	PCN 6	T2.5/2.5 /D1.0/25HRS	ULAC 09.6S 099.4E	KGWC
23	130600	9.8S 99.5E	PCN 6		ULCC FIX	PGTW
24	130833	10.4S 99.4E	PCN 6		ULAC 10.2S 098.7E	KGWC
25	130834	10.4S 99.7E	PCN 5	T1.5/1.5	INIT OBS	FJDG
26	130900	10.2S 99.3E	PCN 6			PGTW
27	131108	11.0S 99.1E	PCN 6			KGWC
28	131200	10.6S 99.5E	PCN 6			PGTW
29	131531	11.1S 99.8E	PCN 6	T3.5/3.5 /D0.5/24HRS		KGWC
30	131600	11.1S 99.9E	PCN 6	T4.0/4.0 /D1.0/22HRS		PGTW
31	131800	11.1S 100.6E	PCN 6			PGTW
32	131932	11.1S 100.8E	PCN 6		ULAC 11.0S 100.4E	KGWC
33	132100	11.1S 101.3E	PCN 6			PGTW
34	132348	11.6S 100.9E	PCN 6		ULAC 11.1S 100.4E	KGWC
35	140000	11.4S 100.8E	PCN 6			PGTW
36	140300	11.6S 101.1E	PCN 6			PGTW
37	140352	11.5S 101.5E	PCN 6	T3.5/3.5 /D1.0/24HRS	ULAC 11.3S 101.3E	KGWC
38	140600	11.9S 101.4E	PCN 6	T4.0/4.0 /D0.5/27HRS		PGTW
39	140822	12.5S 101.6E	PCN 6		ULAC 13.1S 100.9E	KGWC
40	140823	12.7S 101.2E	PCN 5			FJDG
41	141047	12.6S 101.7E	PCN 6		ULAC 12.6S 101.9E	KGWC
42	141200	13.1S 101.4E	PCN 6			PGTW
43	141450	13.4S 102.3E	PCN 6	T3.0/3.5 /W0.5/24HRS	ULAC 13.4S 103.1E	KGWC
44	141600	14.2S 103.2E	PCN 6	T4.5/4.5 /D0.5/24HRS		PGTW
45	141800	14.3S 103.0E	PCN 4			PGTW
46	141926	14.2S 103.7E	PCN 6			KGWC
47	142100	14.3S 103.6E	PCN 6			PGTW
48	142327	14.8S 104.8E	PCN 6			KGWC
49	150000	14.8S 104.3E	PCN 6			PGTW
50	150300	14.7S 104.9E	PCN 6	T4.0/4.0-/S0.0/21HRS		PGTW
51	150331	15.3S 105.3E	PCN 6	T3.0/3.5 /W0.5/23HRS		KGWC
52	150600	15.7S 105.8E	PCN 6		ULCC 15.1S 105.2E	PGTW
53	150811	15.9S 106.0E	PCN 6		ULAC 16.1S 105.6E	KGWC
54	150900	16.4S 106.2E	PCN 6		ULCC FIX	PGTW
55	151200	16.8S 106.9E	PCN 6		ULCC FIX	PGTW
56	151439	16.9S 106.9E	PCN 6	T2.5/3.0 /W0.5/24HRS	EXP LLCC ULAC 17.9S 107.4E	KGWC
57	151915	17.6S 108.0E	PCN 6			KGWC
58	152336	18.4S 108.2E	PCN 6		EXP LLCC ULAC 19.1S 108.9E	KGWC
59	160311	18.6S 109.0E	PCN 3	T2.5/3.0 /W0.5/24HRS	EXP LLCC ULAC 19.4S 109.6E	KGWC
60	160600	18.7S 109.3E	PCN 6	T3.0/4.0 /W1.0/27HRS		PGTW
61	160801	19.0S 108.8E	PCN 4		EXP LLCC ULAC 20.3S 109.4E	KGWC
62	160900	18.7S 109.7E	PCN 6			PGTW
63	161004	18.8S 109.2E	PCN 4		EXP LLCC	KGWC
64	161200	19.2S 109.9E	PCN 6			PGTW
65	161410	18.6S 109.4E	PCN 4	T1.5/2.0 /W1.0/24HRS	EXP LLCC	KGWC
66	161600	19.5S 110.3E	PCN 6			PGTW
67	161904	18.8S 110.5E	PCN 4		EXP LLCC	KGWC
68	162100	18.8S 110.6E	PCN 4		EXP LLCC	PGTW
69	162244	18.7S 110.6E	PCN 4		EXP LLCC	KGWC
70	170000	18.9S 110.8E	PCN 4		EXP LLCC	PGTW
71	170250	18.8S 110.9E	PCN 3		EXP LLCC	KGWC
72	170600	18.7S 110.9E	PCN 6	T1.5/2.5 /W1.5/24HRS	EXP LLCC	PGTW
73	170750	18.4S 110.5E	PCN 3		EXP LLCC	KGWC
74	170900	18.7S 110.9E	PCN 6			PGTW
75	171349	17.9S 110.5E	PCN 4		EXP LLCC	KGWC
76	180000	18.0S 110.5E	PCN 4		EXP LLCC	PGTW
77	180230	17.7S 110.0E	PCN 3			KGWC
78	180600	17.8S 110.1E	PCN 4	T1.0/1.5 /W0.5/24HRS		PGTW
79	181511	17.8S 110.5E	PCN 4		EXP LLCC	KGWC
80	181600	17.4S 110.1E	PCN 6	T1.0/1.0	INIT OBS	PGTW
81	181800	17.5S 110.0E	PCN 6			PGTW
82	190000	17.4S 109.8E	PCN 4		EXP LLCC	PGTW
83	190300	17.4S 110.4E	PCN 4		EXP LLCC	PGTW
84	190351	17.4S 110.4E	PCN 3	T1.0/1.0 /D1.0/24HRS	EXP LLCC ULAC 17.5S 111.2E	KGWC
85	190600	18.1S 110.8E	PCN 4	T1.0/1.0 /S0.0/24HRS		PGTW
86	191450	17.7S 112.6E	PCN 6		ULAC 18.1S 113.8E	KGWC
87	200331	18.6S 111.6E	PCN 5	T1.0/1.0 /S0.0/24HRS	ULAC 18.4S 114.5E	KGWC

