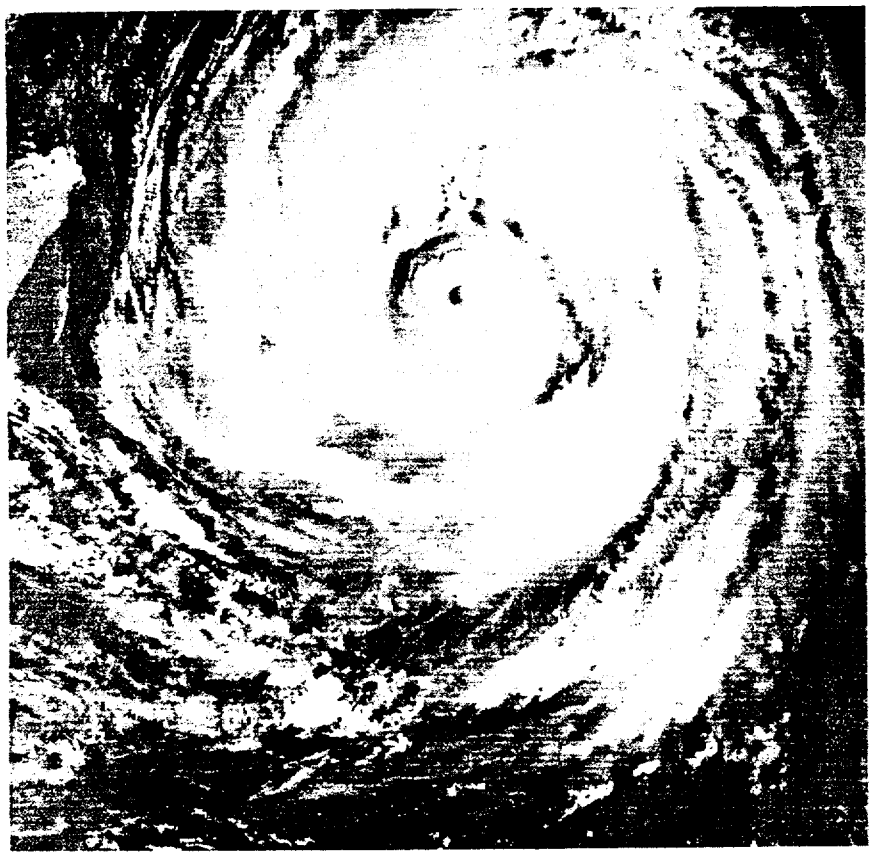
ANNUAL TYPHOON Report

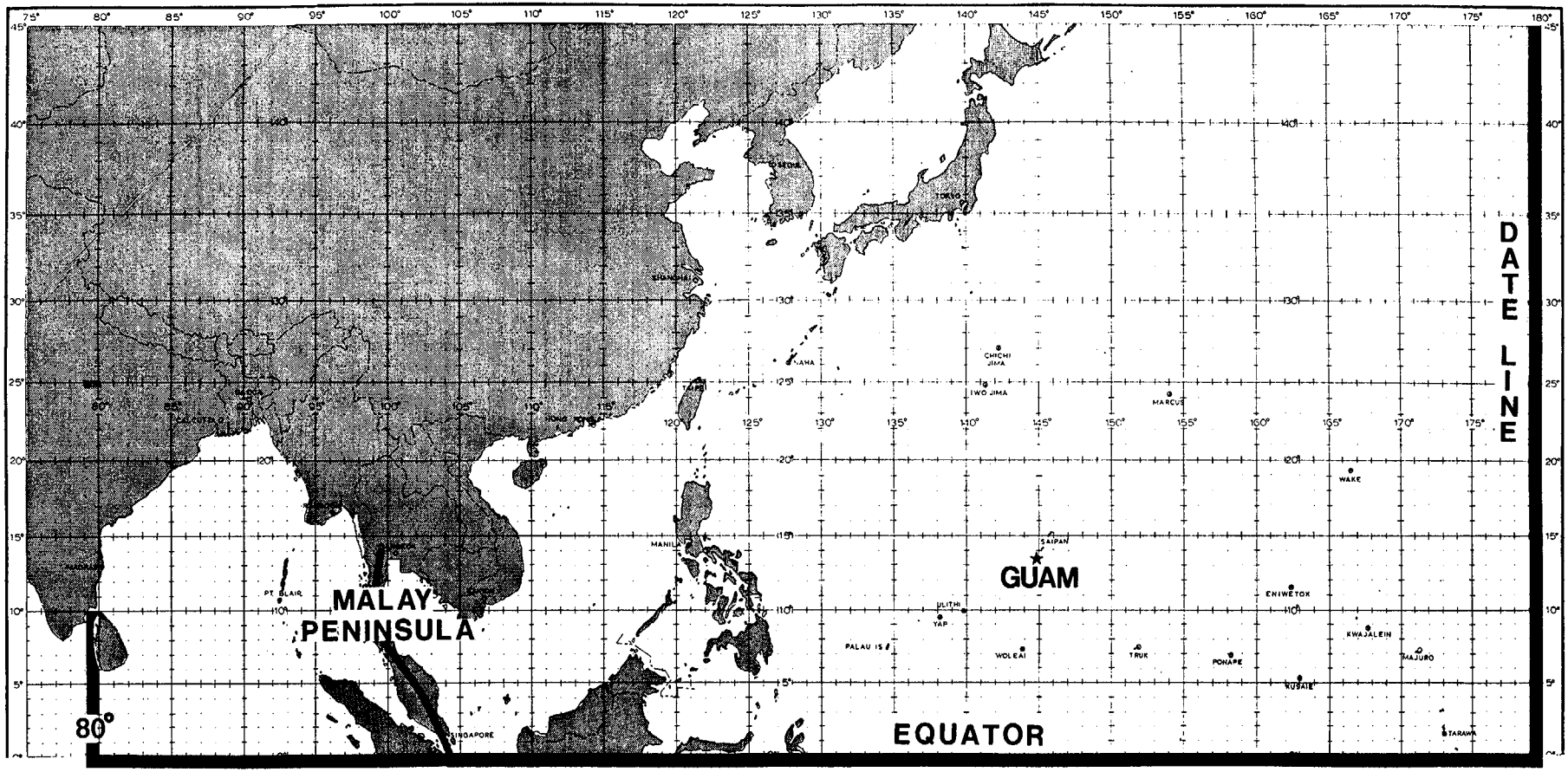


1974

FLEET WEATHER CENTRAL/JOINT TYPHOON WARNING CENTER

Guam, Mariana Islands

SEE EDGE INDEX
ON BACK COVER



AREAS OF RESPONSIBILITY - **JOINT TYPHOON WARNING CENTER, GUAM**

Primary (180° West to Malay Peninsula) **Secondary (Malay Peninsula West to 80° E)**

U. S. FLEET WEATHER CENTRAL
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1974
ANNUAL TYPHOON REPORT
*Departed during 1974 season

In Memory Of

CAPT EDWARD REL BUSHNELL - WEATHER OFFICER

1ST LT GARY WAYNE CRASS - AIRCRAFT COMMANDER

1ST LT TIMOTHY JOHN HOFFMAN - NAVIGATOR

1ST LT MICHAEL PATRICK O'BRIEN - COPILOT

TSGT KENNETH GEORGE SUHR - FLIGHT ENGINEER

SGT DETLEF WOLFGANG RINGLER - WEATHER OBSERVER

U.S. Air Force, 54th Weather Reconnaissance Squadron

(Swan 38, Bess 0827)

WHO DID NOT RETURN FROM A TYPHOON

RECONNAISSANCE FLIGHT OVER THE SOUTH CHINA

SEA 12 OCTOBER 1974

FOREWARD

The body of this report summarizes western North Pacific tropical cyclones. Annex A summarizes tropical cyclones in the central North Pacific from 180° eastward to 140°W, and Annex B summarizes tropical cyclones in the Bay of Bengal. The U.S. National Weather Service publishes summaries of eastern North Pacific tropical cyclones in the Monthly Weather Review, the Mariners Weather Log, and Pilot Charts.

Fleet Weather Central/Joint Typhoon Warning Center (FLEWEACEN/JTWC), Guam has the responsibility to:

1. Provide warnings for all tropical cyclones north of the equator, west of 180° longitude, and east of 80° E longitude;

2. Determine tropical cyclone reconnaissance requirements and assign priorities;

3. Conduct post-analysis programs including preparation of the Annual Typhoon Report; and

4. Conduct tropical cyclone analysis and forecasting research.

Detachment 17/Asian Tactical Forecast Unit, 20th Weather Squadron, Yokota, Japan (formerly Asian Tactical Forecast Center, Fuchu) coordinating with the Naval Weather Service Facility, Yokosuka, Japan, is designated as the alternate JTWC in case of the incapacitation of FLEWEACEN/JTWC Guam.

The JTWC is an integral part of FLEWEACEN Guam and is manned by four officers and four enlisted men each from the Navy and Air Force. The senior Air Force officer is designated as Director, JTWC, and the senior Navy officer is the JTWC Operations Officer.

The western North Pacific Tropical Cyclones Warning System consists of the Joint Typhoon Warning Center, the U.S. Air Force 54th Weather Reconnaissance Squadron stationed at Andersen AFB, Guam, and Air Force Weather Service Defense Meteorological Satellite Program (DMSP) sites at Nimitz Hill, Guam; Yokota AB, Japan; Kadena AB, Japan; Nakon Phanom Airport, Thailand; Hickam AFB, Hawaii; and the Air Force Global Weather Central, Offutt AFB, Nebraska.

The Central Pacific Hurricane Center, Honolulu, is responsible for the area from 180° eastward to 140°W and north of the equator. Warnings are issued in coordination with FLEWEACEN Pearl Harbor and the Air Force Central Pacific Forecast Center, Hickam AFB, Hawaii.

CINCPACFLT, CINCUSARPAC, and CINCPACAF are responsible for further dissemination and, if necessary, local modification of tropical cyclone warnings to U.S. military agencies.

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CHAPTER I — OPERATIONAL PROCEDURES

1. GENERAL

Services provided by the Joint Typhoon Warning Center (JTWC) include forecasts of tropical cyclone formation, location, intensity, direction and speed of movement, and horizontal extent of critical wind speeds (30 knots or greater). This information was disseminated in 1974 by: (1) Tropical Cyclone Formation Alerts issued whenever interpretation of satellite and synoptic data indicated formation of a tropical cyclone was likely; (2) Tropical Cyclone Warnings issued four times daily whenever a significant tropical cyclone was present in the western North Pacific; (3) Tropical Cyclone Warnings issued twice daily whenever a significant tropical cyclone was present in the Bay of Bengal; and (4) Tropical Weather Summaries issued daily with a detailed description of all significant tropical disturbances.

FLEWEACEN Guam provides computerized meteorological/oceanographic products for JTWC. Communication support is furnished by the Naval Telecommunications Center (NTCC) of the Naval Communications Station, Guam.

2. ANALYSES AND DATA SOURCES

a. COMPUTER PRODUCTS:

Use of the varian plotter by the FLEWEACEN Guam Computer Center during 1974 eliminated some of the JTWC hand plotting effort. Varian charts are produced routinely at synoptic times for the surface, 850 mb, 700 mb, and 500 mb levels. In addition, a chart of upper tropospheric data is produced which uses 200 mb rawinsonde data and AIREPS above 33,000 feet within six hours of the 0000Z and 1200Z synoptic times. Data not in the proper format for the computer are hand plotted on the charts. These include pibal gradient-level winds, satellite-derived winds, and missing or late synoptic reports necessary for a detailed analysis.

In addition, the standard array of synoptic-scale computer analyses and prognostic charts from the Fleet Numerical Weather Central (FNWC) at Monterey, California are available.

JTWC extensively utilized the FLEWEACEN Guam Computer Center for objective forecast techniques and statistical post-analysis.

b. JTWC ANALYSES:

(1) Gradient-level (3000 feet) streamline analysis (south of 20°N) and isobaric analysis (north of 20°N) at 0000Z and 1200Z.

(2) 500 mb contour analysis at 0000Z and 1200Z.

(3) A composite upper tropospheric streamline analysis utilizing rawinsonde data from 300 mb to 150 mb and AIREPS at or above 29,000 feet at 0000Z and 1200Z

(4) Reports from weather reconnaissance aircraft are plotted on large-scale sectional charts.

(5) Additional sectional analyses similar to those above, at intermediate synoptic times, during periods of tropical cyclone activity.

c. SATELLITE DATA:

DMSP satellite data played a major role in the early detection of tropical cyclones in 1974. This aspect, as well as applications of satellite data to tropical cyclone tracking, is discussed in Chapter II.

d. RADAR:

Land radar reports, when available, were used for tracking tropical cyclones during the 1974 season. Once a storm moved within range of a land radar site, reports were usually received hourly. Use of radar during 1974 is discussed in Chapter II.

3. FORECAST AIDS

a. CLIMATOLOGY:

Various climatological publications listed in earlier Annual Typhoon Reports were utilized in addition to the following recently received publications:

(1) Changes in the Characteristics of Typhoons Crossing the Island of Taiwan (Brand, S. and J. W. Blelloch, 1973).

(2) Handbook for Forecasters in the Bay of Bengal (Cuming, M. J., 1973).

(3) A Tropical Cyclone Analog Program for the North Indian Ocean (Brand, S., J. M. Long, J. W. Blelloch, and G. D. Hamilton, 1974).

(4) Annual Typhoon Reports, 1959-1973 (FWC/JTWC).

b. OBJECTIVE TECHNIQUES:

During 1974, the following objective forecasting techniques were employed (an evaluation of the techniques is presented in Chapter V):

(1) EXTRAPOLATION - Storm movement is extrapolated by using the past 12-hour mean speed and direction for both 24- and 48-hour forecasts. Forecasts are determined by simple linear extrapolation using the 12-hour old best track position and the current warning position.

(2) MOHATT (modified HATRACK) - Steering by geostrophic winds derived from smoothed height fields at 700 mb and 500 mb levels, biased by 12-hour history inputs.

(3) TYMOD - Steering by global band upper air fields (GBUA) from FNWC Monterey, biased by 12-or 24-hour history inputs.

(4) TYFOON- Analog weighted mean track.

(5) FCSTINT - Uses statistical regression equations to make 24-, 48-, and 72-hour intensity forecasts.

4. FORECASTING PROCEDURES

a. TRACK FORECASTING:

An initial forecast track is developed based on persistence, climatology, and objective techniques. This initial track is subjectively modified based on the following:

(1) The objective techniques are evaluated in conjunction with the best steering level.

(2) The prospects for recurvature are evaluated for all westward moving storms. The basic requisites for this evaluation are accurate continuity on mid-latitude troughs and numerical progs to indicate changes in amplitude or movement of troughs and the subtropical ridge. The northward tendency due to internal forces of each storm is also an important consideration.

(3) Steering is further evaluated by considering the latest upper air analyses as representative of the average upper air flow for the past 24-hours. These analyses are roughly 12 hours old thereby approximating the mid-point of the past 24-hour time interval. By this technique actual past 24-hour movement serves to indicate the best steering level as well as the effectiveness of steering.

(4) A final check is made against climatology to ascertain the likelihood of the forecast track. If the forecast is climatologically unusual, the forecast rationale is reappraised and the forecast track adjusted as necessary.

b. For intensity forecasting, heavy reliance is placed on aircraft reconnaissance reports, the Dvorak satellite interpretation model, and the TYFOON and FCSTINT objective techniques. Upper tropospheric outflow, sea surface temperatures, terrain influences, and speed of movement are additional considerations.

5. WARNINGS

Tropical cyclone warnings are numbered sequentially. If warnings are discontinued and the storm reintensifies, as Typhoon Mary did this year, warnings are numbered consecutively from the last warning issued. Amended or corrected warnings are given the same number as the warnings they modify plus a sequential alphabetical designator to indicate that it is an amended warning. In 1974, a variable warning time was employed to maximize the use of all available reconnaissance platforms and permit flexibility in spreading the warning workload during multiple storm situations. Warnings within the JTWC primary area of responsibility are issued within two hours of 0000Z, 0600Z, 1200Z, and 1800Z with the constraint that two consecutive warnings may not be more than seven hours apart. The forecast intervals are 12 and 24 hours for tropical depressions and 12, 24, 48, and 72 hours for typhoons and tropical storms. Warnings in the JTWC secondary area of responsibility are issued within two hours of 0800Z and 2000Z with the constraint that two consecutive warnings may not be more than 14 hours apart. Warnings for the secondary area are issued only after a tropical cyclone has reached an intensity of 34 knots or greater. The forecast intervals are 24 and 48 hours.

The variable warning time was utilized for 227 warnings out of a possible 657 or for 34.6% of the warnings. Only 29 of these 227 warnings were ± 2 hours from the normal warning times of 0000Z plus every 6 hours. The remainder of the variable warnings were within ± 1 hour of the normal warning times. Of the 173 levied satellite fixes during 1974, 81 were made possible by use of the variable warning time. If the variable warning time had not been available, these 81 fixes would have been levied on aircraft or land radar (if available) and the levy rate for satellite would have been 17.3% instead of the actual 32.5%.

Forecast periods are stated with respect to warning time. Thus, a 24-hour forecast normally verifies 26-28 hours after the latest aircraft or satellite fix and 30-36 hours after the latest surface synoptic chart and upper air charts.

Warning forecast positions are verified against the corresponding post analysis "best track" positions. A summary of verification results for 1974 is presented in Chapter V.

6. PROGNOSTIC REASONING MESSAGE

Whenever warnings for typhoons and tropical storms are issued, a prognostic reasoning message is transmitted at 0000Z and 1200Z for the JTWC primary area of responsibility. This message is intended to provide field meteorologists with the reasoning behind the latest JTWC forecasts.

7. TROPICAL WEATHER SUMMARY

This message, summarizing atmospheric conditions in the JTWC area of responsibility, is issued at 0600Z daily from 1 June to 30 November, and otherwise when the threat of tropical cyclone development exists or when warnings are being issued. It contains a detailed description of all significant tropical disturbances and JTWC's evaluation of potential for development.

8. TROPICAL CYCLONE FORMATION ALERT

Alerts are issued whenever interpretation of synoptic and other meteorological data suggests that formation of a significant tropical cyclone is likely. These alerts are valid for up to 24 hours unless cancelled or reissued.

CHAPTER II — RECONNAISSANCE & COMMUNICATION

1. GENERAL

The foundation of any good tropical cyclone warning is accurate and timely fixes. Because of the vastness of JTWC Guam's area of responsibility and the limited number of land or ship reporting stations, JTWC must rely on two primary means of fixing tropical cyclones, namely aircraft and satellite. Aircraft reconnaissance and satellite derived data provided approximately 88 percent of the required fix data in 1974. This year saw greatly increased utilization of DMSP data with satellite data providing the basis of 44 percent of the warning positions. This increase was primarily a result of the variable warning time, which allowed more flexibility in reconnaissance planning and increased usage of DMSP data.

2. RECONNAISSANCE RESPONSIBILITY AND SCHEDULING

Aircraft weather reconnaissance is performed in the JTWC area of responsibility by the 54th Weather Reconnaissance Squadron (54 WRS). The squadron, presently equipped with eight WC-130 aircraft, is located at Andersen Air Force Base, Guam. The JTWC reconnaissance requirements are sent daily during the typhoon season to the Tropical Cyclone Aircraft Reconnaissance Coordinator. These requirements include areas to be investigated, fix times and forecast position of cyclones to be fixed at those times.

Four fixes per day, at six-hourly intervals, are required (CINCPACINST 3140.1M) on all significant tropical cyclones in the JTWC primary area of responsibility (see inside front cover). Two fixes per day are required in the secondary area of responsibility. During the 1974 season, increased use was made of the Selective Reconnaissance Program (SRP) to fulfill these requirements. The SRP was implemented in 1972 to alleviate pressure on overtaxed aircraft reconnaissance assets. The SRP attempts to optimize the entire reconnaissance system by using each reconnaissance platform (aircraft, satellite, and surface radar) to its full potential. Various factors are considered in selecting which reconnaissance platform to use for any warning, e.g., the cyclone's location and stage of development, the DMSP orbit times and areal coverage, availability of land radar reports, the cyclone's threat to U.S. interests, aircraft operational limitations (e.g., one-fix versus two-fix mission), etc.

Use of the variable warning time was instrumental during the 1974 season in optimizing use of DMSP satellite data. Warnings were scheduled within two hours of the standard warning times with the constraint that no more than seven hours may elapse between two consecutive warnings. Thus, JTWC often was able to use satellite fixes which would not have been timely under a less flexible warning system as a basis for many warnings.

Aircraft reconnaissance remains the only method of accurately determining measurable storm parameters. Only the aircraft can provide direct measurements of height, temperature, flight level winds, sea level pressure, and numerous other parameters. These data are vital to the forecaster for indications of changing cyclone characteristics, thus providing a broader basis for tropical cyclone warnings. The aircraft also provides much greater flexibility in time and space compared to the other platforms.

DMSP satellites provide day and night coverage of the JTWC area of responsibility. Interpretation of DMSP satellite imagery provides estimates of cyclone positions and, for daytime passes, estimates of intensities using the DVORAK Technique (NOAA TECHNICAL MEMORANDUM, NESS-45). A major disadvantage of the satellite is that until a storm has an eye, fix positions can vary significantly depending on the analyst, thus creating possible confusion as to the actual movement of the cyclone. In addition, satellites provide no direct measurements of parameters related to cyclone intensity nor do they give any reliable indication of various wind radii.

Land radar provides useful positioning data on well developed cyclones when in the proximity (usually within 200 nm of radar position) of the Republic of Philippines, Hong Kong, Taiwan, or Japan (including the Ryukyus). Radar does not, however, provide measurements or estimates of tropical cyclone intensity. Subsequent sections summarize the JTWC utilization of the various reconnaissance platforms during 1974.

3. AIRCRAFT RECONNAISSANCE EVALUATION CRITERIA

The following criteria are used to evaluate reconnaissance support to JTWC.

a. Six-hourly fixes - To be counted as made on time, a fix must satisfy the following criteria:

(1) Fix must be made not earlier than 1 hour before, nor later than 1/2 hour after scheduled fix time.

(2) Aircraft in area requested by scheduled fix time, but unable to locate center due to:

(a) Cyclone dissipation; or

(b) rapid acceleration of the cyclone away from the forecast position.

(3) If penetration not possible due to geographic or other flight restrictions, aircraft radar fixes are acceptable.

b. Levied 6-hourly fixes made outside the above limits are evaluated as follows:

(1) Early-fix is made within the interval from 3 hours to 1 hour prior to scheduled fix times; however, no credit will be given for early fixes made within 3 hours of the previous fix.

(2) Late-fix is made within the interval from 1/2 hour to 3 hours after scheduled fix time.

c. When 3-hourly fixes are levied, they must satisfy the same time criteria discussed above in order to be classified as made on time. Three-hourly fixes made that do not meet the above criteria are classified as follows:

(1) Early-fix is made within the interval from 1 1/2 hours to 1 hour prior to scheduled fix time.

(2) Late-fix is made within the interval from 1/2 hour to 1 1/2 hours after scheduled fix time.

d. Fixes not meeting the above criteria are scored as missed.

e. Levied fix time on an "as soon as possible" fix is considered to be:

(1) Sixteen hours plus estimated time enroute after an alert aircraft and crew are levied; or

(2) Four hours plus estimated time enroute after the DTG of message levying an ASAP fix if an aircraft and crew, previously alerted, are available for duty.

f. Investigatives - to be counted as made on time, investigatives must satisfy the following criteria:

(1) The aircraft must be within 250 nm of the specified point by the scheduled time.

(2) The specified flight level and track must be flown.

(3) Reconnaissance observations are required every half-hour in accordance with AWSM 105-1. Turn and mid-point winds shall be reported on each full observation within 250 nm of the levied point.

(4) Observations are required in all quadrants unless a concentrated investigation in one or more quadrants has been specified.

(5) Aircraft must contact JTWC before leaving area of concern.

g. Investigatives not meeting the time criteria of paragraph f, will be classified as follows:

(1) Late-aircraft is within 250 nm of the specified point after the scheduled time, but prior to the scheduled time plus 2 hours.

(2) Missed-aircraft fails to be within 250 nm of the specified point by the scheduled time plus 2 hours.

4. AIRCRAFT RECONNAISSANCE SUMMARY

Aircraft reconnaissance was levied 351 times to make six-hourly fixes on tropical cyclones in 1974. This is an increase of 124 levied fixes over 1973 and represents 66% of the levied six-hourly fixes before the cyclone passed the no-fly line. The remaining required fixes were levied against satellite (32.5%) or land radar (1.5%) as available. The increase in levied aircraft fixes during 1974 was due to the much higher level of tropical cyclone activity compared to 1973 (the year of lightest activity since JTWC was established in 1959). Nevertheless, the percentage increase in levied six-hourly aircraft fixes from 1973 to 1974 (54.6%) was significantly less than the percentage increase in warnings (68.5%) due to the greater use of DMSP data for fixes during 1974.

In addition to the levied six-hourly fixes, 30 investigatives and 7 intermediate fixes were levied by JTWC in 1974.The use of DMSP satellite data in conjunction with synoptic data resulted in only 4 levied investigatives on suspect areas that did not develop into tropical cyclones.

Table 2-1 summarizes reconnaissance effectiveness. Using the scoring criteria in Section 3, the 30 missed fixes (or 8.4% of the total levied fixes) represent a slight increase over 1973. Significantly, approximately one-half of the 1974 missed fixes occurred after mid-October, when the 54th Weather Reconnaissance Squadron was reduced to eight aircraft.

TABLE 2-1. AIRCRAFT RECONNAISSANCE EFFECTIVENESS

	NUMBER OF FIXES	PERCENT
COMPLETED ON TIME	292	81.5
EARLY	1	.3
LATE	35	9.8
MISSED	30	8.4
TOTAL	358	100.0

LEVIED VS. MISSED FIXES

	LEVIED	MISSED	PERCENT
AVERAGE 1965-1970	507	10	2.0
1971	802	61	7.6
1972	624	126	20.2
1973	227	13	5.7
1974	358	30	8.4

5. RADAR RECONNAISSANCE SUMMARY

The 1974 typhoon season produced the largest number of radar reports ever received at JTWC during a single season. A total of 997 radar reports of tropical cyclone positions were received; 995 from land stations[1] and 2 from aircraft. No ship radar reports were received during the 1974 Typhoon season. The large number of radar reports is primarily a result of the track and speed of the storms. Of the sixteen tropical storms and typhoons that came under the surveillance of radar, seven,

Gilda, Jean, Mary, Polly, Rose, Shirley, and Wendy, had tracks within radar range of Japan and the Ryukyu Islands, where the Japanese Meteorological Agency has established an extensive and highly reliable radar network. These seven storms accounted for 78% of all radar reports. Typhoon Shirley, which slowly meandered from central Ryukyus to southern Japan, alone accounted for 225 reports, nearly 23% of the total. During one period, Typhoon Polly was simultaneously surveyed by five radar sites.

To evaluate the quality of the 1974 radar data, the land radar reports were separated into the three categories of accuracy defined in the WMO radar code. These categories are: good (within 10 km; 5.4 nm), fair (within 10-30 km; 5.4-16.2 nm) and poor (within 30-50 km; 16.2-27 nm). Of the 995 reports, 34% were good, 38% were fair and 28% were poor. Consideration of radar reports made only while storms were of typhoon intensity yielded 45% in the good category. All land radar reports were compared to the JTWC best track position and the mean deviation was 12.0 nm. This is identical to the mean deviation obtained during the 1973 season which utilized only 409 land radar reports. The mean deviation of radar reports taken while storms were of typhoon intensity was also 12.0 nm.

Of the 995 land radar reports, 75.3% were obtained from sites in Japan and the Ryukyu Islands, 17.0% from the Philippines, 6.4% from the Royal Observatory at Hong Kong, 0.5% from Taiwan and 0.4% from each Guam and Korea. Although Hong Kong exhibited only a small percentage of reports, these provided valuable positioning information for 6 storms west of the Air Weather Service no-fly line. Sites in Taiwan and Korea provided similar information for Lucy and Wendy. Radars of National Meteorological Agencies accounted for 64% of all reports, AC&W sites 12% and Air Weather Service stations 24% (primarily from Kadena AFB, Okinawa and Clark AFB, Philippines), a 16% increase over the 1973 AWS contribution.

Communication problems in the Philippines resulted in the absence of any radar reports during the passages of Bess and Elaine across northern Luzon, although the storms were within range of four radar sites and very close to two of these. There remains a critical need for radar coverage on the east coast of Luzon and in the Luzon Straits. Hopefully, the site at Catanduanes Island and a new site (BASCO) in the Bataan Islands will be operational by the latter part of the 1975 Typhoon season.

6. SATELLITE RECONNAISSANCE SUMMARY

The use of DMSP satellite data for tropical cyclone reconnaissance provided by U.S. Air Force DMSP sites increased dramatically during 1974. The levy rate for satellite fixes increased to 32.5% compared with 15.4% in 1973. Since there are a number of situations each year when a choice of platforms in not possible (e.g., when cyclones are past the no-fly line near the the Asian coast), the actual use rate of DMSP data for warnings is always significantly higher than the levy rate. During 1974, the use rate increased to 43.8% from 27.4% in 1973. Three factors are responsible for this large increase in the use of satellite data. First, 1974 was a much more active season than 1973, placing a much greater load on available aircraft reconnaissance assets. Selectively using DMSP data for many fixes takes some pressure off the aircraft reconnaissance resources and helps insure that aircraft fixes will be available when needed most. Second, there were always at least two DMSP spacecraft operational during 1974 and during the heart of the primary season (August through November) data were available from three satellites. Thus, during 1974, satellite coverage was available for 88% of the six-hourly warning cycles compared to only 58% during 1973. The third and dominant factor in the increased use of satellite data was the use of the variable warning time option described in Chapter I.

The DMSP satellite network continued to operate smoothly during 1974. DMSP sites made 1203 position estimates on tropical cyclones in the western North Pacifice area compared with 605 during 1973. Once-daily intensity estimates derived from the Dvorak technique (NOAA TM, NESS-45) were also computed. Additionally, hundreds of other satellite analyses were made on tropical disturbances and tropical cyclones in their pre-warning stages. The primary network sites during 1974 were Nimitz Hill, Guam; Fuchu, Japan; and Nakon Phanom, Thailand (NKP). Kadena, Japan and AFGWC served as backup sites for the western North Pacific. Additionally, NKP and AFGWC provided DMSP coverage of tropical cyclone activity in the Bay of Bengal. Late in 1974, the Fuchu site was relocated to Yokota Air Base, Japan. The Kadena site has been returned to a fully operational status and will be a primary site during the 1975 season.

DMSP derived positions of tropical cyclones are separated into six classes according to the method of gridding and type of apparent circulation center. These classes are identified by the Position Code Number (PCN) system shown below.

PCN	CLASS
1	Visible Eye/Geographical Gridding
2	Visible Eye/Ephemeris Gridding
3	Well Defined Circulation Center/ Geographical Gridding
4	Well Defined Circulation Center/ Ephemeris Gridding
5	Poorly Defined Circulation Center/Geographical Gridding
6	Poorly Defined Circulation Center/Ephemeris Gridding

Each derived DMSP position is compared to the JTWC best track position for the corresponding time. The mean deviations between the satellite positions and best track positions for the past three years are shown in Table 2-2. The statistics for 1973 and 1974 are for all sites because the DMSP

1 A list of land radar sites is located in the "Tropical Cyclone Center Fix Data" portion of this report.

satellite network was operational for these years. The statistics for 1972, however, are limited to the Guam site since only positions from the Guam sites were used in the Selective Reconnaissance Program that year and standardized positioning techniques had not been made available to all sites.

Table 2-2. Mean Deviations (nm) of DMSP Derived Tropical Cyclone Positions from JTWC Best Track Positions, 1972-1974. Number of cases shown in parentheses.

PCN	1972 (GUAM)	1973 (ALL SITES)	1974 (ALL SITES)
1	14.2(104)	15.5(129)	13.6(224)
2	15.8(53)	20.0(17)	17.4(37)
3	21.3(100)	20.3(252)	20.1(422)
4	20.2(39)	20.0(24)	23.9(70)
5	29.9(137)	45.9(163)	35.4(342)
6	30.4(157)	29.6(20)	49.4(108)
1&2	14.7(157)	16.0(146)	14.2(261)
3&4	21.0(139)	20.3(276)	20.6(492)
5%6	30.2(294)	44.1(183)	38.8(450)
TOTAL	23.9(590)	26.4(605)	26.0(1203)

The increase in the mean deviations of the poorly defined cases (PCN 5&6) in 1973 and 1974, compared to 1972, is significant. With more experience in DMSP data interpretation and use of various thresholding techniques to amplify the mesoscale features near the cyclone's circulation center, many of the cases that would have been classified as poorly defined in 1972 could be classified as well defined in 1973 and 1974. This did not increase the mean deviations in the well defined category (PCN 3&4); however, it did increase the mean deviations in the poorly defined category since cases in this category during 1973 and 1974 were truly poorly defined. The percent of cases in the poorly defined category was 50% in 1972, 30% in 1973, and 37% in 1974. Poorly defined cases are much more frequent at night due to the coarser resolution of the infrared sensors, e.g., during 1974, 50% of night cases were poorly defined compared to 26% of the daytime cases. The percent of cases with visible eyes (PCN 1&2) has remained relatively stable: 27% in 1972, 24% in 1973, and 22% in 1974.

The 1974 positioning statistics for the individual DMSP sites are given in Table 2-3. There is little difference among the sites in positioning accuracies. These statistics and those in Table 2-2 indicate that the DMSP PCN classification system is stable, reliable, and reproducible by independent analysts following standardized guidance (1 WWP 105-10, Tropical Cyclone Position and Intensity Analysis Using Satellite Data).

Once-daily tropical cyclone intensity estimates are made from the daytime DMSP data using the Dvorak technique. This technique assigns a Current Intensity (CI) number to the cyclone depending on the cyclone's Central Features (CF), Banding Features (BF), and continuity considerations from previous analyses. Following are the Maximum Wind Speeds (MWS) associated with each CI number.

Table 2-3. Mean Deviations (nm) of DMSP Derived Tropical Cyclone Positions from JTWC Best Track Positions for Western North Pacific DMSP Sites during 1974. Number of cases shown in parentheses.

PCN	GUAM	YOKOTA	NAKON PHANOM	KADENA
1&2	12.6(116)	15.7(72)	14.3(36)	11.7(26)
3&4	20.0(231)	21.3(175)	19.6(54)	18.7(24)
5&6	35.4(206)	46.2(118)	37.0(94)	38.5(31)
TOTAL*	24.2(553)	28.3(365)	27.5(184)	24.0(81)

*20 less than 1974 totals in Table 2-2 which includes some positions from AFGWC.

CI	MWS(Knots)	CI	MWS(Knots)	CI	MWS(Knots)
1.5	25	4.0	60	6.5	122
2.0	30	4.5	72	7.0	135
2.5	35	5.0	85	7.5	150
3.0	40	5.5	97	8.0	170
3.5	50	6.0	110		

Figure 2-1 shows a comparison of the derived intensities with the JTWC Best Track (BT) intensities for 1974. The BT intensities were placed into the closest corresponding CI category and deviations computed according to CI numbers. Overall, 74% of the cases fell with ±0.5 CI number and 91% of the cases within ±1.0 CI number. There was a tendency for the DMSP intensity estimates to be slightly higher than the BT wind speeds.

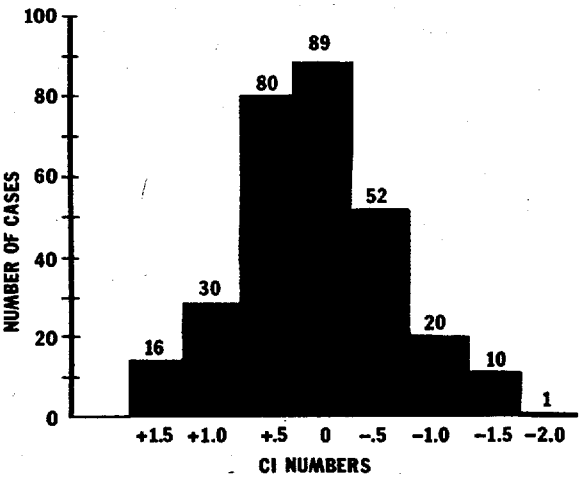


FIGURE 2-1. *Comparison of derived CI number* and JTWC BT intensities.*

**Nimitz Hill site only*

The greatest benefit from DMSP data has been the significant increase in JTWC's ability to forecast tropical cyclone development. By carefully monitoring daily changes in tropical disturbances, JTWC can normally give at least 12 to 24 hours notice that a significant tropical cyclone

is developing. When development during the next 24 hours is judged likely, a tropical cyclone formation alert is issued giving the current location, the estimated maximum winds in the disturbance, and the area where development is likely to occur. Formation alerts are updated as necessary until the cyclone is picked up in warning status or canceled if the disturbance fails to develop. Table 2-4 shows the verification rate of tropical cyclone formation alerts for the past five years. A significant increase in the verification rate occurred in 1971, the first season for which DMSP data was available. Subsequent increases can be attributed to increased skill in interpreting the DMSP imagery and close integration of satellite and conventional meteorological data.

Table 2-4. VERIFICATION SUMMARY FOR TROPICAL CYCLONE FORMATION ALERTS

YEAR	NUMBER OF ALERT SYSTEMS	ALERT SYSTEMS WHICH BECAME NUMBERED TROPICAL CYCLONES	TOTAL NUMBERED TROPICAL CYCLONES	DEVELOPMENT RATE
1970	32	18	27	56%
1971	48	33	37	69%
1972	41	29	32	71%
1973	26	22	23	85%
1974	35	30	35	86%

Due to the use of DMSP data to monitor tropical disturbances in their developing stages, the need for aircraft investigative flights has been greatly reduced resulting in considerable savings of aircraft reconnaissance resources in recent years. Table 2-5 presents a summary of levied investigative flights during the past five years. During the past two years, the ratio of levied investigative flights to the total number of tropical cyclones has been near unity. In most cases during 1973 and 1974, the investigative flight provided the basis for the first warning on the tropical cyclone.

Table 2-5. SUMMARY OF AIRCRAFT INVESTIGATIVE FLIGHTS

YEAR	LEVIED INVESTIGATIVE FLIGHTS	TOTAL TROPICAL CYCLONES	RATIO
1970	170	27	6.3-1
1971	179	37	4.8-1
1972	81	32	2.5-1
1973	28	23	1.2-1
1974	30	35	0.9-1

Some simple calculations illustrate the magnitude of aircraft reconnaissance savings during the developing, pre-warning stages of tropical cyclones. Multiplying the average ratio of investigative flights to tropical cyclones experienced during 1970 and 1971 of 5.5 to 1 times 34 (the average yearly number of tropical cyclones including tropical depressions) results in a requirement of 187 investigative flights in an average year without DMSP data. With DMSP data a ratio of unity can be achieved requiring only 34 investigative flights in an average year. Thus, average savings of 153 investigative flights per year can be achieved. A normal 10 to 12 hour investigative flight is equivalent to a mission making two consecutive six-hourly fixes. Thus, an equivalent savings of 306 six-hourly fixes are realized. When this figure is compared to the average number of levied six-hourly fixes (534) during the last 10 years, the large savings of aircraft resources during the early developing stages of tropical cyclones becomes evident. This use of DMSP data during the pre-warning stages of cyclones and selective use of DMSP data for six-hourly fixes once a cyclone has developed helps explain why the large reductions in aircraft reconnaissance assets have not yet degraded the tropical cyclone warning service. The primary problem facing JTWC in future years will be to optimize the mix of reconnaissance assets so that the maximum capabilities of each resource can be realized.

DMSP satellites have become a vital part of the tropical cyclone warning system during the past few years. Their loss now that the aircraft reconnaissance assets have been drastically reduced would seriously degrade JTWC's warning capabilities. The overall use of DMSP satellite data for warnings should increase in future years; however, the very large increase in satellite use from 1973 to 1974 was due primarily to the one-time benefit of the variable warning time option and increases in future years will probably be at a much slower rate. Also, the potential DMSP satellite use rate is heavily dependent on the number and orbit time of the satellites. During periods when only one DMSP satellite is operational, the potential use rate drops sharply and JTWC's flexibility in optimizing a mix of aircraft and satellite data is greatly reduced.

7. COMMUNICATIONS

a. AIR TO GROUND

Aircraft reconnaissance data are normally received by JTWC via direct phone patch through Andersen Aeronautical Station, which is the primary station for this purpose. Under degraded radio propagation conditions, the Clark or Fuchu aeronautical stations can intercept and relay the data via AUTOVON and teletype to JTWC.

Average communication delays for the preliminary and complete center data messages for past years are compared with 1974 delays in Figure 2-2. Delay times are defined as the difference between the fix time and the time of message receipt at JTWC. The preliminary fix message continued to prove its effectiveness by permitting a significant amount of extra time to be spent in forecast preparation.

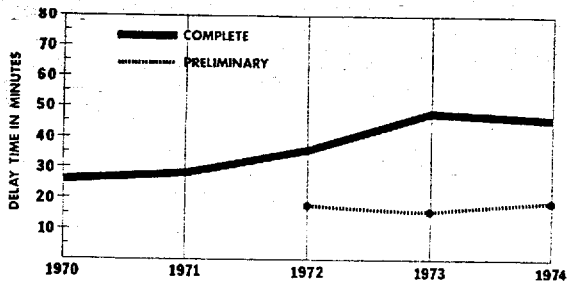


FIGURE 2-2. *DELAY TIMES - Receipt of eye data messages.*

Table 2-6 depicts the complete center data messages received more than one hour after fix time and after warning time. The decrease in the latter can be directly attributed to the variable warning time introduced in 1974.

TABLE 2-6. 1974 AIR/GROUND DELAY STATISTICS FOR AIRCRAFT RECONNAISSANCE COMPARED WITH PREVIOUS YEARS

	1970	1971	1972	1973	1974
% Complete fix messages delayed over one hour	5	6	6	20	19
% Complete fix messages received after warning time	0.9	2.1	5.5	10.1	4.9

b. SELECTIVE RECONNAISSANCE PROGRAM

With the advent of the SRP, the importance of radar and satellite fix data has increased considerably over previous years. A review of the associated communication delays follows with delay times defined as the difference between the observation time and the time of message entry into the AWN. In contrast to previous years, radar reports were received in a very timely manner. Data from the AC&W radar sites in the Philippines and data from nationally operated radars of the Republic of China, Hong Kong, Japan, and the Republic of the Philippines were delayed an average of only 20 to 35 minutes. In the worst cases, JTWC still received the messages within 80 minutes of observation time. Tropical cyclone radar data is routed to JTWC over the AWN through the use of a special high precedence collective indicator. Additionally the AC&W radar reports were phoned to JTWC from Clark AB, thereby providing the information somewhat earlier than indicated.

Over 1557 position and intensity estimates were derived from Air Weather Service (AWS) DMSP sites and the aircraft carrier USS CONSTELLATION during 1974. The data from the AWS DMSP sites were immediately passed via AUTOVON followed by an AWN message. AUTOVON provided rapid communication of the essentials and a brief two-way discussion of the data (a benefit not possible by message). Average delay times of 65 minutes for telephone and 84 minutes for message resulted from a sampling of mid-season storms. These delay times are the difference between satellite equator-crossing time and the time of the telephone call or entry of the message into the AWN. Systematic differences in data processing time among the DMSP sites introduces small variations in the above figures which are independent of communications and analysis time.

c. OUTGOING COMMUNICATIONS

Messages originating at JTWC are processed by the Naval Telecommunications Center (NTCC) of the Naval Communications Station, Guam. By special agreement, all tropical cyclone warnings are placed in the communications system before pending IMMEDIATE precedence traffic. Manual processing is accomplished as though the warning had FLASH precedence. Warnings were delivered to the message center an average of 28 minutes before warning time. In Figure 2-3, yearly averages of the handling time are plotted relative to warning time as indicated by the length of vertical bars. Handling times for tropical depression warnings (not shown) were reduced from 25 minutes in 1973 to 9 minutes in 1974.

The dramatic improvement in handling time achieved during 1973 continued into 1974, thereby allowing the average message to be placed on the circuits before the established warning time. The time of receipt of a warning at a particular station depends on factors beyond the control of either JTWC or NTCC.

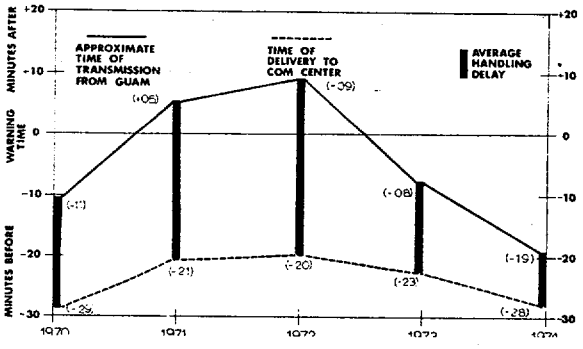


FIGURE 2-3. *AUTODIN handling time data for typhoon and tropical storm warnings.*

CHAPTER III —— RESEARCH SUMMARY

1. GENERAL

One of the three major tasks of the Joint Typhoon Warning Center is to conduct tropical cyclone analysis and forecasting research. In most cases the research projects are directly concerned with either movement or intensity forecast improvement. Meteorologists from outside agencies such as the Environmental Prediction Research Facility, the Naval Postgraduate School, the 54th Weather Reconnaissance Squadron and Detachment 1, 1st Weather Wing often collaborate with JTWC on research projects. The following briefs summarize significant research completed during the past year. Research underway but not yet completed is not reported in this section.

2. COST EFFECTIVENESS EVALUATION OF DROPSONDE DERIVED SEA LEVEL PRESSURES IN TROPICAL CYCLONES OF THE WESTERN NORTH PACIFIC

(Reference: McPeek, R. E. and O. R. Scrivener, FLEWEACEN/JTWC Technical Note 74-6).

From the earliest days of aircraft reconnaissance of tropical cyclones, dropsonde data taken in the cyclone centers showed a very high correlation between dropsonde measured surface pressure and aircraft measured 700-mb height. Jordan (1957) studied this correlation and derived a regression equation that has been used operationally for many years as an initial estimate of surface pressure by Joint Typhoon Warning Center (JTWC), Guam. Sea level pressure measurement is an important tool in deriving maximum surface wind speeds in tropical cyclones. In the light of present day forecasting techniques and ever tightening budgetary constraints, this study was undertaken to determine the feasibility of relying solely on a regression equation to derive sea level pressure from aircraft measured 700-mb heights.

Results showed that Jordan's regression equation can be used operationally for determining tropical cyclone intensity. By using the equation for minimum sea level pressure estimates, instead of dropsonde measured sea level pressure, a dollar savings of approximately $100,000 would be realized in the Western North Pacific each year.

3. DERIVATION OF A REVISED MAXIMUM WIND/MINIMUM SEA LEVEL PRESSURE RELATIONSHIP FOR TROPICAL CYCLONES

(Reference: Atkinson, G. D. and C. R. Holliday, FLEWEACEN/JTWC Technical Note 75-1)

A revised minimum sea level pressure/maximum sustained surface wind relationship for tropical cyclones for the Western North Pacific is derived. The data sample used was 26 years of peak wind gust observations from island and coastal meteorological stations which experienced tropical cyclone hits. Minimum sea level pressures were determined from station pressure data and aircraft reconnaissance observations. The recorded peak gust values were adjusted for differences in station and anemometer elevation and reduced to sustained (one-minute average) surface winds using standard gust factor relationships. The resulting equation is:

$$Vmax = 6.7\ (1010\text{-}Pc)^{0.644}$$

Where Vmax is the maximum sustained surface wind and Pc is the minimum sea level pressure. The standard error of the regression equation on the dependent data is 8.8 knots and 75% of the cases fell within ± 10 knots of the regression line. Due to the availability of better ground truth observations of maximum surface winds, this relationship is considered more accurate than previous minimum pressure/maximum wind relationships which were derived primarily from maximum surface winds estimated from aircraft reconnaissance sea state observations. The new relationship has been adopted for operational use by JTWC and is used in conjunction with maximum flight level (700 mb) winds and satellite intensity estimates to determine the maximum sustained wind speeds in tropical cyclones. The maximum wind values derived from this equation can be adjusted subjectively for synoptic situations in which the environmental pressures on the cyclone's periphery are abnormally high or low. Table 3-1 gives the pressure/wind relationships derived from the equation.

TABLE 3-1. MAXIMUM SUSTAINED (ONE-MINUTE AVERAGE) SURFACE WIND SPEEDS (MWS) (KNOTS) FOR SPECIFIED VALUES OF MINIMUM SEA LEVEL PRESSURE (MSLP) (mb).

MSLP	MWS	MSLP	MWS	MSLP	MWS
1000	30	960	83	920	122
995	38	955	89	915	126
990	46	950	94	910	130
985	53	945	99	905	134
980	60	940	103	900	138
975	66	935	108	895	142
970	72	930	113	890	146
965	78	925	117	885	150

4. FORECAST VERIFICATION AS A FUNCTION OF RECONNAISSANCE PLATFORM

(Reference: Harrison, E. J., Jr., and A. L. Bryant, FLEWEACEN/JTWC Technical Note 75-2)

There has been much discussion in recent years as to the effect of reconnaissance platforms on forecast position accuracy, e.g., will a 24-hour forecast based on an aircraft fix be more accurate than one based on satellite? This study compares the mean warning position and forecast accuracies for JTWC warnings based on aircraft, satellite, radar and other fixes for the 1973 and 1974 seasons. The single most important result of

the study is that warnings based on aircraft fixes are, in the mean, more accurate. The main reason for this is the ability of the aircraft to locate the storm center, regardless of the stage of cyclone development. When storms are well developed, there is essentially no difference in forecast accuracy between warnings based on aircraft and satellite; however, in the poorly developed storms aircraft-based warnings are considerably (approximately 22%) more accurate. The study indicates that continued use of the Selective Reconnaissance Program will provide the most accurate position forecasts possible, while optimizing utility of dwindling aircraft assets.