NOTICE - THE ASTERISKS (*) INDICATE FIXES UNREPRESENTATIVE AND NOT USED FOR BEST TRACK PURPOSES.

APPENDIX I
DEFINITIONS

BEST TRACK - A subjectively smoothed path, versus a precise and very erratic fix-to-fix path, used to represent tropical cyclone movement.

CENTER - The vertical axis or cone of a tropical cyclone. Usually determined by wind, temperature, and/or pressure distribution.

CYCLONE - A closed atmospheric circulation rotating about an area of low pressure (counter-clockwise in the Northern Hemisphere).

EPHEMERIS - Position of a body (satellite) in space as a function of time; used for gridding satellite imagery. Since ephemeris gridding is based solely on the predicted position of the satellite, it is susceptible to errors from vehicle pitch, orbital eccentricity, and the oblateness of the earth.

EXPLOSIVE DEEPENING - A decrease in the minimum sea-level pressure of a tropical cyclone of 2.5 mb/hr for 12 hrs or 5.0 mb/hr for six hrs (ATR 1971).

EXTRATROPICAL - A term used in warnings and tropical summaries to indicate that a cyclone has lost its "tropical" characteristics. The term implies both poleward displacement from the tropics and the conversion of the cyclone's primary energy sources from release of latent heat of condensation to baroclinic processes. The term carries no implications as to strength or size.

EYE - A term used to describe the central area of a tropical cyclone when it is more than half surrounded by wall cloud.

FUJIWHARA EFFECT - An interaction in which tropical cyclones within about 700 nm (1296 km) of each other begin to rotate about one another. When intense tropical cyclones are within about 400 nm (741 km) of each other, they may also begin to move closer to each other.

MAXIMUM SUSTAINED WIND - Highest surface wind speed averaged over a one-minute period of time. Peak gusts over water average 20 to 25 percent higher than sustained winds.

RAPID DEEPENING - A decrease in the minimum sea-level pressure of a tropical cyclone of 1.25 mb/hr for 24 hrs (ATR 1971).

RECURVATURE - The turning of a tropical cyclone from an initial path toward the west or northwest to a path toward the northeast.

RIGHT ANGLE ERROR - The distance described by a perpendicular line from the best track to a forecast position. (See Figure 4-1).

SIGNIFICANT TROPICAL CYCLONE - A tropical cyclone becomes "significant" with the issuance of the first numbered warning by the responsible warning agency.

SUPER TYPHOON/HURRICANE - A typhoon/hurricane in which the maximum sustained surface wind (one-minute mean) is 130 kt (67 m/s) or greater.

TROPICAL CYCLONE - A non-frontal low pressure system of synoptic scale developing over tropical or subtropical waters and having a definite organized circulation.

TROPICAL CYCLONE AIRCRAFT RECONNAISSANCE COORDINATOR - A USCINCPACAF representative designated to levy tropical cyclone aircraft weather reconnaissance requirements of reconnaissance units within a designated area of the PACOM and to function as coordinator between USCINCPACAF, aircraft weather reconnaissance units, and the appropriate typhoon/-hurricane warning center.