CHAPTER IV — SUMMARY OF TROPICAL CYCLONES

1. GENERAL RESUME

During 1974, there was a sharp reversal from the abnormally light tropical cyclone activity observed during 1973. Named tropical cyclones numbered 32 during 1974 (Table 4-1) which is 10% higher than the latest 15-year average[1] displayed in Table 4-2. Climatological statistics on typhoons are given in Table 4-3. Less than half (47%) of these tropical storms developed to typhoon strength (15)--well below the average ratio of 65% derived from the long term average (Table4-4). Deviation of normal monthly typhoon distribution was particularly noticeable during July and August when only 3 were recorded in contrast to the climatological average of 7.

Warnings were issued in 1974 on numbered tropical cyclones during 148 calendar days spanning all months except February. This closely matches the mean of the past 15 years (Table 4-5) but is a significant increase (almost twice) over the number of warning days during 1973.

The number of typhoon days (Table 4-6), however, numbered only 62, well below the 15-year average of 90 days. This reflects the tendency of this season's tropical cyclones not to develop beyond storm strength.

TABLE 4-1. 1974 TROPICAL CYCLONES

CYCLONE	TYPE	NAME	(PRD OF WRNG)	CALENDAR DAYS OF WARNING	MAX SFC WIND+	MIN OBS SLP	WARNINGS ISSUED TOTAL	WARNINGS ISSUED NO. AS TYPHOONS	WARNINGS ISSUED DISTANCE TRAVELED
01	TS	WANDA	10 JAN - 13 JAN	4	55	992	15	---	1050
02	TS	AMY	14 MAR - 19 MAR	6	45	987	21	---	1750
03	TS	BABE	26 APR - 02 MAY	7	60	983	26	---	1600
04	TY	CARLA	02 MAY - 07 MAY	6	80	963	22	7	1550
05	TD	---	07 JUN - 08 JUN	2	30	---	5	---	150
06	TY	DINAH	08 JUN - 14 JUN	7	70	974	26	7	1550
07	TS	EMMA	13 JUN - 18 JUN	6	60	988	21	---	1300
08	TS	FREDA	21 JUN - 22 JUN	2	45	989	7	---	800
09	TY	GILDA	30 JUN - 07 JUL	8	90	944	28	18	1400
10	TS	HARRIET	15 JUL - 18 JUL	4	45	996	13	---	900
11	TS	JEAN	17 JUL - 20 JUL	4	45	995	14	---	850
12	TY	IVY	17 JUL - 22 JUL	6	95	945	23	15	1850
13	TS	KIM	23 JUL - 24 JUL	2	50	989	6	---	350
14	TS	LUCY	09 AUG - 11 AUG	3	54	995	10	---	350
15	TY	MARY	*	13	70	964	47	5	3400
16	TD	---	14 AUG - 15 AUG	2	30	994	5	---	250
17	TS	NADINE	15 AUG - 18 AUG	4	50	982	14	---	1600
18	TS	OLIVE	(CENTRAL PACIFIC HURRICANE CENTER)						
19	TY	POLLY	25 AUG - 02 SEP	9	95	948	31	20	1850
20	TD	---	27 AUG - 28 AUG	2	30	994	6	---	300
21	TS	ROSE	28 AUG - 31 AUG	4	50	985	13	---	800
22	TY	SHIRLEY	04 SEP - 09 SEP	6	70	972	21	9	950
23	TS	TRIX	05 SEP - 06 SEP	2	40	---	5	---	250
24	TY	VIRGINIA	12 SEP - 16 SEP	5	75	969	15	9	780
25	TS	WENDY	24 SEP - 30 SEP	7	60	984	24	---	800
26	TY	AGNES	24 SEP - 02 OCT	9	105	961	30	17	2000
27	TY	BESS	08 OCT - 14 OCT	7	65	980	25	10	1950
28	TY	CARMEN	14 OCT - 19 OCT	6	75	974	21	13	1250
29	TY	DELLA	21 OCT - 27 OCT	7	90	958	25	16	1600
30	TY	ELAINE	24 OCT - 31 OCT	8	95	943	29	14	1700
31	TS	FAYE	01 NOV - 04 NOV	4	55	987	13	---	1250
32	TY	GLORIA	03 NOV - 09 NOV	7	120	931	27	15	1850
33	TS	HESTER	14 NOV - 15 NOV	2	35	1000	5	---	350
34	TY	IRMA	21 NOV - 02 DEC	12	115	939	44	19	2250
35	TS	JUDY	18 DEC - 19 DEC	2	40	998	6	---	150
36	TS	KIT	*	5	40	995	14	---	1200
		1974 TOTALS		148**			657	194	

*Mary 11 Aug - 19 Aug and 23 Aug - 26 Aug
Kit 19 Dec - 21 Dec and 23 Dec - 24 Dec

**Overlapping days included only once in sum
+Over water estimate (one-minute averaging period)

No super typhoons (maximum sustained winds ≥ 130 knots) were observed during 1974, the first year since documentation began in 1959 that no typhoon reached this category. It is suspected, however, that Typhoon Gloria may have approached super typhoon intensity prior to landfall on the Philippine archipelago in early November. This is based on the trend of central pressure fall of the final aircraft fixes, however, lack of additional supporting evidence restricts Gloria from being entered in the super typhoon category.

One of the synoptic features during August and September was the penetration of monsoon westerlies to more poleward latitudes than normal. This situation was caused initially by the extremely large circulation of Typhoon Mary moving to subtropical latitudes. This resulted in an anomalous monsoon trough location extending from coastal South China northeastward to the Ryukyus. Of the four tropical cyclones that developed during this period three (Tropical Depression No. 20, Tropical Storm Rose, and Typhoon Shirley) displayed unusual initial courses compared to climatology by heading northeasterly.

By early October, the monsoon trough became re-established near its normal position in the Philippine Sea, and triggered development of a series of destructive cyclones which crossed the Philippine Islands. This parade of tropical cyclones, led by Bess in October and climaxed by Gloria in early November, subjected the Island of Luzon to the strikes of five typhoons in a period of slightly less than a month. The frequency of these repeated onslaughts to Luzon is unparalleled in climatological records available since World War II.

The Tropical Upper Tropospheric Trough (TUTT) was very active during 1974 producing 19% of the season's named tropical cyclones. Typhoons Polly, Virginia, Agnes and Tropical Storms Freda, Kim, and Wendy developed from disturbances caused by upper lows in the trough. A study of the long term average (Atkinson 1974) indicates approximately 15% of the named tropical cyclones in the western North Pacific can be traced to these disturbances which originate in the trade wind region, and are produced on the south and east periphery of the upper level lows.

TABLE 4-2 FREQUENCY OF TROPICAL STORMS (INCLUDING TYPHOONS) BY MONTHS AND YEARS

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1945	0	0	0	1	1	2	5	7	6	1	3	0	26
1946	0	0	1	0	1	2	3	2	3	1	2	0	15
1947	0	0	1	0	1	1	3	3	5	6	6	1	27
1948	1	0	0	0	2	2	2	5	5	4	3	2	26
1949	1	0	0	0	0	1	5	3	6	1	3	2	22
1950	0	0	0	0	1	2	3	2	3	3	3	1	18
1951	0	0	1	2	1	1	1	2	2	4	1	2	17
1952	0	0	0	0	0	3	3	4	5	6	3	4	28
1953	0	1	0	0	1	2	2	6	3	4	3	1	23
1954	0	0	1	0	1	0	1	6	4	3	3	0	19
1955	1	0	1	1	0	1	6	3	3	4	1	1	22
1956	0	0	1	2	0	1	2	5	5	2	3	1	22
1957	2	0	0	1	1	1	1	3	5	4	3	0	21
1958	1	0	0	0	1	3	5	3	3	3	2	1	22
1959	0	1	1	1	0	0	3	6	6	4	2	2	26
AVERAGE (1945-59)	0.4	0.1	0.5	0.5	0.7	1.5	3.0	4.0	4.3	3.3	2.7	1.2	22.3
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
AVERAGE (1960-70)	0.5	0.3	0.5	0.9	1.4	1.8	4.9	6.1	4.8	4.3	2.6	1.1	29.3

Based on available casualty reports, Typhoons Dinah and Gilda, Tropical Storm Wendy, and Tropical Depression No. 20 accounted for the majority of the tropical cyclone related casualties (Table 4-7). Typhoon Gilda proved the most disastrous of the year. Gilda's circulation triggered flashfloods and landslides in Korea and Japan in early July resulting in a heavy toll of lives (128). Damage estimates of $1.2 billion in Japan rank it among the most costly to strike that country in recent years. Torrential rains from the extra-tropical stages of Tropical Depression No. 20 produced similar results on the western coast of Korea in late August, accounting for a combined missing and dead total of 77. The worst marine disaster occurred near southern Taiwan as 3,500 ton Panamanian freighter SUN SHANG sank in heavy seas produced by Tropical Storm Wendy (60 knots) with the loss of 31 crewmen.

The northern Philippine Islands experienced a high frequency of typhoons (7) during the year with Dinah's crossing Luzon in June being the most disastrous as casualties totaled 106 persons. The succession of typhoons during October and November crossing Luzon, however, also inflicted heavy damage ($23 million) to the rice and sugar cane crops with serious economic impact on the island republic. Reconnaissance of one of these typhoons (Bess) while in the South China Sea, led to the tragic loss of a U.S. Air Force weather reconnaissance aircraft and its crew of six.

Much of the pertinent meteorological data and tropical cyclone damage statistics in this chapter were based on information received from the following sources: Weather Bureau of the Republic of China; Royal Observatory of Hong Kong; Office of the High Commissioner, Trust Territory of the Pacific Islands; Japan Meteorological Agency; National Weather Service of the Republic of the Philippines; and the Environmental Data Service, National Oceanic and Atmospheric Administration, Liverpool Underwriters Association.

[1] The climatology of tropical cyclone activity in the western North Pacific during the last 30 years indicates a significant increase in tropical cyclones since 1960. This is probably due to better observational data, especially satellites, during recent years. Therefore, JTWC considers the last 15-year period as the most representative of the long term average.

TABLE 4-3 FREQUENCY OF TROPICAL STORMS REACHING TYPHOON INTENSITY BY MONTHS AND YEARS

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1945	0	0	0	0	0	1	2	5	3	1	1	0	13
1946	0	0	1	0	1	1	3	1	3	1	2	0	13
1947	0	0	0	0	1	1	0	3	4	5	4	1	19
1948	1	0	0	0	2	0	2	2	4	1	2	1	15
1949	1	0	0	0	0	1	3	3	3	1	1	1	14
1950	0	0	0	0	1	1	1	2	1	3	2	1	12
1951	0	0	1	2	1	1	1	2	2	3	1	2	16
1952	0	0	0	0	0	3	1	3	3	4	3	2	19
1953	0	1	0	0	1	1	2	4	2	4	1	1	17
1954	0	0	0	0	1	0	1	4	4	2	3	0	15
1955	1	0	1	1	0	1	5	3	3	2	1	1	19
1956	0	0	1	1	0	0	2	4	5	1	3	1	18
1957	1	0	0	1	1	1	1	2	5	3	3	0	18
1958	1	0	0	0	1	3	4	3	3	3	1	1	20
1959	0	0	0	1	0	0	1	5	3	3	2	2	17
AVERAGE (1945-59)	0.3	0.1	0.3	0.4	0.7	1.0	1.9	3.1	3.2	2.5	2.0	0.9	16.3
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
AVERAGE (1960-74)	0.2	0.1	0.1	0.7	1.0	1.2	3.1	3.9	3.2	3.4	1.6	0.5	19.1

TABLE 4-4. RATIO OF TROPICAL STORM FREQUENCY DEVELOPMENT TO TYPHOON INTENSITY (1960-1974)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
AVERAGE NUMBER OF TROPICAL STORMS	0.5	0.3	0.5	0.9	1.4	1.8	4.9	6.1	4.8	4.3	2.6	1.1	29.3
AVERAGE NUMBER OF TYPHOONS	0.2	0.1	0.1	0.7	1.0	1.2	3.1	3.9	3.2	3.4	1.6	0.5	19.1
RATIO	.40	.33	.20	.78	.71	.67	.63	.64	.67	.79	.62	.45	.65

TABLE 4-5. SUMMARY OF JTWC WARNINGS 1960-1974

	1960-1974 (AVG)	1970	1971	1972	1973	1974
TOTAL NUMBER OF WARNINGS	704	533	747	739	390	657
CALENDAR DAYS OF WARNING	146	127	163	139	77	148
NUMBER OF WARNING DAYS WITH TWO OR MORE CYCLONES	50	29	54	46	27	38
NUMBER OF WARNING DAYS WITH THREE OR MORE CYCLONES	10	0	6	13	9	4

TABLE 4-6. TYPHOON DAYS 1960 - 1974

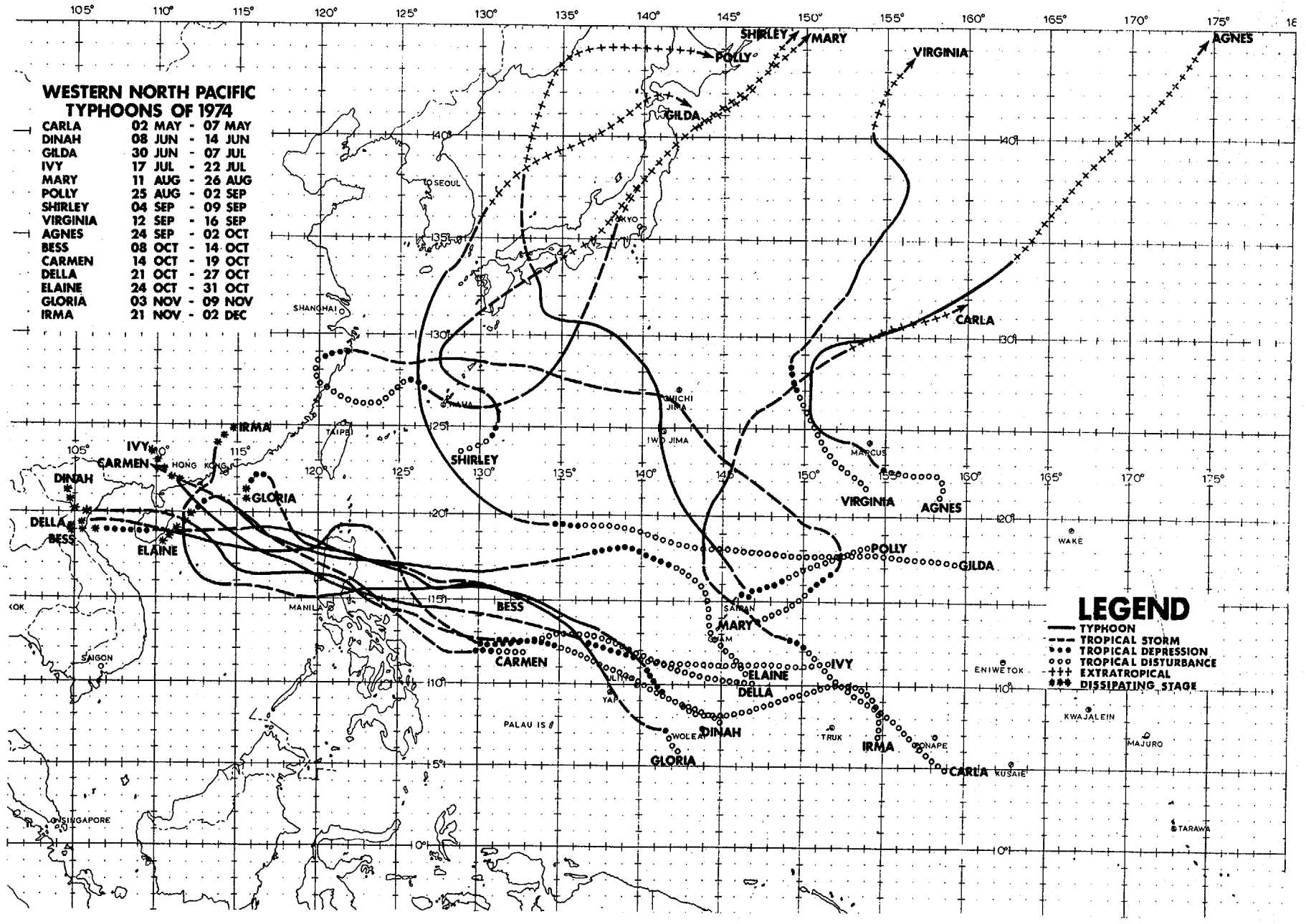
YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL PER YEAR
1960	---	---	---	2	---	10	13	36*	---	23*	2*	12	98
1961	---	---	8	---	8	2	10*	15	23*	17*	6	6	95
1962	---	---	---	7	4	---	14*	37*	8	17*	19*	---	119
1963	---	---	---	4	5	15	11	23*	14*	24*	---	11	107
1964	---	---	---	---	7	5*	22*	18*	28*	14	11*	6	111
1965	2	---	---	2	5	12*	19*	23*	25*	14	6	---	108
1966	---	---	---	5	11	6	7*	16*	23*	11	4	3	86
1967	---	---	2	7	---	4	14*	10	32*	21*	21*	---	111
1968	---	---	---	6	1	7	6	8	32*	19	18*	---	97
1969	5	---	---	5	---	---	8	6	10	18	10*	---	62
1970	---	5	---	---	---	2	5	24*	16	21*	6	---	79
1971	---	---	---	4	13*	8	20*	27*	21*	11	7	---	111
1972	2	---	---	---	1	6	39*	16	16*	21	9	11	121
1973	---	---	---	---	---	---	11*	7*	4	20*	---	---	42
1974	---	---	---	---	3	4	10	6	9	16*	13	---	62
TOTAL	9	5	10	42	58	81	209	272	261	280	132	49	1408
MEAN	0.6	0.3	0.7	2.8	3.9	5.4	13.9	18.1	17.4	18.7	8.8	3.3	93.9

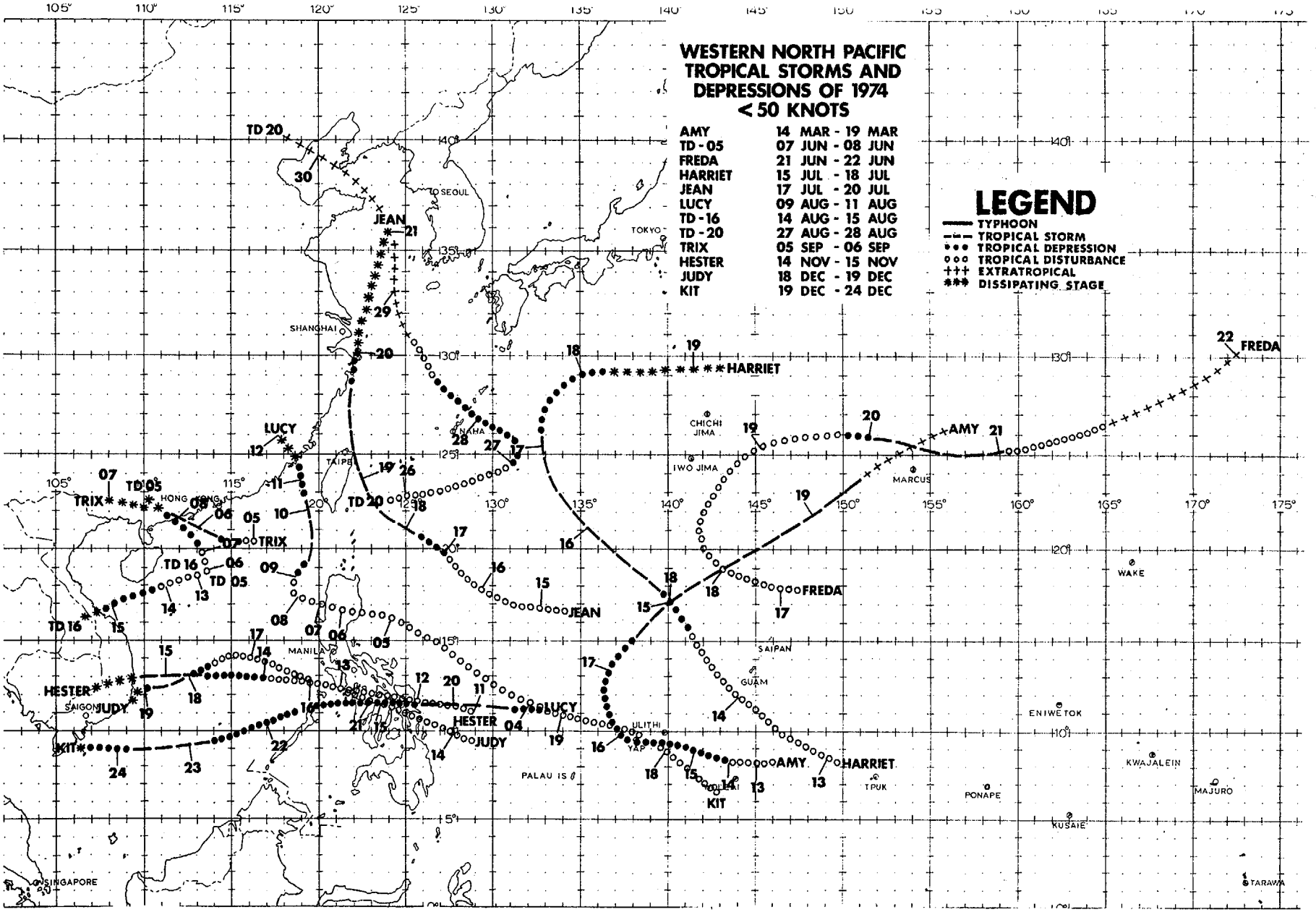
*Two typhoons occurring on the same day are counted as two typhoon days.

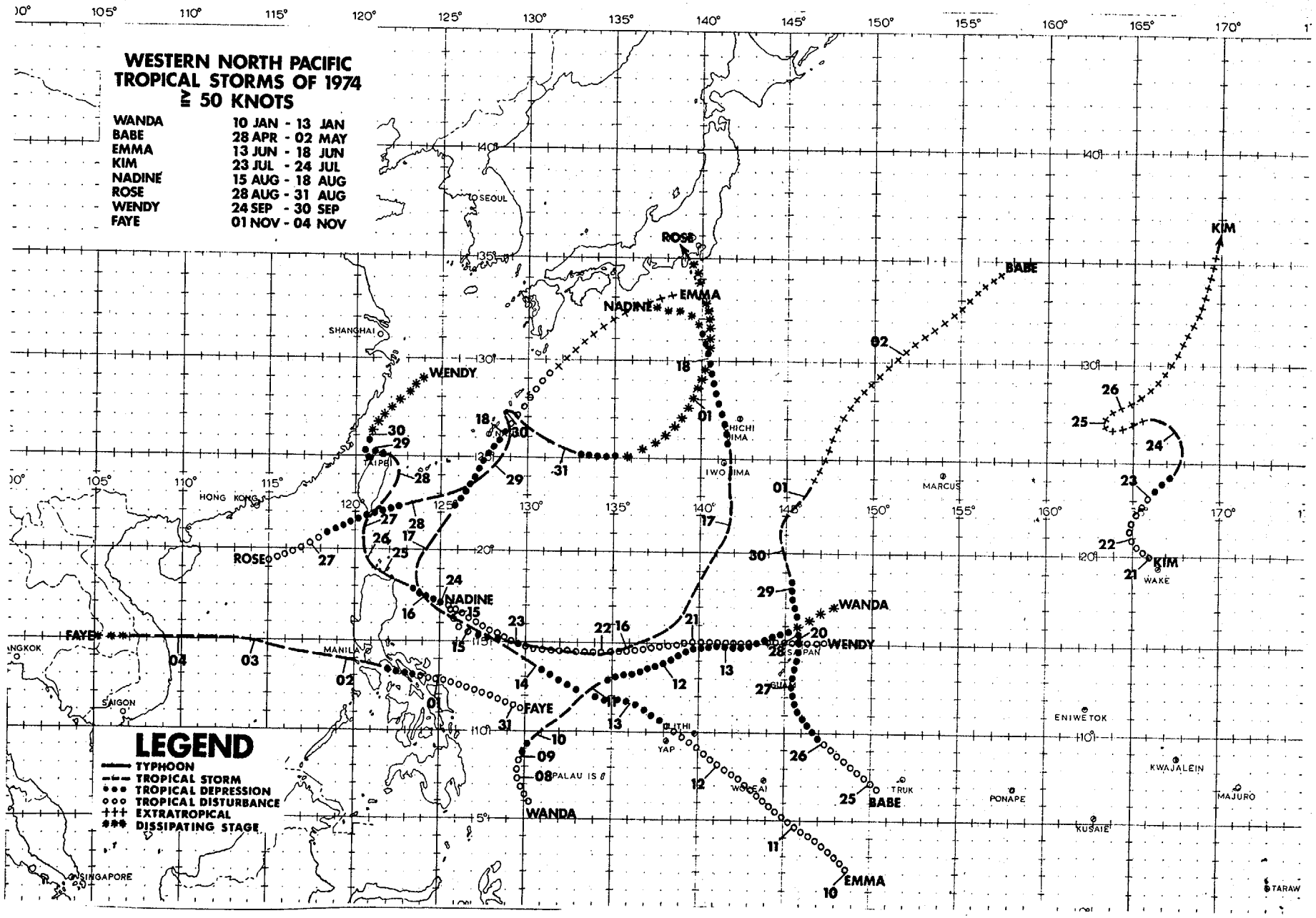
TABLE 4-7. LIST OF ESTIMATED CASUALTIES FOR THE 1974 SEASON

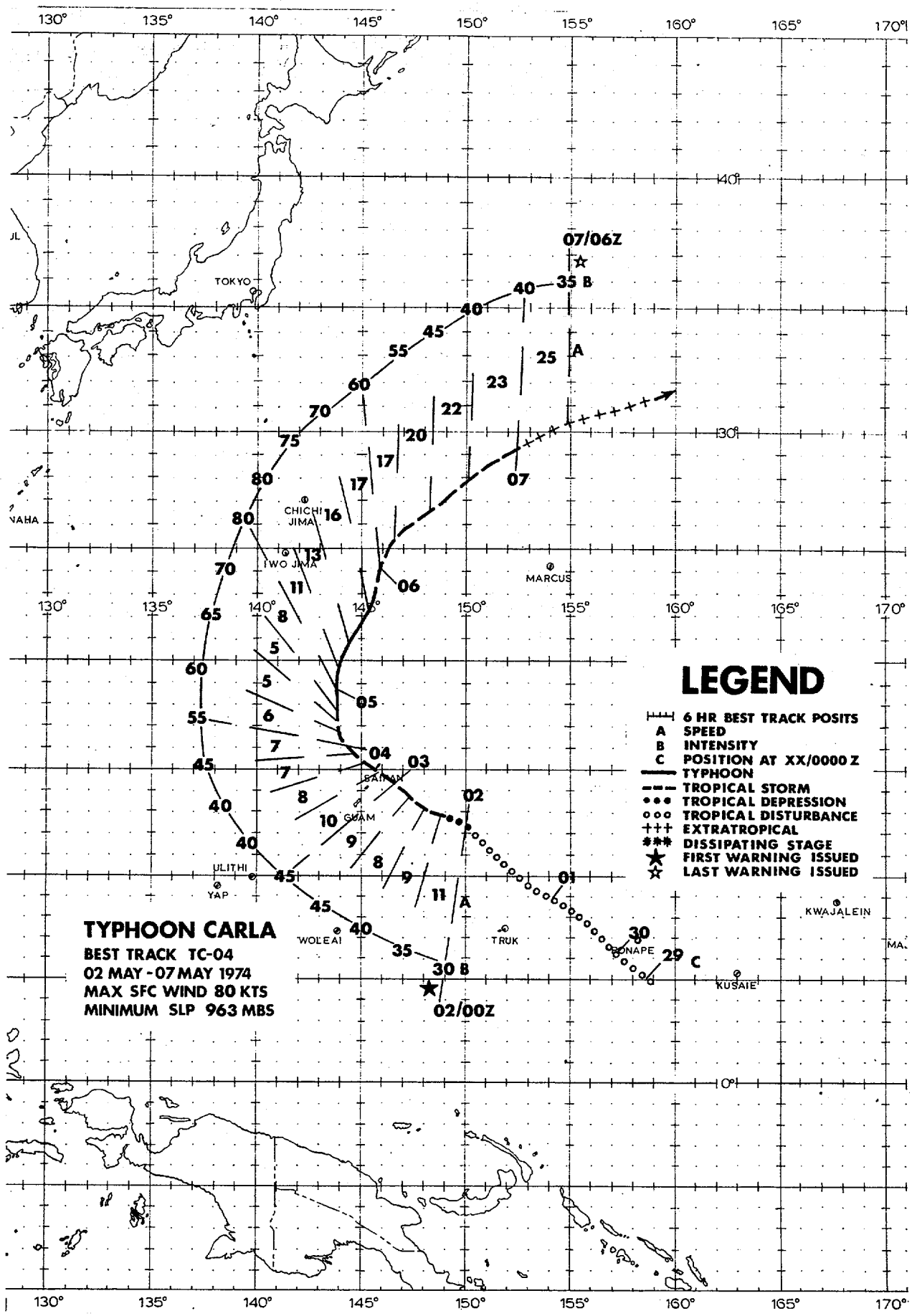
TYPE	NAME	DEATHS	MISSING
T	DINAH	73	33
T	GILDA	128	26
T	IVY	20	46
T	MARY	13	0
TD	NO. 20	9	68
T	POLLY	9	8
T	SHIRLEY	13	---
TS	WENDY	47	7
T	BESS	33	3
T	CARMEN	25	---
T	ELAINE	36	21
TS	FAYE	---	2
T	GLORIA	10	---
T	IRMA	11	---
TS	KIT	17	---
	TOTAL	434	214

NOTE: Only cyclones for which data are available are listed.


WESTERN NORTH PACIFIC
TYPHOONS OF 1974
CARLA 02 MAY - 07 MAY
DINAH 08 JUN - 14 JUN
GILDA 30 JUN - 07 JUL
IVY 17 JUL - 22 JUL
MARY 11 AUG - 26 AUG
POLLY 25 AUG - 02 SEP
SHIRLEY 04 SEP - 09 SEP
VIRGINIA 12 SEP - 16 SEP
AGNES 24 SEP - 02 OCT
BESS 08 OCT - 14 OCT
CARMEN 14 OCT - 19 OCT
DELLA 21 OCT - 27 OCT
ELAINE 24 OCT - 31 OCT
GLORIA 03 NOV - 09 NOV
IRMA 21 NOV - 02 DEC
LEGEND
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
SHIRLEY
MARY
POLLY
VIRGINIA
AGNES
GILDA
CARLA
IRMA
IVY
CARMEN
DINAH
GLORIA
DELLA
BESS
ELAINE
TO SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
HONG KONG
MANILA
SAIGON
SINGAPORE
PALAU IS
YAP
WOLEAI
TRUK
SAIPAN
GUAM
IWO JIMA
MARCUS
WAKE
ENIWETOK
KWAJALEIN
MAJURO
TARAWA
KUSAIE
PONAPE


WESTERN NORTH PACIFIC
TROPICAL STORMS AND
DEPRESSIONS OF 1974
< 50 KNOTS
AMY 14 MAR - 19 MAR
TD - 05 07 JUN - 08 JUN
FREDA 21 JUN - 22 JUN
HARRIET 15 JUL - 18 JUL
JEAN 17 JUL - 20 JUL
LUCY 09 AUG - 11 AUG
TD - 16 14 AUG - 15 AUG
TD - 20 27 AUG - 28 AUG
TRIX 05 SEP - 06 SEP
HESTER 14 NOV - 15 NOV
JUDY 18 DEC - 19 DEC
KIT 19 DEC - 24 DEC
LEGEND
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
HONG KONG
MANILA
SAIGON
SINGAPORE
PALAU IS
CHICHI JIMA
IWO JIMA
MARCUS
SAIPAN
GUAM
ULITHI
YAP
TPUK
PONAPE
KUSAIE
ENIWETOK
WAKE
KWAJALEIN
MAJURO
TARAWA


WESTERN NORTH PACIFIC
TROPICAL STORMS OF 1974
≧ 50 KNOTS
WANDA 10 JAN - 13 JAN
BABE 28 APR - 02 MAY
EMMA 13 JUN - 18 JUN
KIM 23 JUL - 24 JUL
NADINE 15 AUG - 18 AUG
ROSE 28 AUG - 31 AUG
WENDY 24 SEP - 30 SEP
FAYE 01 NOV - 04 NOV
LEGEND
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
SEOUL
SHANGHAI
TAIPEI
HONG KONG
MANILA
SAIGON
SINGAPORE
BANGKOK
IWO JIMA
HICHI JIMA
MARCUS
WAKE
SAIPAN
GUAM
YAP
PALAU IS
TRUK
PONAPE
KUSAIE
ENIWETOK
KWAJALEIN
MAJURO
TARAW


TYPHOON CARLA
BEST TRACK TC-04
02 MAY - 07 MAY 1974
MAX SFC WIND 80 KTS
MINIMUM SLP 963 MBS
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/0000 Z
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
07/06Z
02/00Z
TOKYO
CHICHI JIMA
TWO JIMA
MARCUS
SAIPAN
GUAM
ULITHI
YAP
WOLEAI
TRUK
PONAPE
KUSAIE
KWAJALEIN
130°
135°
140°
145°
150°
155°
160°
165°
170°

2. INDIVIDUAL TYPHOONS

CARLA

In late April, the monsoon trough became active in the central Carolines, producing a tropical depression that later became Tropical Storm Babe. Shortly thereafter, another circulation in the trough near Ponape was noted on 29 April. The system tracked northwestward during the next three days, its development aided by the upper level outflow of Babe tracking north of the Marianas. By 2 May, the circulation located about 225 miles southwest of Saipan, had developed into Tropical Storm Carla (Figure 4-1).

Continuing a northwest track, Carla's center crossed Tinian in the south central Marianas about 0800Z on the 3rd. The U.S. Coast Guard Loran Station on southern Saipan (located a few miles to the north of the center) recorded a peak gust of 57 knots within an hour after passage of the center. The maximum 24-hour rainfall recorded on Saipan during passage was 2.63 inches.

With a mid-tropospheric long wave trough situated between 130 and 135 E, Carla began to turn poleward late on the 3rd. As Carla tracked west of the northern Marianas by some 100 nm on the 4th, aircraft reconnaissance indicated Carla's pressure had fallen to 978 mb and maximum winds around its center neared 65 kts. By 1200Z on the 4th, Carla became the season's first typhoon (Figure 4-2).

The heavy rains and gusty winds brought by Carla to the Marianas took a heavy toll on fruit crops (bananas, citrus, etc.). Rota, Tinian, and Saipan reported 95% damage to crops while Pagan and Agrihan in the northern Marianas reported 45% damage.

Carla continued to deepen on the 5th while tracking northward. Reconnaissance aircraft measurements indicated peak intensity was attained early in the day southwest of the Maug Islands as Carla's central pressure dipped to 963 mb. Maximum sustained surface winds (1 min) were probably close to 80-85 knots near the eye at this time.

Increasing tropospheric shear began to weaken Carla after passage north of the 20th parallel as the cyclone approached the base of the mid-tropospheric westerlies. Twenty-four hours after reaching peak intensity, Carla was reduced to tropical storm intensity, 300 nm east of Iwo Jima.

In advance of a front moving southeastward from Japan, Carla began to accelerate northeastward on the 6th and fill in central pressure. By 1200Z, synoptic and satellite data indicated the remains of Carla had merged with the frontal zone as a weak low near 36N and 158E.

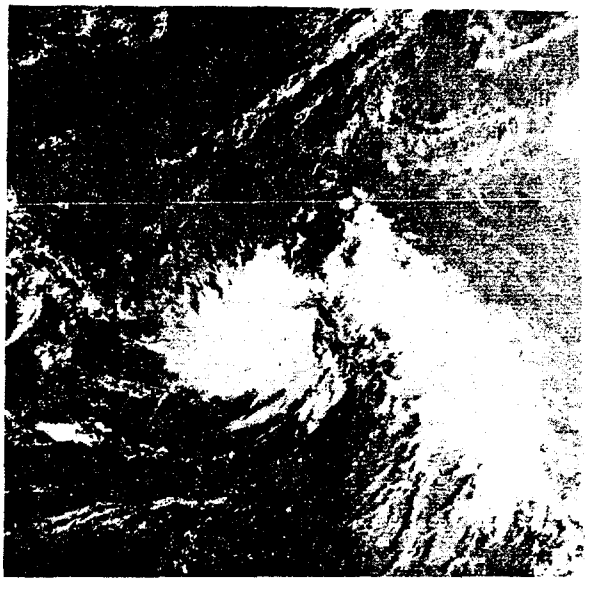
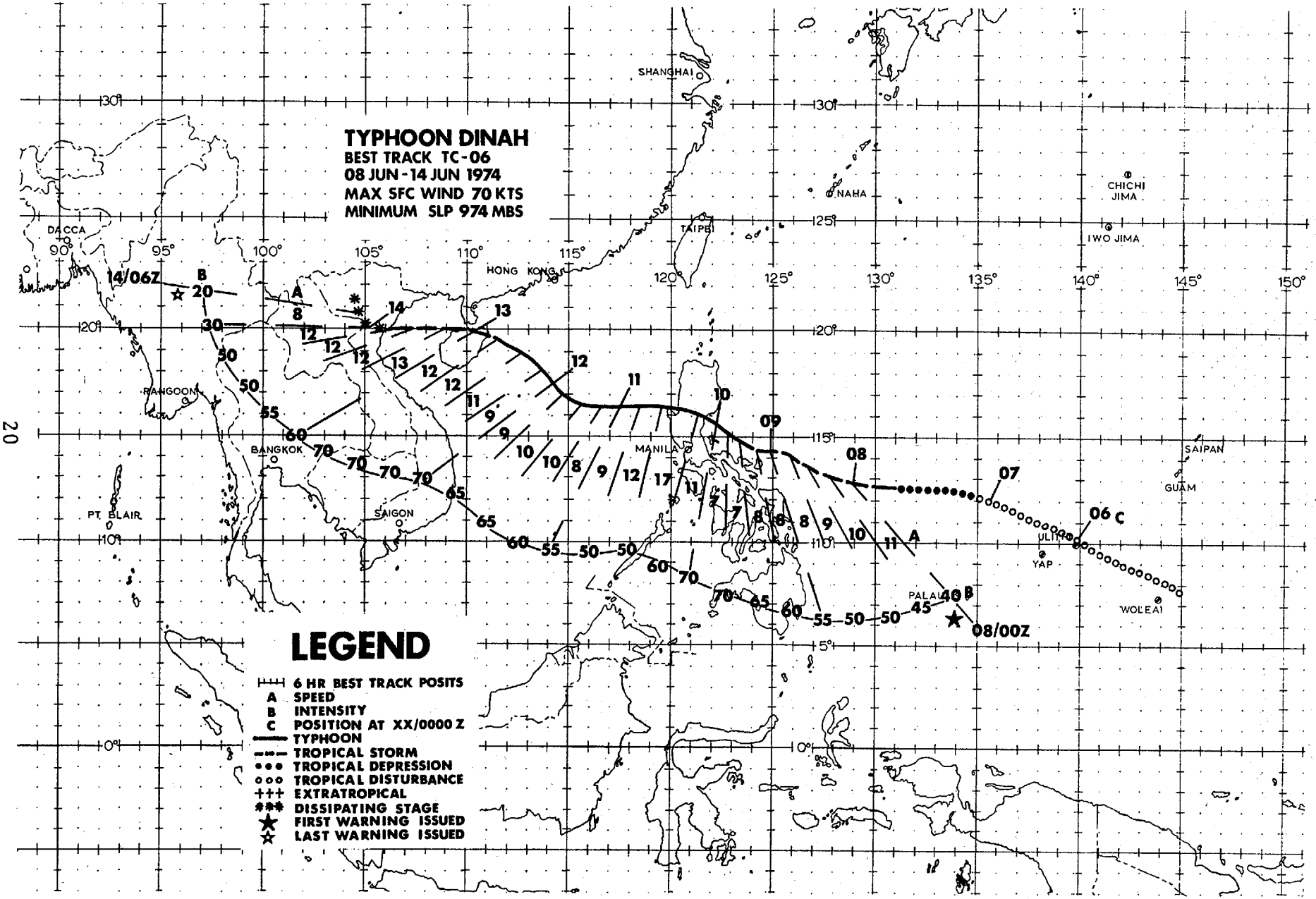


FIGURE 4-1. *Carla prior to attaining tropical storm intensity 300nm southeast of Saipan, 1 May 1974, 2236Z. (DMSP imagery)*

FIGURE 4-2. *Carla achieving typhoon intensity 210nm northwest of Saipan, 5 May 1974, 0205Z. (DMSP imagery)*


TYPHOON DINAH
BEST TRACK TC-06
08 JUN - 14 JUN 1974
MAX SFC WIND 70 KTS
MINIMUM SLP 974 MBS
SHANGHAI
NAHA
CHICHI JIMA
IWO JIMA
TAIPEI
HONG KONG
DACCA
RANGOON
BANGKOK
SAIGON
MANILA
PT BLAIR
SAIPAN
GUAM
YAP
ULITHI
WOLEAI
PALAU
14/06Z
08/00Z
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/0000 Z
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED

Dinah's incipient stages can be traced back to a weak circulation in the monsoon trough first noted on synoptic charts on 5 June in the west central Carolines. The system tracked west-northwestward passing just north of Ulithi atoll early on the 6th reaching tropical depression status the next day (Figure 4-3). As a strong subtropical ridge built westward, the depression crossed the Philippine Sea at a rapid pace up to 20 knots. On the 8th, it began to slow in forward speed and intensify about 200 nm east of Samar Island.

Following somewhat of a meandering course Dinah passed just north of Catanduanes Island on the 9th and veered temporarily to a northwest track in response to a short wave trough over the East China Sea. Aircraft reconnaissance indicated that Dinah had developed typhoon force winds in its northern semicircle during this period. An aircraft measurement shortly before landfall indicated a central pressure of 974 mb (10/0235Z) the lowest observed during the cyclone's lifetime. At landfall, the coastal town of Baler (15 nm south of the center) reported a minimum pressure of 979.8 mb and gusts to 46 knots while Casiguran 35 nm north of the center measured a gust to 47 knots (Figure 4-4).

Dinah cut across Luzon's mountainous terrain in less than 6 hours emerging north of the Lingayen Gulf near the town of San Fernando. Torrential rains (24 hour totals up to 19.4 inches at Virac and 15.4 inches at Baler) set off flash flooding and landslides in the island Republic claiming a toll of 73 dead and 33 missing. Estimates of damage caused by Dinah were approximately $1 million.

Dinah assumed a westerly course after exiting Luzon regaining typhoon strength by midday on the 11th. Aircraft reconnaissance reported a central pressure of 978 mb (11/0855Z) within a broad center estimated to be 50 nm in diameter. The Japanese ship MATSUSHIMA MARU passed about 40 nm east of the center a few hours later (11/1200Z) reporting a minimum pressure of 980.8 mbs. Dinah's central pressure varied little thereafter, and its center remained broad until landfall on Hainan Island.

As a high pressure region over South China advanced into the East China Sea, Dinah shifted course for the Luichow peninsula on the 12th. Rebuilding pressures, however, blocked Dinah from crossing the South China coast. Following transit of northern Hainan Island, Dinah weakened to tropical storm strength and entered North Vietnam south of Haiphong quickly dissipating once inland.

While in the South China Sea, Dinah's circulation was extensive; radius of the area within the 1000 mb isobar was about 360 nm by the 11th. On this day, Pratas Island 150 nm north of the center reported sustained winds (10 min) of 30 knots (11/1200Z), and the Japanese ship NISSHO MARU 125 nm east of the center reported estimated winds of 45 knots. By the 12th, an unidentified ship caught 60 nm north of the center reported estimated winds of 45 knots (12/0000Z). Later that day, the Chinese meteorological station on the Paracel Islands 120 nm south of the center recorded sustained winds (10 min) of 45 knots. Strong gusty winds were also felt in Hong Kong on the 12th as the eye of Dinah passed some 250 to 200 nm south and southwest. Wagland Island in the Colony reported gusts up to 60 knots and the Royal Observatory gusts to 64 knots.

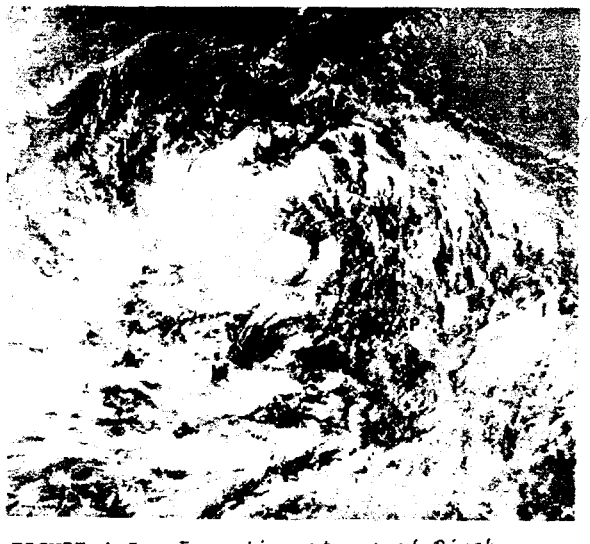


FIGURE 4-3. *Formative stages of Dinah centered 200nm northwest of Yap, 6 June 1974, 2330Z. (DMSP imagery)*

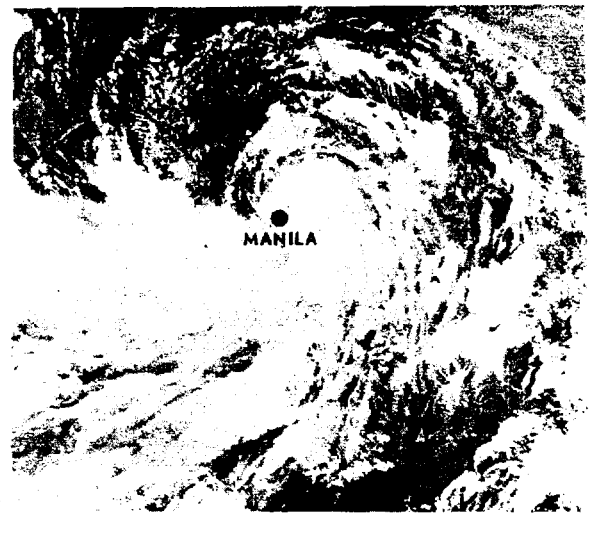
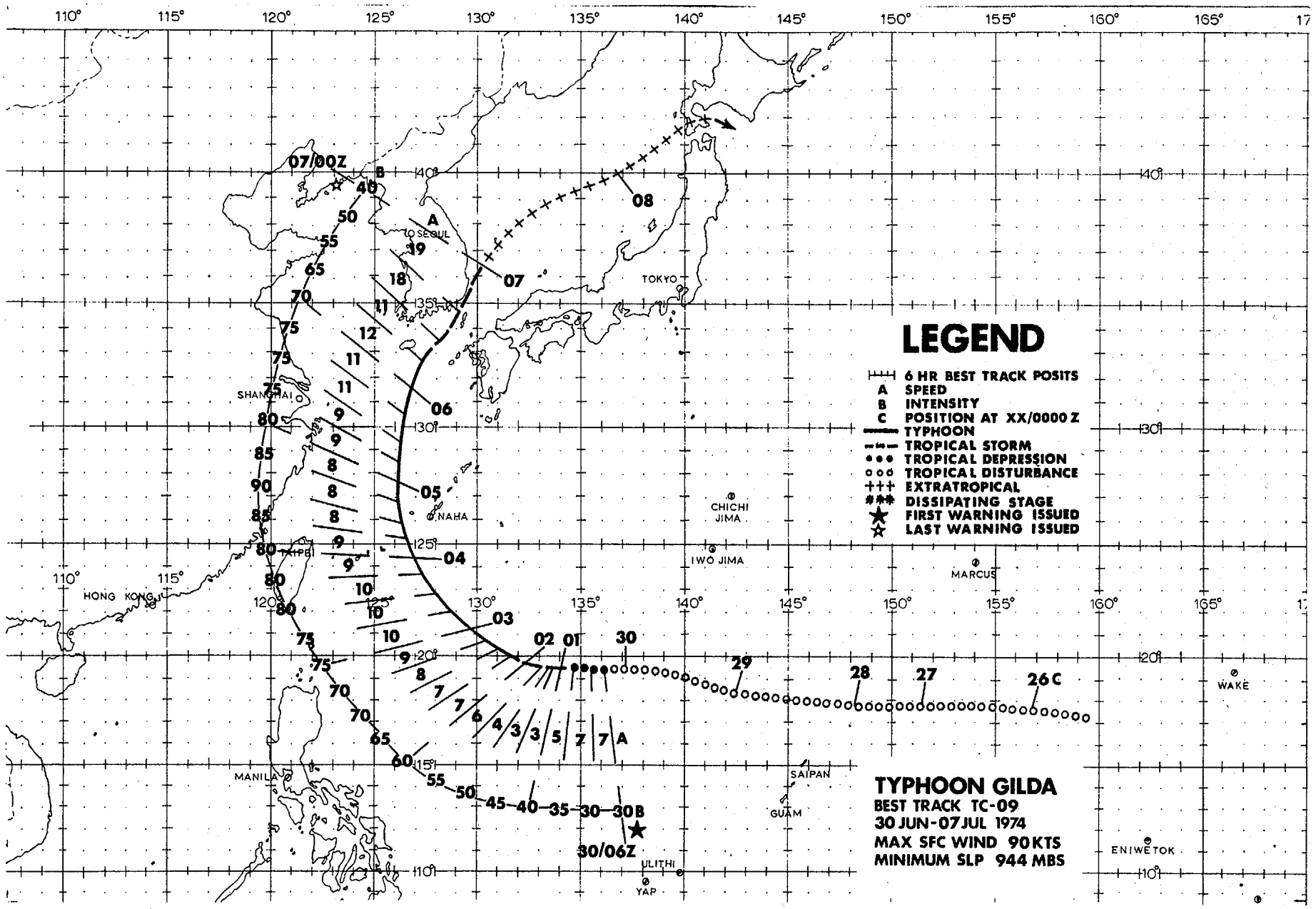


FIGURE 4-4. *Typhoon Dinah a few hours from landfall on Luzon island near Baler, 10 June 1974, 0017Z. (DMSP imagery)*


LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/0000 Z
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
TYPHOON GILDA
BEST TRACK TC-09
30 JUN-07 JUL 1974
MAX SFC WIND 90 KTS
MINIMUM SLP 944 MBS
07/00Z
30/06Z
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
HONG KONG
MANILA
CHICHI JIMA
IWO JIMA
MARCUS
WAKE
SAIPAN
GUAM
ENIWETOK
ULITHI
YAP

The third typhoon of the season, Gilda, developed to typhoon strength 450 nm southeast of Okinawa on 2 July. Initial detection of the system was on 25 June about 400 nm north of Eniwetok as a weak circulation on the trailing edge of a surface trough which extended northeastward to the vicinity of Midway Island. The system tracked westward for five days displaying little marked development based on satellite data coverage. By the 29th, however, signs of increased organization became evident and, late the following day, Gilda's circulation had generated surface winds of tropical storm intensity.