TROPICAL DEPRESSION - A tropical cyclone in which the maximum sustained surface wind (one-minute mean) is 33 kt (17 m/s) or less.

TROPICAL DISTURBANCE - A discrete system of apparently organized convection - generally 100 to 300 nm (185 to 556 km) in diameter - originating in the tropics or subtropics, having a non-frontal migratory character, and having maintained its identity for 24 hours or more. It may or may not be associated with a detectable perturbation of the wind field. As such, it is the basic generic designation which, in successive stages of intensification, may be classified as a tropical depression, tropical storm or typhoon (hurricane).

TROPICAL STORM - A tropical cyclone with maximum sustained surface winds (one-minute mean) in the range of 34 to 63 kt (17 to 32 m/s) inclusive.

TROPICAL UPPER-TROPOSPHERIC TROUGH (TUTT) - A dominant climatological system (upper-level trough), and a daily synoptic feature, of the summer season over the tropical North Atlantic, North Pacific and South Pacific Oceans.

TYPHOON/HURRICANE - A tropical cyclone in which the maximum sustained surface wind (one-minute mean) is 64 kt (33 m/s) or greater. West of 180 degrees longitude they are called typhoons and east of 180 degrees they are called hurricanes. Foreign governments use these or other terms for tropical cyclones and may apply different intensity criteria.

VECTOR ERROR - The distance described by a straight line from the forecast position to the position at verification time as found on the best track. (See Figure 4-1).

WALL CLOUD - An organized band of cumuliform clouds immediately surrounding the central area of a tropical cyclone. The wall cloud may entirely enclose or only partially surround the center.

APPENDIX II

NAMES FOR TROPICAL CYCLONES

Column 1	Column 2	Column 3	Column 4
ANDY	ABBY	ALEX	AGNES
BRENDA	BEN	BETTY	BILL
CECIL	CARMEN	CARY	CLARA
DOT	DOM	DINAH	DOYLE
ELLIS	ELLEN	ED	ELSIE
FAYE	FORREST	FREDA	FABIAN
GORDON	GEORGIA	GERALD	GAY
HOPE	HERBERT	HOLLY	HAL
IRVING	IDA	IAN	IRMA
JUDY	JOE	JUNE	JEFF
KEN	KIM	KELLY	KIT
LOLA	LEX	LYNN	LEE
MAC	MARGE	MAURY	MAMIE
NANCY	NORRIS	NINA	NELSON
OWEN	ORCHID	OGDEN	ODESSA
PEGGY	PERCY	PHYLLIS	PAT
ROGER	RUTH	ROY	RUBY
SARAH	SPERRY	SUSAN	SKIP
TIP	THELMA	THAD	TESS
VERA	VERNON	VANESSA	VAL
WAYNE	WYNNE	WARREN	WINONA

NOTE:

Names are assigned in rotation, alphabetically. When the last name (WINONA) has been used, the sequence will begin again with "ANDY".

Source: CINCPACINST 3140.1 (series)

APPENDIX III

REFERENCES

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APPENDIX IV
PAST ANNUAL TROPICAL CYCLONE REPORTS

Copies of the past Annual Tropical Cyclone/Typhoon Reports can be obtained through:

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ANNUAL PUBLICATION SUMMARIZING THE TROPICAL CYCLONE SEASON IN THE WESTERN NORTH PACIFIC, BAY OF BENGAL AND THE ARABIAN SEA, AND SOUTH PACIFIC AND SOUTH INDIAN OCEANS. A BEST TRACK IS PROVIDED FOR EACH SIGNIFICANT TROPICAL CYCLONE. A BRIEF NARRATIVE IS GIVEN FOR ALL TYPHOONS AND SELECTED TROPICAL CYCLONES IN THE WESTERN NORTH PACIFIC AND NORTH INDIAN OCEAN. ALL RECONNAISSANCE DATA USED TO CONSTRUCT THE BEST TRACKS ARE PROVIDED. FORECAST VERIFICATION DATA AND STATISTICS FOR THE JOINT TYPHOON WARNING CENTER (JTWC) ARE SUMMARIZED.

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DYNAMIC TROPICAL CYCLONE MODELS
TYPHOON ANALOG MODEL
TROPICAL CYCLONE STEERING MODEL
CLIMATOLOGY/PERSISTENCE TECHNIQUES
TROPICAL CYCLONE FIX DATA

The dense white wall cloud of Super Typhoon Dot contrasted with the thin cirrus overhead, as seen across the left wing of the 54th Weather Reconnaissance Squadron WC-130 aircraft. At 1600002 October 1985, the time of this picture, Dot had just reached super typhoon intensity. Dot became the most intense tropical cyclone of the 1985 northwest Pacific season with maximum sustained surface winds of 150 kt (77 m/s) (photo provided by the pilot and photographer Major Barry B. Besold).