Gilda began to move poleward on the 2nd and develop winds of typhoon strength as a stationary mid-tropospheric trough dominated eastern China. Early that day, the Japanese vessel SHINKYOKU MARU crossed southward just ahead of Gilda's path observing northwesterly winds of 45 knots and a pressure of 988.0 mb (02/0600Z).

The typhoon reached its peak intensity during the two-day period it approached the Ryukyu chain (Figure 4-5). Reconnaissance aircraft measured a 944 mb central pressure (04/1431Z) when the eye passed 70 nm southwest of Naha, Okinawa on the 4th. A peak gust of 85 knots was measured at the Naha Observatory (04/0840Z) during passage, while on Kume Jima a gust of 101 knots was registered several hours later (04/1550Z) when Gilda's eye passed 30 nm to the west.

Heavy rain and gusty winds from Gilda were responsible for almost a complete failure in Okinawa's electric power. Heavy rains (up to 10.8 inches at Naha) also accounted for numerous landslides and local flooding. One person was reported killed and several fishing vessels sunk. Crops including sugarcane, bananas, and vegetables suffered extensive damage.

As the typhoon entered the East China Sea, it tracked northward around the western periphery of the mid-tropospheric subtropical ridge. Diminishing in intensity while approaching Cheju Do Island early on the 6th (Figure 4-6), Gilda responded to increasing upper level southwesterly flow over Manchuria, and began to accelerate. By the 7th, Gilda's circulation was in the Sea of Japan as an extratropical system heading toward southern Hokkaido.

Gilda brought torrential rains to Korea during passage near the southeast coast with total rainfall amounts exceeding 10 inches near coastal areas. The highest amount of 10.8 inches was measured at Kwangyang. The heavy rains caused flash flooding and landslides which completely or partially destroyed over 700 dwellings and left over 6000 homeless. Total damage loss was estimated at $2.8 million, with casualties of 21 dead and 11 missing.

Meanwhile, Gilda's circulation activated a stationary front over western and central Japan producing torrential rains over a widespread area. The coastal town of Owase on the Kii peninsula reported an extreme 24 hour total of 16.5 inches. Newspaper reports indicated Gilda caused an estimated $1.2 billion in property damage, including tens of thousands of flooded homes, damaged roads, and washed out railway lines and bridges. The toll in Japan from landslides and flash flooding accounted for 106 dead and 15 missing.

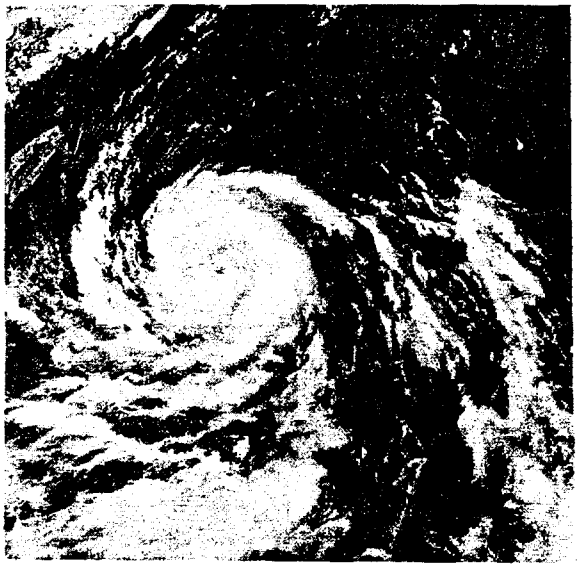


FIGURE 4-5. *Typhoon Gilda near peak intensity 100nm southwest of Naha, Okinawa, 3 July 1974, 0227Z. (DMSP imagery)*

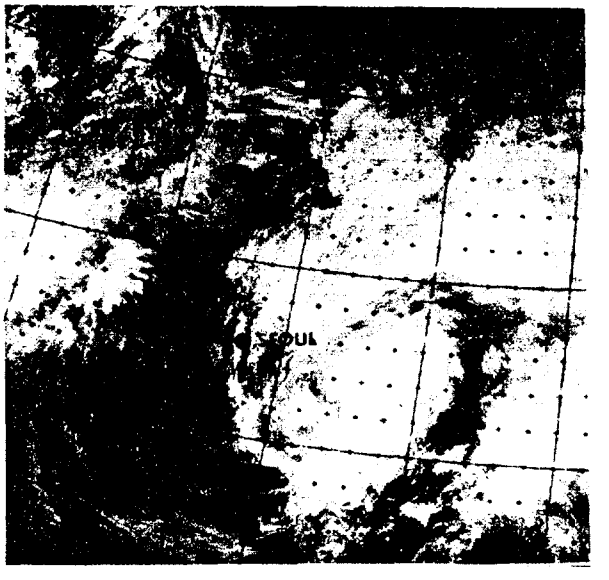
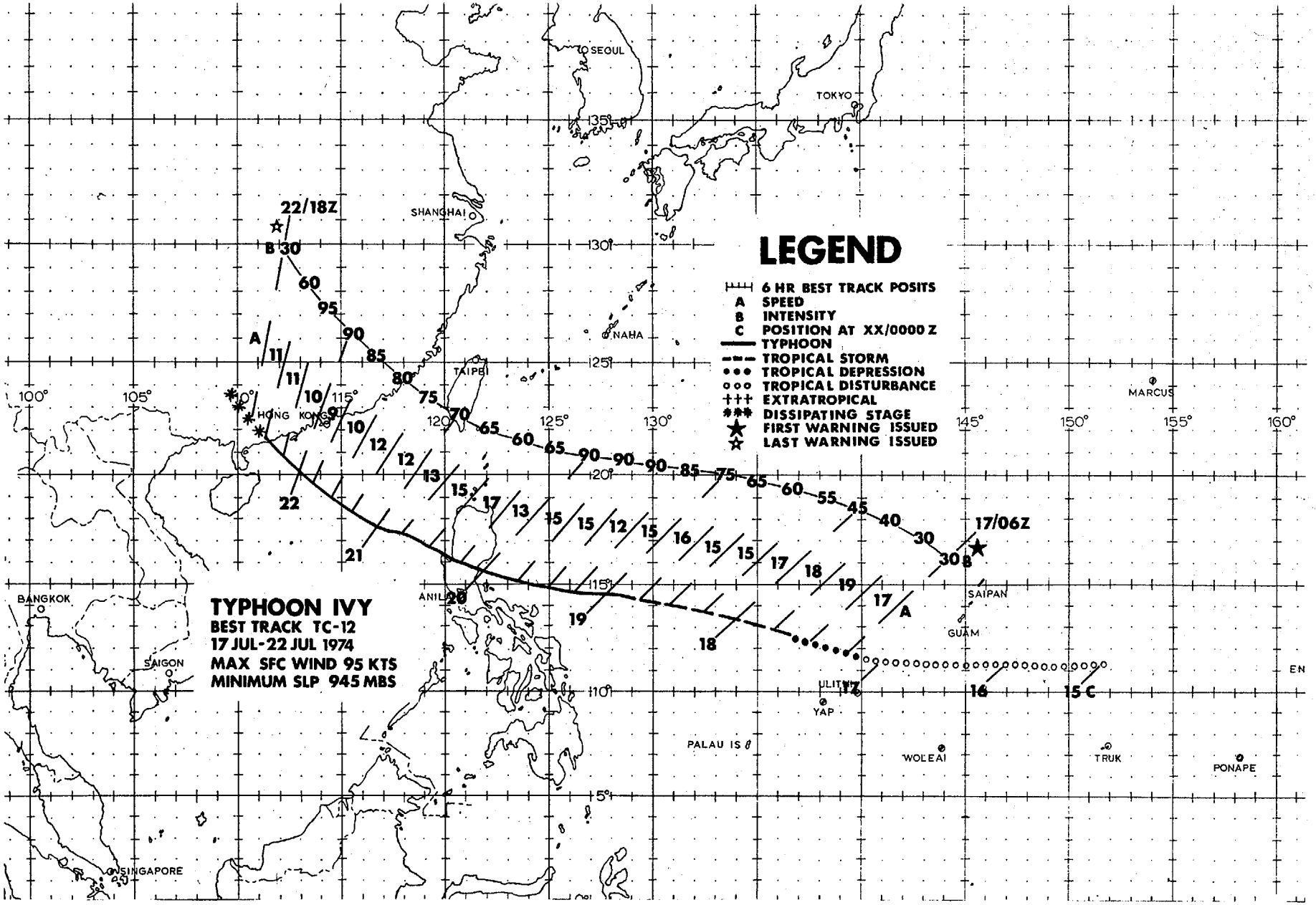


FIGURE 4-6. *Typhoon Gilda acquiring extratropical characteristics in the Sea of Japan 180nm southeast of Seoul, Korea 7 July 1974, 0254Z. (DMSP imagery)*


LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/0000 Z
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
TYPHOON IVY
BEST TRACK TC-12
17 JUL-22 JUL 1974
MAX SFC WIND 95 KTS
MINIMUM SLP 945 MBS
22/18Z
17/06Z
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
HONG KONG
MARCUS
SAIPAN
GUAM
BANGKOK
SAIGON
SINGAPORE
YAP
PALAU IS
WOLEAI
TRUK
PONAPE
100°
105°
110°
115°
120°
125°
130°
135°
145°
150°
155°
160°
5°
10°
15°
20°
25°
30°

The 0000Z synoptic chart for 17 July depicted multiple tropical cyclones over the Philippine Sea. Harriet was weakening to depression status east of Okinawa as Jean developed storm force winds east of the Luzon Straits. Meanwhile, evidence of a strengthening depression was noted in the monsoon trough 250 nm west-southwest of Guam. The last system, destined to become Ivy, intensified to tropical storm force the following day (18th) (Figure 4-7). Within two days, Ivy struck Luzon as a well developed typhoon.

Ivy's track across the Philippine Sea was affected by a strong subtropical ridge resulting in movement speeds of 15-18 knots. Once Tropical Storm Jean crossed into the East China Sea, the subtropical ridge built westward and prevented Typhoon Ivy from taking a climatological northwesterly track. Instead, the typhoon was forced to maintain a westward course near the 15th parallel. The typhoon began to deepen rapidly on the 18th. Its central pressure dropped 32 mb in 20 hours, reaching a minimum of 945 mb (19/1037Z) about 15 hours prior to landfall. Filling slightly, Ivy struck the Luzon coast south of Baler with sustained winds of 90 knots early on the 20th. A peak gust of 97 knots from the east and a minimum pressure of 973 mb was reported at the Baler meteorological station during eye passage.

The severity of turbulence associated with Ivy prior to landfall on Luzon was readily attested to by an aircraft reconnaissance crew late on the 19th. During penetration of the wall cloud, turbulence was sufficient to flame out one of the WC-130's four engines. Fortunately, engine restart was accomplished by the crew while orbiting in the eye.

After crossing central Luzon, Ivy emerged into the South China Sea from the Lingayen Gulf quickly regaining typhoon strength lost during transit over the mountainous terrain. In response to a mid-tropospheric trough positioned just east of the Tibetan Plateau, Ivy began to take a more northward course gradually slowing in forward speed and reintensifying as it approached South China (Figure 4-8). Estimates based on satellite data indicated that prior to landfall (just east of the Luichow peninsula on the 22nd) maximum sustained winds near the center were probably in the 85-95 knot range.

The circulation of Ivy caused gale force gusts at Hong Kong as she passed 150 nm south of the Colony. Peak gusts of 63 knots and 55 knots were recorded on the exposed islands of Cheung Chau and Waglan Island, respectively. Maximum 24-hour rainfall was relatively light at the Royal Observatory with only 1.4 inches recorded on the 22nd. Ivy's circulation quickly lost identity after moving inland midway through the 22nd and the system disappeared from the surface analysis 24 hours later.

In the Philippines, the typhoon's casualty aftermath mounted to 66 persons with 46 of these listed as missing. Hardest hit by Ivy was Baler, a town of 15,000, in which newspaper reports indicated 50% of the houses were leveled. Also in the Polillo Island group in Lamon Bay, 42 fisherman were reported lost following Ivy's passage. Estimates of dollar damage to structures, crops, and livestock in Luzon were placed at $2 million.

FIGURE 4-7. *Tropical Storm Ivy about 450 nm east of Samar Island. Tropical Storm Jean is seen approaching Taiwan, 18 July 1974, 0253Z. (DMSP imagery)*

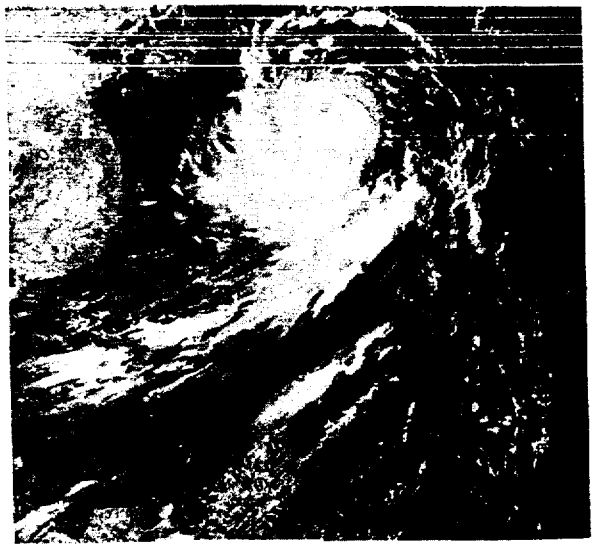
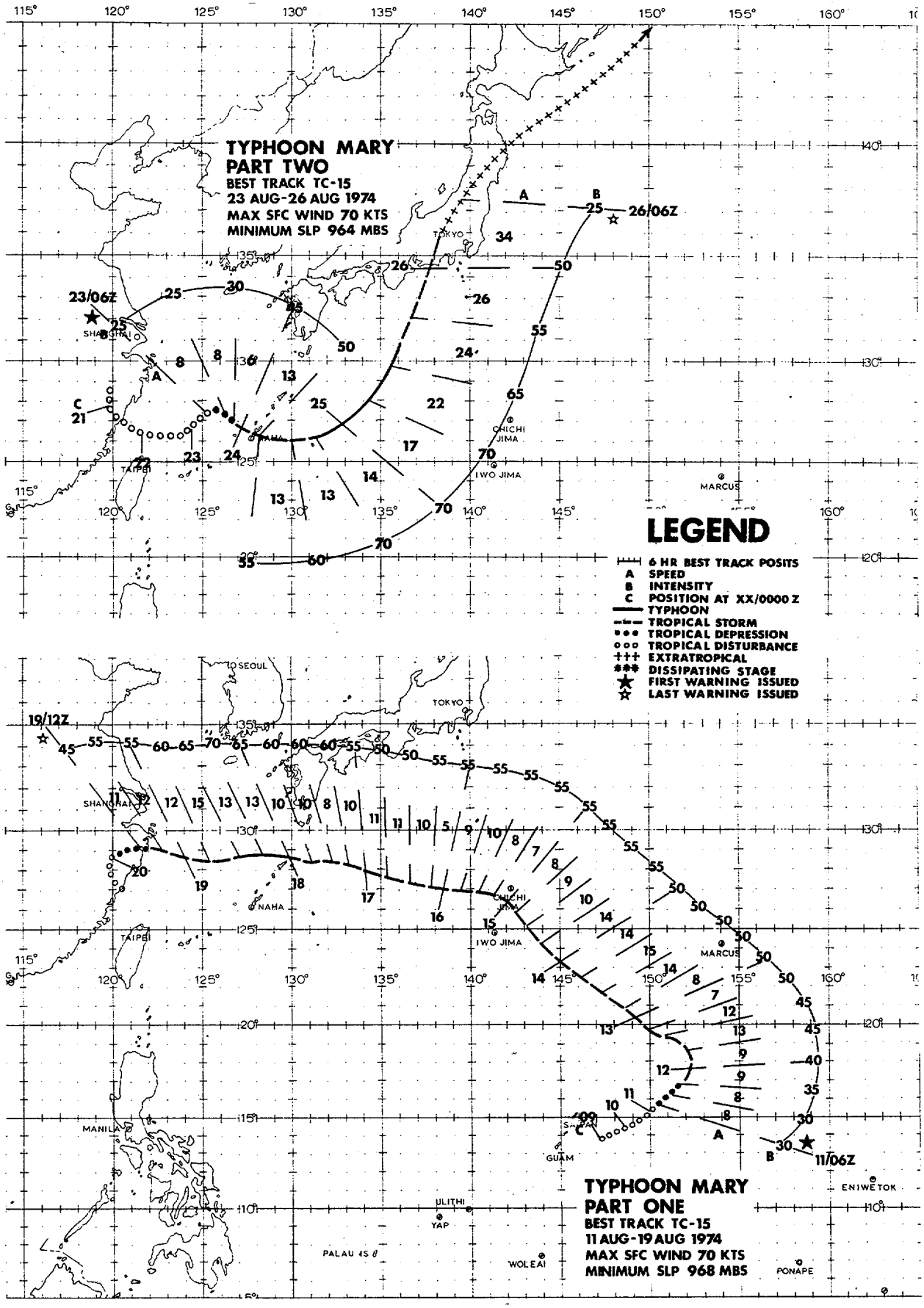


FIGURE 4-8. *Typhoon Ivy in the South China Sea 250 nm south of Hong Kong, 21 July 1974, 0339Z. (DMSP imagery)*


TYPHOON MARY
PART TWO
BEST TRACK TC-15
23 AUG-26 AUG 1974
MAX SFC WIND 70 KTS
MINIMUM SLP 964 MBS
23/06Z
26/06Z
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/0000 Z
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
TYPHOON MARY
PART ONE
BEST TRACK TC-15
11 AUG-19 AUG 1974
MAX SFC WIND 70 KTS
MINIMUM SLP 968 MBS
19/12Z
11/06Z
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
CHICHI JIMA
IWO JIMA
MARCUS
MANILA
GUAM
YAP
ULITHI
WOLEAI
PALAU IS
ENIWETOK
PONAPE

From its early stages east of the Marianas, to final dissipation over Japan, Mary's behavior was atypical of a tropical cyclone. Mary's circulation during the early stages was marked by maximum wind bands removed from the center by several hundred miles. In addition, the storm's circulation reached enormous proportions, dominating the weather events over the entire Philippine Sea for several days. The longest lived tropical cyclone of the season, Mary persisted for 15 days with 2 1/2 of these days spent inland from the East China coast. Toward the end of its lifetime, Mary culminated its unusual behavior by defying climatology, leaving the East China coast on an easterly heading, and regenerating to typhoon strength.

First identified as a weak circulation on synoptic surface charts on 9 August, Mary developed to depression status by the 11th in the monsoon trough some 250 nm east of Saipan. It is significant that during this period surface pressure falls to 5 mb below normal were occurring along the trough across the Philippine Sea. As a result, the monsoon westerlies began to intensify producing a narrow belt of winds averaging 25-30 knots feeding into the depression. By the 11th, satellite data revealed a band of cloudiness extending from the Philippine archipelago to the eastern Carolines in response to the strenthening monsoon flow (Figure 4-9).

Initially moving northeastward, Mary's circulation began to generate winds of tropical storm force late on the 11th. Thereafter, the storm shifted to a northwest course abruptly accelerating in forward speed to 14 knots on the 13th. Mary's circulation was characterized during this period by the existance of maximum wind bands far removed from the low pressure center. Reconnaissance aircraft reports on the 11th and 12th indicated that the center was becoming increasingly separated from the associated convective cloudiness. By the 13th, the center was 200 nm from the nearest convective band. The dimensions of the anomalous structure was readily apparent in satellite views on the 14th (Figure 4-10). By this time a band of convective cloudiness spiraling around the center in a broad arc was evident--a pattern quite similar to an extratropical low.

As Mary's center took a poleward component on the 12th and 13th, the associated convective band leading into the circulation, and trailing some 500 nm south and southwest of the center, drifted over Guam. Winds gusting to gale force occurred over a period of 3 days starting early on the 11th. Peak gusts from the southwest reached 57 knots on the 12th (0950Z) and the 13th (2012Z) at Andersen AFB. Rainfall amounts of 7.25 inches in 24 hours were recorded at Andersen AFB between the 11th and 12th as the island lay beneath Mary's outer convective band. This extreme 24-hour rainfall amount exceeds all records for August on Guam.

The persistent strong southwesterly winds were responsible for significant damage to marine interests on Guam. The CARIBIA, a 40,000 ton passenger liner, being towed to Taiwan for salvage, broke loose from her tug at the entrance to Apra Harbor, ran aground on the breakwater, and later sank. An estimated $3.3 million loss was associated with the sinking of this vessel. The heavy seas also took their toll on small craft (which are normally protected on the leeward side of the island in the trades) as many broke their moorings and went aground. One yacht valued at $250,000 was included among the lost vessels. Two lives were lost due to drowning and damage estimates amounted to over $542,000 in the Territory.

On Rota, Tinian, and Saipan crops were especially hard hit by the strong winds and torrential rains. On Tinian, the vessel MV MARIANAS broke from its moorings and went aground. In the northern Marianas, major damage was sustained mostly to copra and banana trees.

As Mary neared the Volcano Islands, the area of surface pressure of 1000 mb or less was exceedingly large-stretching at its greatest diameter some 1200 nm in a north-northeast/south-southwest orientation and 850 nm in an east-west direction. The unusually low pressures in the trough trailing Mary southwestward into the Philippine Sea caused development of a tropical depression some 350 nm north-northwest of Yap. Moving eastward in Mary's circulation, the depression apparently interacted with the tropical storm midday of the 14th when it approached within 700 nm of Mary's center, Mary's forward motion began to slow and the storm abruptly shifted to a westerly course early on the 15th. Meanwhile the strong tropical depression accelerated in forward speed around Mary's southeastern side and dissipated due to the excessive vertical shear.

Late on the 14th the center of Mary's broad eye crossed 35 nm south of Chichi Jima. The island's meteorological station reported a minimum pressure of 977.1 mb (14/2240Z)--only slightly higher than an aircraft reconnaissance central pressure observation a few hours later (972 mb at 15/0217Z).

On the 15th, a second depression was spawned 300 nm east of Luzon in the low pressure envelope trailing Mary. Accelerating eastward in Mary's circulation, Nadine developed to tropical storm force late on that day. Once Nadine was within 700 nm of Mary's center late on the 15th a second interaction occurred, resulting in Mary's continued westward movement (Figure 4-11).

A long wave mid-tropospheric trough west of Lake Baykal began to deepen on the 16th resulting in a rapid building of a ridge downstream over Manchuria with a high pressure cell centered near Port Arthur. This abnormally strong high blocked any further poleward movement and caused Mary to maintain an anomolous westward course until landfall

on the East China coast on the 19th.

During this westward movement, satellite data indicated that Mary developed a more tropical appearance as a canopy of cloudiness covered the cyclone's center. Mary intensified slightly, and for a short period on the 18th winds reached typhoon force as the storm cut through the Ryukyu chain (Figure 4-12). Naze city on Amami-O-Shima reported the lowest pressure (979.6 mb at 18/0240Z) as Mary's center tracked 20 nm to the north. The highest winds in the Ryukyus were measured at Yakushima Island which recorded a peak gust of 90 knots at 18/0040Z. As the typhoon's precipitation swept over southern Kyushu, heavy rainfall amounts varying between 8 and 11 inches were reported in the mountainous areas. Miyakonjo on Kyushu measured the greatest 24 hour total of 6.4 inches during the 18th.

Moving inland on the China coast about 100 nm south of Shanghai late on the 19th, Mary was blocked from moving into the mountainous interior by a high cell over central China. As a result, Mary stalled just inland as a deep depression for several days. Meanwhile, the mid-tropospheric ridge over Manchuria began to break down rapidly as a developing mid-tropospheric trough east of Lake Baykal begin to deepen equatorwards.

By the 22nd, the increasing westerly flow west of and over the Gulf of Chihli forced the depression back out over the open waters of the East China Sea.

Regenerating to minimum storm strength on the 23rd, Mary passed over Okinawa as a "back door" storm early on the 24th increasing in forward speed to 13 knots during crossing. The meteorological station at Kadena Air Base registered a minimum pressure of 981 mb (24/0105Z) and a peak gust from the northwest at 41 knots. Center passage was estimated 18 nm to the north of Kadena. At the Naha Observatory a peak gust of 58 knots (24/0330Z) was recorded. Later in the day, Mary passed just north of Minami Daito Jima as the storm achieved typhoon intensity. The Japanese weather station on the island experienced a peak gust of 90 knots (24/1707Z) and a minimum pressure of 969.3 mb (24/1704Z).

The development of a low within a mid-tropospheric trough over Korea began to draw Mary on a northward course late on the 24th. Due to the tightening gradient over Japan created by this deepening trough and a sub-tropical ridge cell positioned east of Honshu, Mary accelerated north-northeastward reaching a forward speed of 26 knots prior to striking Honshu near Hamamatsu on the 26th.

Mary briefly maintained typhoon status on the 25th, although the cyclone's winds dropped to storm strength prior to landfall on Honshu. Further evidence of Mary's rejuvenation came from aircraft reconnaissance late on the 24th observing a 15 mb drop in 24 hrs to 964 mb (24/2141Z). Several hours later the British vessel W. C. VAN HORNE was caught near the eye of the typhoon while crossing 30 nm east of the center. Winds of 70 knots from the south and a pressure of 981.8 mb were reported from this vessel at 25/0600Z. Crossing the Japanese coastline near Hamamatsu, the meteorological station indicated Mary's central pressure had risen to 986.2 mb (26/0030Z). Thirty minutes prior to center passage a peak gust of 63 knots was recorded at the station. Elsewhere along the coast, Omaezaki reported a southerly gust of 69 knots (26/0050Z).

Merging with a frontal system over Japan, Mary became extratropical moving inland over Honshu early on the 26th. Heavy rains spread over the north central region of the island with the greatest 24 hour amount of 8.98 inches occurring at Nikko. On the southern coast, Shizuoka City recorded a 24 hour total of 6 inches.

Only one causualty occurred in the Japanese islands as a result of Mary; however, strong winds associated with Mary over the Sea of Japan were responsible for capsizing a fishing trawler off Cape Amasaki. Of a crew of eleven, only one was rescued.

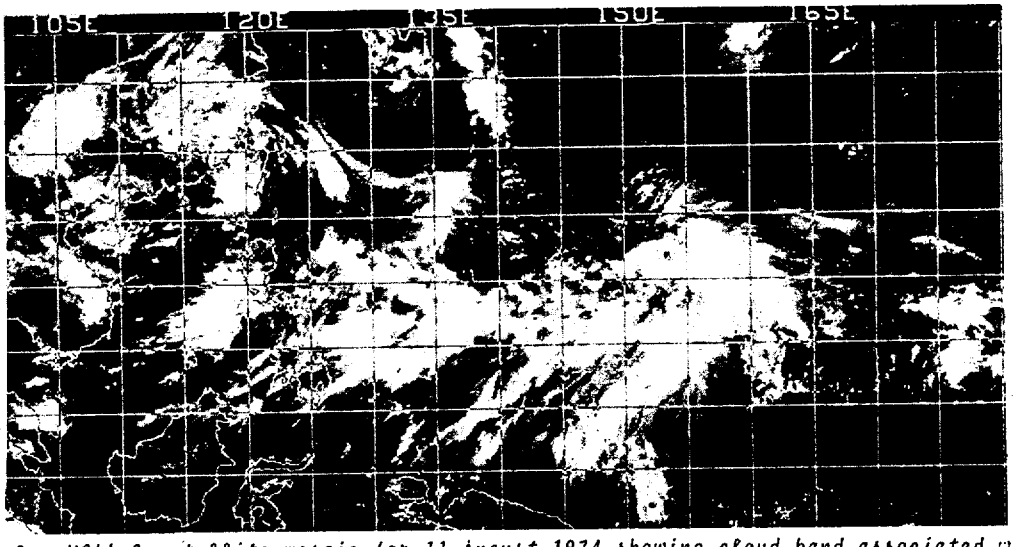


FIGURE 4-9. *NOAA-2 satellite mosaic for 11 August 1974 showing cloud band associated with southwest monsoon extending from the Philippines to Mary developing east of the Marianas.*

FIGURE 4-10. *Tropical Storm Mary appearing as an extratropical system centered 220 nm southeast of Iwo Jima, 14 August 1974, 0118Z. (DMSP imagery)*

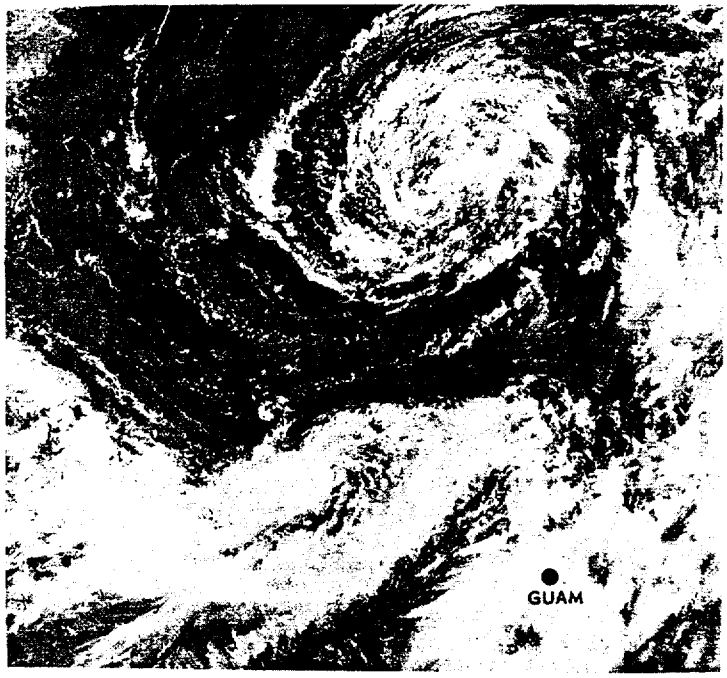


FIGURE 4-11. *Tropical Storm Mary (top) centered 550 nm south of Tokyo. Tropical Storm Nadine (bottom) 700 nm further south in the Philippine Sea is centered 400 nm north of Yap Island, 16 August 1974, 0223Z. (DMSP imagery)*

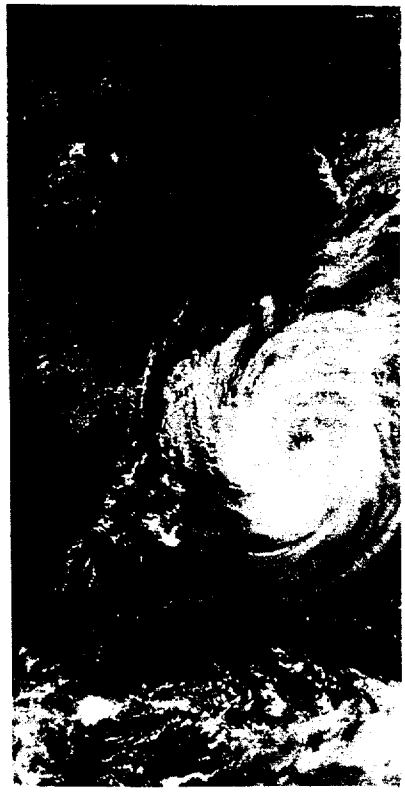
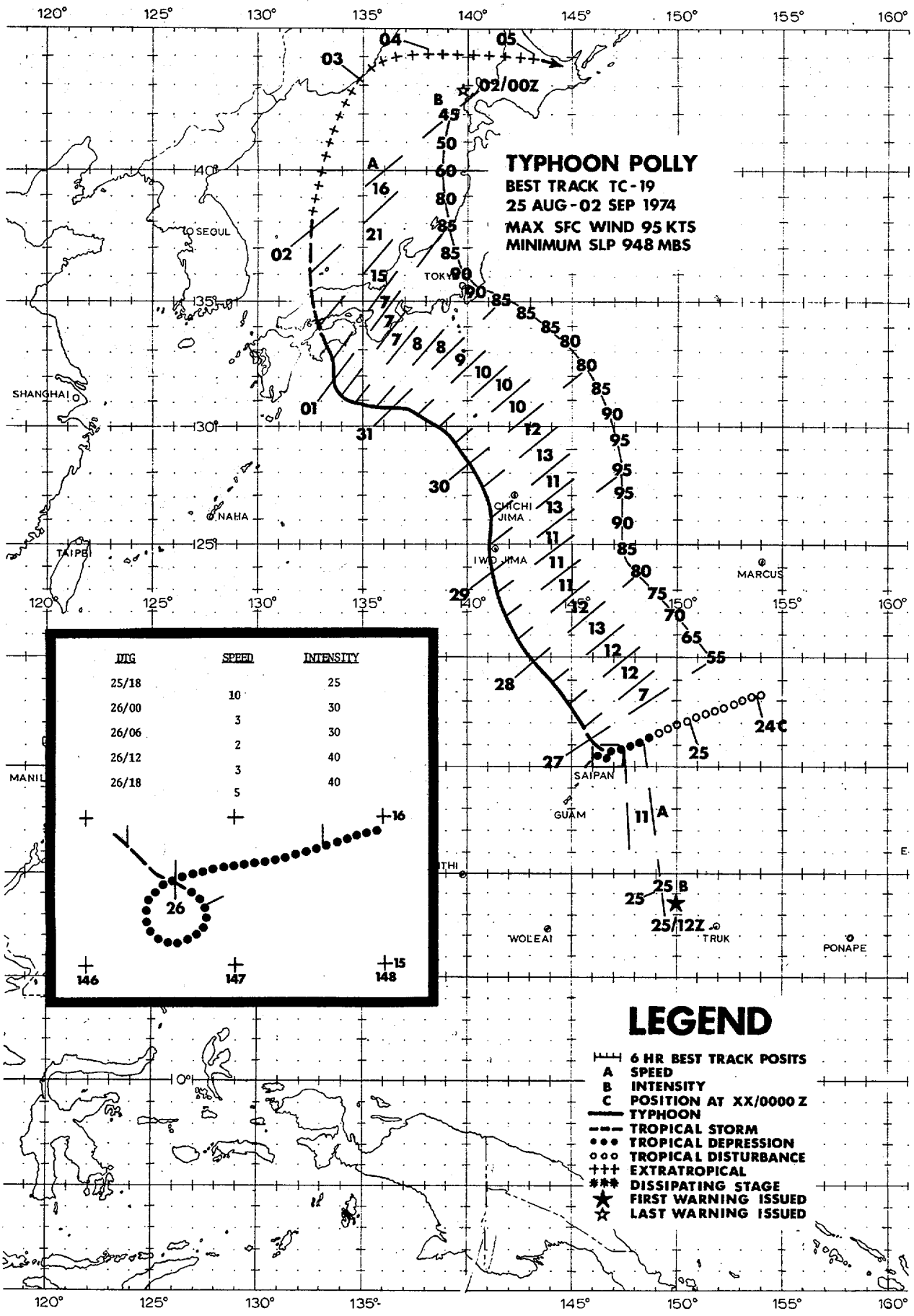


FIGURE 4-12. *Mary after reaching typhoon force centered 100 nm north of Naha, Okinawa, 18 August 1974, 0327Z. (DMSP imagery)*


TYPHOON POLLY
BEST TRACK TC-19
25 AUG-02 SEP 1974
MAX SFC WIND 95 KTS
MINIMUM SLP 948 MBS
02/00Z
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
CHICHI JIMA
IWO JIMA
MARCUS
SAIPAN
GUAM
WOLEAI
TRUK
PONAPE
MANIL
DTG
SPEED
INTENSITY
25/18
26/00
26/06
26/12
26/18
10
3
2
3
5
25
30
30
40
40
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/0000 Z
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED

While Mary was accelerating toward central Honshu, satellite data revealed another disturbance, induced from an upper level low, was showing signs of development 400 nm east of the northern Marianas. Midday on the 26th, the circulation system intensified into Tropical Storm Polly about 40 nm northeast of Saipan. Development was rapid thereafter, as the storm's central pressure dropped 25 mbs in a period of a day after an aircraft reconnaissance reading of 989 mb late on 26th (2056Z).

Polly's movement in the central Marianas was erratic as the storm was impeded by a high pressure cell located to the southwest near Yap. By the 27th, however, the flow about a strong high east of Japan dominated, and Polly departed the "col" region between the two anticyclones increasing in forward speed to 12 knots.

Veering northward late on the 28th, the typhoon took aim on the Volcano Islands. Polly's central pressure continued to fall terminating at a minimum value of 948 mb 170 nm south of Iwo Jima. Twelve hours later the typhoon passed abeam of Iwo Jima and later on the 29th passed about 70 nm west of Chichi Jima. Iwo Jima reported peak gusts of 108 knots from the south (29/0705Z) after the eastern edge of Polly's 20 nm diameter eye passed the island. A minimum pressure of 951.5 mb was registered while in the eye. Later, Chichi Jima recorded a peak gust of 88 knots from the east-northeast (29/1240Z) and a minimum pressure of 989.8 mb (29/1900Z) during passage.

During Polly's advancement northward from the Marianas, Tropical Storm Rose generated east of Taiwan. Late on the 29th, Rose had moved to a position just north of Okinawa, and become quasistationary. The proximity of Tropical Storm Rose 700 nm west of Polly and a blocking high north and northeast of Polly resulted in the beginning of a Fujiwara interaction on the 30th. Polly began to turn northwest to westward during the next day and a half, as Rose sped around the south side of Polly's circulation (Figure 4-13).

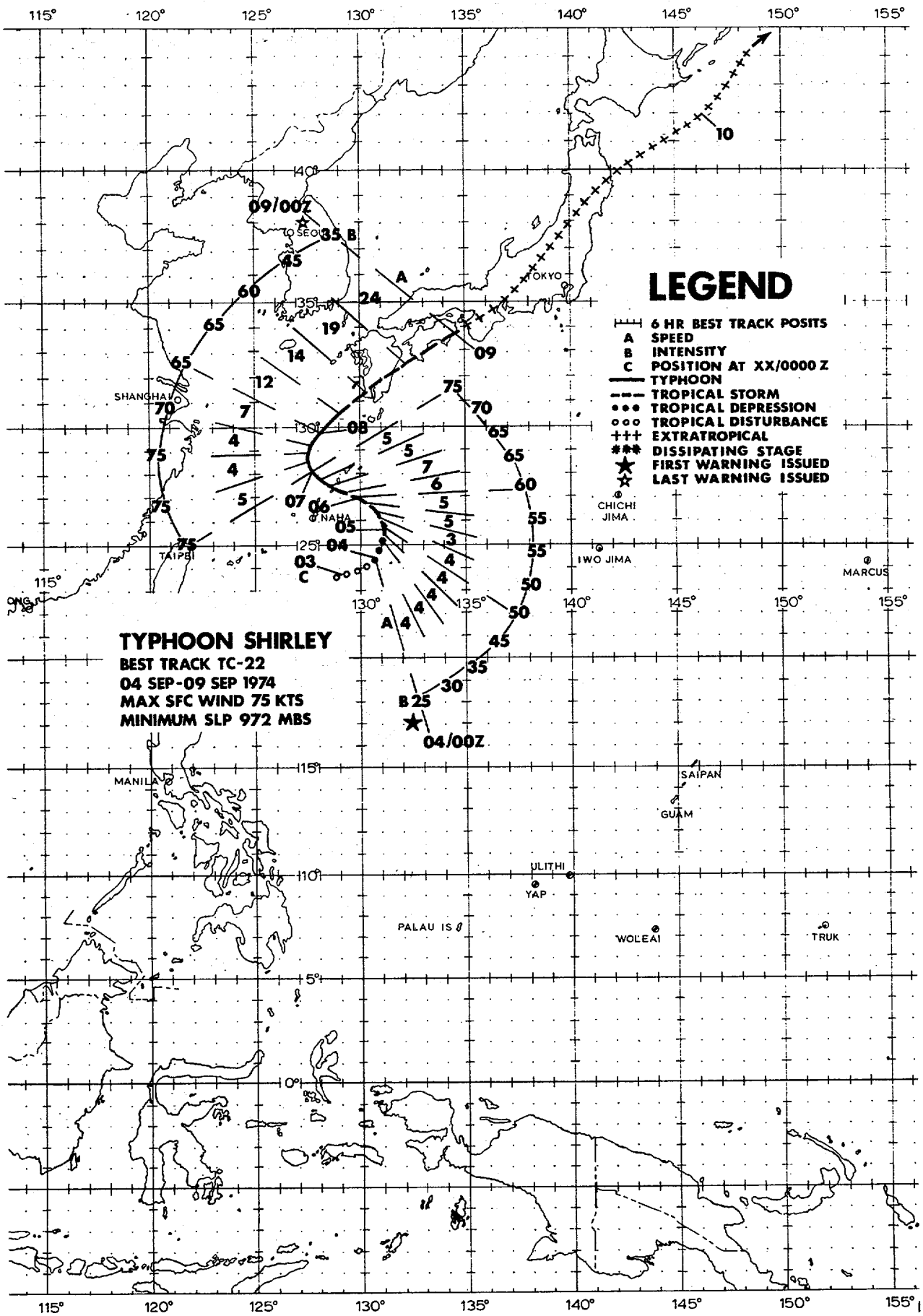
With a long wave trough over eastern China, and Rose weakening significantly on Polly's eastern periphery, the typhoon veered abruptly on a northward track late on the 31st. Increasing in forward speed to 15 knots, Polly's center struck the Japanese islands of Shikoku and southwestern Honshu, emerging six hours later in the Sea of Japan late on the 1st. Diminishing to tropical storm force in the Sea of Japan, Polly continued a poleward movement crossing the Russian coast east of Vladivostak as an extratropical low on the 2nd.

As Polly's eye moved ashore on Shikoku, the Kochi City meteorological station 20 nm east of center, measured a minimum pressure of 976.3 mb (01/0920Z), and a peak gust from the east at 78 knots (01/0930Z). The Ashizuri station (20 nm west of the center), however, reported the lowest pressure on the coast--966.5 mb (01/0740Z). Murotomisaki (elev. 745 ft, 70 nm northeast of the center) reported the highest gust--95 knots from the east (01/0310Z)--several hours before Polly's landfall. Maximum 24-hour rainfall measured on Shikoku Island due to Polly was 11.8 inches at the coastal station of Ashizuri.

During the typhoon's passage across Japan, Polly's circulation intensified a stationary front over east central Honshu bringing excessively heavy rains to the mountainous area west of the Kanto plain. Ogochi, Tokyo prefecture reported a total of 19.7 inches during the typhoon's passage while stations in Saitama and Yamanashi prefectures received totals as high as 19.5 inches and 14.4 inches respectively. These heavy rains set off one of the worst floods in Tokyo since World War II. The swollen Tama River washed over its embankment at Komae, Tokyo prefecture flooding many homes and causing 7600 inhabitants to be evacuated from their homes.

Elsewhere, electrical power was cut off in Kochi and Hiroshima in the path of Polly's center due to the high winds and landslides downing power lines. On the coast, two 10,000 ton freighters, berthed under construction at Urato Bay near Kochi, were washed out to sea when the water level went up some 9 feet. In the typhoon's wake, Polly left over 10,000 homes destroyed or inundated and a casualty toll of 45 injured and 9 dead or missing.

FIGURE 4-13. *Typhoon Polly 250 nm south of Nagoya, Japan. Tropical Storm Rose appears further southwest of Polly centered 230 nm east of Naha, Okinawa. 30 August 1974, 2300Z.* (DMSP *imagery*)


LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/0000 Z
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
TYPHOON SHIRLEY
BEST TRACK TC-22
04 SEP-09 SEP 1974
MAX SFC WIND 75 KTS
MINIMUM SLP 972 MBS
09/00Z
04/00Z
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
CHICHI JIMA
IWO JIMA
MARCUS
MANILA
SAIPAN
GUAM
ULITHI
YAP
PALAU IS
WOLEAI
TRUK
115°
120°
125°
130°
135°
140°
145°
150°
155°
40°
35°
30°
25°
15°
10°
5°
0°

As Polly transformed to an extratropical cyclone in the Sea of Japan, the monsoon trough reformed across the Philippine Sea from Taiwan to the Volcano Islands. On 3 September, a tropical cyclone was evident in synoptic and satellite data about 150 nm south of Okinawa. Drifting east and northeastward, Shirley was located about 60 nm south of Minami Daito Jima on the 4th when aircraft reconnaissance reports observed winds reaching storm force in the circulation's northern semicircle (Figure 4-14).

Located at the base of an upper level trough east of Korea, Shirley drifted slowly northward passing abeam of Minami Daito Jima early on the 5th. A minimum barometric reading of 986.0 mb was recorded at the island's weather station (05/0300Z). Peak gusts out of the south measured 54 knots (05/1300Z).

As the 500-mb trough over the Sea of Japan moved eastward on the 5th, rising heights north of Shirley caused the storm to turn westward. By the 6th, aircraft reconnaissance of Shirley indicated winds had reached typhoon force shortly before the storm's center passed over the island of Okinoerabu-Shima in the Ryukyu chain. (Figure 4-15) The barometer dipped to 977.4 mb on the island during center passage (06/1130Z), and, as winds shifted to the south-southeast, a peak gust of 82 knots was recorded (06/1310Z).

Shirley's circulation was rather small as gale force winds were limited to a radius of 75 nm of the center. To the north, Naze on Amami-O-Shima reported peak gusts to 43 knots (07/0150Z), while to the south the gust recorder at the Naha Observatory measured 44 knots (06/1530Z).

An approaching short wave over the Yellow Sea began to draw Shirley on a slow poleward drift on the 7th. As the base of this trough by-passed the typhoon to the north, Shirley accelerated in a northeasterly direction on the 8th, landing 12 hours later slightly below typhoon force on the coastline of Kyushu. Prior to landfall, the center passed directly over Kusagakishima (elevation 454 feet) which experienced a barometric reading of 982.4 mb (08/0800Z) and sustained 10-minute winds of 70 knots.

The coastal city of Makurazuki, 10 nm south of center crossing, received wind gusts to 90 knots (08/1050Z) from the south-southeast followed by a minimum pressure reading of 985.9 mb (08/1120Z).

Accelerating to forward speeds of 24 kts, Shirley quickly passed Kyushu and Shikoku and transformed into a weak extratropical low over the Kii peninsula on the 9th. Strong gusty winds occurred along the southern coast of Shikoku as Shirley's center passed by late on the 8th. South-southeasterly winds peaking near 42 knots and 70 knots were recorded at Ashizuri and Murotomisaki (station elevation 745 feet) respectively.

Torrential rains brought by Shirley totaled 6.2 inches in 24 hours at Nobeoka on the eastern coast of Kyushu, while Tokushima on the eastern coast of Shikoku reported 7.5 inches (24 hours) during passage. The heavy rains halted the Japanese National Railway services in parts of Kyushu and completely in Shikoku. Power blackouts were also wide spread in Kyushu due to gusty winds downing power lines.

Landslides and flash flooding as a result of the rains were responsible for the flooding of over 30,000 homes, and a casualty toll of 13 dead or missing.

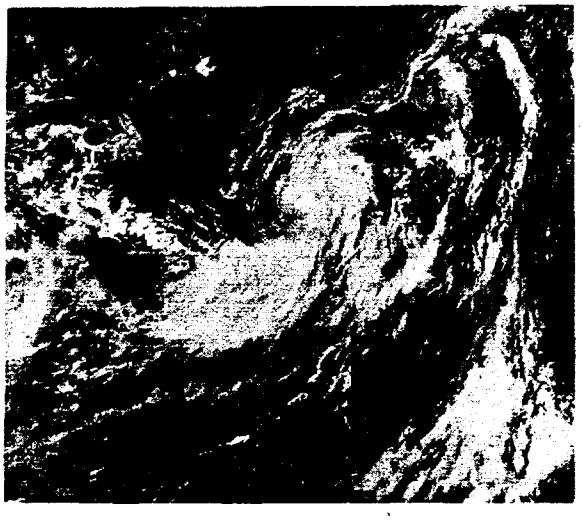


FIGURE 4-14. *Formative stages of Shirley centered 180 nm southeast of Naha, Okinawa, 3 September 1974, 2329. (DMSP imagery)*

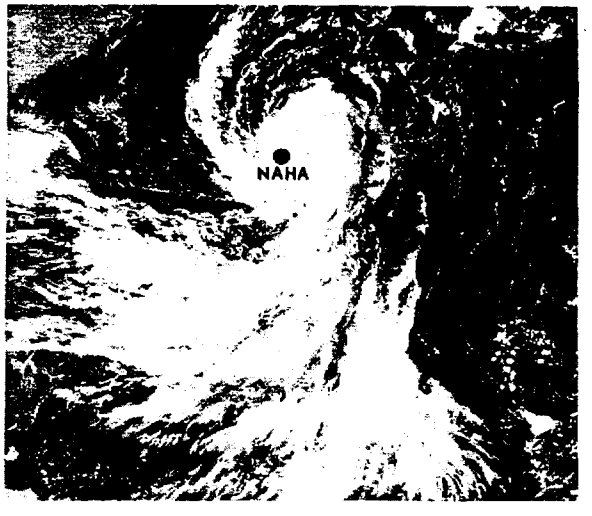
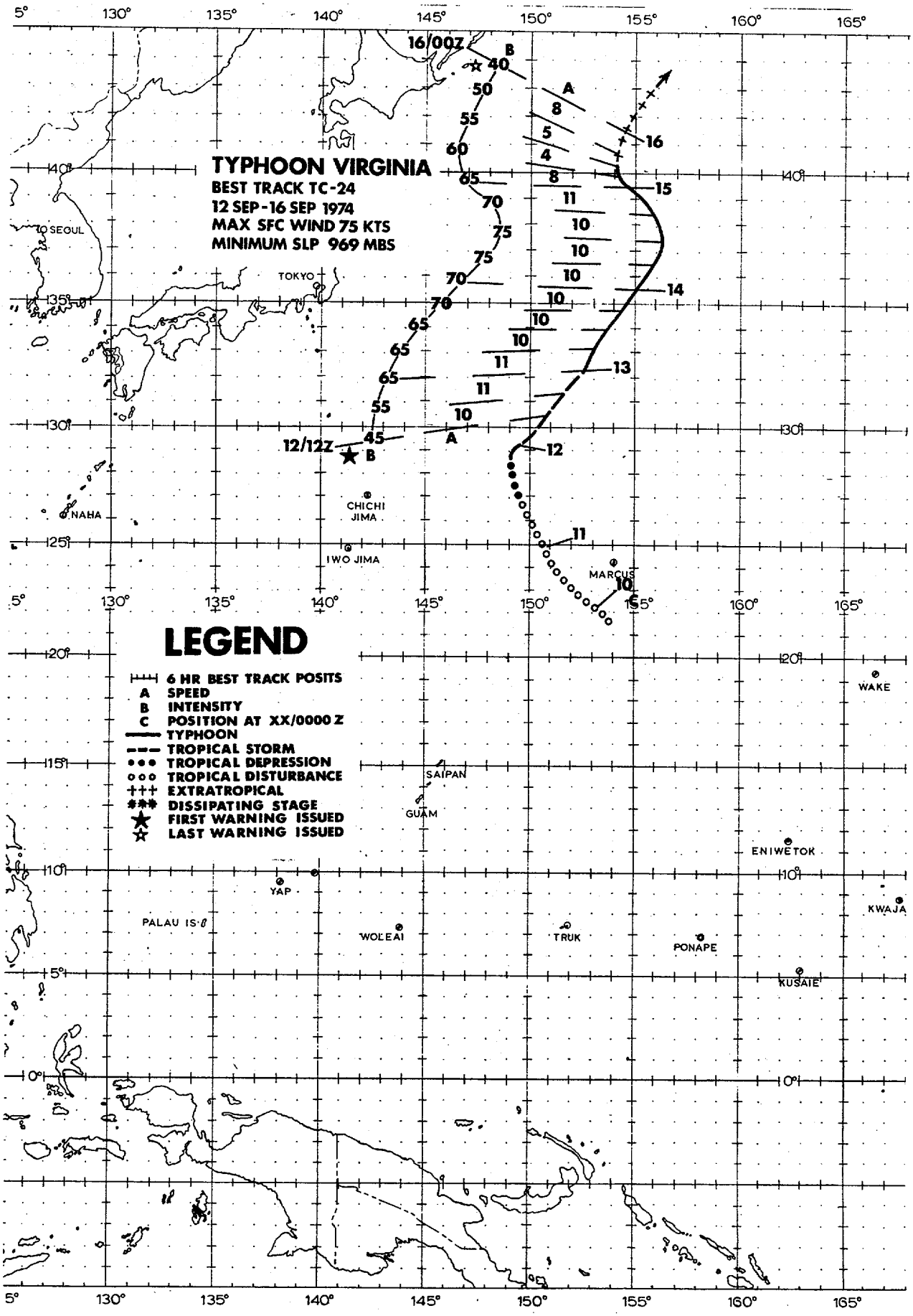


FIGURE 4-15. *Shirley reaching typhoon strength 110 nm northeast of Naha, Okinawa, 6 September 1974, 0239Z. (DMSP imagery)*


TYPHOON VIRGINIA
BEST TRACK TC-24
12 SEP-16 SEP 1974
MAX SFC WIND 75 KTS
MINIMUM SLP 969 MBS
16/00Z
12/12Z
TO SEOUL
TOKYO
NAHA
CHICHI JIMA
IWO JIMA
MARCUS
WAKE
SAIPAN
GUAM
ENIWETOK
YAP
PALAU IS
WOLEAI
TRUK
PONAPE
KUSAIE
KWAJA
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/0000 Z
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED

Developing from a disturbance initiated by an upper tropospheric low, Virginia began to display increasing organization in satellite data early on the 11th, 200 nm west of Marcus Island. The circulation advanced northward, shifting to a northeast course and developed tropical storm force winds on the 12th. (Figure 4-16) By the time aircraft reconnaissance was conducted on Virginia late on the 13th, winds had increased to typhoon intensity. Flight level (700 mb) winds of 80 knots were measured in the southern semi-circle on penetration, while a central pressure of 980 mb was recorded within an eye 40 nm in diameter.

Virginia developed winds of typhoon strength at an unusual poleward latitude of 33°N. This was only the 6th tropical cyclone since 1945 to first achieve typhoon intensity north of the 30th parallel.

As a deepening 500 mb-low approached Manchuria from the Lake Baykal area on the 13th, the accompanying downstream ridging caused the westerlies north of Virginia to weaken and retreat poleward. As a result, the typhoon continued to track northeastward in a favorable vertical shear zone to maintain its intensity. Further aircraft reconnaissance of Virginia at 13/0730Z revealed the storm was still tropical in character at the 37th parallel. The central pressure had dropped to 969 mb in an eye with a 700 mb temperature of 16C° (Figure 4-17). Maximum flight level (700 mb) winds of 90 knots were recorded just outside the eye in the wall cloud region.

By the 14th, a major trough was deepening over Manchuria causing a strong ridge to develop over the Kamchatka peninsula. By mid day, Virginia was blocked by an anomalous high pressure cell to the northeast, resulting in an unusual northwestward movement for a tropical cyclone located at such a northerly latitude (37N). Virginia's tropical lifetime ended shortly thereafter, as satellite data indicated weakening on the 15th and development of extratropical characteristics later in the day 400nm east of Hokkaido.

During the typhoon's northward track, numerous vessels in the shipping lanes were caught in its circulation and reported gale force winds. The strongest winds were experienced by a Netherlands ship (call sign PJSM) (40 knots) on the 13th and the PRESIDENT VAN BUREN (45 knots) on the 14th. The Japanese ship AKAISHI caught near the center on the 15th (0000Z) reported northeasterly winds of 57 knots and a barometer reading of 989.5 mb.

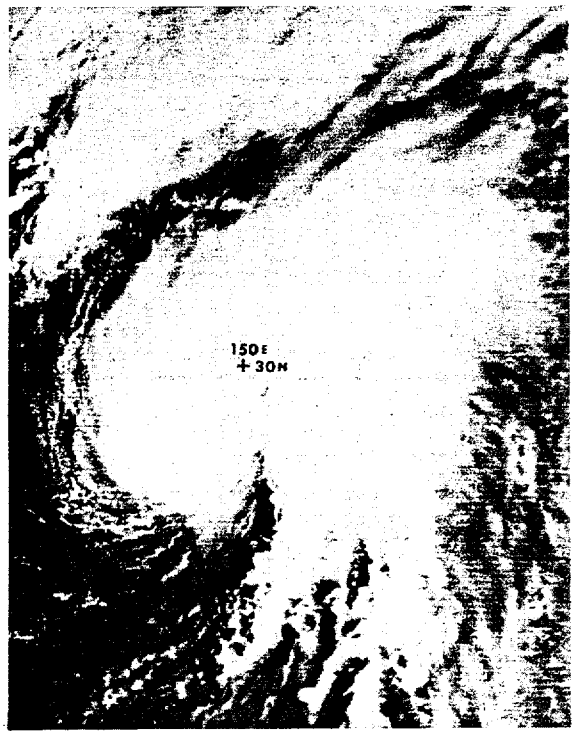


FIGURE 4-16. *Tropical Storm Virginia 370 nm northwest of Marcus Island, 11 September 1974, 2243Z. (DMSP expanded imagery)*

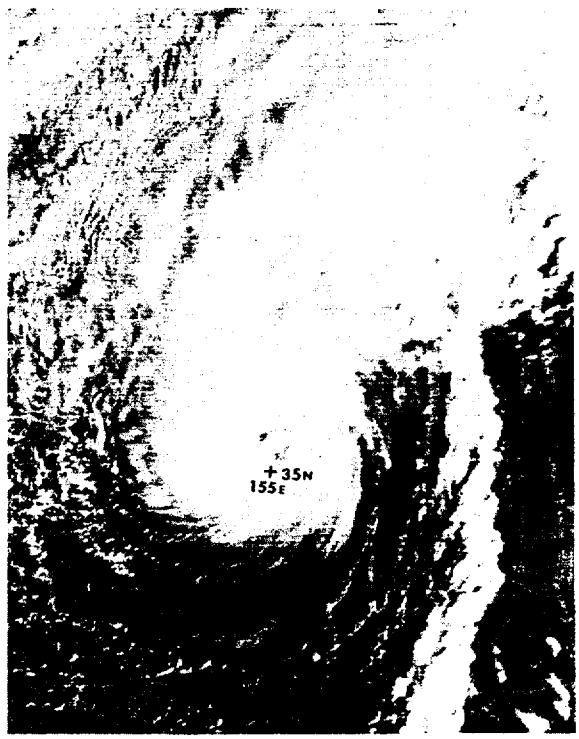
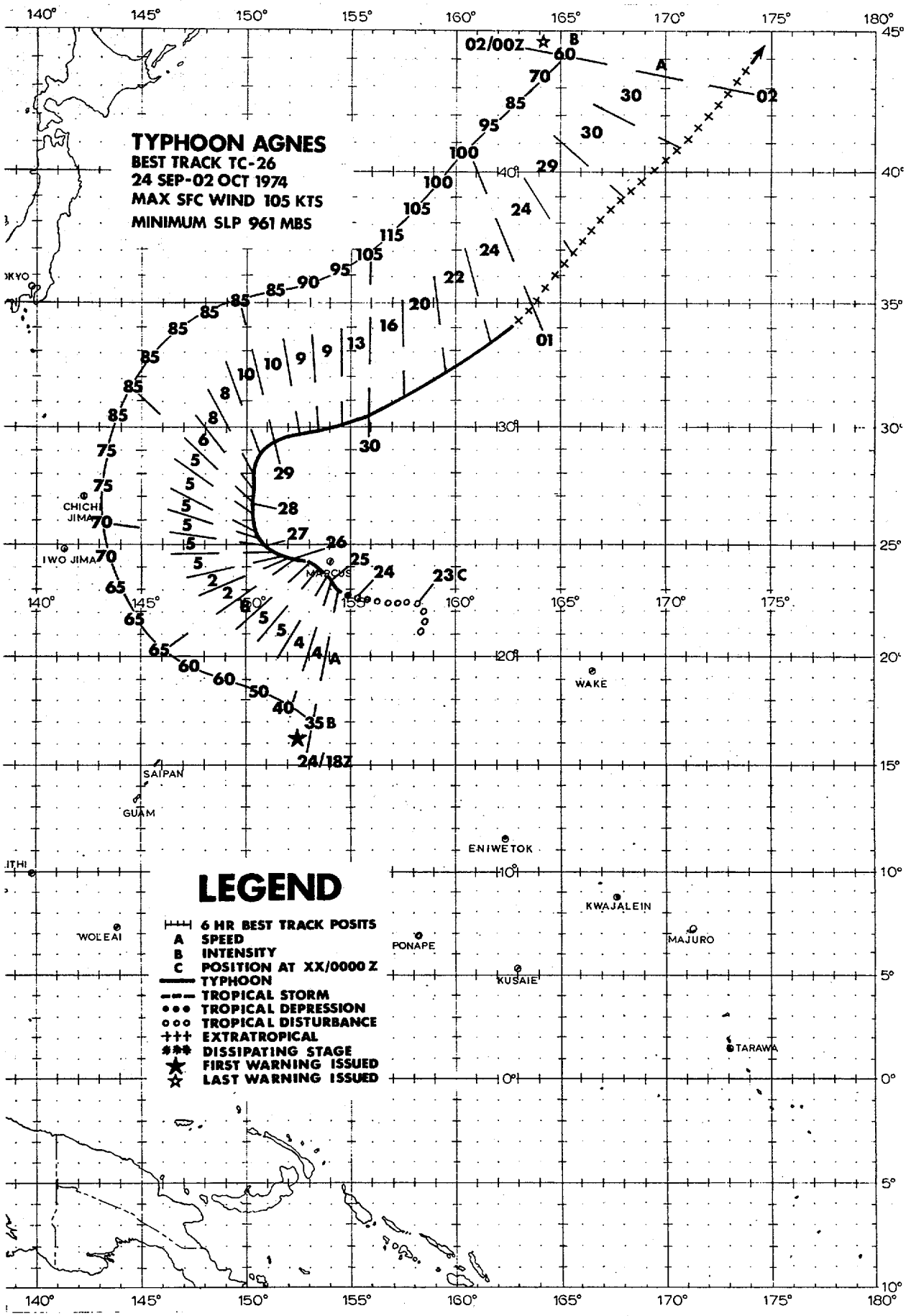


FIGURE 4-17. *Typhoon Virginia near peak intensity after crossing the 35th parallel 750 nm east of Tokyo, 13 September 1974, 2207Z. (DMSP expanded imagery)*


TYPHOON AGNES
BEST TRACK TC-26
24 SEP-02 OCT 1974
MAX SFC WIND 105 KTS
MINIMUM SLP 961 MBS
02/00Z
02
01
24/18Z
CHICHI JIMA
IWO JIMA
MARCUS
WAKE
SAIPAN
GUAM
ENIWETOK
KWAJALEIN
MAJURO
PONAPE
KUSAIE
TARAWA
WOLEAI
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/0000 Z
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED

Evolving from a disturbance initiated by an upper tropospheric low, Agnes developed to depression intensity about 150 nm southeast of Marcus Island on 24 September. Although weak, the flow about the subtropical ridge to the north of the depression kept the tropical cyclone on a slow westerly and later a west-northwesterly track for the next three days.

Indications from satellite data revealed that the circulation was intensifying rapidly on the 25th. Proof of this development occurred when the center of Agnes passed about 60 nm south of Marcus Island later that day. The Japanese meteorological station on the island experienced strong easterly gusts to 81 knots (25/1140Z) following a minimum barometer reading of 998.7 mb (25/0600Z) (Figure 4-18). Aircraft reconnaissance of Agnes the next day (26/1450Z) confirmed that the storm had gained typhoon force. Flight level (700 mb) winds of 70 knots and a central pressure of 984 mb were reported.

As a cell in the subtropical ridge west of Agnes weakened significantly on the 27th, the typhoon began to abruptly track northward. With upper level westerlies strengthening east of Japan, Agnes shifted to an east-northeast track 36 hours thereafter, and accelerated in forward speed early on the 29th (Figure 4-19).

Like typhoon Virginia, Agnes continued to deepen after recurvature. Reconnaissance aircraft observed the lowest central pressure of the typhoon's life (961 mb) on the 30th (0303Z). In addition, flight level (700 mb) winds of 135 knots were observed 40 nm from the center during exit from the eye. Forward speed of Agnes at this time had increased to 15 knots.

Over the Kuril Islands, a 500 mb low was tracking eastward accompanied by a deep trough. The amplification of strong southwesterly flow ahead of the trough caused Agnes to turn on a northeast course and accelerate to 30 knots by 1 October. Satellite data indicated Agnes acquired extratropical characteristics after crossing 35°N; however, the circulation remained intense as evidenced by aircraft flight level (700 mb) winds of 110 knots (01/0415Z). The strong extratropical low of Agnes continued to race poleward thereafter, finally merging with the advancing 500-mb low 300 nm south of Attu in the Aleutian chain on the 3rd.

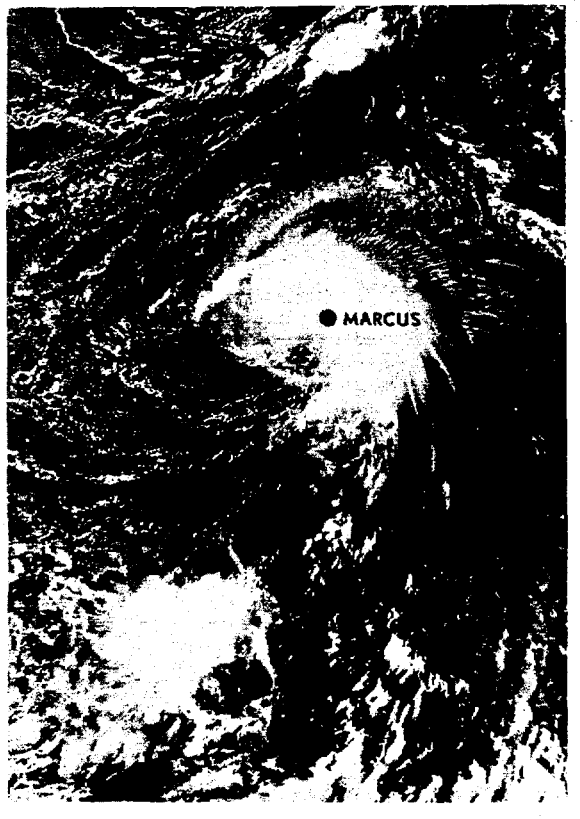


FIGURE 4-18. *Agnes reaching typhoon strength 100 nm west of Marcus Island, 25 September 1974, 2151Z. (DMSP imagery)*

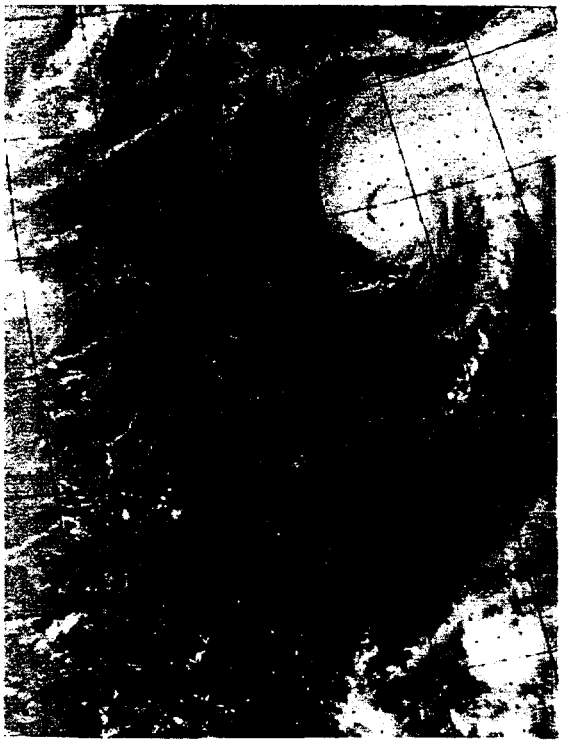
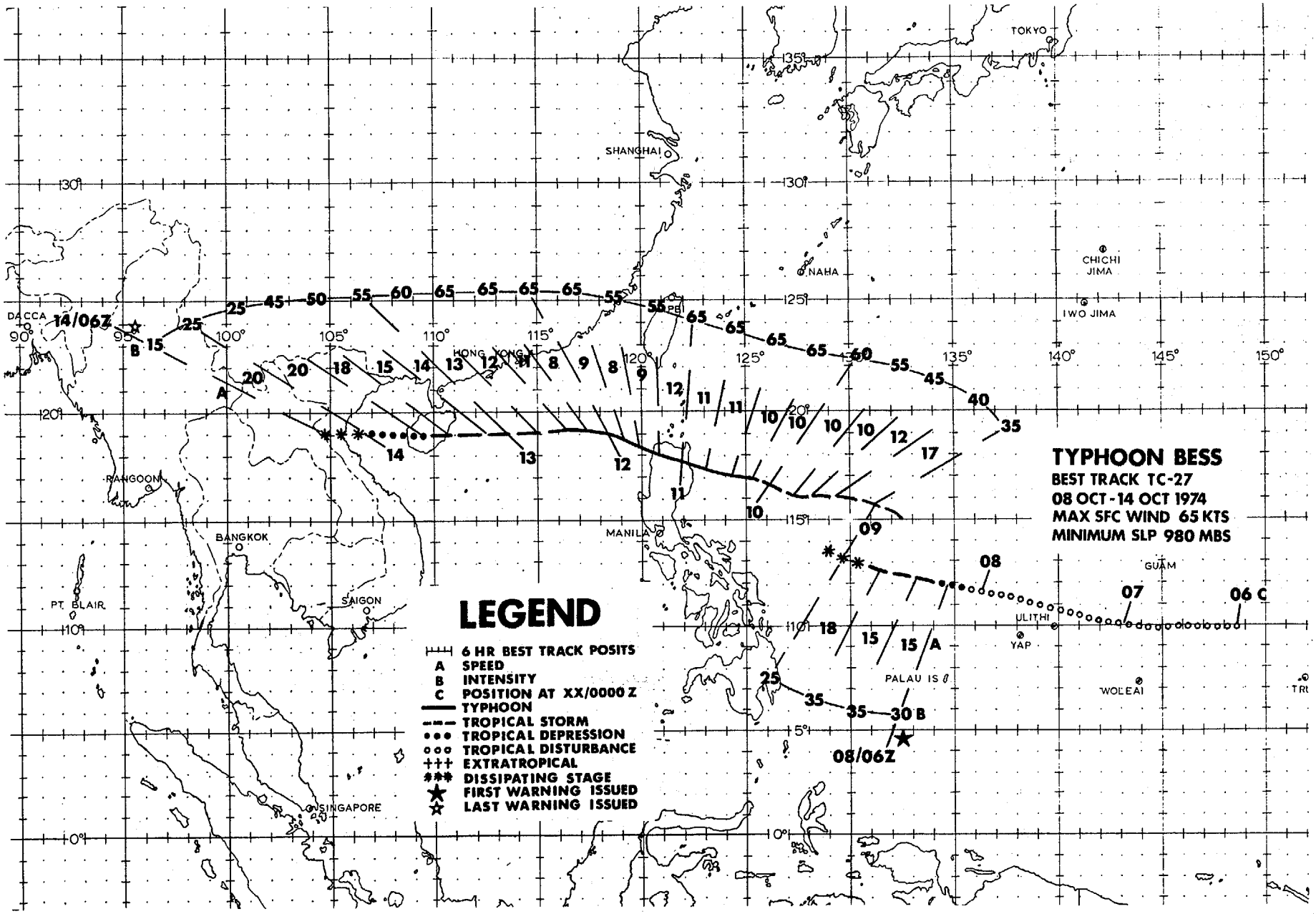


FIGURE 4-19. *Moonlight visual of Typhoon Agnes after shift to an easterly track. Lights of Tokyo 750 nm to the northwest and other cities in Japan are visible in left-hand portion of data, 29 September 1974, 1119Z. (DMSP imagery)*


TOKYO
SHANGHAI
NAHA
CHICHI JIMA
IWO JIMA
DACCA
HONG KONG
RANGOON
BANGKOK
MANILA
GUAM
SAIGON
PT. BLAIR
SINGAPORE
ULITHI
YAP
PALAU IS
WOLEAI
14/06Z
08/06Z
TYPHOON BESS
BEST TRACK TC-27
08 OCT - 14 OCT 1974
MAX SFC WIND 65 KTS
MINIMUM SLP 980 MBS
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/0000 Z
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED

The circulation that eventually developed into Typhoon Bess was first noted on synoptic charts south of Guam on 7 October (0000Z). The circulation was accompanied by broad monsoonal flow, and, by the 9th, evidence from satellite data and aircraft reconnaissance indicated two centers had developed (Figure 4-20). The northern system dominated, while the center that had initially been tracked for several days dissipated. Due to a strong subtropical ridge, movement of the entire circulation complex up to this time had been rapid, with a forward speed of 18 knots. Due to a deepening trough in the westerlies over the East China Sea, the pressures north of the storm weakened, and Bess slowed to almost half its original speed.

Winds in the cyclone reached typhoon intensity early on the 10th as it approached northern Luzon. Approximately 24 hrs later, coastal crossing occurred about 50 nm south of Escarpada Point. Inland, Tuguegarao City reported a pressure of 976.9 mb (the minimum reported during the storm's lifetime) while Bess's center passed 30 nm north of the station. Relatively unaffected by a short journey over the mountainous island, Bess emerged into the South China Sea as a minimal typhoon.

Bess's circulation brought high winds affecting much of Luzon and the straits. Inland, Baguio weather station (elevation 4860 feet) experienced wind gusts to 80 knots while Appari on the northern coast recorded a gust to 96 knots. In the Luzon straits several ships reported strong winds as the typhoon's center passed to the south on the 11th. The Indian ship BAILADIA and a German vessel (call sign DEBC) experienced northeasterly winds of 50 knots and 57 knots respectively. Considerable rainfall with 24 hour totals of 5 to 6 inches occurred over much of northern Luzon, with a 24 hour extreme of 30.8 inches measured at Baguio during passage. Landslides and flash flooding accounted for casualties of 26 killed and 3 missing. Total damage including public and private property, agricultural crops (rice), and livestock were estimated near $9.2 million.

Once in the South China Sea, Bess turned westward in response to a massive high pressure area dominating central and South China. The combination of the typhoon"s envelope of low pressure and this high pressure area generated a strong northeast flow over the waters south of the China coast. Pratas Island, 110 nm to the northwest of the typhoon's center, reported sustained (10 minute) winds of 50 knots on the 12th while the British ship MARCO POLO estimated winds of 45 knots 220 nm northwest of the center (Figure 4-21). As Bess tracked south of Hong Kong late on the 12th, peak gusts of 58 knots and 49 knots were observed at Wagland Island and the Royal Observatory respectively.

As the modifying northeast monsoon flow entered the typhoon's circulation, the central pressure began to fill and winds associated with Bess dropped to tropical storm strength on 13th. Bess increased in forward speed crossing Hainan Island late in the day and weakened to depression intensity. Emerging into the Gulf of Tonkin, the circulation continued to weaken, eventually dissipating on the North Vietnam coast early on the 14th.

In addition to the damage wrought on the Philippines, Bess claimed a U. S. Air Force reconnaissance aircraft in the South China Sea south of Hong Kong on the 12th. Last contact with the mission occurred while the aircraft was collecting peripheral data in the typhoon's northern semicircle. Nothing was ever heard again of the plane or its crew of six.

FIGURE 4-20. *Tropical Storm Bess exhibiting a broad circulation center 500 nm east of Luzon Island, 9 October 1974, 0235Z.*

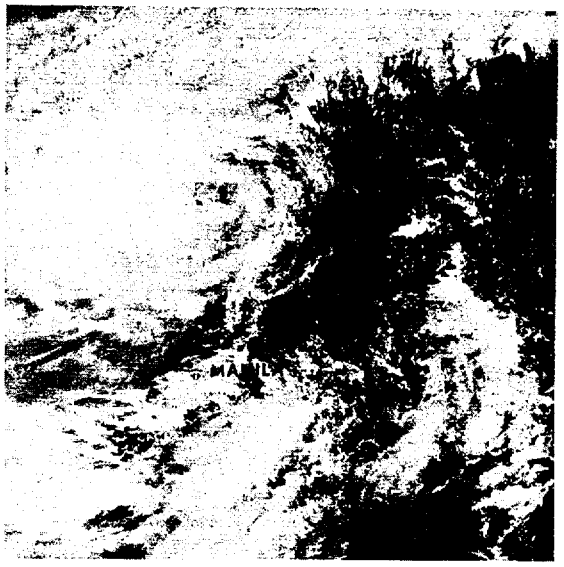
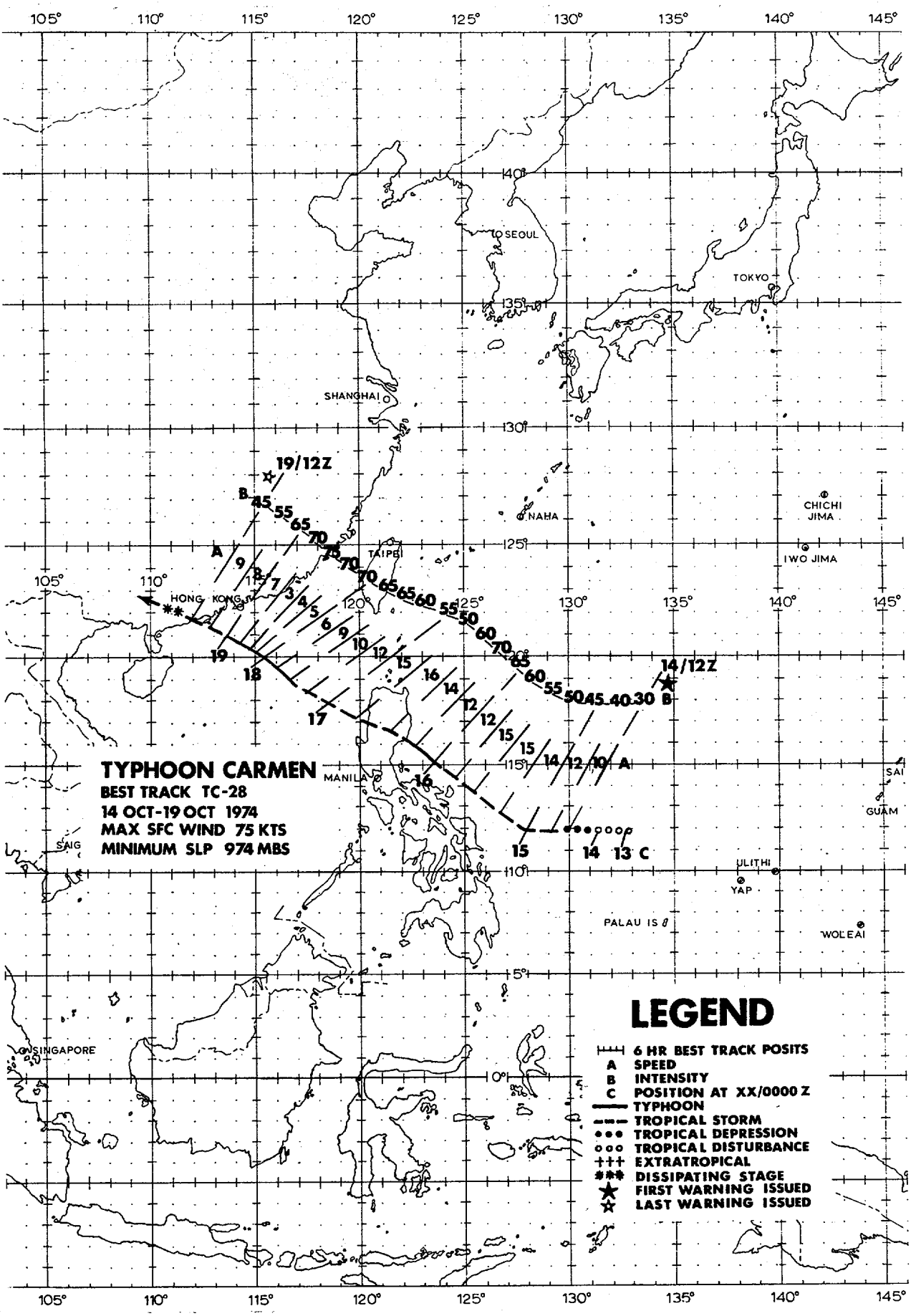


FIGURE 4-21. *Bess of minimal typhoon strength in the South China Sea 290 nm southeast of Hong Kong, 12 October 1974, 0321Z. (DMSP imagery)*


105° 110° 115° 120° 125° 130° 135° 140° 145°
SEOUL
TOKYO
SHANGHAI
NAHA
CHICHI JIMA
IWO JIMA
TAIPEI
HONG KONG
MANILA
SAIGON
SINGAPORE
GUAM
SAI
ULITHI
YAP
PALAU IS
WOLEAI
19/12Z
14/12Z
TYPHOON CARMEN
BEST TRACK TC-28
14 OCT-19 OCT 1974
MAX SFC WIND 75 KTS
MINIMUM SLP 974 MBS
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/0000 Z
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED

As Bess passed south of Hong Kong, the monsoon trough in the Philippine Sea produced another circulation west of Yap. This system moved westward displaying increasing organization on satellite data. Reports received from the Liberian ship ASIAN MORALITY (west wind 45 knots, pressure 998.5 mb) passing close to the center on 15 October (0000Z) confirmed that Carmen had reached tropical storm strength 180 nm east of Samar Island.

Intensifying further, Carmen turned on a northwest course and headed for northern Luzon. Some 12 hours prior to arrival on the Luzon coast near Casiguran, aircraft reconnaissance reported a central pressure of 974 mb (lowest during the lifetime of storm) and winds of minimal typhoon force (Figure 4-22).

Casiguran reported gusts to 59 knots and a minimum pressure of 981.2 mb as the center passed just north of the station. Maximum 24 hour rainfall recorded as the storm cut across Luzon was at Baguio (8.98 inches). Casualties in the wake of Carmen amounted to 13 dead, and damage losses were estimated near $11.6 million.

Elsewhere, eastern Taiwan suffered crop damage near $1.4 million due to the heavy rains associated with typhoons Bess and Carmen. Newspaper reports indicated 11 persons killed on Taiwan.

As Carmen entered the South China Sea, weakening pressures over east central China influenced the typhoon to slow in forward speed. On the 18th, satellite intensity estimates indicated Carmen probably reached a peak strength of 75 knots about 120 nm south of Hong Kong as the storm edged slowly northwestward.

During the 18th, several ships caught in Carmen's circulation reported strong winds. An unidentified vessel experienced northerly winds of 45 knots 150 nm northwest of the typhoon's center, while the Norweigian ship JARAMA reported easterly winds of 50 knots 130 nm to the northeast (both reports 18/0000Z). Later the U. S. ship RAPHAEL SEMMES passing south of the center reported 60 knot winds at 18/1200Z and 19/0000Z.

Following passage of an upper level trough over the Yellow Sea on the 18th, a high pressure ridge began to penetrate into South China, causing a northeasterly flow of modified air from the land mass into the typhoon's circulation. Within 24 hours, Carmen's central pressure began to fill rapidly, and winds dropped to tropical storm force. Turning on a more westerly course, Carmen weakened to depression strength and later dissipated east of the Luichow peninsula early on the 20th.

The center of Carmen approached within 70 nm of Hong Kong on the 19th producing considerable rainfall and gale force winds in the Colony. Peak gusts of 70 knots were observed both at Waglan Island and the Royal Observatory. Maximum rainfall during the 3 day period (18-20 October) totaled 18.1 inches (Figure 4-23). Carmen brought much needed rain to the Colony which was suffering from a drought; however, heavy downpours flooded many low-lying areas and caused landslides and road collapses. Newspaper reports indicated extensive crop damage due to flooding caused by the rains. Two lighters went aground and four other vessels broke away from their moorings. One fatality was attributed to Carmen in the Colony.

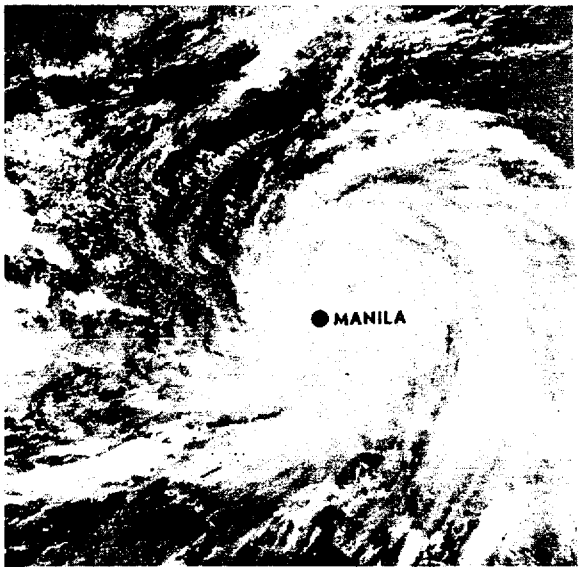


FIGURE 4-22. *Typhoon Carmen a few hours prior to landfall on Luzon near Casiguran, 16 October 1974, 0348Z. (DMSP imagery)*

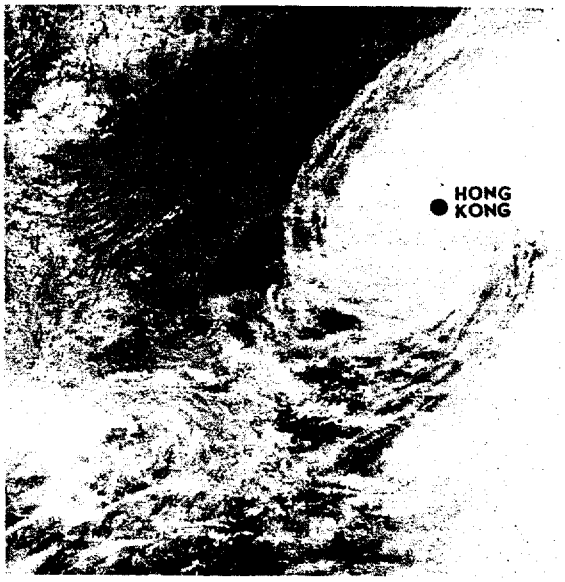
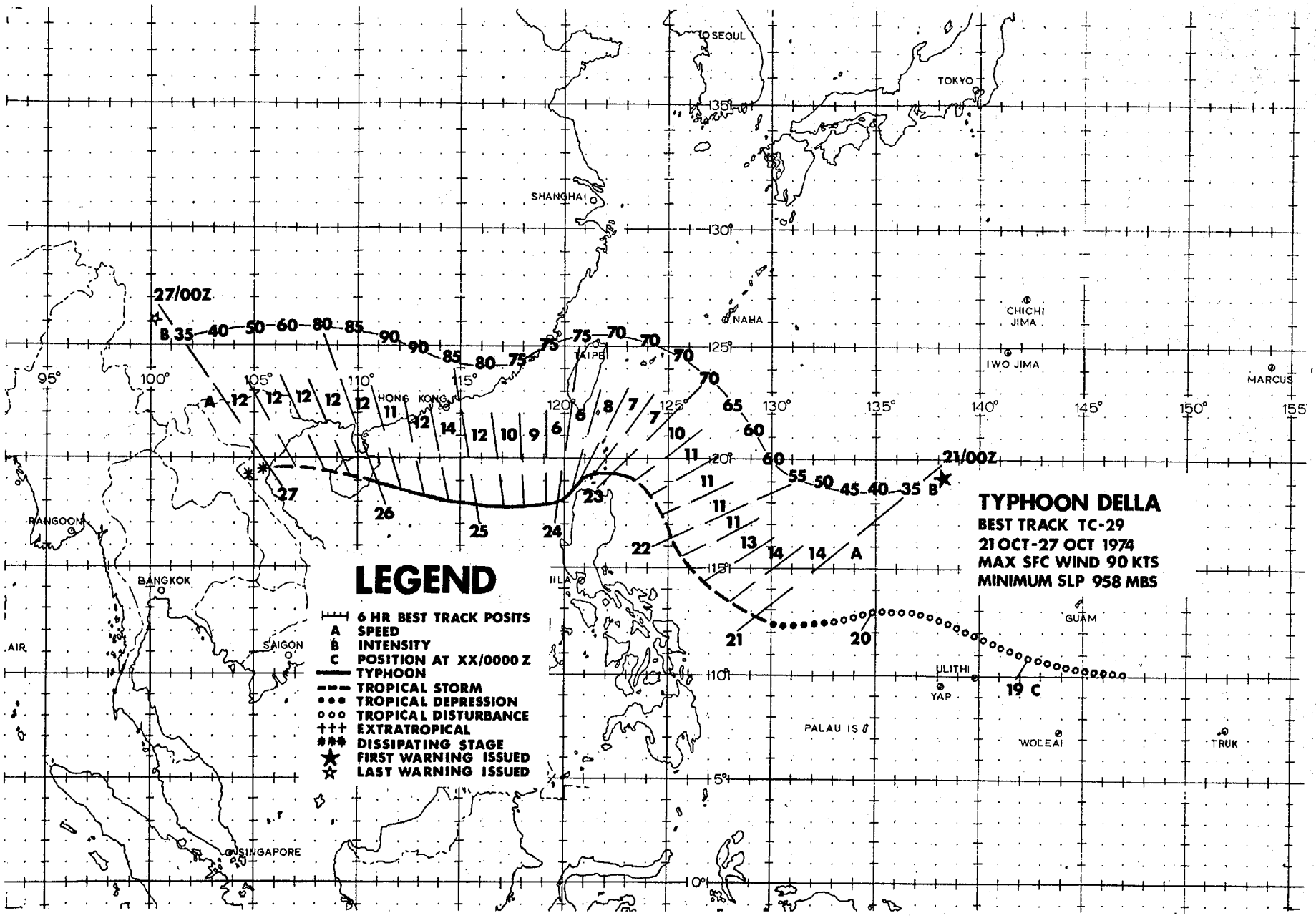


FIGURE 4-23. *Tropical Storm Carmen approaching the South China coast 90 nm southwest of Hong Kong, 19 October 1974, 0434Z. (DMSP imagery)*


SEOUL
TOKYO
SHANGHAI
NAHA
CHICHI JIMA
IWO JIMA
MARCUS
TAIPEI
HONG KONG
RANGOON
BANGKOK
SAIGON
SINGAPORE
PALAU IS
YAP
ULITHI
GUAM
WOLEAI
TRUK
27/00Z
21/00Z
TYPHOON DELLA
BEST TRACK TC-29
21 OCT-27 OCT 1974
MAX SFC WIND 90 KTS
MINIMUM SLP 958 MBS
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/0000 Z
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED

The third in a succession of tropical cyclones developing during October, Della formed in the monsoon trough south of Guam while Carmen weakened in the South China Sea on the 19th. Two days later, the circulation intensified to tropical storm strength approximately 250 nm east of Samar Island (Figure 4-24).

The subtropical ridge north of Della eroded quickly on the 21st as a major short wave in the westerlies approached from China. Della was drawn up into the weakness as the storm shifted to a northwest and later a north-northwest track. While winds about the center reached typhoon force, the short wave trough bypassed the meridian of Della late on the 22nd. With passage of the trough, a strong mass of high pressure advanced into southeast China and blocked further poleward movement of Della. The typhoon responded by turning sharply westward.

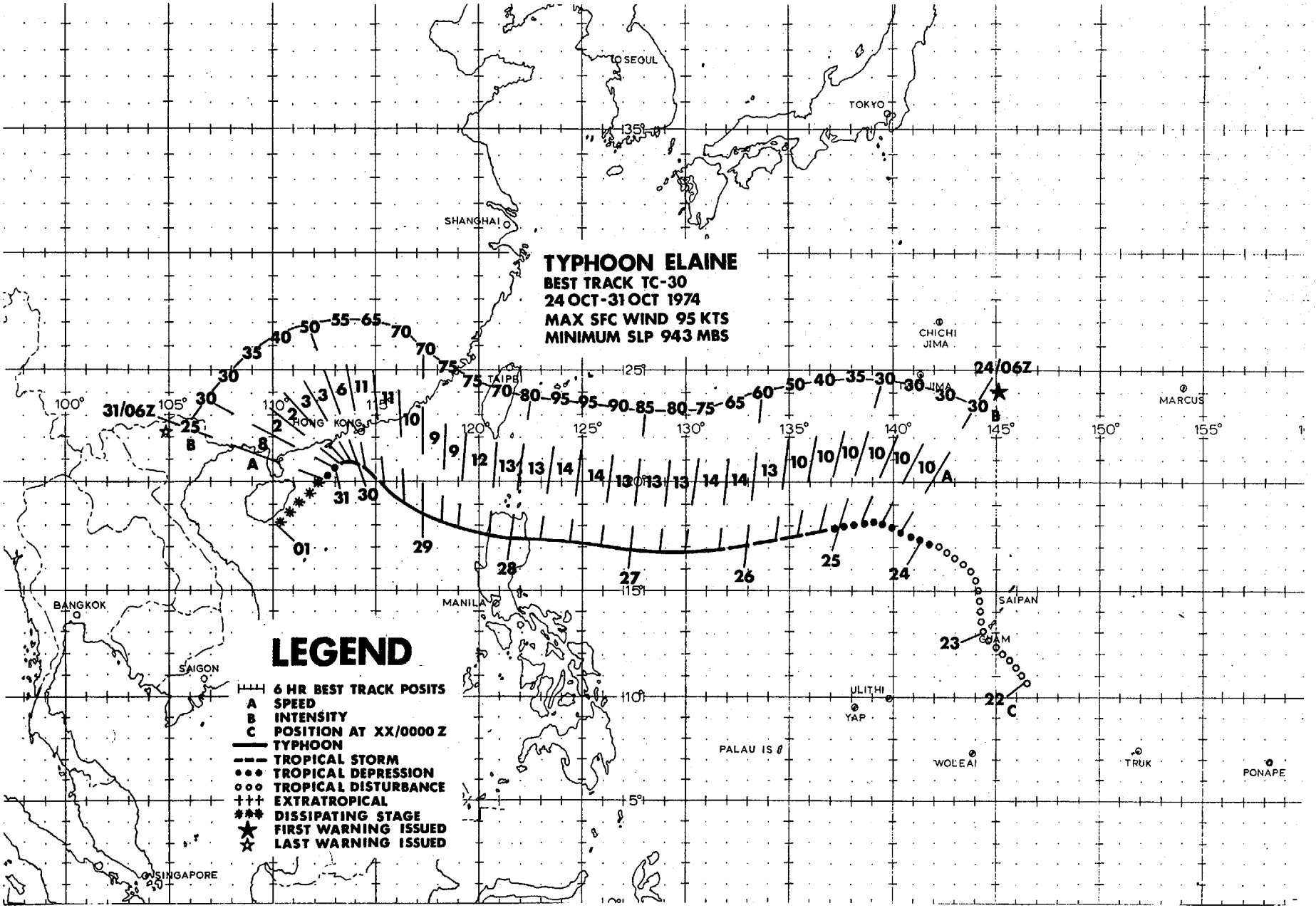
Navigating the Luzon straits during the 23rd, Della's center shifted southwestward and skirted the Luzon coast near Cape Bojeador. During this period, strong gusty winds swept the northern Luzon coastline. Aparri measured a gust to 85 knots from the south after center passage, while Laoag reported southwesterly winds gusting to 56 knots. Vigan, on the west coast, received the heaviest 24-hour rainfall (3.1 inches). Only slight damage occurred in the Philippines due to the center avoiding landfall.

Charting a westward course across the South China Sea as a relatively small typhoon, Della intensified steadily. A Japanese ship the YAMAMIZU MARU encountered winds of 60 knots southeast of the center on the 24th (0600Z) while the Israeli ship NURITH reported 60 knot winds as it crossed west of Della's eye 12 hours later (24/1800Z). Aircraft reconnaissance of Della on the 25th (0456Z) measured a central pressure of 958 mb (lowest recorded during the storm's life) within a tight eye 15 nm in diameter (Figure 4-25).

Intensity estimates from satellite data suggested that Della weakened slightly before landfall on Hainan Island on the 26th. Emerging into and crossing the Gulf of Tonkin, the storm never regained its former intensity. Following coastal crossing of North Vietnam early on the 27th, the circulation weakened and subsequently disappeared from synoptic analyses.

FIGURE 4-24. *Della achieving tropical storm strength in the Philippine Sea 210 nm east of Samar Island, 21 October 1974, 0023Z. (DMSP imagery)*

FIGURE 4-25. *Typhoon Della near peak intensity in the South China Sea 280 nm south of Hong Kong. 25 October 1974, 0052Z. (DMSP imagery)*


TYPHOON ELAINE
BEST TRACK TC-30
24 OCT-31 OCT 1974
MAX SFC WIND 95 KTS
MINIMUM SLP 943 MBS
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/0000 Z
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
SEOUL
TOKYO
SHANGHAI
TAIPEI
HONG KONG
CHICHI JIMA
JIMA
MARCUS
BANGKOK
SAIGON
MANILA
SAIPAN
GUAM
ULITHI
YAP
PALAU IS
WOLEAI
TRUK
PONAPE
SINGAPORE
31/06Z
24/06Z
100°
105°
110°
115°
120°
125°
130°
135°
140°
145°
150°
155°
160°
25°
20°
15°
10°
5°

Elaine, the largest of the typhoons to traverse the Philippine Sea during October, was upgraded from tropical depression status early on 25 October about 550 nm northwest of Guam. Developing from a circulation in the monsoon trough near Guam (the fourth to form in the trough during October), the envelope of Elaine's 1000 mb isobar eventually grew to 500 nm in diameter prior to striking Luzon a week after initial detection (Figure 4-26). During this period, Elaine intensified markedly as aircraft reconnaissance of the typhoon, 12 hours prior to striking Luzon, observed a central pressure of 943 mb and 700 mb flight level winds of 110 knots.

The same high pressure regime that forced Della on a westerly track through the Luzon straits on the 23rd extended eastward, and, late on the 24th, blocked Elaine (as a depression) from any further poleward movement. For a period of three days, Elaine was influenced by this ridge of high pressure to the north, forcing the typhoon on an atypical westerly heading across the Philippine Sea - an anamolous track for October tropical cyclones developing near the Marianas which normally follow a northward recurving course.

Elaine, the most severe typhoon to strike Luzon in the month, brought strong winds over a large expanse of the northern Philippines. Inland, Tuguegarao City observed a minimum pressure of 958.7 mb (27/2300Z) and peak gusts to 96 knots as the center passed south of the station. The west coast station of Vigan recorded a minimum pressure of 972.0 mb with an extreme gust of 100 knots (28/1100Z) as the center emerged into the South China Sea. Newspaper reports indicated the winds were strong enough to lift a new galvanized iron roof off a centuries old cathedral in Vigan. Manila (180 nm to the south) received gusts to 43 knots. Baguio (elevation 4860 feet) experienced extreme winds of 76 knots when the center passed 70 nm to the north.

Elaine brought 24-hour rainfall totals of 3 to 4 inches to northern Luzon while Manila reported 10.5 inches. An extreme 24-hour amount of 32.2 inches was reported at Baguio. The heavy rains combined with those brought by Della several days earlier left most farmlands under water.

Damage was extensive in Luzon with estimates of losses to crops, private and public properties amounting to $21 million. Thousands of homes were destroyed or damaged with some 300,000 persons left homeless. A total of 23 persons were listed as killed, 14 of whom were lost when swept off a ferryboat in the Sibuyan Sea.

Maritime casualties were high as 20 Philippine fishermen were counted missing in coastal waters. At sea, the 39-ton Japanese vessel KOSHU MARU sank east of Luzon with its crew of 11 presumed lost. The 3800 ton Korean ship MOKPO reported flooding and serious damage near the Luzon straits.

Elaine turned westward then west-northwestward while moving across the South China Sea as the region of high pressure dominating China weakened. During the 28th and 29th, the typhoon's circulation brought strong winds to several merchant vessels. The highest values reported were from the Japanese vessel OYLMPUS MARU experiencing 50 knots west of the center on 28/1200Z as Elaine was emerging from the Luzon coast, and later from the Russian ship ALEXANDER IVANOV on the 29th (1200Z) 120 nm north of the center who reported winds of 50 knots. Pratas Island observed sustained (10-minute) winds of 45 knots as Elaine's center passed 120 nm to the south on the 29th.

As the typhoon advanced northwestward, pressure over South China continued to fall causing Elaine to slow to almost a stall 90 nm south of Hong Kong late on the 29th. At this time, an onset of northeast monsoon flow influenced Elaine's circulation with subsequent filling and rapid weakening of winds about the center to storm strength. By the 31st, Elaine was reduced to a tropical depression and forced southwestward by an advancing high pressure ridge over South China. One day later the circulation dissipated southeast of Hainan Island.

During the cyclone's close proximity to Hong Kong, Elaine brought gale force winds to the Colony. The Royal Observatory registered a gust of 52 knots, while winds peaked to 55 knots on Wagalan Island. A two-day (30th & 31st) rainfall amount of 8.6 inches was measured at the Royal Observatory while Elaine stalled offshore.

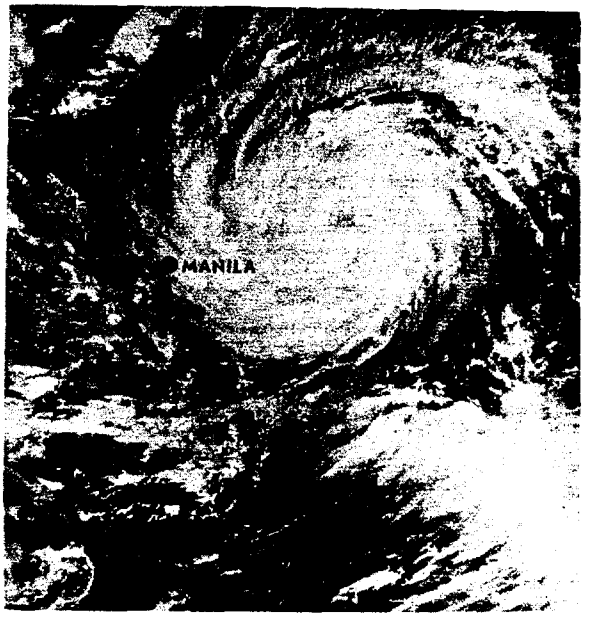
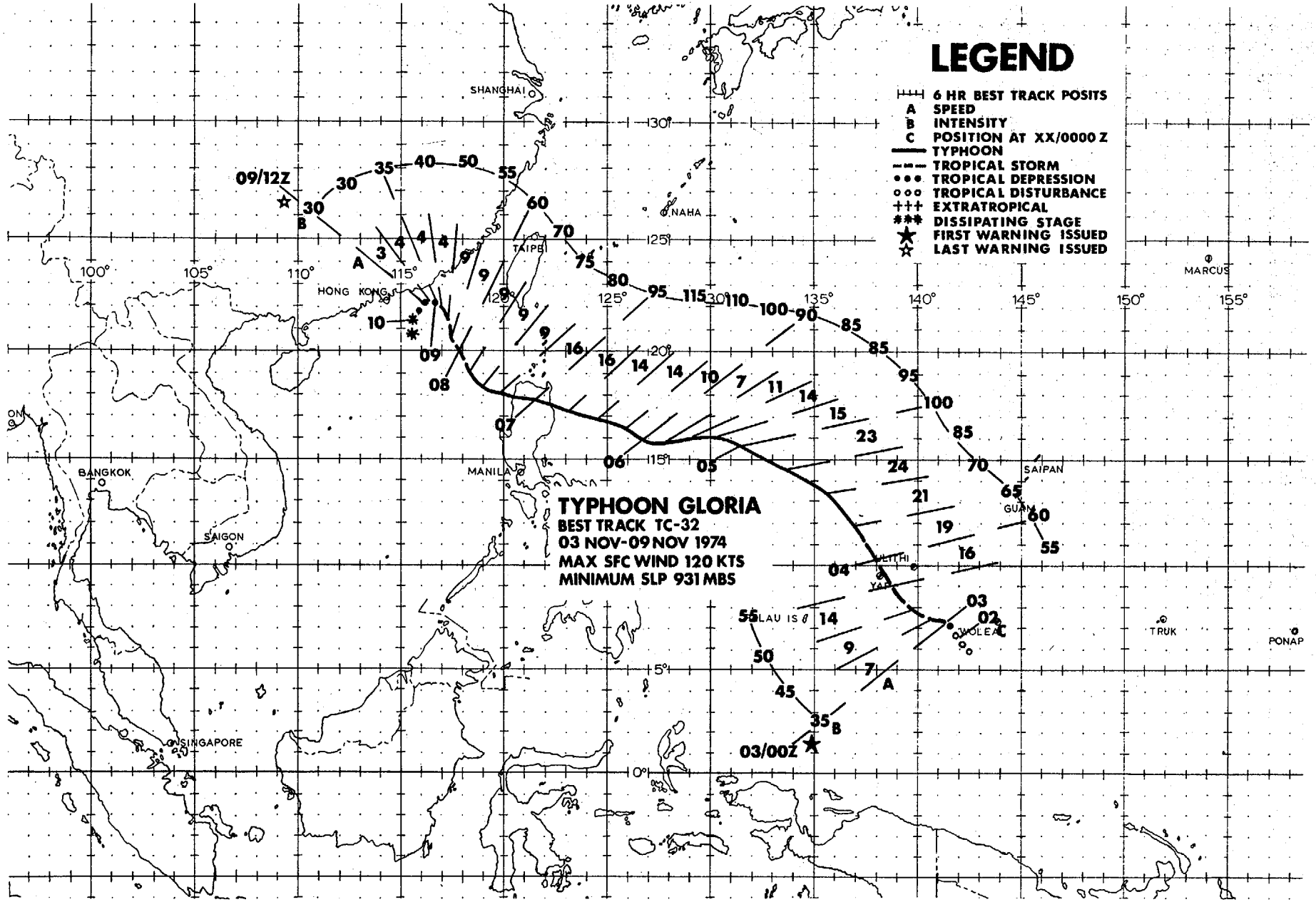


FIGURE 4-26. *Massive Typhoon Elaine 300 nm east of Luzon, one day prior to the center striking the island, 27 October 1974, 0015Z. (DMSP imagery)*


LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/0000 Z
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
TYPHOON GLORIA
BEST TRACK TC-32
03 NOV-09 NOV 1974
MAX SFC WIND 120 KTS
MINIMUM SLP 931 MBS
09/12Z
03/00Z
SHANGHAI
NAHA
TAIPEI
HONG KONG
MANILA
BANGKOK
SAIGON
SINGAPORE
SAIPAN
GUAM
TRUK
PONAP
MARCUS
LAU IS
YAP
WOLEAI
100°
105°
110°
115°
120°
125°
130°
135°
140°
145°
150°
155°
30°
25°
20°
15°
10°
5°
0°

Gloria, like Elaine, developed a large circulation with the cyclone's 1000 mb isobar reaching 400 nm in diameter while traversing the Philippine Sea. Gloria, however, developed to these dimensions early in its life as the storm reached typhoon force 50 nm north of Yap Island on 4 November (Figure 4-27). Earlier Gloria, developing from a depression in the active monsoon trough, had passed about 10 nm northeast of Yap Island. The island's weather station registered a minimum pressure of 985.7 mb at 03/2020Z and later a peak gust of 46 knots as winds shifted to the west.

The building of a strong surface ridge southwest from Marcus Island subjected Gloria to a tightening gradient and strengthening flow in the right semicircle. Strong winds were observed at a considerable distance to the northeast with Andersen AFB Guam, 350 nm from the center, observing gusts to 46 knots midday on the 3rd.

Gloria commenced an unusual acceleration in forward speed up to 24 knots during the 4th - twice the normal for the area. Moving some 500 nm in 24 hours, Gloria occupied the central Philippine Sea early on the 5th. The FREDRICK LYKES caught west of the center at 05/0000Z reported northwest winds of 60 knots, while the barometer dipped to 983.4 mb.

Rapid deepening occurred once typhoon force was attained early on the 4th as Gloria's central pressure fell at a rate of 2.3 mb/hr during the rest of the day culminating in a minimum of 937 mb at 05/0400Z. Aircraft reconnaissance of the central core region early on the 5th proved extremely difficult as the eye diameter was only 4 nm. Subsequently, the typhoon's central pressure rose to 955 mb during the next 12 hours as Gloria's forward motion slowed temporarily to 10 knots. Following the rapid filling process, the typhoon's central pressure began an unusual second deepening as Gloria once again increased in forward speed (15 knots) targeting in on northern Luzon. The last aircraft reconnaissance of the typhoon in the Philippine Sea (10 hours before landfall) revealed Gloria had strengthened markedly--700 mb flight level winds of 120 knots during penetration and a minimum pressure of 931 mb at 06/0916Z (lowest pressure recorded during the year).

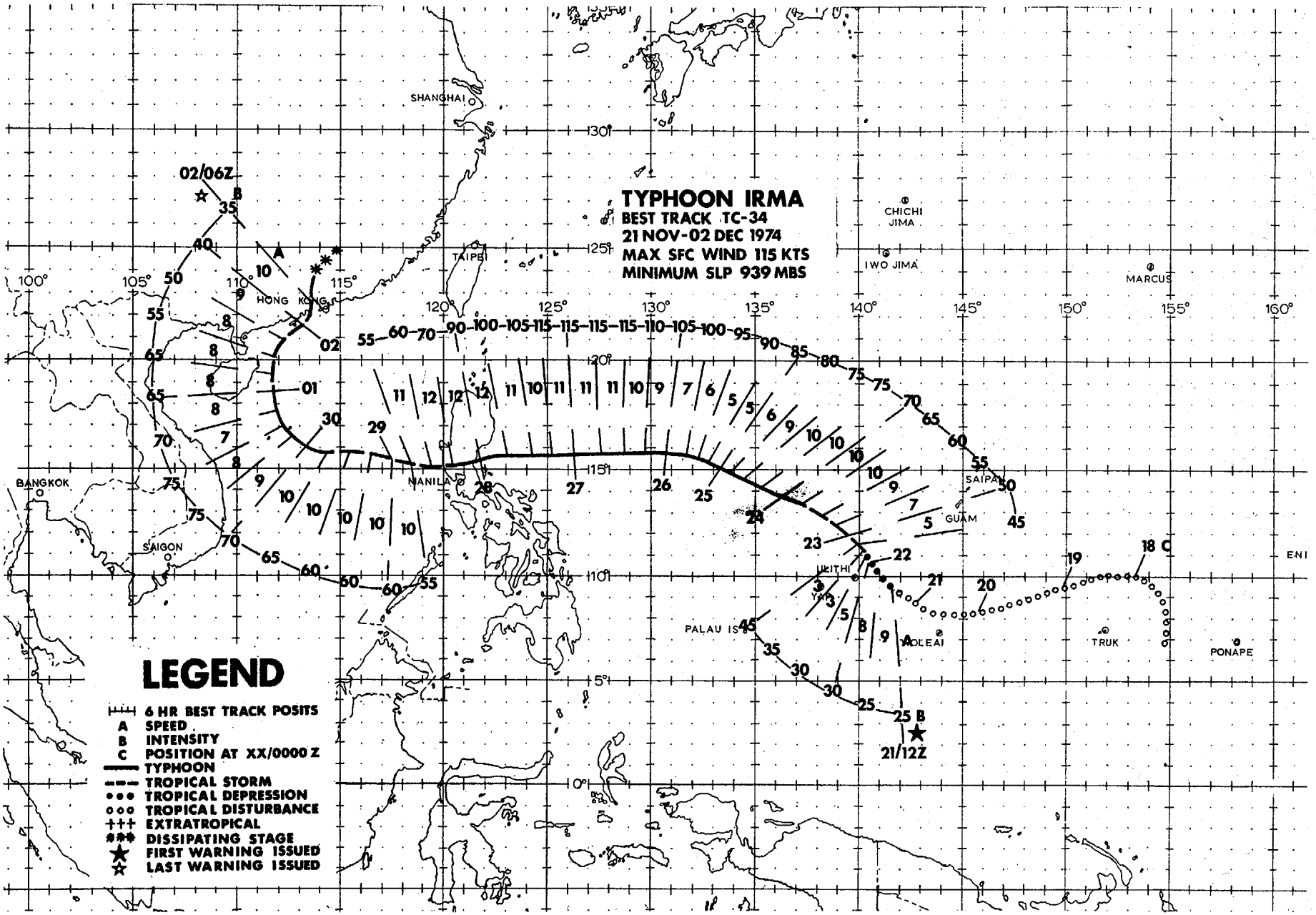
Following landfall, Gloria cut across Luzon in 6 hours. Maximum winds recorded during the cyclone's passage occurred at the northern coastal station of Aparri which reported gusts to 96 knots from the northeast and Vigan on the west coast registering south-southwest winds peaking at 94 knots. Laoag received winds gusting to 81 knots prior to Gloria's emergence in the South China Sea. The island town of Tugubgarao, 20 nm south of the center's path, observed the lowest pressure--972.9 mb. Rainfall amounts for a 24-hour period ranged from 3.8 inches at Aparri to 7.8 inches at Tugubgarao while Baguio reported an extreme of 18.9 inches.

Gloria climaxed a series of five typhoons which affected Luzon in less than a month--a record frequency dating back to 1945. Newspaper reports indicated $3.2 million in damage to crops and public and private property as a result of Gloria. Over 700 homes were destroyed by wind or inundated by floodwaters leaving close to a 1000 persons homeless. A casualty toll of 10 persons was reported in the typhoon's wake mostly due to drownings.

As Gloria exited Luzon into the South China Sea on the 7th, its forward motion slowed and a gradual northward track commenced as surface pressures were anomalously low over South China. However, like Elaine, Gloria failed to reach the China coast. A massive high pressure area from Manchuria began to penetrate into central China on the 9th blocking further northward progress. The influx of modified air off the mainland due to the onset of a northeast monsoon began to affect Gloria by midday of the 8th as the circulation dropped in intensity to storm force. Reduced to a tropical depression by the 9th, Gloria began to drift southward and dissipated on the 10th as pressures continued to build over South China.

During the storm's transit of the waters west of Luzon during the 7th and 8th some of the highest winds reported by merchant vessels during the year occurred. Winds of 65 knots were reported from a British vessel (call sign MYCE) (07/1200Z) and a Kuwait ship (call sign 9KSD) (08/0000Z) as both vessels passed within 60 nm of the eye.

FIGURE 4-27. *Gloria achieving typhoon strength 100 nm north of Yap Island in the Philippine Sea, 4 November 1974, 0300Z. (DMSP imagery)*


TYPHOON IRMA
BEST TRACK TC-34
21 NOV-02 DEC 1974
MAX SFC WIND 115 KTS
MINIMUM SLP 939 MBS
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/0000 Z
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
02/06Z
21/12Z
SHANGHAI
TAIPEI
HONG KONG
BANGKOK
SAIGON
MANILA
PALAU IS
CHICHI JIMA
IWO JIMA
MARCUS
SAIPAN
GUAM
UKITHI
YAP
ADLEAI
TRUK
PONAPE

The year's last typhoon, Irma terminated the barrage of late season typhoons to strike Luzon Island of the Philippine archipelago during October and November.

Initial development of Irma took place south of Guam as a depression in the monsoon trough. Passing north of Ulithi atoll on 22 November (Figure 4-28), Irma's circulation intensified rapidly producing typhoon force winds late on the 23rd. Like Elaine and Gloria, Irma's circulation dominated the Philippine Sea with the diameter of the 1000 mb isobar extending about 450 nm by the 23rd. The central pressure of the typhoon plummeted after passage of Ulithi until a minimum of 939 mb was recorded by aircraft reconnaissance 3 1/2 days later at 26/0635Z. Sustained surface winds generated around Irma's eye were estimated to be 115 kts during the 26th as the typhoon reached its peak intensity 400 nm east of Luzon.

Late on the 25th a massive high pressure ridge extending eastward from China to the Ryukyu chain prevented further poleward movement by Typhoon Irma near 16°N (Figure 4-29). This ridge dominated the region north of the typhoon through the 27th forcing Irma on an almost straight westerly track until it crossed the coast of Luzon. The turn of Irma to the west was very unusual. After reaching such a poleward latitude in the Philippine Sea few November typhoons fail to recurve.

Of the ships caught in the typhoon's gale force wind area in the Philippine Sea, the vessels MIKUNISAN MARU (200 nm west of the center at 25/1200Z), and a British ship (call sign GPIP) 200 nm northeast of the center at 26/0000Z) both reported 45 knot winds.

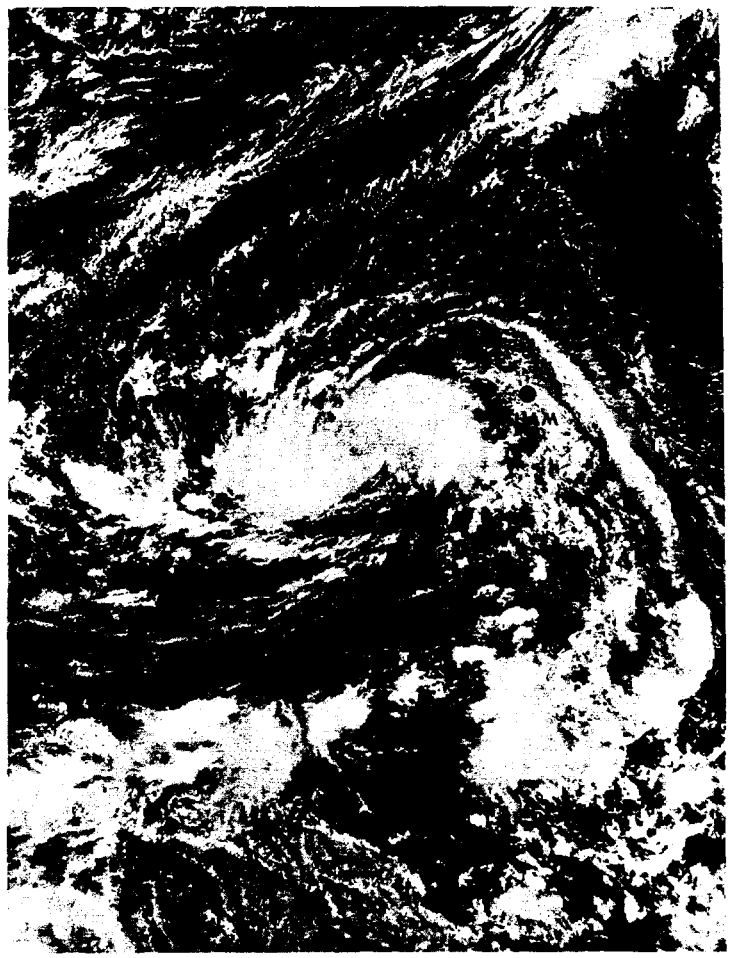


FIGURE 4-28. *Irma strengthening to tropical storm intensity 300 nm southwest of Guam, 22 November 1974, 0229Z. (DMSP imagery)*

Maritime casualties included several ships caught in heavy seas produced by Irma's pheripheral winds. The 5 ton Liberian ship PACIFICOEVERTT ran aground near Siarago Island in the southern portion of the Philippine archipelago, while the 4 1/2 ton Singapore ship FWSAN met the same fate at Nazasa Bay on Subic Bay. Reports from Catabato, Mindanao indicated the 2 ton Philippine vessel ZAMBOANGA CITY capsized and sunk offshore but all the crew survied. Not so fortunate was the 3 ton Panamanian ship GREEN HILL which sank after the cargo shifted 60 nm north of Miyako Jima in the Ryukyu chain. Of a crew of 20, four were lost.

Striking Luzon early on the 28th, the eye of Irma crossed the coastline 30 nm south of Baler, passing directly over Clark Air Base, later exiting Luzon near Iba on the west coast. Peak gusts of 74 knots and a minimum pressure of 983.9 mb were experienced at Baler. Later Clark AB recorded a barometric reading of 979.0 mb in the eye at 28/0700Z while registering a peak gust of 83 knots from the northwest at 28/0500Z. This was the highest recorded gust at Clark AB since before World War II. As Irma's eye emerged on the west coast, east-southeasterly winds peaking at 58 knots occurred at Iba as the pressure dropped to 983.5 mb.

Twenty-four hour rainfall totals from Irma generally varied from 2 to 5 inches over Luzon with an extreme of 6.7 inches recorded at Cubi Point Naval Air Station. This amount broke previous station records for the month of November (previous 24-hour maximum was 5.3 inches).

Irma brought strong gale force winds to the metropolitan area of Manila. A gust to 51 knots from the southwest was reported at the international airport while the port area experienced westerly winds gusting to 60 knots. Several ships in Manila Bay were reported blown almost to the Roxas Boulevard seawall during the seige.

Damage to public and private buildings, public works, crops, and livestock was estimated at $7.3 million. Over 1000 homes were reported destroyed or partially damaged by the winds. Newspaper reports indicated Irma claimed 11 lives in addition to sinking several small vessels and fishing boats.

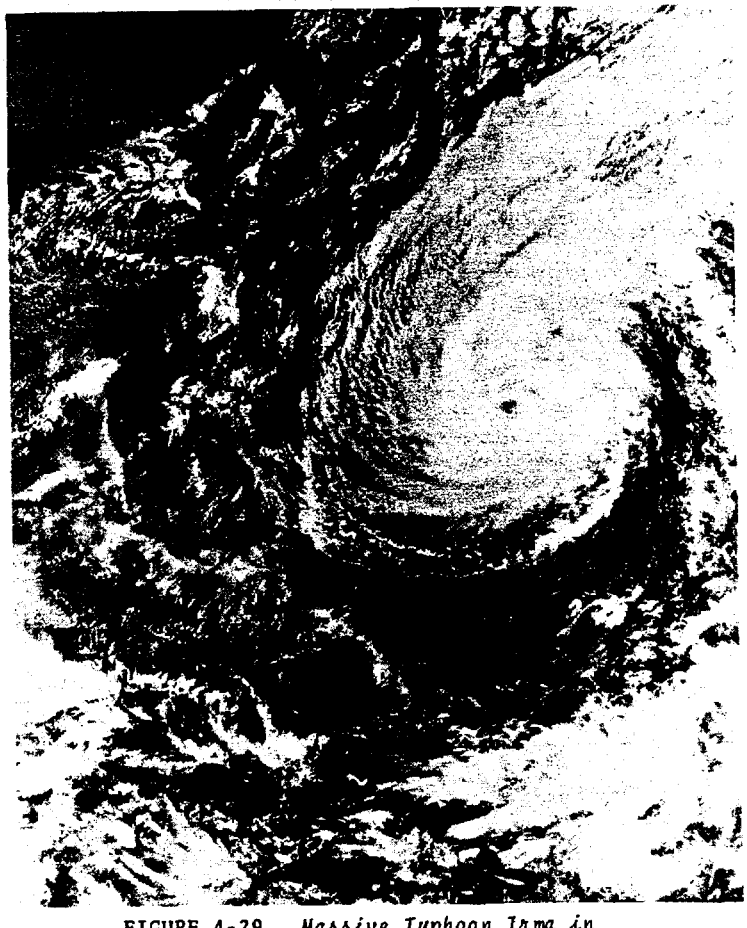


FIGURE 4-29. *Massive Typhoon Irma in the central Philippine Sea 500 nm east of Cantanduanes Island, 25 November 1974, 0315Z. [DMSP imagery]*

As Irma departed Luzon, the ridge of high pressure over South China weakened, allowing the cyclone, then of tropical storm strength, to take a slight poleward motion during its track across the South China Sea. Late on the 29th, pressure began to fall over southwestern China as remains of a tropical depression (formerly T.C. 30-74) moved into the area from Burma. Irma briefly regained typhoon strength during this period, and abruptly turned to the north on the 30th passing over the Paracel Islands. A meteorological station in the islands observed a pressure minimum of 970.5 mb (30/1200Z) and sustained (10 minute) wind of 60 knots as winds shifted from the west at 20/1500Z. Based on available records since 1945, no tropical cyclone has been as intense as Irma so late in the season in the northern South China Sea.

Passing abeam of Hainan Island on 1 December, Irma dropped below typhoon strength and rapidly filled while approaching the South China coast. Tracking 30 nm west of Hong Kong the circulation dissipated inland one day later. Maximum rainfall brought to Hong Kong by the weakening storm was 7.0 inches recorded at the Royal Observatory during the 2nd, while southerly winds gusting to 34 knots were observed at Cheung Chau. It is noteworthy to mention that Irma was the latest tropical storm on record to affect the South China coast.

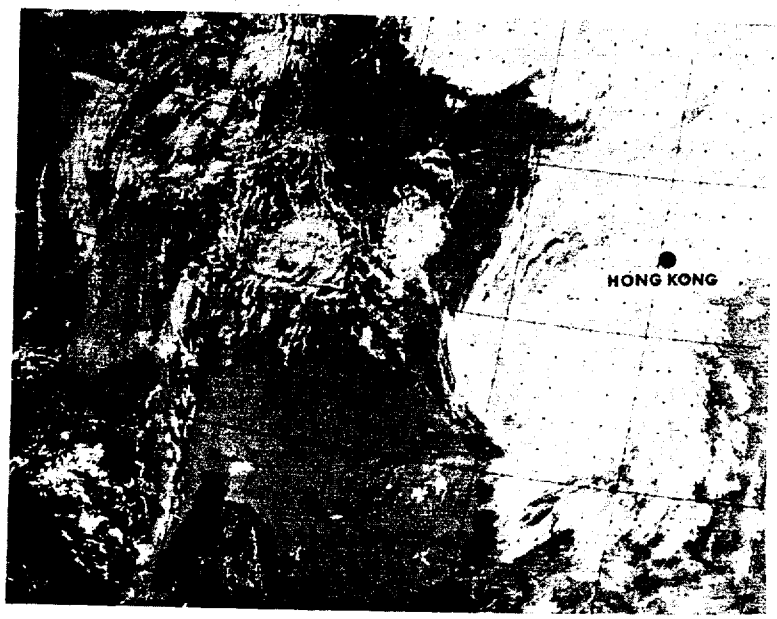


FIGURE 4-30. *Typhoon Irma 270 nm south-southwest of Hong Kong 1 December 1974, 0124Z. (DMSP imagery)*

3. TROPICAL CYCLONE CENTER FIX DATA

a. Discussion of Data:

The fix data computer print-out includes all sources of fix data for each tropical cyclone. Regardless of the type of fix, the first four columns of the print-out list the same information as follows:

FIX NO. - Fixes are numbered sequentially.

TIME - In day, hour and minutes (Zulu Time) of fix.

POSIT - Position of storm center in degrees and tenths.

FIXCAT - Type of fix used (SAT-satellite, P-aircraft penetration, LRDR-land radar, AC R-aircraft radar, SRDR-ship radar, CPA-station experiencing center passage, SCF-synoptic chart fix).

The format of the remainder of the print-out varies with the type of fix.

(1) SATELLITE - The primary satellite fix data was obtained from the various DMSP sites (Chapter II). Additional fix data was obtained from FLEWEAFAC and NESS, Suitland, Maryland (NOAA-2 prior to 16 Oct 1974, NOAA-3 from 16 Oct 74 to 17 Dec 1974, and NOAA-4 after 17 Dec 1974). Intensity estimates and trends (when available) are listed using the NESS classification system. If the source was DMSP data, the Position Code Number (PCN) appears followed by the acronym DMSP. If the source was NOAA-2, NOAA-3, or NOAA-4 data, the acronym NON DMSP appears followed by the type of satellite utilized and the CONF Number.

(2) RADAR - The latitude and longitude of radar site is given in the POSIT OF RADAR column. If available, plain language remarks appear after AC&W radar reports regarding tropical cyclone characteristics, size and accuracy of fix. All other land radar contain a 5-digit code group (if available) identical to the WMO radar code for reporting tropical cyclone characteristics with regard to size, development, and accuracy of location of the center or eye. A list of those land radar sites providing data in the fix print-out is given in Table 4-8 .

(3) AIRCRAFT PENETRATION - This data was normally obtained at scheduled fix times. Additional reconnaissance aircraft fixes are sometimes made during peripheral data gathering legs between scheduled fixes. These additional fixes normally provide date, time, and position data only.

The categories containing information from reconnaissance aircraft are:

(a) ACCRY (Accuracy)

The estimated navigation (first number) and meteorological (second number) accuracies are expressed in nautical miles.

(b) FIX LVL (Fix Level)

A constant-pressure-surface flight level (listed in millibars) is normally maintained during a tropical cyclone fix mission. Low-level missions (1500 feet) are conducted at a constant, true altitude.

(c) MAX OBS FLT LVL WIND

Wind speed (kt) at flight level is measured by the AN/APN 147 doppler radar system aboard the WC-130 aircraft. Values entered in this category represent the maximum wind measured prior to obtaining a scheduled fix. This measurement may not represent the maximum wind because the aircraft samples only those portions of the central core region along the flight path. For this reason, the observed maximum wind may be significantly lower than the true maximum wind in the circulation (e.g., penetration through weak semicircle on first fix).

A limitation of the doppler radar system occasionally prevents the measurement of the maximum wind in intense typhoons. In areas of heavy rainfall, the radar may track energy reflected from precipitation rather than the sea surface, preventing accurate wind measurement. In these cases the wind speed will not be reported. Also, the doppler radar mount on the WC-130 restricts wind measurements to drift angles $\leq 27°$ if wind is normal to aircraft heading.

(d) MAX OBS SFC WIND

The maximum surface wind (knots) estimated from flight level is entered in this column. The observation is an estimate based on sea state. The sampling limitation noted in paragraph (c) also pertains to this category. In addition, availability of this data is dependent on the absence of undercast conditions. The position of maximum flight level winds and maximum observed surface winds do not necessarily coincide.

(e) OBS MIN SLP

The minimum observed sea level pressure is normally obtained from a dropsonde released in the vortex center. If the ocean surface is visible, the dropsonde will be released over the center of the area of calm seas; otherwise it is released over a center determined by flight level winds. If the fix is made at 1500 feet, the sea level pressure is extrapolated from that level.

(f) MIN 700 MB HT

The minimum height of the 700 mb surface in the vortex center is recorded in decameters.

(g) FLT LVL TI/TO

Denotes maximum temperatures measured in the center (TI) and ambient temperature outside the center (TO). Ambient temperature is measured just prior to entering the wall cloud. Both temperature observations are in degrees Celsius and are made at flight level.

Reconnaissance aircraft seldom penetrate on the same azimuth from one fix to another. Thus, the position of TO normally varies from the center, both in bearing and range. This position is dependent on radar definition of the storm.

(h) EYE FORM/ORIENTATION/DIA

The shape and diameter (nautical miles) of the eye are determined by radar. This is reported only if the center is 50% or more surrounded by wall cloud. The orientation of the major axis concerns elliptical eyes. Abbreviations for the eye forms are as follows:

CIRC - Circular

ELIP - Elliptical

CONC - Concentric

TABLE 4-8. LAND RADAR SITES

Location	Station No.	ICAO	Station Name
14.2N 122.0E	98440	RPUD	DAET
14.6N 121.0E	98425		MANILA
16.4N 120.6E	98328	RPUB	BAGUIO
15.2N 120.5E	98327	RPMK	CLARK AB (USAF)
14.4N 122.6E			PARANAL AS (AC&W)
16.6N 120.3E			WALLACE AS (AC&W)
18.1N 120.5E			PARADES AS (AC&W)
13.6N 144.9E	91218	PGUA	ANDERSEN AFB (USAF)
26.1N 127.8E	47937		ITOKAZU
26.4N 127.8E	47931	RODN	KADENA AB (USAF)
26.2N 127.7E	47930	ROAHJ	NAHA AB (JASDF)
24.8N 125.3E	47927	ROMY	MIYAKOJIMA
24.3N 124.2E	47918	ROIG	ISHIGAKIJIMA
28.4N 129.5E	47909		NAZE
33.3N 134.2E	47899		MUROTOMISAKI
30.6N 131.0E	47869		TANEGASHIMA/NAKA
33.6N 130.5E	47808	RJFFJ	FUKUOKA/ITAZUKE (JASDF)
33.4N 130.4E	47806		FUKUOKA/SEFURISAN
34.3N 132.6E	47792		HIROSHIMA/HAIGAMINE
35.5N 133.1E	47791		MATSUE/MISAKAYAWA
35.8N 139.4E	47643	RJTJJ	IRUMA AB (JASDF)
35.7N 139.3E	47642	RJTY	YOKOTA AB (USAF)
35.4N 138.7E	47639		FUJISAN
35.2N 137.0E	47636		NAGOYA
33.2N 126.3E	47187	RKPM	CHEJU-DO/MOSLUPO AB
24.3N 120.6E	46770	RCQM	CCK AB/TAIWAN (USAF)
24.0N 121.6E	46763	RCYU	HUA-LIEN
22.6N 120.3E	46744		KAOHSIUNG
24.0N 121.6E	46699		HWALIEN
22.3N 114.2E	45005		HONG KONG OBSR.

b. FIX DATA PRINTOUTS;

TROPICAL STORM WANDA
FIX POSITIONS FOR CYCLONE NO. 1
0000Z 10 JAN TO 1200Z 13 JAN

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL	BRG RNG	MAX OBS SFC WIND VEL	BRG RNG	OBS MIN SLP	MIN /00MB HGT	FLT LVL T1/T0	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	0601202	7.6N 128.3E	SAT		(T1.5/1.5 /D0.5/24HRS)			NOAA-2		(CONF 03)							
2	0821262	7.4N 128.7E	SAT		(T1.5/1.5 /D / HRS)			PCN 5 DMSP									
3	0900152	8.1N 129.1E	SAT		(T3.0/3.0 /D1.0/24HRS)			NOAA-2		(CONF 01)							
4	0900162	8.0N 129.0E	SAT		(T2.0/2.0 /D1.0/24HRS)			NOAA-2		(CONF 02)							
5	0903392	8.0N 129.8E	SAT		(T1.5/1.5 /D / HRS)			PCN 5 DMSP									
6	0911482	9.7N 130.2E	SAT					PCN 5 DMSP									
7	0916222	10.0N 130.5E	SAT					PCN 5 DMSP									
8	0922492	9.2N 131.3E	SAT		(T2.0/2.0 / / HRS)			PCN 5 DMSP									
9	1001102	11.0N 131.0E	SAT		(T3.0/3.0 /S /23HRS)			NOAA-2		(CONF 01)							
10	1001112	11.0N 131.0E	SAT		(T3.0/3.0 /D1.0/24HRS)			NOAA-2		(CONF 02)							
11	1001152	10.0N 131.0E	P	- 15	700 270 55 170			45 55 170		45 998	305	14 -	-	- -	-		1
12	1003252	9.9N 132.2E	SAT		(T2.0/2.0 /D0.5/28HRS)			PCN 3 DMSP									
13	1003252	10.0N 132.1E	SAT		(T2.0/2.0 / / HRS)			PCN 3 DMSP									
14	1004152	10.3N 131.9E	P	2 15	700 270 55 190			40 60 180		40 992	302	14 -	-	- -	-		1
15	1011312	10.8N 133.0E	SAT					PCN 5 DMSP									
16	1011312	10.8N 133.0E	SAT					PCN 5 DMSP									
17	1015362	11.5N 131.5E	AC R	-									-	- -	-		-
18	1016082	11.8N 132.0E	SAT					PCN 5 DMSP									
19	1016082	11.3N 131.8E	SAT		(IR DATA)			PCN 5 DMSP									
20	1100102	12.5N 133.5E	SAT		(T4.0/4.0 / / HRS)			NOAA-2									
21	1100122	12.8N 133.8E	SAT		(T3.0/3.0-/D1.0/24HRS)			PCN 5 DMSP									
22	1100122	12.9N 133.5E	SAT		(T3.5/3.5 /D1.5/25HRS)			PCN 3 DMSP									
23	1100122	12.7N 133.9E	SAT		(T3.0/3.0 /D2.0/ HRS)			PCN 5 DMSP									
24	1103102	13.3N 133.9E	SAT		(T3.0/3.0-/ /24HRS)			PCN 3 DMSP									
25	1103102	13.6N 133.9E	SAT		(T3.5/3.5 / / HRS)			PCN 5 DMSP									
26	1104302	12.5N 133.9E	P	5 20	1500 - - -			- 25 120		30 996	-	25 -	-	- -	-		4
27	1115532	12.0N 136.8E	SAT					PCN 3 DMSP									
28	1122132	13.4N 137.8E	SAT		(T3.0/3.0-/ /24HRS)			PCN 3 DMSP									
29	1123092	14.0N 138.0E	SAT		(T2.0/3.0 /W2.0/23HRS)			NOAA-2		(CONF 02)							
30	1123092	14.0N 137.8E	SAT		(T2.0/3.0 /W2.0/24HRS)			NOAA-2		(CONF 01)							
31	1123542	13.5N 138.0E	SAT		(T2.0/2.0 /W1.0/24HRS)			PCN 5 DMSP									
32	1123542	13.7N 138.2E	SAT		(T2.0/2.0 /W1.5/24HRS)			PCN 5 DMSP									
33	1200472	13.7N 138.1E	P	5 10	700 160 30 100			120 30 00		40 999	308	12 -	-	- -	-		7
34	1202552	13.5N 138.3E	SAT		(T2.0/2.0 /W1.0/24HRS)			PCN 5 DMSP									
35	1202552	13.5N 138.6E	SAT		(T2.0/2.0 /W1.5/ HRS)			PCN 5 DMSP									
36	1202552	13.4N 138.0E	SAT		(T1.5/1.5 / / HRS)			PCN 5 DMSP									
37	1203102	14.0N 138.3E	P	5 10	1500 - - -			- - -		- 999	-	25 -	-	- -	-		7
38	1209002	14.5N 139.3E	P	10 10	700 120 35 120			60 35 330		15 993	303	12 13	-	- -	-		8
39	1210542	14.6N 139.8E	SAT					PCN 5 DMSP									
40	1210542	14.1N 139.5E	SAT					PCN 5 DMSP									
41	1215392	14.6N 140.4E	SAT					PCN 5 DMSP									
42	1215392	14.7N 141.1E	SAT					PCN 5 DMSP									
43	1215392	15.5N 141.3E	SAT					PCN 5 DMSP									
44	1221542	15.0N 141.7E	SAT		(T2.0/2.0 /W1.0/24HRS)			PCN 5 DMSP									
45	1221582	14.8N 142.2E	P	5 10	1500 360 35 320			70 30 20		50 998	-	20 -	-	- -	-		9
46	1223362	14.4N 142.0E	SAT		(T2.0/2.0 /S /24HRS)			PCN 3 DMSP									
47	1223362	15.0N 142.6E	SAT		(T2.0/2.0 /S /25HRS)			PCN 5 DMSP									
48	1300002	17.5N 145.0E	SAT		(T2.0/2.0 /S /23HRS)			NOAA-2		(CONF 01)							
49	1302412	14.8N 143.0E	SAT		(T2.0/2.0 /S /24HRS)			PCN 3 DMSP									
50	1302412	14.8N 143.0E	SAT		(T2.0/2.0 /S / HRS)			PCN 5 DMSP									
51	1302412	14.7N 143.1E	SAT		(T1.5/1.5 /W /24HRS)			PCN 5 DMSP									
52	1308152	15.9N 145.6E	P	1 5	1500 40 30 320			30 20 140		34 1003	-	26 -	-	- -	-		10

TROPICAL STORM AMY
FIX POSITIONS FOR CYCLONE NO. 2
1200Z 14 MAR TO 1200Z 19 MAR

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL	BRG RNG	MAX OBS SFC WIND VEL	BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T1/T0	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	1222352	8.2N 145.4E	SAT		(IR DATA)			PCN 4 DMSP									
2	1322172	8.1N 143.2E	SAT		(T1.0/1.0 /D1.0/24HRS)			PCN 3 DMSP									
3	1410592	8.3N 142.4E	SAT					PCN 5 DMSP									
4	1423402	8.7N 142.1E	SAT		(T1.5/1.5 /D0.5/24HRS)			PCN 3 DMSP									
5	1500432	8.8N 138.7E	SAT		(T2.0/2.0 /D1.0/24HRS)			NOAA-2		(CONF 01)							
6	1510402	9.1N 141.2E	SAT					PCN 5 DMSP									
7	1523222	10.3N 137.0E	SAT		(T2.0/2.0 /D0.5/24HRS)			PCN 5 DMSP									
8	1523302	10.7N 137.0E	SAT		(T2.5/2.5 /D0.5/24HRS)			NOAA-2		(CONF 01)							
9	1611122	11.4N 136.5E	P	- -	700 - - -			- - -		- 996	305	- -	-	- -	-		3
10	1612042	11.7N 136.2E	SAT					PCN 5 DMSP									
11	1614102	11.7N 136.3E	P	5 10	700 290 25 200			20 - -		- 1001	308	9 9	-	- -	-		3
12	1623042	13.1N 136.8E	SAT		(T2.5/2.5 /D0.5/24HRS)			PCN 3 DMSP									
13	1700222	14.0N 136.9E	SAT		(T3.0/3.0 /D0.5/24HRS)			NOAA-2		(CONF 01)							
14	1704252	14.0N 137.2E	P	5 3	1500 180 50 140			90 30 240		12 990	-	24 -	-	- -	-		5
15	1709052	14.9N 137.6E	P	5 5	1500 40 35 320			90 3 20		50 992	-	24 -	-	- -	-		5
16	1711452	15.9N 138.3E	SAT					PCN 6 DMSP									
17	1715132	15.6N 138.9E	P	3 5	700 210 52 110			120 - -		- 996	304	12 10	-	- -	-		6
18	1722462	17.4N 140.0E	SAT		(12.5/2.5 /S /24HRS)			PCN 5 DMSP									
19	1722462	17.0N 140.1E	SAT		(T2.0/2.0 / / HRS)			PCN 5 DMSP									
20	1723212	17.7N 140.5E	SAT		(T3.0/3.0-/S /24HRS)			NOAA-2		(CONF 01)							
21	1801432	17.4N 140.1E	SAT		(T2.0/2.0 / / HRS)			PCN 3 DMSP									
22	1803142	17.8N 141.1E	P	5 8	1500 20 50 340			50 3 330		30 995	-	22 -	-	- -	-		7
23	1811272	19.3N 143.8E	SAT					PCN 5 DMSP									
24	1815352	19.4N 144.5E	P	20 10	700 80 35 40			45 - -		- 987	298	12 11	-	- -	-		8
25	1820302	21.0N 146.4E	P	20 10	700 310 40 -			- 60 240		10 -	-	17 15	-	- -	-		8
26	1822222	22.9N 149.0E	SAT		(T2.0/3.0 /W1.0/24HRS)			NOAA-2		(CONF 02)							
27	1822272	22.1N 149.1E	SAT		(T3.0/3.0-/D0.5/24HRS)			PCN 3 DMSP									
28	1900452	23.5N 151.0E	P	5 5	1500 - - -			- 3 280		25 993	-	20 -	-	- -	-		9
29	1908152	23.6N 151.6E	P	- -	1500 - - -			- - -		- 993	-	- -	-	- -	-		9
30	1909122	24.3N 151.7E	P	5 2	1500 270 30 -			- - -		- -	166	13 -	-	- -	-		9

TROPICAL STORM BABE
FIX POSITIONS FOR CYCLONE NO. 3
0000Z 26 APR TO 0600Z 02 MAY

FIX NO.	TIME	POSIT	FIX CAT	ACCNY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/ID	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	2321432	1.8N 153.8E	SAT	([1.5/1.5 /D0.5/24HRS)						NOAA-2			(CONF 02)							
2	2421512	6.3N 156.3E	SAT	([1.5/1.5 /S /24HRS)						NOAA-2			(CONF 01)							
3	2501482	7.4N 152.6E	SAT	([1.5/1.5 /D0.5/24HRS)						PCN 5 DMSP										
4	2510032	9.3N 149.5E	SAT							PCN 6 DMSP										
5	2514292	9.3N 149.3E	SAT							PCN 6 DMSP										
6	2522452	11.4N 148.4E	SAT	([2.0/2.0 /D0.5/20HRS)						PCN 5 DMSP										
7	2522592	11.0N 148.7E	SAT	([2.0/2.0 /D0.5/24HRS)						NOAA-2			(CONF 02)							
8	2523012	9.2N 147.5E	P	10 20 1500	80	20	350			20	20	350	90 1002	-	22	22	-	- -	-			1
9	2601292	11.6N 147.6E	SAT	([2.0/2.0 /D0.5/20HRS)						PCN 5 DMSP										
10	2603202	9.9N 146.9E	P	3 10 1500	190	25	110			100	15	-	- 1001	-	22	-	-	- -	-			1
11	2608352	10.9N 146.1E	P	5 10 700	40	30	320			80	15	340	120 1002	309	11	10	-	- -	-			2
12	2611272	12.4N 145.8E	SAT							PCN 6 DMSP										
13	2613182	11.7N 145.8E	P	7 5	700	350	35	290		50	-	-	- 1002	309	12	10	-	- -	-			2
14	2614102	12.5N 145.6E	SAT							PCN 6 DMSP										
15	2615192	11.9N 145.4E	P	7 5	700	90	30	360		40	-	-	- 999	307	12	10	-	- -	-			2
16	2618202	12.2N 145.5E	P	5 6	700	320	30	280		38	-	-	- 990	306	12	-	-	- -	-			3
17	2621042	12.2N 145.5E	P	5 1	700	210	30	160		60	20	90	10 998	308	13	-	-	- -	-			3
18	2621452	12.1N 145.3E	LNDR	- POSSIBLE CENTER, 15 DEG SPIRAL OVERLAY, NEG. WALL CLOUD																13.6N 144.9E		
19	2622142	12.2N 144.2E	SAT	([2.5/2.5 / / HRS)						NOAA-2										
20	2622262	12.4N 145.3E	SAT	([3.0/3.0-/D1.0/24HRS)						PCN 3 DMSP										
21	2622262	12.6N 145.4E	SAT	([2.0/2.0 /S / HRS)						PCN 3 DMSP										
22	2700052	12.6N 145.3E	P	5 5 1500	110	25	360			70	20	270	10 1001	-	24	-	-	- -	-			3
23	2701112	12.7N 145.4E	SAT	([3.0/3.0-/D1.0/24HRS)						PCN 3 DMSP										
24	2705402	13.5N 145.3E	LNDR	- POSSIBLE CENTER, 20 DEG SPIRAL OVERLAY, WALL CLOUD FORMING ALL QUADS																13.6N 144.9E		
25	2706102	13.5N 145.5E	LNDR	- ELIP EYE 34X16, OPEN NE																13.6N 144.9E		
26	2708352	13.6N 145.6E	P	5 3 700	180	20	90			10	25	240	10 996	306	12	9	-	- -	-			4
27	2711082	14.3N 146.4E	SAT							PCN 6 DMSP										
28	2712402	13.8N 145.9E	LNDR	- POSSIBLE CENTER, 15 DEG SPIRAL OVERLAY, WALL CLOUD S-W-NW																13.6N 144.9E		
29	2714342	14.5N 145.8E	P	4 8 700	280	40	220			180	-	-	- -	-	10	9	-	- -	-			4
30	2722082	15.9N 145.9E	SAT	([2.0/3.0+/W1.0/24HRS)						PCN 5 DMSP										
31	2723222	15.5N 145.5E	SAT	([2.0/2.5 /W0.5/24HRS)						NOAA-2			(CONF 01)							
32	2800052	16.1N 145.6E	SAT	([2.0/3.0+/W1.0/24HRS)						PCN 5 DMSP										
33	2803252	16.1N 145.6E	P	2 5 700	80	23	350			25	25	160	35 995	303	14	-	-	- -	-			5
34	2809252	16.5N 145.6E	P	2 10 700	300	25	210			30	20	10	95 996	306	13	-	-	- -	-			5
35	2810502	17.0N 145.4E	SAT							PCN 6 DMSP										
36	2813332	17.7N 145.7E	SAT							PCN 4 DMSP										
37	2814352	17.4N 145.7E	P	5 10 700	360	20	270			35	-	-	- 995	305	13	-	-	- -	-			5
38	2821502	18.0N 144.9E	SAT	([3.5/3.5-/D1.5/24HRS)						PCN 3 DMSP										
39	2821502	17.6N 145.2E	SAT	([3.5/3.5-/D1.5/48HRS)						PCN 3 DMSP										
40	2821582	17.8N 145.1E	P	20 2 700	320	25	250			30	25	230	200 -	307	10	10	-	- -	-			6
41	2822392	17.8N 145.2E	SAT	([4.0/4.0 /D2.0/24HRS)						NOAA-2			(CONF 01)							
42	2823322	18.1N 145.0E	SAT	([3.5/3.5-/D1.5/24HRS)						PCN 3 DMSP										
43	2902152	18.4N 145.1E	SAT	([3.5/3.5-/D1.5/24HRS)						PCN 3 DMSP										
44	2902152	18.5N 144.9E	SAT	([3.5/3.5-/D1.5/48HRS)						PCN 3 DMSP										
45	2907532	18.8N 145.2E	P	5 5 700	260	40	210			40	25	20	25 997	305	14	12	-	- -	-			7
46	2910322	18.9N 144.3E	SAT							PCN 3 DMSP										
47	2910322	19.0N 144.2E	SAT							PCN 6 DMSP										
48	2914432	19.7N 145.3E	P	5 5 700	180	55	90			40	-	-	- 985	297	16	13	-	- -	-			7
49	2914562	19.2N 144.7E	SAT							PCN 5 DMSP										
50	2914562	19.3N 145.0E	SAT							PCN 3 DMSP										
51	2923132	20.3N 145.0E	SAT	([3.5/3.5-/S /25HRS)						PCN 1 DMSP										
52	2923132	20.1N 144.8E	SAT	([4.0/4.0-/D0.5/25HRS)						PCN 1 DMSP										
53	2923452	20.0N 145.0E	SAT	([5.0/5.0 /D1.0/24HRS)						NOAA-2			(CONF 02)							
54	3001572	20.5N 144.8E	SAT	([3.5/3.5-/S /25HRS)						PCN 1 DMSP										
55	3001572	20.3N 144.6E	SAT	([4.0/4.0-/D0.5/25HRS)						PCN 1 DMSP										
56	3004042	20.5N 144.3E	P	2 2 1500	330	35	240			20	40	240	20 983	-	25	-	-	- -	-			8
57	3009152	21.3N 144.3E	P	5 5 700	320	75	250			35	5	20	50 983	295	15	-	-	- -	-			8
58	3011552	21.4N 144.9E	SAT							PCN 3 DMSP										
59	3014372	21.7N 145.2E	SAT							PCN 3 DMSP										
60	3015102	22.1N 144.9E	P	10 10 700	270	70	180			50	-	-	- -	292	16	17	-	- -	-			9
61	3022552	22.6N 146.3E	SAT	([3.0/3.5 /W0.5/24HRS)						PCN 3 DMSP										
62	0101382	23.2N 146.9E	SAT	([3.0/3.5 /W0.5/24HRS)						PCN 3 DMSP										
63	0102502	23.6N 146.1E	P	10 5 700	250	75	180			30	10	180	60 984	293	14	10	-	- -	-			9
64	0108202	25.2N 147.0E	P	10 5 700	290	50	200			35	30	240	35 983	294	16	13	-	- -	-			10
65	0111372	26.1N 147.3E	SAT							PCN 3 DMSP										
66	0114192	26.5N 148.0E	SAT							PCN 3 DMSP										
67	0122162	28.8N 151.0E	SAT	([3.0/3.0 /W2.0/48HRS)						NOAA-2			(CONF 01)							
68	0122372	30.0N 151.2E	SAT	([2.0/3.0 /W1.0/24HRS)						PCN 3 DMSP										
69	0122372	30.0N 151.2E	SAT	([2.0/2.5 /W0.5/ HRS)						PCN 3 DMSP										
70	0123152	30.0N 151.2E	P	10 10 700	-	-	-			-	10	230	120 994	301	13	-	-	- -	-			11
71	0201192	31.0N 152.7E	SAT	([2.0/3.0 /W1.0/24HRS)						PCN 3 DMSP										
72	0201402	30.9N 152.9E	SAT	([2.0/2.5 /W0.5/ HRS)						PCN 3 DMSP										
73	0211192	29.4N 157.0E	SAT							PCN 6 DMSP										

TYPHOON CARLA
FIX POSITIONS FOR CYCLONE NO. 4
0000Z 02 MAY TO 0600Z 07 MAY

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/IO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	282150Z	5.0N 158.4E	SAT	(T1.5/1.5 /D0.5/24HRS)						PCN 3 DMSP										
2	291315Z	5.5N 157.6E	SAT							PCN 6 DMSP										
3	292132Z	6.0N 156.6E	SAT	(T1.5/1.5 /S /24HRS)						PCN 6 DMSP										
4	302108Z	8.0N 156.0E	SAT	(T2.0/2.0 /D1.0/24HRS)						NOAA-2			(CONF 03)							
5	302255Z	8.1N 155.0E	SAT	(T1.5/1.5 /S /24HRS)						PCN 5 DMSP										
6	010138Z	9.0N 154.5E	SAT	(T1.5/1.5 /S /24HRS)						PCN 5 DMSP										
7	010955Z	9.8N 152.3E	SAT							PCN 6 DMSP										
8	011419Z	10.4N 151.6E	SAT							PCN 5 DMSP										
9	011419Z	10.5N 151.5E	SAT	(IR DATA)						PCN 6 DMSP										
10	012221Z	12.2N 150.3E	SAT	(T2.0/2.0 /S /24HRS)						NOAA-2			(CONF 01)							
11	012237Z	11.9N 150.3E	SAT	(T2.0/2.0 /D0.5/24HRS)						PCN 3 DMSP										
12	020119Z	12.5N 149.9E	SAT	(T2.0/2.0 /D0.5/24HRS)						PCN 3 DMSP										
13	020435Z	12.6N 149.2E	P	5	5	1500	180	45	90	15	37	90	15	998	-	25	-	-	- -	-	1
14	020930Z	12.8N 148.3E	P	5	5	700	90	50	10	60	3	10	60	-	306	11	-	-	- -	-	1
15	021119Z	13.0N 148.4E	SAT							PCN 3 DMSP										
16	021119Z	12.9N 147.8E	SAT	(IR DATA)						PCN 4 DMSP										
17	021401Z	13.4N 147.6E	SAT							PCN 3 DMSP										
18	021401Z	13.4N 146.9E	SAT							PCN 4 DMSP										
19	021435Z	13.4N 147.4E	P	-	5	700	340	35	250	15	-	-	-	996	306	15	11	-	- -	-	2
20	021620Z	13.4N 147.5E	P	-	-	700	-	-	-	-	-	-	-	-	-	-	-	-	- -	-	2
21	021818Z	13.6N 147.3E	P	10	5	700	320	30	-	-	-	-	-	992	301	13	-	-	- -	-	3
22	022103Z	14.0N 147.1E	P	5	5	700	130	60	30	35	50	-	-	988	299	15	8	-	- -	-	3
23	022219Z	13.9N 147.0E	SAT	(T3.5/3.5 /D1.5/24HRS)						PCN 3 DMSP										
24	022219Z	14.2N 147.2E	SAT	(T3.0/3.0 /S /24HRS)						PCN 3 DMSP										
25	022326Z	13.7N 146.2E	SAT	(T3.5/3.5 /D1.5/25HRS)						NOAA-2			(CONF 01)							
26	030101Z	14.1N 146.3E	SAT	(T3.5/3.5 /D1.5/24HRS)						PCN 3 DMSP										
27	030351Z	14.5N 146.2E	P	5	10	700	260	20	170	25	40	170	45	991	301	12	9	-	- -	-	3
28	030843Z	15.1N 145.5E	P	2	5	700	290	35	220	50	3	220	45	994	304	12	8	-	- -	-	4
29	031100Z	15.5N 145.1E	SAT							PCN 3 DMSP										
30	031100Z	14.9N 144.8E	SAT							PCN 4 DMSP										
31	031342Z	15.5N 144.6E	SAT							PCN 3 DMSP										
32	031447Z	15.6N 144.9E	P	2	5	700	120	45	70	35	-	-	-	989	301	13	12	-	- -	-	4
33	032200Z	16.1N 144.1E	SAT	(T3.5/3.5-/S /24HRS)						PCN 3 DMSP										
34	032200Z	15.7N 144.2E	SAT	(T3.0/3.0 /S /24HRS)						PCN 3 DMSP										
35	032243Z	16.1N 144.6E	SAT	(T4.5/4.5 /D1.0/24HRS)						NOAA-2			(CONF 01)							
36	040224Z	16.6N 144.2E	SAT	(T3.5/3.5-/S /24HRS)						PCN 1 DMSP										
37	040224Z	16.1N 144.2E	SAT	(T5.0/5.0 / / HRS)						PCN 1 DMSP										
38	040330Z	16.3N 144.2E	P	5	5	700	320	35	230	30	5	250	10	978	291	15	10	-	- -	-	5
39	040830Z	17.0N 143.9E	P	5	5	700	150	60	130	60	50	60	12	973	285	17	13	CIRC		25	5
40	041041Z	17.1N 143.7E	SAT							PCN 1 DMSP										
41	041042Z	17.3N 143.5E	SAT							PCN 2 DMSP										
42	041505Z	17.5N 143.9E	SAT							PCN 1 DMSP										
43	041505Z	17.5N 143.9E	SAT							PCN 1 DMSP										
44	042048Z	18.1N 143.7E	P	3	3	700	280	90	220	20	90	240	15	963	278	17	12	CIRC		20	6
45	042324Z	18.5N 143.9E	SAT	(T4.5/4.5-/D1.0/24HRS)						PCN 1 DMSP										
46	042324Z	18.4N 144.0E	SAT	(T5.0/5.0 / / HRS)						PCN 1 DMSP										
47	042350Z	18.4N 143.9E	SAT	(T5.5/5.5 /D1.0/25HRS)						NOAA-2			(CONF 01)							
48	050206Z	19.1N 143.9E	SAT	(T4.5/4.5-/D1.0/24HRS)						PCN 1 DMSP										
49	050206Z	19.0N 143.9E	SAT	(T6.0/6.0-/D1.0/24HRS)						PCN 1 DMSP										
50	050242Z	19.1N 143.7E	P	4	3	700	280	100	280	15	100	280	15	963	278	19	12	CIRC		25	6
51	050850Z	20.4N 144.0E	P	5	2	700	260	80	190	35	80	240	10	965	275	23	16	CIRC		20	7
52	051024Z	20.3N 144.1E	SAT							PCN 1 DMSP										
53	051205Z	21.3N 144.2E	SAT							PCN 1 DMSP										
54	051446Z	21.6N 145.2E	SAT							PCN 3 DMSP										
55	051447Z	21.3N 144.9E	SAT							PCN 1 DMSP										
56	051510Z	21.4N 144.8E	P	10	2	700	330	60	240	30	-	-	-	969	282	19	11	CIRC		20	7
57	052302Z	23.7N 145.4E	SAT	(T5.0/5.0 /W0.5/23HRS)						NOAA-2			(CONF 01)							
58	052305Z	23.7N 145.7E	SAT	(T4.5/4.5-/W /24HRS)						PCN 3 DMSP										
59	052305Z	23.4N 145.6E	SAT	(T4.5/5.5 /W1.5/21HRS)						PCN 3 DMSP										
60	060147Z	24.3N 146.0E	SAT	(T4.5/4.5-/W /24HRS)						PCN 3 DMSP										
61	060147Z	24.1N 146.0E	SAT	(T4.5/5.5 /W1.5/21HRS)						PCN 3 DMSP										
62	060421Z	25.0N 145.8E	P	10	2	700	330	50	240	10	70	00	35	983	293	14	-	-	- -	-	8
63	060845Z	25.9N 147.0E	P	10	2	700	240	80	150	70	4	300	20	984	294	14	-	-	- -	-	8
64	061147Z	26.8N 148.4E	SAT							PCN 3 DMSP										
65	061147Z	26.5N 148.2E	SAT							PCN 3 DMSP										
66	061428Z	27.2N 149.1E	SAT							PCN 3 DMSP										
67	061428Z	27.0N 148.8E	SAT							PCN 3 DMSP										
68	062106Z	28.8N 151.3E	SAT	(T4.5/4.5-/W /24HRS)						PCN 3 DMSP										
69	062247Z	28.9N 151.8E	SAT	(T2.5/3.5-/W2.0/24HRS)						PCN 3 DMSP										
70	062247Z	29.0N 151.8E	SAT	(T4.5/5.5 /W1.5/21HRS)						PCN 3 DMSP										
71	070128Z	29.6N 153.1E	SAT	(T2.5/3.5-/W2.0/24HRS)						PCN 3 DMSP										
72	070128Z	29.3N 153.2E	SAT	(T2.5/3.5 /W2.0/26HRS)						PCN 3 DMSP										
73	071129Z	31.2N 158.1E	SAT							PCN 3 DMSP										
74	071129Z	31.0N 158.1E	SAT							PCN 5 DMSP										

TROPICAL DEPRESSION 5
FIX POSITIONS FOR CYCLONE NO. 5
0600Z 07 JUN TO 0600Z 08 JUN

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	060402Z	18.9N 113.5E	SAT	(T1.0/1.0 /D1.0/24HRS)			PCN 5 DMSP								
2	070112Z	19.9N 113.3E	SAT	(T2.5/2.5 /D1.5/21HRS)			PCN 3 DMSP								
3	070344Z	20.1N 112.8E	SAT	(T2.5/2.5 /D1.5/21HRS)			PCN 3 DMSP								
4	080325Z	21.0N 111.0E	SAT	(T2.0/2.0-/ / HRS)			PCN 5 DMSP								
5	080325Z	21.0N 111.3E	SAT	(T2.0/2.5 /W0.5/27HRS)			PCN 5 DMSP								
6	080325Z	20.6N 110.7E	SAT	(T2.0/2.0 / / HRS)			PCN 5 DMSP								
7	081335Z	21.2N 109.7E	SAT				PCN 6 DMSP								
8	081606Z	20.8N 108.8E	SAT				PCN 6 DMSP								
9	081607Z	21.7N 109.5E	SAT				PCN 6 DMSP								

TYPHOON DINAH
FIX POSITIONS FOR CYCLONE NO. 6
0000Z 08 JUN TO 0600Z 14 JUN

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	042225Z	5.5N 146.5E	SAT	(T1.0/1.0 /D1.0/24HRS)			PCN 5 DMSP								
2	050239Z	6.7N 144.0E	SAT	(T1.0/1.0 /D1.0/24HRS)			PCN 5 DMSP								
3	051107Z	7.5N 143.3E	SAT				PCN 5 DMSP								
4	051329Z	8.0N 142.7E	SAT				PCN 5 DMSP								
5	052349Z	10.4N 139.2E	SAT	(T2.5/2.5 /D1.5/24HRS)			PCN 3 DMSP								
6	060221Z	11.2N 138.5E	SAT	(T2.5/2.5 /D1.5/24HRS)			PCN 5 DMSP								
7	060659Z	10.4N 138.8E	P	5 5 1500 260 25 210			15 25 10	15 1009	-	- 26	-	- -	-		2
8	061049Z	11.1N 137.4E	SAT				PCN 6 DMSP								
9	061230Z	11.3N 137.3E	SAT				PCN 6 DMSP								
10	061502Z	12.0N 136.6E	SAT				PCN 5 DMSP								
11	062120Z	11.6N 135.8E	P	2 1 1500 120 25 60			110 25 360	30 1001	-	24 -	-	- -	-		3
12	062330Z	12.1N 135.9E	SAT	(T1.5/2.5 /W1.0/24HRS)			PCN 3 DMSP								
13	062356Z	12.0N 135.0E	SAT	(T3.0/4.0 /D1.0/24HRS)			NOAA-2	(CONF 02)							
14	070113Z	12.3N 135.1E	P	2 1 700 110 35 30			12 30 -	-	-	- -	-	- -	-		3
15	070202Z	12.5N 135.3E	SAT	(T1.5/2.5 /W1.0/24HRS)			PCN 5 DMSP								
16	071212Z	12.5N 132.7E	SAT				PCN 5 DMSP								
17	071444Z	12.7N 131.2E	SAT				PCN 5 DMSP								
18	072312Z	13.2N 128.4E	SAT	(T2.5/2.5 /D1.0/24HRS)			PCN 5 DMSP								
19	072312Z	13.1N 128.6E	SAT	(T2.5/2.5 / / HRS)			PCN 5 DMSP								
20	072358Z	13.0N 128.2E	SAT	(T4.0/4.0 /W1.0/25HRS)			NOAA-2	(CONF 02)							
21	080114Z	13.0N 128.1E	P	15 2 1500 300 50 300			25 4 300	20 991	-	- 26	-	- -	-		4
22	080325Z	12.8N 128.1E	SAT	(T2.5/2.5 /D1.0/24HRS)			PCN 3 DMSP								
23	080325Z	12.7N 128.1E	SAT	(T3.0/3.0 / / HRS)			PCN 3 DMSP								
24	080330Z	13.0N 127.8E	P	15 2 1500 300 68 200			20 60 190	25 979	-	- 26	-	- -	-		4
25	080915Z	13.4N 127.4E	P	5 2 700 130 40 80			32 50 80	42 986	300	20 -	-	- -	-		5
26	081154Z	13.4N 126.5E	SAT				PCN 5 DMSP								
27	081435Z	13.8N 126.6E	P	5 3 700 310 40 190			85 - -	- 989	300	15 -	-	- -	-		5
28	081607Z	13.6N 125.2E	SAT				PCN 6 DMSP								
29	082146Z	14.3N 125.6E	P	5 2 700 140 40 40			60 3 40	60 989	302	20 -	-	- -	-		6
30	090020Z	13.5N 125.0E	SAT	(T4.5/4.5 / /25HRS)			NOAA-2	(CONF 02)							
31	090035Z	14.5N 125.3E	SAT	(T3.5/3.5 /D0.5/21HRS)			PCN 3 DMSP								
32	090307Z	14.9N 124.8E	SAT	(T4.0/4.0-/D1.5/28HRS)			PCN 3 DMSP								
33	091158Z	14.3N 123.4E	P	5 5 700 60 55 330			70 - -	-	294	- 14	-	- -	-		7
34	091317Z	14.4N 122.9E	SAT				PCN 6 DMSP								
35	091415Z	14.3N 123.5E	LNDR	- POSSIBLE EYE,15 DEG SPIRAL OVERLAY										14.4N 122.6E	
36	091435Z	14.9N 123.5E	LNDR	- POSSIBLE EYE,15 DEG SPIRAL OVERLAY										14.4N 122.6E	
37	091500Z	14.7N 123.2E	LNDR	- FAIR FIX, EYE NOT VISIBLE										14.4N 122.6E	
38	091506Z	14.5N 122.6E	LNDR	- GOOD FIX, 15 DEG SPIRAL OVERLAY, POSSIBLE EYE										15.2N 120.6E	
39	091523Z	14.6N 123.1E	P	5 5 700 40 70 340			525 - -	-	977	291 - 15	-	- -	-		7
40	091548Z	15.0N 123.4E	SAT				PCN 1 DMSP								
41	091548Z	14.8N 122.9E	SAT				PCN 6 DMSP								
42	091548Z	15.0N 123.3E	SAT	(IR DATA)			PCN 3 DMSP								
43	091600Z	14.8N 123.0E	LNDR	- CIRCULAR EYE 01AM 34 NM										14.4N 122.6E	
44	091608Z	14.5N 122.5E	LNDR	- GOOD FIX, 90 PERCENT WALL CLOUD										15.2N 120.6E	
45	091638Z	14.6N 122.6E	LNDR	- FAIR FIX, ELLIPTICAL EYE 3 X14 NM, 90 PERCENT WALL CLOUD										15.2N 120.6E	
46	091705Z	14.7N 122.3E	LNDR	- FAIR FIX, NEG EYE, 15 DEG SPIRAL OVERLAY										15.2N 120.6E	
47	091808Z	14.7N 122.3E	LNDR	- FAIR FIX, NEG EYE, 15 DEG SPIRAL OVERLAY										15.2N 120.6E	
48	091838Z	14.7N 122.3E	LNDR	- FAIR FIX, NEG EYE, 15 DEG SPIRAL OVERLAY										15.2N 120.6E	
49	091938Z	14.3N 122.0E	LNDR	- FAIR FIX, NEG EYE, 15 DEG SPIRAL OVERLAY										15.2N 120.6E	
50	091945Z	15.0N 122.6E	LNDR	- CIRCULAR EYE 32 NM DIAM, WALL CLOUD OPEN SOUTH										14.4N 122.6E	

TYPHOON DINAH
FIX POSITIONS FOR CYCLONE NO. 6
0000Z 08 JUN TO 0600Z 14 JUN

FIX NO.	TIME	POSIT	FIX CAT	ACCNY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T1/T0	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
51	0919452	15.1N 122.7E	LHDR		- POSSIBLE EYE														16.4N 120.6E	
52	0920002	15.0N 122.6E	LHDR		- CIRCULAR EYE 30 NM DIAM, 100 PERCENT WALL CLOUD														14.4N 122.6E	
53	0920382	15.2N 122.6E	LHDR		- CIRCULAR EYE 26 NM DIAM														15.2N 120.6E	
54	0920452	15.0N 122.6E	P	2 2	700	350	58	250	28	40	350	10	974	287	14 -	ELIP	SW-NE	40X20		8
55	0921002	15.0N 122.6E	LHDR		- CIRCULAR EYE 25 NM DIAM, GOOD FIX														14.4N 122.6E	
56	0921002	15.2N 122.8E	LHDR		- ELLIPTICAL EYE 45X35 NM, 90 PERCENT WALL CLOUD														16.4N 120.6E	
57	0923352	15.5N 122.5E	LHDR		- CIRCULAR EYE 32 NM DIAM, 80 PERCENT WALL CLOUD														14.4N 122.6E	
58	1000002	15.6N 122.3E	LHDR		- CIRCULAR EYE 25 NM DIAM														14.4N 122.6E	
59	1000082	15.3N 122.3E	LHDR		- FAIR FIX, EYE NOT VISIBLE, 15 DEG SPIRAL OVERLAY														15.2N 120.6E	
60	1000172	15.5N 122.4E	SAT		(T4.5/4.5-/D0.5/21HRS)								PCN 1 DMSP							
61	1000172	15.4N 122.5E	SAT		(T5.0/5.0-/D1.5/24HRS)								PCN 1 DMSP							
62	1000172	15.4N 122.0E	SAT		(IR DATA)								PCN 3 DMSP							
63	1000302	15.3N 122.5E	LHDR		- FAIR FIX, EYE NOT VISIBLE 15 DEG SPIRAL OVERLAY														15.2N 120.6E	
64	1001082	15.9N 122.6E	LHDR		- CIRCULAR EYE 20 NM DIAM														15.2N 120.6E	
65	1001282	15.5N 122.7E	SAT		(T5.0/5.0 /W0.5/25HRS)								NOAA-2		(CONF 01)					
66	1001302	15.4N 122.6E	LHDR		- CIRCULAR EYE 25 NM DIAM, 90 PERCENT WALL CLOUD														15.2N 120.6E	
67	1002352	15.6N 122.2E	P	2 5	700	70	68	320	50	5	10	20	974	287	14 -	CIRC		20		8
68	1002482	15.7N 121.6E	SAT		(T4.5/4.5-/D0.5/21HRS)								PCN 1 DMSP							
69	1004482	15.8N 121.9E	SAT		(T5.0/5.0-/ / HRS)								PCN 1 DMSP							
70	1003052	15.7N 121.8E	LHDR		- CIRCULAR EYE 30 NM DIAM, 90 PERCENT WALL CLOUD														15.2N 120.6E	
71	1003302	15.7N 121.8E	LHDR		- CIRCULAR EYE 30 NM DIAM, 90 PERCENT WALL CLOUD														15.2N 120.6E	
72	1004002	15.8N 121.9E	LHDR		- CIRCULAR EYE 26 NM DIAM, 100 PERCENT WALL CLOUD														16.4N 120.6E	
73	1005002	16.0N 121.8E	LHDR		- CIRCULAR EYE 26 NM DIAM, 100 PERCENT WALL CLOUD														16.4N 120.6E	
74	1007002	16.2N 120.8E	LHDR		- POSSIBLE EYE 15 DEG SPIRAL OVERLAY														16.6N 120.3E	
75	1009312	16.4N 120.4E	LHDR		- POOR FIX, POSSIBLE EYE, 15 DEG SPIRAL OVERLAY														15.2N 120.6E	
76	1010052	16.5N 120.3E	LHDR		- POOR FIX, POSSIBLE EYE, 15 DEG SPIRAL OVERLAY														15.2N 120.6E	
77	1010352	16.6N 120.1E	LHDR		- POOR FIX, POSSIBLE EYE, 15 DEG SPIRAL OVERLAY														15.2N 120.6E	
78	1011002	17.3N 119.9E	LHDR		- POOR FIX, POSSIBLE CENTER, 15 DEG SPIRAL OVERLAY														16.6N 120.3E	
79	1012002	17.0N 120.0E	LHDR		- 1035/														15.2N 120.6E	
80	1012592	16.8N 119.6E	SAT										PCN 3 DMSP							
81	1012592	16.6N 119.2E	SAT										PCN 2 DMSP							
82	1015292	17.4N 118.5E	SAT										PCN 3 DMSP							
83	1015302	17.8N 119.0E	SAT										PCN 6 DMSP							
84	1022272	16.3N 118.0E	P	15 8	700	-	-	-	-	50	20	90	986	297	13 -	-	- -	-		9
85	1023592	16.8N 116.8E	SAT		(T2.5/3.5+/W1.0/24HRS)								PCN 3 DMSP							
86	1023592	16.7N 117.6E	SAT		(T4.0/4.0+/W1.0/24HRS)								PCN 3 DMSP							
87	1023592	16.2N 117.6E	SAT		(T3.0/4.0 /W2.0/21HRS)								PCN 3 DMSP							
88	1103352	16.5N 117.1E	P	10 5	700	-	-	-	-	60	60	120	-	295	12 -	-	- -	-		9
89	1104092	16.8N 117.2E	SAT		(T4.0/4.0+/W1.0/24HRS)								PCN 3 DMSP							
90	1108552	16.5N 116.7E	P	8 5	700	180	60	110	120	60	110	120	978	293	18 -	-	- -	-		11
91	1112402	16.9N 116.1E	SAT										PCN 4 DMSP							
92	1112402	16.7N 115.6E	SAT										PCN 4 DMSP							
93	1115902	16.6N 115.0E	P	3 7	700	120	40	200	150	-	-	-	-	290	13 -	-	- -	-		12
94	1116532	16.7N 115.3E	SAT										PCN 6 DMSP							
95	1120502	17.0N 113.8E	P	10 30	500	170	80	90	100	60	90	80	978	-	- -	-	- -	-		12
96	1201222	17.1N 113.9E	SAT		(T4.0/4.0 /S /24HRS)								PCN 3 DMSP							
97	1201242	17.7N 114.4E	SAT		(T4.5/4.5 /D0.5/24HRS)								PCN 1 DMSP							
98	1201522	17.5N 115.5E	SAT		(T4.5/4.5 /W0.5/24HRS)								NOAA-2		(CONF 01)					
99	1203522	17.5N 114.1E	SAT		(T4.0/4.0 /S /24HRS)								PCN 3 DMSP							
100	1209152	18.5N 113.6E	P	5 5	700	80	80	70	40	15	70	40	-	288	14 -	-	- -	-		13
101	1210302	18.6N 113.0E	P	5 3	700	-	-	-	-	-	-	-	-	289	14 -	CIRC		10		13
102	1216332	19.6N 111.6E	SAT										PCN 4 DMSP							
103	1301042	20.0N 110.4E	SAT		(T4.0/4.0-/S /24HRS)								PCN 4 DMSP							
104	1301062	20.2N 110.8E	SAT		(T4.0/4.0 /S /25HRS)								NOAA-2		(CONF 01)					
105	1303342	20.1N 109.3E	SAT		(T4.0/4.0-/S /24HRS)								PCN 3 DMSP							
106	1303342	19.9N 109.5E	SAT		(T3.5/3.5 / / HRS)								PCN 3 DMSP							
107	1313452	20.3N 108.1E	SAT										PCN 4 DMSP							
108	1316152	20.8N 107.5E	SAT										PCN 3 DMSP							
109	1400462	20.1N 105.3E	SAT		(IR DATA)								PCN 5 DMSP							

TROPICAL STORM EMMA
FIX POSITIONS FOR CYCLONE NO. 7
0600Z 13 JUN TO 0600Z 18 JUN

FIX NO.	TIME	POSIT	FIX CAT	ACCNY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT BY RADAR	MSN NMBR
1	100107Z	2.0N 149.0E	SAT	(T1.0/1.0 /D1.0/21HRS)					PCN 5	UMSP									
2	101117Z	3.1N 147.4E	SAT						PCN 6	UMSP									
3	101348Z	3.8N 147.3E	SAT						PCN 5	UMSP									
4	102217Z	4.2N 147.0E	SAT	(T1.5/1.5 /D0.5/21HRS)					PCN 5	UMSP									
5	110230Z	5.4N 144.0E	SAT	(T1.5/1.5 /D0.5/21HRS)					PCN 5	UMSP									
6	111059Z	6.3N 143.2E	SAT						PCN 5	UMSP									
7	112341Z	8.0N 142.0E	SAT	(T1.5/1.5 /S /25HRS)					PCN 5	UMSP									
8	120211Z	8.5N 141.7E	SAT	(T1.5/1.5 /S /25HRS)					PCN 3	UMSP									
9	121452Z	10.8N 137.9E	SAT						PCN 5	UMSP									
10	122313Z	12.3N 136.8E	SAT	(T2.5/2.5 /D0.5/25HRS)					NOAA-2				(CONF 01)						
11	122322Z	11.4N 136.3E	SAT	(T2.5/2.5 /D1.0/24HRS)					PCN 5	UMSP									
12	122322Z	12.4N 136.4E	SAT	(T3.0/3.0 / / HRS)					PCN 3	UMSP									
13	130143Z	11.2N 135.7E	P	10 2 1500	140	27	50		13	30	50	13	1001	-	26	25	-	- -	-	1
14	130152Z	12.3N 135.6E	SAT	(T2.5/2.5 /D1.0/24HRS)					PCN 5	UMSP									
15	130152Z	12.4N 134.9E	SAT	(T3.0/3.0 / / HRS)					PCN 5	UMSP									
16	130248Z	11.4N 135.9E	P	10 2 1500	110	30	360		38	30	360	38	1001	-	27	25	-	- -	-	1
17	131204Z	13.4N 132.4E	SAT						PCN 6	UMSP									
18	131434Z	13.6N 131.8E	SAT						PCN 5	UMSP									
19	131434Z	13.3N 132.1E	SAT						PCN 5	UMSP									
20	131555Z	12.3N 132.2E	P	- - 700	-	-	-		-	-	-	-	-	-	-	-	-	- -	-	3
21	132130Z	13.0N 131.6E	P	10 10 700	10	35	310		40	25	300	25	998	310	13	9	-	- -	-	3
22	132304Z	13.0N 130.0E	SAT	(T3.0/3.0 /D0.5/24HRS)					PCN 3	UMSP									
23	132304Z	13.5N 130.4E	SAT	(T3.0/3.0 /S /24HRS)					PCN 3	UMSP									
24	140315Z	14.4N 129.5E	SAT	(T3.0/3.0 /D0.5/24HRS)					PCN 3	UMSP									
25	140444Z	14.3N 130.0E	P	10 5 1500	180	30	90		15	40	350	10	1001	-	-	-	-	- -	-	4
26	140830Z	14.7N 129.3E	P	5 5 700	70	45	300		50	25	90	20	998	308	-	-	-	- -	-	4
27	141145Z	15.2N 127.7E	SAT						PCN 5	UMSP									
28	141145Z	15.2N 127.1E	SAT						PCN 5	UMSP									
29	141940Z	15.2N 128.0E	P	8 8 700	30	45	330		40	-	-	-	998	307	12	-	-	- -	-	5
30	141557Z	15.3N 127.1E	SAT						PCN 5	UMSP									
31	141557Z	15.6N 127.6E	SAT						PCN 3	UMSP									
32	142050Z	15.6N 127.6E	P	1 2 700	20	45	300		30	4	270	20	994	305	15	-	-	- -	-	5
33	142336Z	16.0N 126.6E	SAT	(T3.5/3.5 /S /24HRS)					NOAA-2				(CONF 01)						
34	150027Z	15.9N 126.6E	SAT	(T3.5/3.5 /D0.5/25HRS)					PCN 3	UMSP									
35	150257Z	16.0N 125.8E	SAT	(T3.5/3.5 /D0.5/25HRS)					PCN 3	UMSP									
36	150257Z	16.0N 126.1E	SAT	(T3.5/3.5 /D0.5/28HRS)					PCN 3	UMSP									
37	150857Z	16.8N 125.5E	P	5 5 700	20	70	270		15	5	230	10	990	304	15	13	CIRC	15		6
38	151309Z	16.6N 124.7E	SAT	(IR DATA)					PCN 5	UMSP									
39	151535Z	17.1N 124.5E	P	5 10 700	200	80	110		20	-	-	-	995	305	12	-	-	- -	-	6
40	151538Z	16.6N 125.0E	SAT						PCN 5	UMSP									
41	151538Z	16.2N 124.4E	SAT						PCN 5	UMSP									
42	152117Z	17.6N 124.5E	P	5 5 700	30	35	130		20	55	90	20	994	305	14	-	-	- -	-	7
43	160009Z	17.4N 124.5E	SAT	(T3.5/3.5-/S /24HRS)					PCN 3	UMSP									
44	160009Z	18.1N 124.4E	SAT	(T3.0/4.0+/W1.0/24HRS)					PCN 3	UMSP									
45	160009Z	17.6N 124.1E	SAT	(T3.5/3.5 /S /22HRS)					PCN 5	UMSP									
46	160230Z	18.0N 124.2E	P	10 5 700	30	40	10		50	4	330	20	995	305	14	-	-	- -	-	7
47	160238Z	17.8N 124.2E	SAT	(T3.5/3.5-/S /24HRS)					PCN 3	UMSP									
48	160238Z	17.9N 124.2E	SAT	(T3.5/3.5 /S /22HRS)					PCN 5	UMSP									
49	160835Z	18.8N 123.7E	P	3 2 700	60	40	40		20	50	90	30	988	299	17	-	-	- -	-	8
50	161250Z	18.6N 124.4E	SAT						PCN 3	UMSP									
51	161250Z	18.0N 124.2E	SAT						PCN 5	UMSP									
52	161445Z	19.2N 123.5E	P	5 15 700	280	55	180		30	50	10	70	995	304	14	-	-	- -	-	8
53	161520Z	18.8N 123.8E	SAT						PCN 5	UMSP									
54	161520Z	17.6N 123.9E	SAT						PCN 5	UMSP									
55	162351Z	19.9N 124.2E	SAT	(T3.5/3.5 /S /24HRS)					PCN 3	UMSP									
56	162351Z	19.8N 124.1E	SAT	(T4.0/4.0 /D0.5/24HRS)					PCN 3	UMSP									
57	162359Z	19.0N 125.0E	SAT	(T3.5/3.5 /S /23HRS)					NOAA-2				(CONF 01)						
58	170220Z	20.4N 124.7E	SAT	(T3.5/3.5 /S /24HRS)					PCN 3	UMSP									
59	170220Z	20.2N 124.8E	SAT	(T2.5/3.0 /W0.5/26HRS)					PCN 3	UMSP									
60	170220Z	20.4N 124.6E	SAT	(T4.0/4.0 /D0.5/24HRS)					PCN 4	UMSP									
61	170230Z	21.0N 123.8E	P	10 5 700	130	50	50		40	50	00	60	-	-	10	14	-	- -	-	9
62	170830Z	21.4N 125.3E	P	13 7 700	190	50	110		40	40	150	60	-	-	10	13	-	- -	-	9
63	171232Z	21.9N 125.8E	SAT						PCN 5	UMSP									
64	171232Z	21.8N 125.9E	SAT						PCN 5	UMSP									
65	171501Z	22.5N 126.2E	SAT						PCN 5	UMSP									
66	171501Z	22.6N 126.7E	SAT						PCN 5	UMSP									
67	171501Z	22.7N 126.6E	SAT						PCN 5	UMSP									
68	172333Z	26.0N 128.6E	SAT	(T2.0/3.0 /W1.5/24HRS)					PCN 3	UMSP									
69	172333Z	26.0N 128.6E	SAT	(T2.0/3.0 /W2.0/24HRS)					PCN 3	UMSP									
70	180201Z	26.4N 129.1E	SAT	(T2.0/3.0 /W1.5/24HRS)					PCN 3	UMSP									
71	180201Z	26.6N 129.0E	SAT	(T2.0/2.5 /W0.5/24HRS)					PCN 3	UMSP									
72	180201Z	26.4N 128.9E	SAT	(T2.0/3.0 /W2.0/24HRS)					PCN 3	UMSP									
73	181214Z	29.0N 131.3E	SAT						PCN 5	UMSP									
74	181214Z	31.0N 134.1E	SAT						PCN 5	UMSP									
75	181443Z	30.0N 132.3E	SAT						PCN 6	UMSP									
76	190019Z	33.0N 139.5E	SAT	(T1.5/2.0-/W0.5/25HRS)					NOAA-2				(CONF 02)						

TROPICAL STORM FREDA
FIX POSITIONS FOR CYCLONE NO. 8
0000Z 21 JUN TO 1200Z 22 JUN

FIX NO.	TIME	POSIT	FIX CAT	ACCHY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	162209Z	18.0N 146.9E	SAT	(T1.0/1.0 /D	/24HRS)				PCN 5	DMSP										
2	162209Z	17.8N 146.9E	SAT	(T1.0/1.0 /	/ HRS)				PCN 3	DMSP										
3	170220Z	18.3N 146.2E	SAT	(T1.0/1.0 /D	/24HRS)				PCN 5	DMSP										
4	170220Z	17.7N 147.4E	SAT	(T1.0/1.0 /	/ HRS)				PCN 6	DMSP										
5	172332Z	18.5N 143.3E	SAT	(T1.5/1.5 /D0.5/24HRS)					PCN 5	DMSP										
6	172332Z	18.8N 143.3E	SAT	(T1.5/1.5 /D0.5/25HRS)					PCN 5	DMSP										
7	180201Z	19.5N 142.4E	SAT	(T1.5/1.5 /D0.5/24HRS)					PCN 5	DMSP										
8	180201Z	19.3N 141.6E	SAT	(T1.5/1.5 /D0.5/25HRS)					PCN 3	DMSP										
9	181443Z	19.7N 142.2E	SAT	(IR DATA	)				PCN 5	DMSP										
10	182314Z	21.4N 142.7E	SAT	(IR DATA	)				PCN 5	DMSP										
11	190142Z	21.7N 142.0E	SAT	(IR DATA	)				PCN 5	DMSP										
12	191156Z	22.3N 142.4E	SAT	(IR DATA	)				PCN 4	DMSP										
13	192256Z	25.2N 144.9E	SAT	(IR DATA	)				PCN 5	DMSP										
14	200124Z	25.5N 145.5E	SAT	(IR DATA	)				PCN 3	DMSP										
15	201137Z	25.8N 148.5E	SAT	(IR DATA	)				PCN 3	DMSP										
16	202238Z	26.0N 151.3E	SAT	(T2.5/2.5 /	/ HRS)				PCN 3	DMSP										
17	210105Z	26.2N 151.9E	SAT	(T2.5/2.5 /	/ HRS)				PCN 3	DMSP										
18	210105Z	26.0N 151.9E	SAT	(T2.0/2.0 /	/ HRS)				PCN 4	DMSP										
19	210516Z	25.7N 152.8E	P	5 3	700	220	55	-	-		5	220	25	989	301	15 -	CIRC		5		1
20	211119Z	24.9N 154.9E	SAT						PCN 5	DMSP										
21	211119Z	24.9N 155.0E	SAT						PCN 4	DMSP										
22	211347Z	25.0N 155.6E	SAT						PCN 3	DMSP										
23	211347Z	24.9N 154.8E	SAT						PCN 6	DMSP										
24	212220Z	25.3N 158.1E	SAT	(T2.0/2.5 /W0.5/24HRS)					PCN 3	DMSP										
25	212220Z	24.9N 158.5E	SAT	(T1.5/2.0 /W0.5/20HRS)					PCN 4	DMSP										
26	220047Z	25.3N 159.1E	SAT	(T2.0/2.5 /W0.5/24HRS)					PCN 3	DMSP										
27	220047Z	25.1N 159.2E	SAT	(T1.5/2.0 /W0.5/20HRS)					PCN 4	DMSP										
28	230028Z	30.2N 172.8E	SAT	(IR DATA	)				PCN 3	DMSP										

TYPHOON GILDA
FIX POSITIONS FOR CYCLONE NO. 9
0600Z 30 JUN TO 0000Z 07 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCHY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	251006Z	17.3N 160.0E	SAT	(IR DATA	)				PCN 6	DMSP										
2	260114Z	17.8N 156.2E	SAT	(IR DATA	)				PCN 5	DMSP										
3	260948Z	18.0N 154.5E	SAT	(IR DATA	)				PCN 6	DMSP										
4	261356Z	18.0N 154.1E	SAT	(IR DATA	)				PCN 5	DMSP										
5	262230Z	18.0N 151.8E	SAT	(T1.0/1.0 /	/ HRS)				PCN 5	DMSP										
6	262230Z	18.0N 151.8E	SAT	(T1.5/1.5 /	/ HRS)				PCN 5	DMSP										
7	270055Z	18.1N 151.0E	SAT	(IR DATA	)				PCN 5	DMSP										
8	270055Z	18.0N 150.9E	SAT	(IR DATA	)				PCN 6	DMSP										
9	271500Z	18.5N 145.0E	SAT						PCN 6	DMSP										
10	272211Z	18.1N 148.6E	SAT	(T1.5/1.5 /D0.5/24HRS)					PCN 4	DMSP										
11	280218Z	18.1N 147.9E	SAT	(IR DATA	)				PCN 4	DMSP										
12	281053Z	17.5N 146.8E	SAT	(IR DATA	)				PCN 6	DMSP										
13	281500Z	17.7N 145.0E	SAT	(IR DATA	)				PCN 5	DMSP										
14	282153Z	17.8N 143.4E	SAT	(T2.0/2.0 /D0.5/24HRS)					PCN 6	DMSP										
15	282235Z	18.0N 143.0E	SAT	(T1.5/1.5 /D0.5/24HRS)					NOAA-2				(CONF 02)							
16	282335Z	18.7N 143.1E	SAT	(IR DATA	)				PCN 5	DMSP										
17	290200Z	18.8N 141.6E	SAT	(IR DATA	)				PCN 4	DMSP										
18	290200Z	18.5N 141.6E	SAT	(T1.5/1.5 /	/ HRS)				PCN 5	DMSP										
19	290300Z	17.8N 141.6E	P	2 3	700	-	-	-	-	-	-	-	1009	311	9 -	-	- -	-		1
20	291216Z	18.2N 140.0E	SAT	(IR DATA	)				PCN 5	DMSP										
21	291216Z	19.3N 139.2E	SAT	(IR DATA	)				PCN 6	DMSP										
22	291442Z	19.7N 139.7E	SAT						PCN 5	DMSP										
23	291442Z	19.5N 139.7E	SAT	(IR DATA	)				PCN 6	DMSP										
24	292316Z	21.0N 136.7E	SAT	(IR DATA	)				PCN 3	DMSP										
25	292316Z	19.4N 135.4E	SAT	(T1.5/1.5 /S	/21HRS)				PCN 5	DMSP										
26	292345Z	21.5N 136.5E	SAT	(T2.5/2.5 /D1.0/25HRS)					NOAA-2				(CONF 02)							
27	300141Z	20.8N 135.8E	SAT	(IR DATA	)				PCN 3	DMSP										
28	300141Z	20.4N 135.7E	SAT	(IR DATA	)				PCN 5	DMSP										
29	301158Z	20.3N 134.9E	SAT	(IR DATA	)				PCN 3	DMSP										
30	301341Z	19.5N 135.0E	P	5 3	700	80	30	360	25	-	-	-	990	301	17 11	-	- -	-		3
31	301423Z	20.2N 134.7E	SAT	(IR DATA	)				PCN 3	DMSP										
32	301423Z	20.6N 135.5E	SAT	(IR DATA	)				PCN 4	DMSP										
33	302150Z	19.8N 134.3E	P	3 2	700	150	30	70	100	25	70	100	990	301	14 11	-	- -	-		4
34	302258Z	20.0N 134.0E	SAT	(T4.0/4.0 /D2.0/24HRS)					PCN 3	DMSP										
35	302258Z	19.7N 134.0E	SAT	(T3.0/3.0 /D1.5/24HRS)					PCN 3	DMSP										
36	302259Z	20.0N 135.0E	SAT	(T3.5/3.5 /D1.0/24HRS)					NOAA-2				(CONF 02)							
37	010235Z	19.4N 134.1E	P	5 2	700	340	40	270	60	30	270	60	983	296	14 11	-	- -	-		4
38	010304Z	19.2N 134.0E	SAT	(IR DATA	)				PCN 3	DMSP										
39	011140Z	19.4N 133.9E	SAT	(IR DATA	)				PCN 4	DMSP										
40	011140Z	19.6N 133.3E	SAT	(IR DATA	)				PCN 4	DMSP										
41	011237Z	18.5N 133.5E	SAT	(IR DATA	)				NOAA-2				(CONF 01)							
42	011546Z	19.6N 133.4E	SAT	(IR DATA	)				PCN 5	DMSP										
43	011546Z	19.4N 133.6E	SAT	(IR DATA	)				PCN 4	DMSP										
44	012240Z	19.7N 132.3E	SAT	(IR DATA	)				PCN 3	DMSP										
45	012240Z	19.4N 132.4E	SAT	(T4.0/4.0 /D1.0/24HRS)					PCN 4	DMSP										
46	020020Z	19.4N 132.3E	P	5 2	700	180	70	90	70	100	90	70	971	287	17 12	CIRC		50		6
47	020021Z	19.9N 132.4E	SAT	(IR DATA	)				PCN 3	DMSP										
48	020021Z	20.0N 132.2E	SAT	(IR DATA	)				PCN 3	DMSP										
49	020051Z	20.0N 132.5E	SAT	(T5.0/5.0 /D1.0/26HRS)					NOAA-2				(CONF 01)							
50	020246Z	19.8N 132.0E	SAT	(T4.5/4.5 /D0.5/24HRS)					PCN 1	DMSP										
51	020320Z	19.7N 132.0E	P	5 1	700	190	65	110	40	70	130	75	967	282	18 14	CIRC		30		6
52	021121Z	20.2N 130.7E	SAT	(IR DATA	)				PCN 4	DMSP										
53	021127Z	20.1N 131.5E	SAT	(IR DATA	)				PCN 6	DMSP										
54	021217Z	20.0N 130.8E	P	10 5	700	180	75	60	35	-	-	-	961	277	18 14	CIRC		30		7
55	021303Z	20.4N 130.8E	SAT	(IR DATA	)				PCN 2	DMSP										
56	021527Z	20.6N 130.6E	SAT	(IR DATA	)				PCN 1	DMSP										
57	021528Z	20.9N 130.6E	SAT	(IR DATA	)				PCN 2	DMSP										
58	021546Z	20.1N 130.7E	P	20 2	700	190	75	110	35	-	-	-	961	277	17 14	EYE	N-S	25X20		7
59	022137Z	21.0N 129.8E	P	2 3	700	180	70	70	22	80	110	12	963	278	15 13	CIRC		20		8
60	022351Z	21.5N 128.8E	SAT	(T5.5/5.5 /D0.5/23HRS)					NOAA-2				(CONF 01)							
61	030003Z	21.2N 129.9E	SAT	(T5.5/5.5-/D1.0/24HRS)					PCN 1	DMSP										

TYPHOON GILDA
FIX POSITIONS FOR CYCLONE NO. 9
0600Z 30 JUN TO 0000Z 07 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCHY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	RAD	RNG	MAX OBS SFC WIND VEL	RAD	RNG	OBS MIN SLP	MIN /00MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
62	030003Z	21.0N 129.8E	SAT	(T5.0/5.0 /D1.0/25HRS)						PCN 3 DMSP										
63	030227Z	21.5N 129.2E	SAT	(IR DATA		)				PCN 1 DMSP										
64	030227Z	21.6N 129.3E	SAT	(IR DATA		)				PCN 1 DMSP										
65	030232Z	21.5N 129.3E	P	2 3	700	360	70	290	60	60	40	40	956	272	17 13	CIRC		18		8
66	030935Z	22.7N 128.4E	P	5 5	700	130	65	50	30	70	160	15	951	267	18 -	CIRC		25		9
67	031233Z	22.0N 128.5E	SAT	(IR DATA		)				NOAA-2			(CONF 01)							
68	031245Z	22.8N 128.4E	SAT	(IR DATA		)				PCN 1 DMSP										
69	031245Z	23.2N 128.3E	SAT	(IR DATA		)				PCN 2 DMSP										
70	031245Z	22.6N 128.3E	SAT	(IR DATA		)				PCN 1 DMSP										
71	031430Z	23.2N 127.9E	P	5 5	700	260	50	200	20	- -		-	954	270	16 -	CIRC		20		9
72	031509Z	23.3N 127.8E	SAT	(IR DATA		)				PCN 1 DMSP										
73	031509Z	23.6N 127.9E	SAT	(IR DATA		)				PCN 2 DMSP										
74	031700Z	23.6N 127.8E	LRDR	- 45//3															24.8N 125.3E	
75	031800Z	23.7N 127.7E	LRDR	- 4///3															24.8N 125.3E	
76	031815Z	23.8N 127.6E	LRDR	- 15 DEG SPIRAL OVERLAY															26.4N 127.8E	
77	031843Z	23.8N 127.2E	LRDR	- 15 DEG SPIRAL OVERLAY															26.4N 127.8E	
78	031900Z	23.8N 127.6E	LRDR	- 9592															26.2N 127.8E	
79	031945Z	23.9N 127.5E	LRDR	- GOOD FIX															26.2N 127.7E	
80	032000Z	23.9N 127.5E	LRDR	- 41712															26.2N 127.8E	
81	032115Z	24.0N 127.5E	P	5 2	700	290	85	180	30	- -		-	952	269	18 16	CIRC		18		10
82	032240Z	24.2N 127.3E	LRDR	- GOOD FIX															26.4N 127.8E	
83	032300Z	24.5N 127.3E	LRDR	- 55/42															24.3N 124.2E	
84	032300Z	24.3N 127.3E	LRDR	- 10612															26.2N 127.8E	
85	032300Z	24.4N 127.3E	LRDR	- 12773															24.8N 125.3E	
86	032300Z	24.3N 127.3E	LRDR	- GOOD FIX															26.4N 127.8E	
87	032320Z	24.3N 127.2E	LRDR	- GOOD FIX, 15 DEG SPIRAL OVERLAY															26.4N 127.8E	
88	032330Z	24.4N 127.3E	LRDR	- GOOD FIX															26.2N 127.7E	
89	032345Z	24.4N 127.1E	SAT	(T5.5/5.5 /S /24HRS)						PCN 1 DMSP										
90	032345Z	24.4N 127.2E	SAT	(T6.0/6.0 /D1.0/24HRS)						PCN 1 DMSP										
91	032345Z	24.4N 127.1E	LRDR	- GOOD FIX, 15 DEG SPIRAL OVERLAY, 20 PERCENT WALL CLOUD															26.4N 127.8E	
92	040005Z	24.3N 127.4E	LRDR	-											-	- -	-		26.2N 127.7E	-
93	040015Z	24.5N 127.2E	LRDR	- GOOD FIX, CIRCULAR EYE 15 NM DIAM, 50 PERCENT WALL CLOUD															26.4N 127.8E	
94	040030Z	24.5N 127.1E	LRDR	- GOOD FIX															26.2N 127.7E	
95	040040Z	24.2N 127.6E	LRDR	-											-	- -	-		26.2N 127.7E	-
96	040045Z	24.7N 127.1E	LRDR	- GOOD FIX, CIRCULAR EYE 15 NM DIAM, 50 PERCENT WALL CLOUD															26.4N 127.8E	
97	040100Z	24.7N 127.1E	LRDR	- 55112															24.8N 124.2E	
98	040100Z	24.8N 127.1E	LRDR	- 10673															24.8N 125.3E	
99	040115Z	24.7N 126.9E	LRDR	- CIRCULAR EYE 12 NM DIAM, 60 PERCENT WALL CLOUD															26.4N 127.8E	
100	040145Z	24.8N 126.8E	LRDR	- GOOD FIX, CIRCULAR EYE 12 NM DIAM, 50 PERCENT WALL CLOUD															26.4N 127.8E	
101	040200Z	24.8N 126.9E	LRDR	- 12673															24.8N 125.3E	
102	040200Z	24.8N 126.9E	LRDR	- 10512															26.2N 127.8E	
103	040209Z	24.9N 126.8E	SAT	(IR DATA		)				PCN 1 DMSP										
104	040209Z	25.0N 126.4E	SAT	(IR DATA		)				PCN 1 DMSP										
105	040215Z	24.7N 126.7E	LRDR	- FAIR FIX, CIRCULAR EYE 12 NM DIAM, 40 PERCENT WALL CLOUD															26.4N 127.8E	
106	040230Z	24.8N 126.8E	LRDR	- GOOD FIX															26.2N 127.7E	
107	040245Z	24.8N 126.7E	LRDR	- CIRCULAR EYE 12 NM DIAM, 60 PERCENT WALL CLOUD															26.4N 127.8E	
108	040300Z	24.8N 127.0E	P	5 2	700	230	85	100	35	5	150	20	947	265	18 15	CIRC		15		10
109	040300Z	24.9N 126.7E	LRDR	- 12673															24.8N 125.3E	
110	040300Z	24.9N 126.7E	LRDR	- 45//3															24.3N 124.2E	
111	040315Z	24.8N 126.6E	LRDR	- GOOD FIX, CIRCULAR EYE 15 NM DIAM, 70 PERCENT WALL CLOUD															26.4N 127.8E	
112	040330Z	24.8N 126.7E	LRDR	- GOOD FIX															26.2N 127.7E	
113	040345Z	24.8N 126.6E	LRDR	- GOOD FIX, CIRCULAR EYE 15 NM DIAM, 60 PERCENT WALL CLOUD															26.4N 127.8E	
114	040350Z	24.7N 126.4E	SAT	(T5.5/5.5-/ / HRS)						PCN 1 DMSP										
115	040400Z	24.8N 126.6E	LRDR	- 10412															26.2N 127.8E	
116	040400Z	24.8N 126.7E	LRDR	- 55//3															24.3N 124.2E	
117	040400Z	24.9N 126.7E	LRDR	- 12623															24.8N 125.3E	
118	040415Z	24.9N 126.6E	LRDR	- GOOD FIX, CIRCULAR EYE 12 NM DIAM, 75 PERCENT WALL CLOUD															26.4N 127.8E	
119	040430Z	24.9N 126.6E	LRDR	- GOOD FIX															26.2N 127.7E	
120	040445Z	24.9N 126.6E	LRDR	- GOOD FIX, CIRCULAR EYE 12 NM DIAM, 75 PERCENT WALL CLOUD															26.4N 127.8E	
121	040500Z	24.9N 126.8E	LRDR	- 12613															24.8N 125.3E	
122	040500Z	24.9N 126.7E	LRDR	- 10412															26.2N 127.8E	
123	040500Z	24.9N 126.7E	LRDR	- 55//3															24.3N 124.2E	
124	040515Z	24.9N 126.6E	LRDR	- GOOD FIX, CIRCULAR EYE 12 NM DIAM, 70 PERCENT WALL CLOUD															26.4N 127.8E	
125	040545Z	24.9N 126.6E	LRDR	- GOOD FIX, CIRCULAR EYE 12 NM DIAM, 60 PERCENT WALL CLOUD															26.4N 127.8E	
126	040600Z	25.1N 126.8E	LRDR	- 12633															24.8N 125.3E	
127	040600Z	25.0N 126.8E	LRDR	- 5///3															24.3N 124.2E	
128	040615Z	24.9N 126.8E	LRDR	- FAIR FIX, CIRCULAR EYE 10 NM DIAM, 50 PERCENT WALL CLOUD															26.4N 127.8E	
129	040630Z	25.0N 126.8E	LRDR	- GOOD FIX															26.2N 127.7E	
130	040645Z	25.1N 126.8E	LRDR	- FAIR FIX, CIRCULAR EYE 10 NM DIAM, 50 PERCENT WALL CLOUD															26.4N 127.8E	
131	040700Z	25.1N 126.9E	LRDR	- 12613															24.8N 125.3E	
132	040700Z	25.1N 126.8E	LRDR	- 10532															26.2N 127.8E	
133	040700Z	25.1N 126.9E	LRDR	- 55//3															24.3N 124.2E	
134	040730Z	25.2N 126.7E	LRDR	- GOOD FIX															26.2N 127.7E	
135	040745Z	25.3N 127.0E	LRDR	- GOOD FIX, CIRCULAR EYE 10 NM DIAM, 70 PERCENT WALL CLOUD															26.4N 127.8E	
136	040800Z	25.2N 126.9E	LRDR	- 5///3															24.3N 124.2E	
137	040800Z	25.3N 126.9E	LRDR	- 11633															26.2N 127.8E	
138	040830Z	25.5N 126.8E	LRDR	- GOOD FIX															26.2N 127.7E	
139	040845Z	25.6N 126.8E	LRDR	- GOOD FIX, CIRCULAR EYE 10 NM DIAM, 60 PERCENT WALL CLOUD															26.4N 127.8E	
140	040930Z	25.7N 126.8E	LRDR	- GOOD FIX															26.2N 127.7E	
141	040945Z	25.7N 126.8E	LRDR	- GOOD FIX, CIRCULAR EYE 10 NM DIAM, 50 PERCENT WALL CLOUD															26.4N 127.8E	
142	041000Z	25.7N 126.7E	LRDR	- 12733															24.8N 125.3E	
143	041000Z	25.8N 126.8E	LRDR	- 10482															26.2N 127.8E	
144	041030Z	25.8N 126.6E	LRDR	- GOOD FIX															26.2N 127.7E	
145	041100Z	25.8N 126.5E	LRDR	- 12523															24.8N 125.3E	
146	041118Z	25.9N 126.4E	LRDR	- GOOD FIX, CIRCULAR EYE 25 NM DIAM, 60 PERCENT WALL CLOUD															26.4N 127.8E	
147	041145Z	25.9N 126.3E	LRDR	- GOOD FIX, CIRCULAR EYE 15 NM DIAM, 60 PERCENT WALL CLOUD															26.4N 127.8E	
148	041155Z	25.9N 126.3E	P	3 2	700	240	65	130	10	- -		-	945	262	17 15	CIRC		10		11
149	041157Z	25.8N 126.5E	SAT	(IR DATA		)				NOAA DMSP										
150	041200Z	25.8N 126.4E	LRDR	- 10482															26.2N 127.8E	
151	041200Z	25.8N 126.4E	LRDR	- 12513															24.8N 125.3E	
152	041213Z	25.8N 126.3E	LRDR	- GOOD FIX, CIRCULAR EYE 12 NM DIAM, 80 PERCENT WALL CLOUD															26.4N 127.8E	
153	041226Z	25.7N 126.4E	SAT	(IR DATA		)				PCN 1 DMSP										
154	041226Z	26.0N 126.3E	SAT	(IR DATA		)				PCN 2 DMSP										
155	041238Z	25.8N 126.3E	LRDR	- GOOD FIX, CIRCULAR EYE 12 NM DIAM, 90 PERCENT WALL CLOUD															26.4N 127.8E	
156	041300Z	25.7N 126.4E	LRDR	- 12513															24.8N 125.3E	
157	041300Z	25.8N 126.3E	LRDR	- 105//															26.2N 127.8E	
158	041400Z	25.9N 126.5E	LRDR	- 12633															24.8N 125.3E	
159	041400Z	25.8N 126.5E	LRDR	- 10612															26.2N 127.8E	
160	041430Z	25.9N 126.5E	LRDR	- GOOD FIX															26.2N 127.7E	

TYPHOON GILDA
FIX POSITIONS FOR CYCLONE NO. 9
0600Z 30 JUN TO 0000Z 07 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCMY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT BF RADAR	MSN NMBR
161	0414312	25.9N 126.6E	P	2 1	700	70	68	330	10	-	-	-	944	263	18 16	CIRC		15		11
162	0414482	25.9N 126.5E	LNDR	- GOOD FIX, CIRCULAR EYE 20 NM DIAM, 50 PERCENT WALL CLOUD															26.4N 127.8E	
163	0414502	25.7N 126.6E	SAT	(IR DATA) PCN 1 DMSP																
164	0415002	25.9N 126.5E	LNDR	- 1142															26.2N 127.8E	
165	0415482	26.3N 126.6E	LNDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY, 40 PERCENT WALL CLOUD															26.4N 127.8E	
166	0416002	26.4N 126.6E	LNDR	- 12823															24.8N 125.3E	
167	0416202	26.3N 126.5E	LNDR	- 12732															26.2N 127.8E	
168	0416302	26.4N 126.5E	LNDR	- GOOD FIX															26.2N 127.7E	
169	0416322	26.2N 126.5E	SAT	(IR DATA) PCN 3 DMSP																
170	0416402	26.6N 126.5E	LNDR	- FAIR FIX, CIRCULAR EYE 18 NM DIAM, 50 PERCENT WALL CLOUD															26.4N 127.8E	
171	0417002	26.6N 126.4E	LNDR	- 12832															26.2N 127.8E	
172	0417302	26.7N 126.2E	LNDR	- GOOD FIX															26.2N 127.7E	
173	0418002	26.8N 126.1E	LNDR	- 21842															26.2N 127.8E	
174	0418002	26.8N 126.3E	LNDR	- 22753															24.8N 125.3E	
175	0418152	26.8N 126.2E	LNDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY, 40 PERCENT WALL CLOUD															26.4N 127.8E	
176	0418302	26.8N 126.0E	LNDR	- GOOD FIX															26.2N 127.7E	
177	0419002	26.9N 126.1E	LNDR	- 2 ///2															24.8N 125.3E	
178	0419002	26.7N 126.0E	LNDR	- 51742															26.2N 127.8E	
179	0419132	26.8N 126.3E	LNDR	- POOR FIX, EXTRAP EYE, 20 PERCENT WALL CLOUD															26.4N 127.8E	
180	0419152	26.8N 126.3E	LNDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY, 30 PERCENT WALL CLOUD															26.4N 127.8E	
181	0419302	26.8N 125.8E	LNDR	- GOOD FIX															26.2N 127.7E	
182	0419422	26.8N 126.3E	LNDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY, 30 PERCENT WALL CLOUD															26.4N 127.8E	
183	0419432	26.8N 126.3E	LNDR	- POOR FIX															26.4N 127.8E	
184	0420002	26.8N 126.0E	LNDR	- 2///2															24.8N 125.3E	
185	0420302	26.7N 126.2E	LNDR	- GOOD FIX															26.2N 127.7E	
186	0421002	26.7N 126.1E	LNDR	- 21612															26.2N 127.8E	
187	0421002	26.9N 126.3E	LNDR	- 3///3															24.8N 125.3E	
188	0421152	26.8N 126.3E	LNDR	- GOOD FIX, 50 PERCENT WALL CLOUD															26.4N 127.8E	
189	0421402	26.8N 126.3E	LNDR	- GOOD FIX, 60 PERCENT WALL CLOUD															26.4N 127.8E	
190	0422002	26.8N 126.3E	LNDR	- 20612															26.2N 127.8E	
191	0422152	26.9N 126.3E	LNDR	- FAIR FIX, UNIFORM EYE, 35 PERCENT WALL CLOUD															26.4N 127.8E	
192	0422472	26.9N 126.3E	LNDR	- FAIR FIX, 30 PERCENT WALL CLOUD															26.4N 127.8E	
193	0423002	27.1N 126.5E	LNDR	- FAIR FIX, 30 PERCENT WALL CLOUD															24.8N 127.8E	
194	0423002	27.1N 126.4E	LNDR	- GOOD FIX															26.2N 127.7E	
195	0423152	27.1N 126.3E	LNDR	- FAIR FIX, 30 PERCENT WALL CLOUD															26.4N 127.8E	
196	0423272	27.7N 126.3E	SAT	(T3.5/4.5 /W2.0/24HRS) PCN 3 DMSP																
197	0423272	27.1N 126.0E	SAT	(T3.0/6.0 /W1.0/24HRS) PCN 3 DMSP																
198	0423302	27.5N 126.3E	LNDR	- GOOD FIX															26.2N 127.7E	
199	0423442	27.7N 126.3E	SAT	(T6.5/6.5 /S - /23HRS) NOAA-2 (CONF 01)																
200	0423452	27.2N 126.3E	LNDR	- FAIR FIX, 30 PERCENT WALL CLOUD															26.4N 127.8E	
201	0500122	27.4N 126.3E	LNDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY, 30 PERCENT WALL CLOUD															26.4N 127.8E	
202	0500302	27.5N 126.3E	LNDR	- GOOD FIX															26.2N 127.7E	
203	0501302	27.6N 126.3E	LNDR	- GOOD FIX															26.2N 127.7E	
204	0502002	27.8N 125.8E	LNDR	- 6///3															26.2N 127.8E	
205	0502302	27.8N 126.3E	LNDR	- GOOD FIX															26.2N 127.7E	
206	0502452	27.8N 126.5E	LNDR	- POOR FIX															26.4N 127.8E	
207	0503322	27.9N 126.7E	SAT	(IR DATA) PCN 3 DMSP																
208	0503322	27.8N 126.9E	SAT	(T4.0/5.0 /W1.5/24HRS) PCN 3 DMSP																
209	0504002	28.0N 126.1E	P	5 5 700 170 70 60 35 50 60 60 958 273 18 15 CIRC 35																14
210	0504002	28.3N 125.8E	LNDR	- 6///3															26.2N 127.8E	
211	0508402	28.9N 126.6E	P	5 5 700 220 80 160 100 75 280 90 955 271 17 15 CIRC 30																12
212	0512082	29.2N 126.3E	SAT	(IR DATA) PCN 3 DMSP																
213	0512082	29.5N 126.2E	SAT	(IR DATA) PCN 4 DMSP																
214	0516132	30.2N 127.1E	SAT	(IR DATA) PCN 4 DMSP																
215	0521002	30.7N 126.8E	LNDR	- 6////															30.0N 131.0E	
216	0521422	31.2N 126.4E	P	8 4 700 160 82 90 106 50 90 106 962 275 17 13 - - -																13
217	0522002	31.0N 126.7E	LNDR	- 6///3															30.0N 131.0E	
218	0523082	31.4N 126.9E	SAT	(T3.0/4.0 /W2.0/24HRS) PCN 3 DMSP																
219	0600002	31.6N 127.0E	LNDR	- 6///2															30.0N 131.0E	
220	0600372	32.0N 129.6E	SAT	(T4.5/4.5-/W2.0/25HRS) NOAA-2																
221	0601002	31.8N 127.1E	LNDR	- 5///3															33.4N 130.4E	
222	0601002	31.8N 127.2E	LNDR	- 6///2															30.0N 131.0E	
223	0602002	32.0N 127.1E	LNDR	- 5///2															33.4N 130.4E	
224	0603002	32.2N 127.2E	LNDR	- 5//02															33.4N 130.4E	
225	0603132	32.1N 127.0E	SAT	(IR DATA) PCN 3 DMSP																
226	0603232	31.7N 127.3E	P	10 3 700 130 70 30 70 55 170 140 964 277 15 12 - - -																14
227	0604002	32.3N 127.3E	LNDR	- 5///2															33.4N 130.4E	
228	0604002	32.4N 127.4E	LNDR	- 6////															30.0N 131.0E	
229	0604152	32.1N 127.5E	LNDR	- CIRCULAR EYE OPEN TO SE, 30 PERCENT WALL CLOUD															33.4N 126.6E	
230	0605002	32.4N 127.3E	LNDR	- 5///2															33.4N 130.4E	
231	0605152	32.6N 127.6E	LNDR	- CIRCULAR EYE OPEN TO SE AND S, 30 PERCENT WALL CLOUD															33.4N 126.6E	
232	0606002	32.8N 127.5E	LNDR	- 5//42															33.4N 130.4E	
233	0606002	32.7N 127.5E	LNDR	- POOR FIX															33.0N 130.5E	
234	0606152	32.8N 127.7E	LNDR	- CIRCULAR EYE OPEN TO SE AND S, 40 PERCENT WALL CLOUD															33.3N 126.6E	
235	0606002	33.2N 127.8E	LNDR	- 5//42															33.4N 130.4E	
236	0610002	33.1N 128.0E	LNDR	- 5//02															33.4N 130.4E	
237	0611002	33.4N 128.1E	LNDR	- 13472															33.4N 130.4E	
238	0611152	33.6N 128.0E	LNDR	-													-	-		-
239	0611302	33.3N 128.3E	LNDR	- POOR FIX															33.0N 130.5E	
240	0611502	33.5N 128.0E	SAT	(IR DATA) PCN 5 DMSP																
241	0611502	34.0N 127.9E	SAT	(IR DATA) PCN 4 DMSP																
242	0612002	33.5N 128.2E	LNDR	- 20932															33.4N 130.4E	
243	0613002	33.7N 128.3E	LNDR	- 20932															33.4N 130.4E	
244	0614002	33.8N 128.3E	LNDR	- 30912															33.4N 130.4E	
245	0615002	33.9N 128.4E	LNDR	- 20972															33.4N 130.4E	
246	0615552	33.6N 128.1E	SAT	(IR DATA) PCN 4 DMSP																
247	0616002	34.1N 128.6E	LNDR	- 22912															33.4N 130.4E	
248	0617002	34.4N 128.8E	LNDR	- 20912															33.4N 130.4E	
249	0619002	35.0N 129.2E	LNDR	- 20922															33.4N 130.4E	
250	0619552	35.2N 129.5E	LNDR	-													-	-		-
251	0620002	35.3N 129.5E	LNDR	- 205/2															33.4N 130.4E	
252	0621002	35.6N 129.5E	LNDR	- 55/42															33.4N 130.4E	
253	0622002	35.9N 129.8E	LNDR	- 55/42															33.4N 130.4E	
254	0622302	36.0N 130.0E	SAT	(T2.0/3.0-/W1.0/24HRS) PCN 3 DMSP																
255	0623002	36.2N 129.9E	LNDR	- 6///2															33.4N 130.4E	
256	0623422	36.0N 129.7E	SAT	(T3.0/4.5 /W1.5/24HRS) NOAA-2 (CONF 02)																
257	0702542	36.9N 130.4E	SAT	(IR DATA) PCN 3 DMSP																
258	0711322	38.7N 133.0E	SAT	(IR DATA) PCN 5 DMSP																

TROPICAL STORM HARRIET
FIX POSITIONS FOR CYCLONE NO. 10
0600Z 15 JUL TO 0600Z 18 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T1/T0	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	122242Z	10.8N 148.4E	SAT	(T1.0/1.0 / / HRS)			PCN 5 DMSP								
2	122330Z	12.0N 149.0E	SAT	(T1.5/1.5 /D1.0/24HRS)			NOAA-2		(CONF 01)						
3	130103Z	11.1N 148.3E	SAT	(IR DATA)			PCN 5 DMSP								
4	131037Z	13.0N 147.0E	SAT	(IR DATA)			NOAA-2		(CONF 02)						
5	131123Z	12.3N 146.7E	SAT	(IR DATA)			PCN 5 DMSP								
6	131345Z	12.7N 146.2E	SAT	(IR DATA)			PCN 6 DMSP								
7	132224Z	14.2N 145.9E	SAT	(T2.0/2.0 /D1.0/24HRS)			PCN 6 DMSP								
8	140226Z	15.3N 144.2E	SAT	(IR DATA)			PCN 5 DMSP								
9	141105Z	15.1N 142.7E	SAT	(IR DATA)			PCN 3 DMSP								
10	141107Z	15.0N 142.5E	SAT	(IR DATA)			NOAA-2		(CONF 01)						
11	141508Z	16.0N 141.9E	SAT	(IR DATA)			PCN 3 DMSP								
12	141508Z	16.0N 141.9E	SAT	(IR DATA)			PCN 3 DMSP								
13	142323Z	16.9N 139.1E	SAT	(T2.5/2.5 /S /24HRS)			NOAA-2		(CONF 02)						
14	142324Z	17.3N 138.5E	SAT	(IR DATA)			NOAA-2		(CONF 02)						
15	142347Z	17.8N 140.3E	SAT	(T2.0/2.0 / / HRS)			PCN 5 DMSP								
16	142347Z	17.5N 140.7E	SAT	(T2.0/2.0 /S /25HRS)			PCN 5 DMSP								
17	150207Z	17.7N 139.1E	SAT	(IR DATA)			PCN 5 DMSP								
18	150207Z	17.5N 139.5E	SAT	(IR DATA)			PCN 5 DMSP								
19	150430Z	17.8N 139.2E	P	10 5 1500 130 45 60			10 40 60	10	1001	-	23 23	-	- -	-	
20	150930Z	18.7N 138.4E	P	10 1 1500 50 48 320			25 40 20	25	996	-	25 23	-	- -	-	1 1
21	151203Z	19.0N 137.8E	SAT	(IR DATA)			NOAA-2								
22	151203Z	19.0N 138.0E	SAT	(IR DATA)			NOAA-2		(CONF 01)						
23	151228Z	18.8N 137.9E	SAT	(IR DATA)			PCN 5 DMSP								
24	151228Z	19.3N 137.9E	SAT	(IR DATA)			PCN 5 DMSP								
25	151449Z	19.9N 136.9E	SAT	(IR DATA)			PCN 3 DMSP								
26	151449Z	19.9N 136.9E	SAT	(IR DATA)			PCN 5 DMSP								
27	151555Z	19.6N 136.3E	P	5 10 700 200 28 70			40 - -	-	1009	313	11 -	-	- -	-	2
28	152040Z	20.5N 136.1E	P	3 2 700 130 55 30			30 4 310	10	997	308	15 11	ELIP	SW-NE	30X15	2
29	152329Z	21.0N 135.7E	SAT	(T3.0/3.0 /D1.0/24HRS)			PCN 3 DMSP								
30	152329Z	21.0N 135.8E	SAT	(T3.0/3.0 /D1.0/24HRS)			PCN 3 DMSP								
31	160016Z	21.0N 135.0E	SAT	(T2.5/3.0 /W0.5/24HRS)			NOAA-2		(CONF 01)						
32	160017Z	21.0N 134.5E	SAT	(T1.5/2.0 /W1.0/24HRS)			NOAA-2		(CONF 01)						
33	160149Z	21.6N 135.1E	SAT	(IR DATA)			PCN 3 DMSP								
34	160149Z	21.5N 135.0E	SAT	(IR DATA)			PCN 3 DMSP								
35	160351Z	22.0N 134.9E	P	5 3 700 250 30 170			65 50 90	15	998	309	15 12	-	- -	-	3
36	160952Z	23.1N 134.2E	P	5 2 700 240 30 160			38 4 100	38	998	309	13 -	-	- -	-	3
37	161210Z	22.6N 132.6E	SAT	(IR DATA)			PCN 1 DMSP								
38	161210Z	22.8N 133.5E	SAT	(IR DATA)			PCN 5 DMSP								
39	161431Z	23.0N 132.3E	SAT	(IR DATA)			PCN 5 DMSP								
40	161431Z	23.2N 132.6E	SAT	(IR DATA)			PCN 5 DMSP								
41	161612Z	24.2N 133.3E	SAT	(IR DATA)			PCN 5 DMSP								
42	161700Z	24.1N 132.8E	P	20 3 700 190 30 120			25 - -	-	1001	310	13 -	-	- -	-	
43	162118Z	24.8N 132.7E	P	5 2 700 220 40 150			100 40 60	40	1002	311	13 -	-	- -	-	4
44	162310Z	25.1N 133.1E	SAT	(T2.0/3.0 /W1.0/24HRS)			PCN 3 DMSP								4
45	162310Z	25.0N 133.0E	SAT	(T2.0/3.0 /W1.0/24HRS)			PCN 3 DMSP								
46	170111Z	26.0N 133.4E	SAT	(T1.5/2.0 /S /25HRS)			NOAA-2		(CONF 01)						
47	170312Z	26.1N 133.0E	SAT	(IR DATA)			PCN 3 DMSP								
48	170312Z	26.1N 132.7E	SAT	(IR DATA)			PCN 3 DMSP								
49	171152Z	27.8N 133.2E	SAT	(IR DATA)			PCN 6 DMSP								
50	171152Z	27.4N 132.8E	SAT	(IR DATA)			PCN 3 DMSP								
51	171554Z	28.5N 134.1E	SAT	(IR DATA)			PCN 3 DMSP								
52	171850Z	27.0N 132.0E	SAT	(IR DATA)			NOAA-2		(CONF 01)						
53	172252Z	29.2N 135.0E	SAT	(T1.0/2.0 /W1.0/24HRS)			PCN 3 DMSP								
54	172252Z	29.1N 135.0E	SAT	(T1.0/2.0 /W1.0/24HRS)			PCN 3 DMSP								
55	180253Z	29.2N 135.8E	SAT	(IR DATA)			PCN 3 DMSP								
56	180253Z	29.0N 135.7E	SAT	(IR DATA)			PCN 3 DMSP								
57	181134Z	29.7N 138.1E	SAT	(IR DATA)			PCN 3 DMSP								

TROPICAL STORM JEAN
FIX POSITIONS FOR CYCLONE NO. 11
0900Z 17 JUL TO 0600Z 20 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T1/T0	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	150207Z	16.8N 132.3E	SAT	(T1.0/1.0 / / HRS)			PCN 3 DMSP								
2	150207Z	16.8N 132.8E	SAT	(T1.5/1.5 / / HRS)			PCN 5 DMSP								
3	151228Z	17.3N 129.7E	SAT	(IR DATA)			PCN 5 DMSP								
4	151449Z	18.2N 128.5E	SAT	(IR DATA)			PCN 5 DMSP								
5	151449Z	18.3N 128.3E	SAT	(IR DATA)			PCN 5 DMSP								
6	152329Z	17.7N 129.3E	SAT	(T1.5/1.5 /D0.5/24HRS)			PCN 3 DMSP								
7	152329Z	17.8N 129.4E	SAT	(T2.0/2.0 /D0.5/24HRS)			PCN 3 DMSP								
8	160018Z	17.5N 129.0E	SAT	(T1.5/1.5 /D1.0/24HRS)			NOAA-2		(CONF 01)						
9	160330Z	17.8N 128.6E	SAT	(IR DATA)			PCN 5 DMSP								
10	160330Z	18.6N 128.5E	SAT	(IR DATA)			PCN 5 DMSP								
11	160751Z	18.3N 128.8E	P	5 15 1500 210 25 130			25 25 130	20	1004	-	26 -	-	- -	-	1
12	161210Z	18.5N 128.4E	SAT	(IR DATA)			PCN 5 DMSP								
13	161210Z	19.0N 127.6E	SAT	(IR DATA)			PCN 5 DMSP								
14	161612Z	19.7N 128.0E	SAT	(IR DATA)			PCN 3 DMSP								
15	162310Z	19.7N 127.3E	SAT	(T2.0/2.0 /D0.5/24HRS)			PCN 3 DMSP								
16	162310Z	19.8N 127.3E	SAT	(T3.0/3.0 /D1.0/24HRS)			PCN 3 DMSP								
17	170113Z	20.0N 126.8E	SAT	(T2.0/2.0 /D0.5/25HRS)			NOAA-2		(CONF 01)						
18	170312Z	19.7N 126.9E	SAT	(IR DATA)			PCN 3 DMSP								
19	170312Z	19.9N 126.9E	SAT	(IR DATA)			PCN 3 DMSP								
20	171152Z	20.2N 126.1E	SAT	(IR DATA)			PCN 5 DMSP								
21	171152Z	20.4N 125.9E	SAT	(IR DATA)			PCN 6 DMSP								
22	171158Z	19.7N 125.6E	SAT	(IR DATA)			NOAA-2		(CONF 02)						
23	171401Z	20.3N 126.3E	P	10 10 700 40 30 320			50 - -	-	999	307	13 11	-	- -	-	3
24	171554Z	20.5N 126.2E	SAT	(IR DATA)			PCN 3 DMSP								
25	171554Z	20.6N 126.1E	SAT	(IR DATA)			PCN 3 DMSP								
26	172304Z	21.2N 125.3E	P	10 2 700 120 38 60			30 4 60	45	998	307	12 -	-	- -	-	4
27	180013Z	20.8N 125.0E	SAT	(T3.0/3.0 /D0.5/23HRS)			NOAA-2		(CONF 01)						
28	180034Z	21.2N 125.3E	SAT	(T3.0/3.0 / / HRS)			PCN 3 DMSP								
29	180253Z	21.2N 124.5E	SAT	(T3.5/3.5 /D1.5/24HRS)			PCN 3 DMSP								
30	180253Z	21.2N 123.9E	SAT	(T3.5/3.5 /D0.5/28HRS)			PCN 3 DMSP								

TROPICAL STORM JEAN
FIX POSITIONS FOR CYCLONE NO. 11
0000Z 17 JUL to 0600Z 20 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCMY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN /OOMB HGT	FLT LVL T/TD	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
31	180900Z	21.4N 123.1E	LNDR		- 6////														24.3N 124.2E	
32	181000Z	21.9N 123.9E	LNDR		- 7////														24.8N 125.3E	
33	181100Z	22.0N 123.7E	LNDR		- 6////														24.3N 124.2E	
34	181100Z	22.0N 123.7E	LNDR		- 7////														24.8N 125.3E	
35	181200Z	22.1N 123.5E	LNDR		- 55//0														24.3N 124.2E	
36	181200Z	22.1N 123.6E	LNDR		- 7////														24.8N 125.3E	
37	181210Z	22.1N 123.9E	P	5 2	700	140	45	60	30	-	-	-	995	307	14 11	-	- -	-		5
38	181255Z	22.6N 124.0E	SAT	(IR DATA		)			NOAA-2				(CONF 01)							
39	181300Z	22.2N 123.4E	LNDR		- 7////														24.8N 125.3E	
40	181300Z	22.2N 123.2E	LNDR		- 6////														24.3N 124.2E	
41	181315Z	22.4N 124.0E	SAT	(IR DATA		)			PCN 3	DMSP										
42	181315Z	22.5N 123.5E	SAT	(IR DATA		)			PCN 4	DMSP										
43	181400Z	22.2N 123.2E	LNDR		- 7////														24.8N 125.3E	
44	181400Z	22.3N 123.1E	LNDR		- 6///1														24.3N 124.2E	
45	181450Z	22.8N 123.1E	LNDR		- 55//3														24.0N 121.6E	
46	181500Z	22.4N 123.0E	LNDR		- 5///1														24.3N 124.2E	
47	181500Z	22.4N 123.0E	LNDR		- 7////														24.8N 125.3E	
48	181525Z	22.4N 123.1E	P	5 2	700	120	55	340	70	-	-	-	995	305	14 13	-	- -	-		5
49	181535Z	22.6N 122.8E	SAT	(IR DATA		)			PCN 3	DMSP										
50	181535Z	22.6N 122.9E	SAT	(IR DATA		)			PCN 3	DMSP										
51	181600Z	22.6N 122.9E	LNDR		- 7///														24.8N 125.3E	
52	181800Z	22.6N 123.0E	LNDR		- 5///1														24.3N 124.2E	
53	181700Z	22.7N 122.8E	LNDR		- 7////														24.8N 125.3E	
54	181800Z	22.8N 123.3E	LNDR		- 45/13														24.0N 121.6E	
55	181800Z	22.9N 122.8E	LNDR		- 6//11														24.3N 124.2E	
56	181800Z	23.1N 122.8E	LNDR		- 7////1														24.8N 125.3E	
57	181900Z	23.1N 122.8E	LNDR		- 5///1														24.3N 124.2E	
58	182000Z	23.3N 122.6E	LNDR		- 6///1														24.3N 124.2E	
59	182000Z	23.3N 122.7E	LNDR		- 7///1														24.8N 125.3E	
60	182100Z	23.3N 122.7E	LNDR		- 7///1														24.8N 125.3E	
61	182100Z	23.3N 122.5E	LNDR		- 5///1														24.3N 124.2E	
62	182200Z	23.4N 122.5E	LNDR		- 6///1														24.3N 124.2E	
63	182300Z	23.6N 122.4E	LNDR		- 6///1														24.3N 124.2E	
64	182305Z	23.6N 123.0E	LNDR		- GOOD FIX														24.0N 121.6E	
65	190005Z	23.8N 122.8E	LNDR		- GOOD FIX, ELLIPTICAL EYE E-W														24.3N 120.6E	
66	190015Z	23.7N 122.6E	SAT	(IR DATA		)			PCN 3	DMSP										
67	190015Z	23.7N 122.4E	SAT	(T4.0/4.0 /	/ HRS)	PCN 1	DMSP													
68	190015Z	23.8N 122.4E	SAT	(T4.5/4.5-/D1.0/24HRS)		PCN 1	DMSP													
69	190100Z	23.9N 122.5E	LNDR		- 6////														24.3N 124.2E	
70	190106Z	23.5N 122.0E	SAT	(T3.0/3.0 /S	/25HRS)	NOAA-2							(CONF 01)							
71	190120Z	24.1N 122.5E	LNDR		- FAIR FIX, TEAR DROP EYE														24.0N 122.0E	
72	190200Z	24.0N 122.3E	LNDR		- 5////2														24.8N 125.3E	
73	190220Z	24.2N 122.3E	LNDR		- ELLIPTICAL EYE 34/30														24.0N 122.0E	
74	190235Z	24.5N 122.3E	SAT	(T4.0/4.0-/D0.5/24HRS)		PCN 3	DMSP													
75	190235Z	24.1N 122.1E	SAT	(IR DATA		)			PCN 3	DMSP										
76	190320Z	24.3N 122.2E	LNDR		- CIRCULAR EYE, 45 NM DIAM														24.0N 122.0E	
77	190400Z	24.7N 122.2E	LNDR		- 6////1														24.3N 124.2E	
78	190400Z	24.7N 122.0E	LNDR		- 5////														24.8N 125.3E	
79	190400Z	24.6N 122.1E	LNDR		-											-	- -	-	25.0N 121.8E	-
80	190420Z	24.6N 122.1E	LNDR		- CIRCULAR EYE, 22 NM DIAM, OPEN TO NW-S														24.0N 122.0E	
81	190500Z	24.9N 122.2E	LNDR		- 6////2														24.3N 124.2E	
82	190500Z	24.9N 121.8E	LNDR		- 47///														24.8N 125.3E	
83	190800Z	25.5N 122.0E	LNDR		- 6////1														24.3N 124.2E	
84	191257Z	25.4N 122.5E	SAT	(IR DATA		)			PCN 3	DMSP										
85	191257Z	26.5N 121.7E	SAT	(IR DATA		)			PCN 5	DMSP										
86	191517Z	27.6N 121.6E	SAT	(IR DATA		)			PCN 5	DMSP										
87	191517Z	27.2N 121.0E	SAT	(IR DATA		)			PCN 5	DMSP										
88	192357Z	30.1N 122.1E	SAT	(T1.5/2.5-/W3.0/24HRS)		PCN 3	DMSP													
89	200005Z	30.1N 122.0E	SAT	(T2.5/2.5 /W0.5/23HRS)		NOAA-2							(CONF 01)							
90	200216Z	31.0N 122.3E	SAT	(IR DATA		)			PCN 3	DMSP										

TYPHOON IVY
FIX POSITIONS FOR CYCLONE NO. 12
0600Z 17 JUL TO 1800Z 22 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN TWOMB MGT	FLT LVL T/TD	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	150207Z	11.4N 151.4E	SAT	(T1.0/1.0 / / HRS)						PCN 5 DMSP										
2	151047Z	11.4N 149.7E	SAT	(IR DATA)						PCN 5 DMSP										
3	151449Z	11.3N 147.9E	SAT	(IR DATA)						PCN 5 DMSP										
4	151449Z	11.1N 148.0E	SAT	(IR DATA)						PCN 5 DMSP										
5	160149Z	11.4N 146.8E	SAT	(T1.5/1.5 /D0.5/24HRS)						PCN 3 DMSP										
6	161029Z	11.5N 144.2E	SAT	(IR DATA)						PCN 6 DMSP										
7	161431Z	11.4N 143.2E	SAT	(IR DATA)						PCN 5 DMSP										
8	162310Z	11.8N 140.6E	SAT	(T2.0/2.0 /D0.5/24HRS)						PCN 5 DMSP										
9	162320Z	10.0N 139.0E	SAT	(T1.5/1.5 /D1.0/24HRS)						NOAA-2			(CONF 01)							
10	170130Z	12.2N 139.4E	SAT	(IR DATA)						PCN 5 DMSP										
11	170605Z	11.8N 139.5E	P	5 5 1900	50	30	310	40	3	310	40	1002	-	22	22	CIRC		25		1
12	170925Z	12.0N 138.7E	P	8 10 700	130	35	60	40	30	60	40	1004	310	9	9	CIRC		25		1
13	171152Z	12.2N 137.5E	SAT	(IR DATA)						PCN 5 DMSP										
14	171152Z	12.6N 137.5E	SAT	(IR DATA)						PCN 6 DMSP										
15	171412Z	12.0N 136.7E	SAT	(IR DATA)						PCN 5 DMSP										
16	171450Z	12.7N 136.8E	P	5 5 700	170	35	100	95	-	-	-	1002	309	10	7	CIRC		40		2
17	172045Z	13.1N 135.2E	P	5 1 700	110	60	10	20	60	130	18	997	306	11	10	CIRC		30		2
18	172252Z	13.0N 134.3E	SAT	(T3.5/3.5 /D1.5/24HRS)						PCN 5 DMSP										
19	172252Z	13.3N 134.3E	SAT	(T2.5/2.5 / / HRS)						PCN 3 DMSP										
20	172252Z	13.1N 134.4E	SAT	(T3.5/3.5 / / HRS)						PCN 3 DMSP										
21	180015Z	13.0N 134.2E	SAT	(T3.0/3.0 /D1.0/25HRS)						NOAA-2			(CONF 01)							
22	180253Z	13.2N 133.2E	SAT	(IR DATA)						PCN 1 DMSP										
23	180453Z	13.5N 133.4E	SAT	(IR DATA)						PCN 3 DMSP										
24	181057Z	13.6N 131.3E	SAT	(IR DATA)						NOAA-2			(CONF 01)							
25	181134Z	14.2N 131.1E	SAT	(IR DATA)						PCN 5 DMSP										
26	181134Z	14.0N 130.9E	SAT	(IR DATA)						PCN 5 DMSP										
27	181228Z	14.2N 130.8E	P	5 2 700	130	80	90	20	-	-	-	987	297	14	10	CIRC		15		3
28	181535Z	14.2N 130.0E	SAT	(IR DATA)						PCN 5 DMSP										
29	181535Z	14.6N 129.8E	SAT	(IR DATA)						PCN 5 DMSP										
30	181559Z	14.3N 130.0E	P	5 2 700	180	75	150	20	-	-	-	979	292	16	10	CIRC		10		3
31	182130Z	14.6N 128.6E	P	8 5 700	30	70	340	20	100	360	5	971	283	17	10	ELIP	N-S	15X10		4
32	190015Z	14.7N 127.7E	SAT	(T4.5/4.5 /D1.0/24HRS)						PCN 1 DMSP										
33	190015Z	14.8N 127.8E	SAT	(T4.5/4.5 / / HRS)						PCN 1 DMSP										
34	190109Z	14.1N 127.0E	SAT	(T5.0/5.0 /D1.5/25HRS)						NOAA-2			(CONF 01)							
35	190235Z	14.8N 127.0E	SAT	(IR DATA)						PCN 1 DMSP										
36	190235Z	14.8N 126.6E	SAT	(T5.0/5.0 /D1.5/28HRS)						PCN 1 DMSP										
37	190830Z	14.9N 125.8E	LMDR	- POSSIBLE EYE, ELLIPTICAL AXIS 20/30, 50 PERCENT WALL CLOUD															14.4N 142.6E	
38	190830Z	14.8N 125.8E	P	5 1 700	210	100	300	5	120	30	6	946	268	16	12	ELIP	N-S	10X 7		5
39	190930Z	14.9N 125.6E	LMDR	- CIRCULAR EYE 10 NM DIAM, 80 PERCENT WALL CLOUD															14.4N 142.6E	
40	191000Z	14.9N 125.5E	LMDR	- CIRCULAR EYE 7 NM DIAM, 70 PERCENT WALL CLOUD															14.4N 142.6E	
41	191030Z	14.9N 125.4E	LMDR	- CIRCULAR EYE OPEN NW, 5 NM DIAM, 50 PERCENT WALL CLOUD															14.4N 142.6E	
42	191037Z	14.8N 125.3E	P	- - 700	-	-	-	-	-	-	-	945	-	-	-	-	- -	-		5
43	191100Z	14.9N 125.2E	LMDR	- CIRCULAR EYE OPEN N, 7 NM DIAM, 50 PERCENT WALL CLOUD															14.4N 142.6E	
44	191130Z	14.3N 125.2E	LMDR	- CIRCULAR EYE OPEN N, 7 NM DIAM, 80 PERCENT WALL CLOUD															14.4N 142.6E	
45	191153Z	14.0N 125.0E	SAT	(IR DATA)						NOAA-2			(CONF 02)							
46	191200Z	14.9N 125.1E	LMDR	- CIRCULAR EYE, 50 PERCENT WALL CLOUD															14.4N 142.6E	
47	191257Z	14.9N 124.9E	SAT	(IR DATA)						PCN 5 DMSP										
48	191257Z	14.1N 122.8E	SAT	(IR DATA)						PCN 5 DMSP										
49	191300Z	14.9N 124.9E	LMDR	- CIRCULAR EYE OPEN W, 80 PERCENT WALL CLOUD															14.4N 142.6E	
50	191330Z	15.0N 124.8E	LMDR	- CIRCULAR EYE 8 NM DIAM, 100 PERCENT WALL CLOUD															14.4N 142.6E	
51	191400Z	15.0N 124.7E	LMDR	- CIRCULAR EYE OPEN NNW, 7 NM DIAM, 60 PERCENT WALL CLOUD															14.4N 142.6E	
52	191430Z	15.0N 124.6E	LMDR	- CIRCULAR EYE OPEN NNW, 7 NM DIAM, 60 PERCENT WALL CLOUD															14.4N 142.6E	
53	191500Z	15.1N 124.4E	LMDR	- CIRCULAR EYE 6 NM DIAM, 100 PERCENT CONCENTRIC															14.4N 142.6E	
54	191517Z	15.4N 124.1E	SAT	(IR DATA)						PCN 1 DMSP										
55	191517Z	15.0N 124.0E	SAT	(IR DATA)						PCN 5 DMSP										
56	191530Z	15.2N 124.2E	LMDR	- CIRCULAR EYE OPEN NW, 9 NM DIAM, 70 PERCENT WALL CLOUD															14.4N 142.6E	
57	191530Z	15.1N 124.3E	P	5 3 700	20	85	230	12	-	-	-	952	268	15	12	CIRC		35		5
58	191630Z	15.2N 124.0E	LMDR	- CIRCULAR EYE 9 NM DIAM, 100 PERCENT WALL CLOUD															14.4N 142.6E	
59	191700Z	15.3N 123.9E	LMDR	- CIRCULAR EYE OPEN NNW, 7 NM DIAM, 90 PERCENT WALL CLOUD															14.4N 142.6E	
60	191800Z	15.3N 123.6E	LMDR	- CIRCULAR EYE 6 NM DIAM, 100 PERCENT WALL CLOUD															14.4N 142.6E	
61	191830Z	15.3N 123.4E	LMDR	- ELLIPTICAL EYE 8X10 NM, 100 PERCENT WALL CLOUD															14.4N 142.6E	
62	191900Z	15.3N 123.3E	LMDR	- ELLIPTICAL EYE 7X10 NM, 100 PERCENT WALL CLOUD															14.4N 142.6E	
63	191930Z	15.3N 123.2E	LMDR	- ELLIPTICAL EYE 7X10 NM, 100 PERCENT WALL CLOUD															14.4N 142.6E	
64	192032Z	15.3N 123.0E	P	2 2 700	350	80	290	20	-	-	-	948	262	16	-	CIRC		8		6
65	192035Z	15.4N 122.9E	LMDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY															15.2N 120.6E	
66	192100Z	15.4N 122.8E	LMDR	- CIRCULAR EYE OPEN NNE, 8 NM DIAM, 90 PERCENT WALL CLOUD															14.4N 122.6E	
67	192105Z	15.4N 122.8E	LMDR	- FAIR FIX, POSSIBLE EYE, 10 DEG SPIRAL OVERLAY															15.2N 120.6E	
68	192135Z	15.6N 122.6E	LMDR	- FAIR FIX, POSSIBLE EYE, 10 DEG SPIRAL OVERLAY															15.2N 120.6E	
69	192207Z	15.5N 122.4E	LMDR	- FAIR FIX, POSSIBLE EYE, 15 DEG SPIRAL OVERLAY															15.2N 120.6E	
70	192215Z	15.6N 122.5E	LMDR	- CIRCULAR EYE 20 NM DIAM, 100 PERCENT WALL CLOUD															14.4N 122.6E	
71	192238Z	15.6N 122.3E	LMDR	- FAIR FIX, POSSIBLE EYE, 10 DEG SPIRAL OVERLAY															15.2N 120.6E	
72	192300Z	15.6N 122.3E	LMDR	- FAIR FIX, POSSIBLE EYE, 10 DEG SPIRAL OVERLAY															14.4N 122.6E	
73	192308Z	15.6N 122.2E	LMDR	- CIRCULAR EYE 20 NM DIAM, 90 PERCENT WALL CLOUD															15.2N 120.6E	
74	192330Z	15.6N 122.2E	LMDR	- CIRCULAR EYE OPEN NNW, 20 NM DIAM, 90 PERCENT WALL CLOUD															14.4N 122.6E	
75	192357Z	15.3N 122.1E	SAT	(T4.5/4.5-/S /24HRS)						PCN 3 DMSP										
76	192357Z	15.6N 122.0E	SAT	(T4.5/5.0-/W /24HRS)						PCN 5 DMSP										
77	192357Z	15.5N 122.0E	SAT	(T5.5/5.5 /D0.5/21HRS)						PCN 3 DMSP										
78	192358Z	15.6N 122.4E	P	1 5 700	180	100	90	15	140	-	-	-	267	-	-	CIRC		18		6
79	200000Z	15.5N 122.1E	LMDR	- OVAL EYE, 15X20 NM NW/SE, 100 PERCENT WALL CLOUD															14.4N 122.6E	
80	200007Z	15.2N 122.0E	LMDR	- GOOD FIX, CIRCULAR EYE 25 NM DIAM, 80 PERCENT WALL CLOUD															15.2N 120.6E	
81	200036Z	15.3N 121.8E	LMDR	- GOOD FIX															15.2N 120.6E	
82	200100Z	15.6N 121.9E	LMDR	- OVAL EYE 15X22 NM, 100 PERCENT WALL CLOUD															14.4N 122.6E	
83	200106Z	15.4N 121.7E	LMDR	- GOOD FIX, CIRCULAR EYE 25 NM DIAM															15.2N 120.6E	
84	200136Z	15.3N 121.6E	LMDR	- GOOD FIX, CIRCULAR EYE 25 NM DIAM															15.2N 120.6E	
85	200200Z	15.6N 121.8E	LMDR	- GOOD FIX, CIRCULAR EYE 17 NM DIAM, 100 PERCENT WALL CLOUD															14.4N 122.6E	
86	200230Z	15.7N 121.7E	LMDR	- ELLIPTICAL EYE 13X17 NM NE/SW, 100 PERCENT WALL CLOUD															14.4N 122.6E	
87	200233Z	15.5N 121.7E	LMDR	- GOOD FIX, CIRCULAR EYE 20 NM DIAM															15.2N 120.6E	
88	200300Z	15.5N 122.0E	LMDR	- CIRCULAR EYE, 100 PERCENT WALL CLOUD															14.4N 122.6E	
89	200303Z	15.6N 121.6E	LMDR	- GOOD FIX, CIRCULAR EYE 18 NM DIAM															15.2N 120.6E	
90	200330Z	15.7N 121.5E	LMDR	- CIRCULAR EYE 13 NM DIAM, 100 PERCENT WALL CLOUD															14.4N 122.6E	
91	200335Z	15.6N 121.5E	LMDR	- GOOD FIX, CIRCULAR EYE 16 NM DIAM															15.2N 120.6E	
92	200358Z	15.7N 121.4E	SAT	(IR DATA)						PCN 5 DMSP										
93	200400Z	15.8N 121.4E	LMDR	- ELLIPTICAL EYE, NE/SW 13X8 NM, 100 PERCENT WALL CLOUD															15.2N 120.6E	
94	200402Z	15.6N 121.4E	LMDR	- GOOD FIX, CIRCULAR EYE 5 NM DIAM, 80 PERCENT WALL CLOUD															15.2N 120.6E	
95	200433Z	15.7N 121.3E	LMDR	- EYE DIFFUSE, POOR FIX															15.2N 120.6E	
96	200503Z	15.8N 121.0E	LMDR	- EYE DIFFUSE, POOR FIX															15.2N 120.6E	
97	200605Z	15.8N 121.0E	LMDR	- FAIR FIX															15.2N 120.6E	
98	200634Z	16.0N 120.8E	LMDR	- FAIR FIX, 15 DEG SPIRAL OVERLAY															15.2N 120.6E	
99	200704Z	16.1N 120.7E	LMDR	- FAIR FIX, 15 DEG SPIRAL OVERLAY															15.2N 120.6E	
100	200800Z	16.2N 120.3E	LMDR	- 20922															14.4N 121.0E	

TYPHOON IVY
FIX POSITIONS FOR CYCLONE NO. 12
0600Z 17 JUL TO 1800Z 22 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T1/T0	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
101	200808Z	16.1N 120.3E	LNDR	- FAIR FIX, POSSIBLE EYE, 15 DEG SPIRAL OVERLAY															15.2N 120.6E	
102	200938Z	16.3N 119.9E	LNDR	- POOR FIX, POSSIBLE EYE, 15 DEG SPIRAL OVERLAY															15.2N 120.6E	
103	201009Z	16.3N 120.0E	LNDR	- FAIR FIX, POSSIBLE EYE, 15 DEG SPIRAL OVERLAY															15.2N 120.6E	
104	201239Z	16.7N 119.0E	SAT	(IR DATA)						PCN 5 DMSP										
105	201239Z	16.6N 118.4E	SAT	(IR DATA)						PCN 5 DMSP										
106	201247Z	17.0N 119.0E	SAT	(IR DATA)						NOAA-2			(CONF 03)							
107	201625Z	17.3N 118.3E	P	1 15 700	160	80	40	13	-	-	-		989	298	12 11	-	- -	-		7
108	201639Z	17.7N 118.2E	SAT	(IR DATA)						PCN 5 DMSP										
109	202215Z	17.6N 117.0E	P	5 2 700	270	50	110	35	60	00	30		975	291	12 11	CTHC		35		7
110	202338Z	17.5N 116.9E	SAT	(IR DATA)						PCN 5 DMSP										
111	202339Z	18.0N 117.1E	SAT	(T4.5/4.5+/S1.0/24HRS)						PCN 3 DMSP										
112	210103Z	18.0N 116.0E	SAT	(T5.0/5.0 /D0.5/23HRS)						NOAA-2			(CONF 01)							
113	210120Z	17.9N 116.5E	SAT	(T5.0/5.0 /D0.5/25HRS)						PCN 1 DMSP										
114	210339Z	18.1N 115.9E	SAT	(T5.0/5.0 /D0.5/28HRS)						PCN 1 DMSP										
115	210339Z	18.4N 116.1E	SAT	(T4.5/4.5 / / HRS)						PCN 1 DMSP										
116	210900Z	18.7N 114.9E	LNDR	- 2080/															22.3N 114.2E	
117	211035Z	18.9N 114.9E	P	5 2 700	140	100	70	40	100	70	95		967	281	15 10	ELIP	SW-NE	25X23		8
118	211200Z	18.9N 114.4E	LNDR	- 2////															22.3N 114.2E	
119	211344Z	20.0N 115.0E	SAT	(IR DATA)						NOAA-2			(CONF 02)							
120	211402Z	19.4N 114.2E	SAT	(IR DATA)						PCN 5 DMSP										
121	211435Z	19.2N 114.2E	P	5 2 700	-	-	-	-	-	-	-		965	279	17 -	ELIP	E-W	30X27		8
122	211500Z	19.2N 114.0E	LNDR	- 20///															22.3N 114.2E	
123	211621Z	19.6N 113.9E	SAT	(IR DATA)						PCN 5 DMSP										
124	212100Z	19.8N 113.2E	LNDR	- 2////															22.3N 114.2E	
125	220000Z	20.2N 112.9E	LNDR	- 105//															22.3N 114.2E	
126	220100Z	20.2N 112.8E	SAT	(T5.5/5.5 /D0.5/24HRS)						PCN 1 DMSP										
127	220300Z	20.4N 112.7E	LNDR	- 105//															22.3N 114.2E	
128	220321Z	20.4N 112.4E	SAT	(T5.5/5.5-/D0.5/24HRS)						PCN 1 DMSP										
129	220321Z	20.3N 112.1E	SAT	(T6.0/6.0 / / HRS)						PCN 1 DMSP										
130	220600Z	20.9N 112.2E	LNDR	- 1083/															22.3N 114.2E	
131	220900Z	21.3N 111.9E	LNDR	- 1085/															22.3N 114.2E	
132	221200Z	21.6N 111.3E	LNDR	- 1075/															22.3N 114.2E	
133	221244Z	21.8N 111.5E	SAT	(IR DATA)						NOAA-2										
134	221602Z	21.4N 111.0E	SAT	(IR DATA)						PCN 5 DMSP										
135	221602Z	21.8N 110.9E	SAT	(IR DATA)						PCN 5 DMSP										
136	221602Z	22.8N 111.3E	SAT	(IR DATA)						PCN 1 DMSP										

TROPICAL STORM KIM
FIX POSITIONS FOR CYCLONE NO. 13
0000Z 23 JUL TO 0600Z 24 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T1/T0	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	2021572	17.6N 165.1E	SAT	(T1.0/1.0 / / HRS)						PCN 5 DMSP										
2	2100162	18.5N 165.4E	SAT	(IR DATA)						PCN 5 DMSP										
3	2110392	19.7N 164.4E	SAT	(IR DATA)						PCN 5 DMSP										
4	2112582	19.9N 164.3E	SAT	(IR DATA)						PCN 5 DMSP										
5	2121392	20.9N 164.8E	SAT	(T1.0/1.0 /S /24HRS)						PCN 3 DMSP										
6	2210212	20.8N 165.3E	SAT	(IR DATA)						PCN 5 DMSP										
7	2221072	23.2N 167.1E	SAT	(T3.0/3.0 /D2.0/23HRS)						NOAA-2			(CONF 01)							
8	2221202	23.0N 167.3E	SAT	(T1.5/1.5 /D0.5/24HRS)						PCN 6 DMSP										
9	2223392	23.0N 165.3E	SAT	(T1.5/1.5 / / HRS)						PCN 5 DMSP										
10	2301202	23.3N 166.1E	SAT	(IR DATA)						PCN 5 DMSP										
11	2309502	24.5N 169.0E	SAT	(IR DATA)						NOAA-2			(CONF 02)							
12	2310022	23.5N 168.0E	SAT	(IR DATA)						PCN 6 DMSP										
13	2321022	25.8N 167.9E	SAT	(T2.0/2.0 /S0.5/24HRS)						PCN 3 DMSP										
14	2322012	26.0N 168.4E	SAT	(T3.5/3.5 /S /25HRS)						NOAA-2			(CONF 01)							
15	2323202	26.2N 167.7E	SAT	(T3.0/3.0 /D0.5/24HRS)						PCN 4 DMSP										
16	2401022	26.7N 167.2E	SAT	(IR DATA)						PCN 3 DMSP										
17	2401022	26.8N 167.2E	SAT	(T2.0/2.0 / / HRS)						PCN 4 DMSP										
18	2401022	25.5N 166.7E	SAT	(T2.0/2.0 /D0.5/24HRS)						PCN 3 DMSP										
19	2403202	27.2N 166.3E	P	13 7 700	180	65	30	25	65	30	25		989	301	18 -	-	- -	-		2
20	2410472	26.8N 164.0E	SAT	(IR DATA)						NOAA-2			(CONF 02)							
21	2413442	26.5N 163.4E	SAT	(IR DATA)						PCN 6 DMSP										

TROPICAL STORM LUCY
FIX POSITIONS FOR CYCLONE NO. 14
0000Z 09 AUG TO 0600Z 11 AUG

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T1/T0	EYE FORM	ORIENTATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	040242Z	12.2N 134.0E	SAT	(T1.0/1.0 / / HRS)			PCN 5 DMSP								
2	041128Z	14.0N 130.9E	SAT	(IR DATA)			PCN 5 DMSP								
3	041309Z	13.2N 126.3E	SAT	(IR DATA)			PCN 6 DMSP								
4	041524Z	13.6N 129.2E	SAT	(IR DATA)			PCN 5 DMSP								
5	041524Z	13.2N 129.0E	SAT	(IR DATA)			PCN 6 DMSP								
6	050009Z	16.6N 124.5E	SAT	(T1.5/1.5 / / HRS)			PCN 5 DMSP								
7	050009Z	16.0N 124.3E	SAT	(T1.5/1.5 /D0.5/24HRS)			PCN 5 DMSP								
8	050225Z	16.4N 123.8E	SAT	(IR DATA)			PCN 5 DMSP								
9	051251Z	14.9N 122.9E	SAT	(IR DATA)			PCN 5 DMSP								
10	051505Z	15.0N 122.6E	SAT	(IR DATA)			PCN 5 DMSP								
11	052451Z	16.6N 121.6E	SAT	(T1.0/1.5+/W0.5/24HRS)			PCN 5 DMSP								
12	060522Z	11.0N 134.9E	SAT	(IR DATA)			NOAA-2 (CONF 03)								
13	080310Z	19.6N 118.6E	SAT	(T1.0/1.0 / / HRS)			PCN 5 DMSP								
14	081338Z	18.0N 116.3E	SAT	(IR DATA)			PCN 5 DMSP								
15	081551Z	17.4N 117.9E	SAT	(IR DATA)			PCN 5 DMSP								
16	081551Z	17.7N 117.8E	SAT	(IR DATA)			PCN 5 DMSP								
17	090038Z	18.2N 117.2E	SAT	(T1.0/1.0 / / HRS)			PCN 5 DMSP								
18	090115Z	19.0N 118.0E	SAT	(T2.0/2.0 /D1.0/24HRS)			NOAA-2 (CONF 02)								
19	090251Z	18.3N 117.9E	SAT	(T1.5/1.5 / / HRS)			PCN 5 DMSP								
20	090251Z	18.7N 117.4E	SAT	(T1.5/1.5 /D0.5/24HRS)			PCN 3 DMSP								
21	090305Z	18.9N 119.2E	P	15 5 1500 50 25 330		30 25 330	30	994	-	26	-	-	- -	-	1
22	090433Z	18.8N 118.9E	SAT	(IR DATA)			PCN 5 DMSP								
23	090955Z	19.7N 119.6E	P	10 5 700 230 50 170		150 4 170	30	-	305	14	-	-	- -	-	3
24	091319Z	20.2N 119.3E	SAT	(IR DATA)			PCN 5 DMSP								
25	091431Z	20.7N 119.9E	P	3 20 700 - - -		- - -	9	973	61	30	-	-	- -	-	3
26	091532Z	20.4N 119.2E	SAT	(IR DATA)			PCN 5 DMSP								
27	091533Z	21.0N 119.6E	SAT	(IR DATA)			PCN 5 DMSP								
28	092253Z	20.2N 119.4E	P	1 5 1500 240 40 160		150 25 150	35	997	-	24	-	-	- -	-	3
29	100019Z	22.2N 119.2E	SAT	(T3.0/3.0-/D2.0/24HRS)			PCN 5 DMSP								
30	100019Z	21.9N 118.9E	SAT	(T1.5/1.5 /S /21HRS)			PCN 5 DMSP								
31	100019Z	22.5N 119.4E	SAT	(T2.5/2.5-/D1.0/21HRS)			PCN 3 DMSP								
32	100208Z	23.5N 120.3E	SAT	(T3.0/3.0 /D1.0/25HRS)			NOAA-2 (CONF 02)								
33	100414Z	22.8N 118.9E	SAT	(IR DATA)			PCN 5 DMSP								
34	100414Z	22.5N 120.1E	SAT	(T3.0/3.0 / / HRS)			PCN 5 DMSP								
35	101257Z	23.0N 118.9E	SAT	(IR DATA)			NOAA-2 (CONF 02)								
36	101301Z	22.7N 119.5E	SAT	(IR DATA)			PCN 5 DMSP								
37	101301Z	22.5N 119.2E	SAT	(IR DATA)			PCN 6 DMSP								
38	101301Z	22.8N 119.7E	SAT	(IR DATA)			PCN 5 DMSP								
39	110001Z	23.5N 118.6E	SAT	(T2.0/2.0 /D0.5/24HRS)			PCN 5 DMSP								
40	110001Z	23.6N 118.6E	SAT	(T2.0/2.5-/W0.5/24HRS)			PCN 3 DMSP								
41	110109Z	23.8N 118.0E	SAT	(T2.5/3.0 /W0.5/23HRS)			NOAA-2 (CONF 01)								
42	110356Z	24.4N 119.1E	SAT	(T3.0/3.0 /S /28HRS)			PCN 3 DMSP								
43	111243Z	24.8N 119.2E	SAT	(IR DATA)			PCN 5 DMSP								
44	111243Z	24.6N 118.7E	SAT	(IR DATA)			PCN 5 DMSP								
45	111243Z	24.9N 118.7E	SAT	(IR DATA)			PCN 6 DMSP								
46	112343Z	25.7N 117.9E	SAT	(IR DATA)			PCN 5 DMSP								

TYPHOON MARY
FIX POSITIONS FOR CYCLONE NO. 15
0600Z 11 AUG TO 0600Z 26 AUG

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T1/T0	EYE FORM	ORIENTATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	090110Z	14.0N 148.0E	SAT	(T1.0/1.0 / / HRS)			PCN 5 DMSP								
2	092238Z	15.3N 150.3E	SAT	(T1.5/1.5 /D0.5/21HRS)			PCN 5 DMSP								
3	100051Z	15.2N 150.8E	SAT	(IR DATA)			PCN 6 DMSP								
4	101333Z	15.5N 150.6E	SAT	(IR DATA)			PCN 6 DMSP								
5	102219Z	15.4N 150.2E	SAT	(T1.5/1.5 /S /24HRS)			PCN 5 DMSP								
6	110214Z	15.5N 150.3E	SAT	(IR DATA)			PCN 5 DMSP								
7	110745Z	15.7N 151.1E	P	10 10 1500 100 35 20		120 35 20	120	995	-	23	24	-	- -	-	1
8	110840Z	15.6N 150.9E	P	10 10 1500 100 35 20		38 35 20	120	995	-	23	24	-	- -	-	1
9	111101Z	14.8N 151.3E	SAT	(IR DATA)			PCN 5 DMSP								
10	111101Z	14.7N 151.1E	SAT	(IR DATA)			PCN 6 DMSP								
11	111314Z	14.9N 151.2E	SAT	(IR DATA)			PCN 6 DMSP								
12	111430Z	16.5N 150.1E	P	8 10 700 50 25 330		70 - -	-	994	303	12	11	-	- -	-	1
13	112201Z	17.7N 154.3E	SAT	(T3.0/3.0 /D1.5/24HRS)			PCN 5 DMSP								
14	112215Z	17.5N 154.2E	SAT	(T2.5/2.5 /D1.0/23HRS)			NOAA-2 (CONF 01)								
15	120155Z	18.2N 154.0E	SAT	(IR DATA)			PCN 5 DMSP								
16	120155Z	17.3N 153.8E	SAT	(T2.0/2.0 / / HRS)			PCN 6 DMSP								
17	120234Z	18.1N 152.3E	P	5 3 700 160 45 120		25 60 360	50	989	301	13	-	-	- -	-	2
18	120530Z	18.1N 152.2E	P	5 5 700 160 45 20		25 60 360	50	991	301	13	-	-	- -	-	2
19	120920Z	19.3N 151.5E	P	3 6 700 40 35 290		80 40 270	60	993	302	13	11	-	- -	-	4
20	121043Z	19.8N 153.5E	SAT	(IR DATA)			PCN 6 DMSP								
21	121043Z	20.4N 153.9E	SAT	(IR DATA)			PCN 6 DMSP								
22	121055Z	19.0N 154.0E	SAT	(IR DATA)			NOAA-2 (CONF 01)								
23	121437Z	20.1N 152.9E	SAT	(IR DATA)			PCN 5 DMSP								
24	121437Z	20.2N 153.8E	SAT	(IR DATA)			PCN 6 DMSP								
25	121458Z	19.4N 150.0E	P	3 6 700 80 62 300		60 - -	-	989	300	14	12	-	- -	-	4
26	122100Z	19.9N 149.6E	P	5 4 700 230 25 230		40 25 260	15	991	300	12	-	-	- -	-	5
27	122143Z	22.2N 151.9E	SAT	(T4.0/4.0 /D1.0/24HRS)			PCN 5 DMSP								
28	122143Z	24.8N 151.8E	SAT	(T3.5/3.5 /D1.5/20HRS)			PCN 6 DMSP								
29	122310Z	21.5N 151.5E	SAT	(T3.5/3.5 /D1.0/25HRS)			NOAA-2 (CONF 01)								
30	130137Z	22.8N 151.2E	SAT	(IR DATA)			PCN 5 DMSP								
31	130137Z	22.4N 151.4E	SAT	(IR DATA)			PCN 5 DMSP								
32	130320Z	20.0N 147.2E	P	- - 700 - - -		- - -	-	-	-	-	-	-	- -	-	6
33	130830Z	21.1N 148.5E	P	8 20 1500 270 20 170		15 - -	-	984	-	23	-	-	- -	-	6
34	130955Z	22.0N 147.5E	SAT	(IR DATA)			NOAA-2 (CONF 01)								
35	131025Z	24.0N 149.8E	SAT	(IR DATA)			PCN 6 DMSP								
36	131025Z	24.0N 150.4E	SAT	(IR DATA)			PCN 6 DMSP								
37	131418Z	25.2N 149.1E	SAT	(IR DATA)			PCN 6 DMSP								
38	131418Z	24.8N 148.1E	SAT	(IR DATA)			PCN 6 DMSP								
39	132306Z	22.5N 146.8E	SAT	(T2.5/3.5 /W1.5/24HRS)			PCN 3 DMSP								
40	132306Z	22.4N 146.9E	SAT	(T1.0/1.0 / / HRS)			PCN 5 DMSP								
41	132306Z	25.3N 144.9E	SAT	(T2.0/3.0 /W1.5/23HRS)			PCN 5 DMSP								
42	140118Z	23.5N 145.0E	SAT	(IR DATA)			PCN 3 DMSP								
43	140118Z	23.5N 145.4E	SAT	(IR DATA)			PCN 3 DMSP								
44	140558Z	24.3N 144.0E	P	10 10 700 20 60 310		120 55 240	45	973	287	10	14	-	- -	-	8
45	140900Z	24.7N 143.8E	P	10 5 700 260 50 180		60 50 240	125	976	287	11	11	-	- -	-	8

TYPHOON MARY
FIX POSITIONS FOR CYCLONE NO. 15
0600Z 11 AUG TO 0600Z 26 AUG

46	1411482	24.9N	143.9E	SAT	(IR DATA)							PCN 5 DMSP													
47	1411482	24.6N	143.8E	SAT	(IR DATA)							PCN 6 DMSP													
48	1413592	25.3N	143.4E	SAT	(IR DATA)							PCN 4 DMSP													
49	1413592	24.8N	143.0E	SAT	(IR DATA)							PCN 6 DMSP													
50	1422482	25.6N	142.3E	SAT	(I2.0/3.0 /W0.5/24HRS)							PCN 3 DMSP													
51	1422482	26.5N	142.4E	SAT	(I1.5/1.5 /D0.5/24HRS)							PCN 3 DMSP													
52	1423032	26.6N	142.5E	SAT	(T1.5/2.5 /W1.0/24HRS)							NOAA-2							(CONF 02)						
53	1501002	26.6N	141.5E	SAT	(IR DATA)							PCN 5 DMSP													
54	1501002	26.9N	142.0E	SAT	(IR DATA)							PCN 4 DMSP													
55	1502172	26.6N	141.9E	P	1 2 700 240 25 190							35 25 190	40	972	286	15	-	-	- -	-					10
56	1502412	26.9N	141.6E	SAT	(IR DATA)							PCN 3 DMSP													
57	1502412	26.8N	141.6E	SAT	(IR DATA)							PCN 3 DMSP													
58	1508342	26.7N	141.2E	P	1 2 700 230 40 180							40 25 80	30	972	286	15	13	-	- -	-					10
59	1511292	27.2N	140.7E	SAT	(IR DATA)							PCN 4 DMSP													
60	1511302	26.8N	140.5E	SAT	(IR DATA)							PCN 3 DMSP													
61	1515232	27.0N	139.8E	SAT	(IR DATA)							PCN 3 DMSP													
62	1515232	27.1N	139.9E	SAT	(IR DATA)							PCN 3 DMSP													
63	1520352	27.0N	138.8E	P	3 4 700 40 35 330							4 3 30	602	97	729	1	10	-	- -	-					11
64	1521342	26.7N	138.5E	SAT	(IR DATA)							PCN 3 DMSP													
65	1522302	26.8N	138.4E	SAT	(T3.0/3.0-/D1.0/24HRS)							PCN 3 DMSP													
66	1522302	26.8N	138.3E	SAT	(T2.5/2.5 /D1.0/24HRS)							PCN 3 DMSP													
67	1523582	26.8N	138.2E	SAT	(I2.5/2.5 /S /24HRS)							NOAA-2							(CONF 01)						
68	1602232	27.2N	138.2E	SAT	(IR DATA)							PCN 3 DMSP													
69	1602232	26.9N	138.0E	SAT	(IR DATA)							PCN 3 DMSP													
70	1606212	27.3N	137.6E	P	3 2 700 310 40 260							30 3 260	40	976	290	16	13	-	- -	-					12
71	1610182	27.9N	137.3E	SAT	(IR DATA)							PCN 4 DMSP													
72	1610492	28.8N	137.2E	SAT	(IR DATA)							NOAA-2													
73	1611112	27.9N	136.8E	SAT	(IR DATA)							PCN 3 DMSP													
74	1611112	27.9N	136.6E	SAT	(IR DATA)							PCN 6 DMSP													
75	1614282	27.2N	135.6E	P	5 25 700 220 20 180							12 - -	-	984	295	12	-	-	- -	-					12
76	1615042	26.2N	136.3E	SAT	(IR DATA)							PCN 3 DMSP													
77	1615042	25.1N	136.1E	SAT	(IR DATA)							PCN 4 DMSP													
78	1621192	27.9N	134.4E	SAT	(IR DATA)							PCN 3 DMSP													
79	1623532	27.7N	134.7E	SAT	(I3.5/3.5 /D0.5/25HRS)							PCN 3 DMSP													
80	1623532	27.8N	134.1E	SAT	(I3.5/3.5+/S1.0/25HRS)							PCN 3 DMSP													
81	1623532	27.6N	134.7E	SAT	(I2.0/2.0 / / HRS)							PCN 3 DMSP													
82	1700532	27.9N	134.1E	SAT	(I3.0/2.5 /D0.5/25HRS)							NOAA-2							(CONF 01)						
83	1702042	28.1N	133.7E	SAT	(IR DATA)							PCN 3 DMSP													
84	1702042	28.1N	133.8E	SAT	(IR DATA)							PCN 3 DMSP													
85	1702342	28.1N	133.8E	P	2 2 700 360 45 270							100 40 270	100	979	293	15	11	-	- -	-					13
86	1708302	28.4N	132.8E	P	1 2 700 120 50 40							90 - -	-	968	284	16	12	CIMC		30					13
87	1710022	28.2N	132.5E	SAT	(IR DATA)							PCN 6 DMSP													
88	1711452	29.9N	131.0E	SAT	(IR DATA)							NOAA-2													
89	1712352	28.3N	132.2E	SAT	(IR DATA)							PCN 3 DMSP													
90	1712352	28.5N	132.1E	SAT	(IR DATA)							PCN 4 DMSP													
91	1713002	28.4N	132.2E	LMDM	- 22752																		30.6N	131.0E	
92	1713002	28.5N	132.3E	LMDM	- 25/6/																		28.4N	129.5E	
93	1714002	28.7N	132.1E	LMDM	- 2548/																		28.4N	129.5E	
94	1714462	28.7N	131.9E	SAT	(IR DATA)							PCN 3 DMSP													
95	1714462	28.6N	132.0E	SAT	(IR DATA)							PCN 3 DMSP													
96	1715002	28.7N	131.7E	LMDM	- 25/6/																		28.4N	129.5E	
97	1716272	28.7N	130.2E	SAT	(IR DATA)							PCN 4 DMSP													
98	1721042	28.4N	130.4E	SAT	(IR DATA)							PCN 3 DMSP													
99	1721102	28.2N	130.4E	P	5 3 700 340 30 310							25 55 260	30	974	290	19	15	CIMC		35					14
100	1723002	28.4N	130.4E	LMDM	- 12482																		28.4N	129.5E	
101	1723352	28.6N	130.2E	SAT	(T4.0/4.0 /D0.5/24HRS)							PCN 3 DMSP													
102	1723352	28.8N	129.6E	SAT	(T3.5/3.5 /S /24HRS)							PCN 3 DMSP													
103	1723532	28.2N	129.7E	SAT	(T3.5/3.5 /D0.5/24HRS)							NOAA-2													
104	1801002	28.9N	130.0E	LMDM	- 11412																		28.4N	129.5E	
105	1801352	28.9N	129.9E	P	- - 700 - - - - - -								-	-	-	19	-	-	- -	-					14
106	1801452	28.7N	129.9E	SAT	(IR DATA)							PCN 5 DMSP													
107	1801462	28.6N	129.4E	SAT	(IR DATA)							PCN 3 DMSP													
108	1802002	29.0N	129.6E	LMDM	- 2770/																		30.6N	131.0E	
109	1802002	28.9N	129.6E	LMDM	- 12312																		28.4N	129.5E	
110	1802312	28.9N	129.5E	P	10 5 700 150 55 80 100 70 30								60	-	290	19	16	CIMC		30					14
111	1803002	29.1N	129.3E	LMDM	- 3///4																		30.6N	131.0E	
112	1803002	29.0N	129.3E	LMDM	- 10412																		28.4N	129.5E	
113	1803202	29.0N	129.0E	LMDM	- POOR FIX, 10 DEG SPIRAL OVERLAY																		26.4N	127.8E	
114	1803272	29.1N	128.9E	SAT	(IR DATA)							PCN 3 DMSP													
115	1803452	28.7N	128.9E	LMDM	- POOR FIX, 10 DEG SPIRAL OVERLAY																		26.4N	127.8E	
116	1804002	29.0N	128.8E	LMDM	- 11312																		28.4N	129.5E	
117	1804142	28.7N	128.7E	LMDM	- POOR FIX, 20 DEG SPIRAL OVERLAY																		26.4N	127.8E	
118	1804402	30.0N	129.4E	AC R	-													-	- -	-					-
119	1804472	29.0N	128.7E	LMDM	- POOR FIX, 15 DEG SPIRAL OVERLAY																		26.4N	127.8E	
120	1805002	29.0N	128.5E	LMDM	- 11312																		28.4N	129.5E	
121	1805122	29.0N	128.7E	LMDM	- POOR FIX, 15 DEG SPIRAL OVERLAY																		26.4N	127.8E	
122	1805402	29.0N	128.7E	LMDM	- POOR FIX, 15 DEG SPIRAL OVERLAY																		26.4N	127.8E	
123	1806102	29.0N	128.6E	LMDM	- POOR FIX, 15 DEG SPIRAL OVERLAY																		26.4N	127.8E	
124	1806002	28.7N	127.8E	LMDM	- 10412																		28.4N	129.5E	
125	1809002	28.6N	127.7E	LMDM	- /1733																		28.4N	129.5E	
126	1810002	29.5N	127.5E	LMDM	- 21523																		28.4N	129.5E	
127	1811002	28.6N	127.5E	LMDM	- 11542																		28.4N	129.5E	
128	1812002	28.7N	127.4E	LMDM	- 12443																		28.4N	129.5E	
129	1812162	29.3N	127.0E	SAT	(IR DATA)							PCN 5 DMSP													
130	1812162	29.1N	127.3E	SAT	(IR DATA)							PCN 6 DMSP													
131	1812392	28.0N	127.5E	SAT	(IR DATA)							NOAA-2													
132	1813002	28.6N	127.1E	LMDM	- 12513																		28.4N	129.5E	
133	1814002	28.8N	126.8E	LMDM	- 11413																		28.4N	129.5E	
134	1815572	28.6N	125.8E	P	3 2 700 220 60 160							40 - -	-	975	290	17	-	-	- -	-					15
135	1816092	28.8N	126.1E	SAT	(IR DATA)							PCN 5 DMSP													
136	1816092	28.8N	125.5E	SAT	(IR DATA)							PCN 6 DMSP													
137	1822302	28.3N	124.5E	SAT	(IR DATA)							PCN 3 DMSP													
138	1823162	28.8N	124.8E	SAT	(T3.5/4.0 /S0.5/24HRS)							PCN 3 DMSP													
139	1903092	29.1N	123.6E	SAT	(IR DATA)							PCN 3 DMSP													
140	1903092	28.9N	123.5E	SAT	(T4.0/4.0 /D0.5/27HRS)							PCN 3 DMSP													
141	1911132	29.5N	121.6E	SAT	(IR DATA)							PCN 3 DMSP													
142	1911132	29.0N	122.1E	SAT	(IR DATA)							PCN 3 DMSP													
143	2223452	26.6N	125.3E	SAT	(T1.5/1.5 / / HRS)							PCN 5 DMSP													

TYPHOON MARY
FIX POSITIONS FOR CYCLONE NO. 15
0600Z 11 AUG TO 0600Z 26 AUG

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN /00MB HGT	FLT LVL TT/TD	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR		MSN NMBR
144	230408Z	27.0N 124.6E	SAT	(IR DATA	)					PCN 5	DMSP										
145	231012Z	27.8N 126.6E	SAT	(IR DATA	)					PCN 4	DMSP										
146	231012Z	27.5N 125.8E	SAT	(IR DATA	)					PCN 5	DMSP										
147	231012Z	27.5N 125.8E	SAT	(IR DATA	)					PCN 5	DMSP										
148	231130Z	28.0N 127.0E	SAT	(IR DATA	)					NOAA-2			(CONF 01)								
149	2312272	28.0N 126.4E	SAT	(IR DATA	)					PCN 3	DMSP										
150	2312272	27.7N 126.1E	SAT	(IR DATA	)					PCN 5	DMSP										
151	231617Z	27.3N 126.4E	SAT	(IR DATA	)					PCN 5	DMSP										
152	231617Z	27.3N 126.8E	SAT	(IR DATA	)					PCN 3	DMSP										
153	2316402	26.8N 126.6E	LHDR	- POOR FIX, 10 DEG SPIRAL OVERLAY															26.4N	127.8E	
154	231800Z	26.7N 126.7E	LHDR	- POOR FIX, 10 DEG SPIRAL OVERLAY															26.4N	127.8E	
155	2318502	26.7N 126.8E	LHDR	- FAIR FIX, POSSIBLE EYE, 10 DEG SPIRAL OVERLAY															26.4N	127.8E	
156	2320002	27.0N 126.6E	LHDR	- 6////															26.1N	127.8E	
157	232100Z	27.0N 126.7E	LHDR	- 6////															26.1N	127.8E	
158	2321132	27.0N 127.0E	SAT	(IR DATA	)					PCN 5	DMSP										
159	232200Z	26.9N 126.9E	LHDR	- 6////															26.1N	127.8E	
160	2323002	26.9N 127.2E	LHDR	- 6////															26.1N	127.8E	
161	2323272	26.8N 127.7E	SAT	(T2.5/2.5 / / HRS)						PCN 3	DMSP										
162	2324272	26.6N 127.3E	SAT	(T3.0/3.0 /D1.5/24HRS)						PCN 1	DMSP										
163	2401002	26.8N 127.4E	LHDR	- 6////															28.4N	129.5E	
164	240105Z	26.7N 127.7E	LHDR	- GOOD FIX, 10 DEG SPIRAL OVERLAY															26.4N	127.8E	
165	2401332	26.3N 127.0E	SAT	(T2.5/2.5 /D1.0/25HRS)						NOAA-2											
166	2402002	26.8N 127.4E	LHDR	- 6////															28.4N	129.5E	
167	2402002	26.6N 127.7E	LHDR	- 25/02															26.1N	127.8E	
168	2403002	26.5N 127.8E	LHDR	- 21672															26.1N	127.8E	
169	2403172	26.4N 127.5E	SAT	(IR DATA	)					PCN 3	DMSP										
170	2403172	26.6N 128.1E	SAT	(IR DATA	)					PCN 3	DMSP										
171	2403172	26.4N 127.7E	SAT	(T3.0/3.0 / / HRS)						PCN 3	DMSP										
172	2404002	26.7N 128.1E	LHDR	- 6////															28.4N	129.5E	
173	2404002	26.3N 128.2E	LHDR	- 5///2															26.1N	127.8E	
174	2405002	26.3N 128.4E	LHDR	- 5///1															26.1N	127.8E	
175	2405002	26.1N 128.6E	LHDR	- 10305															28.4N	129.5E	
176	2405002	26.5N 128.5E	LHDR	- 15 DEG SPIRAL OVERLAY															26.4N	127.8E	
177	2405552	26.3N 128.7E	P	2 5 700 340 25 240	20	30	10	25		980	291	16	13	CTRC			10				16
178	2407002	26.0N 128.8E	LHDR	- 5////															26.1N	127.8E	
179	2407102	26.3N 128.6E	LHDR	- GOOD FIX, HVY ATTN, 15 DEG SPIRAL OVERLAY															26.4N	127.8E	
180	2407452	26.3N 128.7E	LHDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY															26.4N	127.8E	
181	2408002	26.2N 129.0E	LHDR	- POOR FIX															26.2N	127.7E	
182	2408102	26.2N 129.2E	LHDR	- FAIR FIX, HVY ATTN															26.4N	127.8E	
183	2408302	26.1N 129.2E	P	2 5 700 210 35 160	30	55	190	30		975	290	16	12	CTRC			15				16
184	2408432	26.2N 129.3E	LHDR	- FAIR FIX, HVY ATTN, 10 DEG SPIRAL OVERLAY															26.4N	127.8E	
185	2409002	26.1N 129.4E	LHDR	- 52713															28.4N	129.5E	
186	2409002	26.2N 129.3E	LHDR	- 5////															26.1N	127.8E	
187	2409112	26.2N 129.3E	LHDR	- FAIR FIX, HVY ATTN, 15 DEG SPIRAL OVERLAY															26.4N	127.8E	
188	2409382	26.1N 129.4E	LHDR	- FAIR FIX, HVY ATTN, 20 DEG SPIRAL OVERLAY															26.4N	127.8E	
189	2409562	26.2N 129.8E	SAT	(IR DATA	)					PCN 4	DMSP										
190	2409562	25.5N 128.6E	SAT	(IR DATA	)					PCN 6	DMSP										
191	2410002	26.0N 129.6E	LHDR	- 6////															26.1N	127.8E	
192	2410002	26.1N 129.3E	LHDR	- POOR FIX															26.2N	127.7E	
193	2410082	26.0N 129.6E	LHDR	- FAIR FIX, HVY ATTN, 15 DEG SPIRAL OVERLAY															26.4N	127.8E	
194	2410422	26.0N 129.6E	LHDR	- FAIR FIX, HVY ATTN, 15 DEG SPIRAL OVERLAY															26.4N	127.8E	
195	2411082	26.1N 129.8E	LHDR	- 50713															28.4N	129.5E	
196	2411102	25.8N 129.8E	LHDR	- FAIR FIX, HVY ATTN, 20 DEG SPIRAL OVERLAY															26.4N	127.8E	
197	2411382	25.9N 129.8E	SAT	(IR DATA	)					PCN 3	DMSP										
198	2412002	25.9N 130.1E	LHDR	- 6////															26.1N	127.8E	
199	2412082	26.0N 130.4E	SAT	(IR DATA	)					PCN 3	DMSP										
200	2412082	26.3N 129.8E	SAT	(IR DATA	)					PCN 3	DMSP										
201	2412102	25.9N 130.3E	LHDR	- FAIR FIX, HVY ATTN, F.E. BECOMING DIFFUSE AND BREAKING UP															26.4N	127.8E	
202	2412362	25.9N 130.3E	LHDR	- POOR FIX, HVY ATTN, F.E. DIFFUSE, 15 DEG SPIRAL OVERLAY															26.4N	127.8E	
203	2413002	26.0N 130.3E	LHDR	- 6////															26.1N	127.8E	
204	2414002	26.1N 130.5E	LHDR	- 6////															26.1N	127.8E	
205	2414472	25.9N 130.6E	P	2 1 700 220 65 110	20	-	-	-		975	290	16	13	-	-	-	-				17
206	2415002	26.1N 130.8E	LHDR	- 6////															26.1N	127.8E	
207	2415592	25.6N 130.6E	SAT	(IR DATA	)					PCN 3	DMSP										
208	2415592	26.1N 130.3E	SAT	(IR DATA	)					PCN 5	DMSP										
209	2420002	26.3N 131.9E	LHDR	- 52763															28.4N	129.5E	
210	2420582	26.4N 131.5E	SAT	(T4.0/4.0-/D1.0/24HRS)						PCN 5	DMSP										
211	2421412	26.6N 132.1E	P	1 1 700 300 75 200	22	60	240	10		964	281	19	15	CTRC			25				17
212	2423082	26.3N 132.5E	SAT	(T3.0/3.0 /D0.5/24HRS)						PCN 5	DMSP										
213	2423082	26.1N 132.1E	SAT	(IR DATA	)					PCN 3	DMSP										
214	2500342	26.4N 132.6E	SAT	(T3.5/3.5 /S /25HRS)						NOAA-2			(CONF 01)								
215	2502592	27.4N 133.5E	SAT	(IR DATA	)					PCN 1	DMSP										
216	2502592	27.1N 133.1E	SAT	(IR DATA	)					PCN 3	DMSP										
217	2504912	28.8N 134.7E	SAT	(IR DATA	)					PCN 6	DMSP										
218	2510252	29.4N 135.5E	P	5 5 700 280 60 220	60	60	160	110		972	287	19	-	-	-	-	-				18
219	2511502	29.6N 135.6E	SAT	(IR DATA	)					PCN 4	DMSP										
220	2511502	29.4N 135.1E	SAT	(IR DATA	)					PCN 5	DMSP										
221	2515002	31.0N 136.4E	P	5 5 700 240 60 180	25	-	-	-		973	288	18	12	EYE	SE-NW		-				19
222	2515402	30.9N 135.6E	SAT	(IR DATA	)					PCN 5	DMSP										
223	2520422	32.9N 137.1E	SAT	(T3.0/4.0 /W1.0/24HRS)						PCN 5	DMSP										
224	2521002	33.1N 137.2E	LHDR	- 35972															35.3N	138.7E	
225	2522002	33.8N 137.6E	LHDR	- 35717															35.3N	138.7E	
226	2522002	33.5N 137.2E	LHDR	- 35971															35.3N	138.7E	
227	2522102	33.8N 137.5E	LHDR	-											-	-	-		35.8N	139.4E	-
228	2522502	33.9N 137.3E	SAT	(T4.0/3.0 /W1.0/24HRS)						PCN 5	DMSP										
229	2522502	34.2N 137.0E	SAT	(IR DATA	)					PCN 5	DMSP										
230	2523002	34.1N 137.4E	LHDR	- 52717															35.3N	138.7E	
231	2523002	33.9N 137.3E	LHDR	- 25931															35.4N	138.7E	
232	2523312	34.0N 135.9E	SAT	(T2.0/3.5 /W1.5/23HRS)						NOAA-2			(CONF 02)								
233	2600202	34.5N 138.0E	LHDR	-											-	-	-		35.8N	139.4E	-
234	2601002	34.8N 137.6E	LHDR	- 24847															35.3N	138.7E	
235	2601202	35.2N 138.2E	LHDR	-											-	-	-		35.8N	139.4E	-
236	2602002	35.5N 137.8E	LHDR	- 10971															35.4N	138.7E	
237	2602302	35.8N 138.3E	LHDR	-											-	-	-		35.8N	139.4E	-
238	2602352	36.1N 138.2E	LHDR	- POOR FIX, 10 DEG SPIRAL OVERLAY															35.7N	139.3E	
239	2602402	36.5N 138.4E	SAT	(IR DATA	)					PCN 5	DMSP										
240	2603002	36.4N 138.3E	LHDR	- 75741															35.4N	138.7E	
241	2604132	36.0N 138.3E	LHDR	- POOR FIX, 10 DEG SPIRAL OVERLAY															35.7N	139.3E	
242	2604352	36.4N 138.5E	LHDR	- POOR FIX, 15 DEG SPIRAL OVERLAY															35.7N	139.3E	
243	2606102	37.7N 139.1E	LHDR	- POOR FIX, 15 DEG SPIRAL OVERLAY															35.7N	139.3E	

TROPICAL DEPRESSION 16
FIX POSITIONS FOR CYCLONE NO. 16
0600Z 14 AUG TO 0600Z 15 AUG

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	1412442	16.2N 109.0E	SAT	(IR DATA				)	NOAA-2										
2	1500302	16.8N 107.8E	SAT	(T2.5/2.5-/D1.5/24HRS)					PCN 5	OMSP									
3	1500302	16.9N 107.7E	SAT	(T2.0/2.0 / / HRS)					PCN 5	OMSP									
4	1504232	16.6N 107.0E	SAT	(IR DATA				)	PCN 5	OMSP									

TROPICAL STORM NADINE
FIX POSITIONS FOR CYCLONE NO. 17
0600Z 15 AUG TO 1200Z 18 AUG

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	1500302	16.3N 127.1E	SAT	(T2.0/2.0 / / HRS)						PCN 5	OMSP									
2	1501022	16.8N 126.8E	SAT	(T1.5/1.5 /D0.5/24HRS)						NOAA-2			(CONF 02)							
3	1502412	16.3N 127.1E	SAT	(IR DATA					)	PCN 5	OMSP									
4	1511442	16.0N 131.0E	SAT	(IR DATA					)	NOAA-2			(CONF 02)							
5	1514302	15.6N 131.6E	P	10 20 700	350	35	270	30	-	-	-		997	303	10 10	-	- -	-		1
6	1515232	15.5N 131.5E	SAT	(IR DATA					)	PCN 5	OMSP									
7	1515232	15.6N 131.6E	SAT	(IR DATA					)	PCN 5	OMSP									
8	1521342	15.5N 134.8E	SAT	(IR DATA					)	PCN 3	OMSP									
9	1523252	15.6N 135.5E	P	2 5 700	300	55	250	60	60	140	30		982	295	10 14	-	- -	-		1
10	1600112	15.8N 135.6E	SAT	(T3.0/3.0 /D1.0/24HRS)						PCN 3	OMSP									
11	1600112	15.8N 135.9E	SAT	(T3.0/3.0 / / HRS)						PCN 3	OMSP									
12	1602232	16.0N 136.3E	SAT	(IR DATA					)	PCN 3	OMSP									
13	1602232	15.9N 136.5E	SAT	(T3.0/3.0 / / HRS)						PCN 3	OMSP									
14	1602402	16.3N 136.5E	P	1 4 700	260	50	100	35	55	140	70		985	296	14 11	-	- -	-		1
15	1608252	17.3N 138.7E	P	10 2 1500	220	45	130	100	4	130	60		988	-	25 23	-	- -	-		3
16	1610182	17.6N 138.9E	SAT	(IR DATA					)	PCN 6	OMSP									
17	1610462	18.0N 139.0E	SAT	(IR DATA					)	NOAA-2										
18	1611112	17.7N 138.8E	SAT	(IR DATA					)	PCN 5	OMSP									
19	1611112	17.6N 138.6E	SAT	(IR DATA					)	PCN 6	OMSP									
20	1614362	18.6N 140.3E	P	10 5 700	220	40	140	70	-	-	-		996	304	13 11	-	- -	-		3
21	1615042	18.8N 139.9E	SAT	(IR DATA					)	PCN 5	OMSP									
22	1615042	18.2N 139.1E	SAT	(IR DATA					)	PCN 6	OMSP									
23	1622112	20.9N 141.5E	SAT	(T3.5/3.5 /D0.5/25HRS)						PCN 3	OMSP									
24	1622112	20.9N 141.2E	SAT	(T1.5/2.5 /W1.5/20HRS)						PCN 4	OMSP									
25	1702042	22.3N 141.8E	SAT	(IR DATA					)	PCN 3	OMSP									
26	1702042	21.7N 141.3E	SAT	(IR DATA					)	PCN 3	OMSP									
27	1703252	22.3N 141.6E	P	5 5 700	180	50	90	18	85	30	10		990	302	17 12	-	- -	-		4
28	1710022	23.8N 141.1E	SAT	(IR DATA					)	PCN 6	OMSP									
29	1710532	23.7N 141.3E	SAT	(IR DATA					)	PCN 6	OMSP									
30	1710532	23.9N 140.3E	SAT	(IR DATA					)	PCN 6	OMSP									
31	1714462	24.2N 141.0E	SAT	(IR DATA					)	PCN 5	OMSP									
32	1714462	24.2N 140.6E	SAT	(IR DATA					)	PCN 3	OMSP									
33	1721042	29.1N 140.6E	SAT	(IR DATA					)	PCN 3	OMSP									
34	1721532	29.3N 140.7E	SAT	(T2.5/3.5 /W1.0/24HRS)						PCN 3	OMSP									
35	1721532	29.3N 140.7E	SAT	(T2.5/2.5 /D1.0/24HRS)						PCN 3	OMSP									
36	1723352	29.9N 140.4E	SAT	(IR DATA					)	PCN 3	OMSP									
37	1723552	30.0N 139.8E	SAT	(IR DATA					)	PCN 3	OMSP									
38	1801462	30.6N 140.1E	SAT	(IR DATA					)	PCN 3	OMSP									
39	1801462	30.7N 140.5E	SAT	(IR DATA					)	PCN 3	OMSP									
40	1805202	30.8N 139.8E	P	5 5 500	200	40	250	120	25	360	40		1002	-	24 -	-	- -	-		5
41	1809472	32.2N 138.9E	SAT	(IR DATA					)	PCN 6	OMSP									
42	1812162	32.6N 138.4E	SAT*	(IR DATA					)	PCN 6	OMSP									
43	1823162	32.2N 137.2E	SAT	(IR DATA					)	PCN 3	OMSP									

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FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	2300132	21.2N 160.8E	SAT	(T1.5/1.5 / / HRS)						PCN 6	OMSP									
2	2308302	19.6N 159.2E	SAT	(IR DATA					)	PCN 6	OMSP									
3	2314522	19.6N 159.1E	SAT	(IR DATA					)	PCN 5	OMSP									
4	2321132	19.7N 154.1E	SAT	(IR DATA					)	PCN 5	OMSP									
5	2321452	18.2N 154.2E	SAT	(T1.5/1.5 /S /22HRS)						PCN 3	OMSP									
6	2401362	19.2N 153.4E	SAT	(IR DATA					)	PCN 5	OMSP									
7	2408142	16.2N 157.0E	SAT	(IR DATA					)	PCN 5	OMSP									
8	2410272	16.1N 156.4E	SAT	(IR DATA					)	PCN 5	OMSP									
9	2414172	16.5N 156.2E	SAT	(IR DATA					)	PCN 5	OMSP									
10	2414172	16.5N 155.7E	SAT	(IR DATA					)	PCN 6	OMSP									
11	2420582	17.3N 150.9E	SAT	(T2.0/2.0 /D0.5/24HRS)						PCN 3	OMSP									
12	2423082	17.4N 150.5E	SAT	(IR DATA					)	PCN 3	OMSP									
13	2501172	17.2N 150.0E	SAT	(IR DATA					)	PCN 5	OMSP									
14	2501172	16.7N 155.1E	SAT	(T1.5/1.5 / / HRS)						PCN 5	OMSP									
15	2503302	16.9N 150.6E	P	5 10 1500	80	25	360	10	25	360	10		1003	-	25 -	-	- -	-		1
16	2509412	16.5N 149.3E	SAT	(IR DATA					)	PCN 6	OMSP									
17	2509412	17.1N 149.8E	SAT	(IR DATA					)	PCN 6	OMSP									
18	2510092	16.7N 149.2E	SAT	(IR DATA					)	PCN 6	OMSP									
19	2511202	15.5N 151.2E	SAT	(IR DATA					)	NOAA-2			(CONF 02)							
20	2511502	16.6N 148.7E	SAT	(IR DATA					)	PCN 5	OMSP									
21	2513082	16.1N 148.2E	SAT	(IR DATA					)	PCN 6	OMSP									
22	2520422	15.4N 146.9E	SAT	(T2.5/2.5 /D0.5/24HRS)						PCN 5	OMSP									
23	2522502	15.2N 146.8E	SAT	(IR DATA					)	PCN 5	OMSP									
24	2522502	15.2N 146.8E	SAT	(T2.0/2.0 /W0.5/22HRS)						PCN 5	OMSP									
25	2600122	15.7N 146.6E	P	3 3 700	310	30	240	25	25	140	25		1003	310	12 12	CTHC		10		1
26	2602402	15.3N 145.9E	SAT	(IR DATA					)	PCN 3	OMSP									
27	2602402	15.1N 146.3E	SAT	(IR DATA					)	PCN 5	OMSP									
28	2603302	15.2N 146.8E	P	2 10 700	230	30	120	30	3	20	20		997	306	14 11	CTHC		25		1
29	2605112	15.4N 146.9E	P	- - 700	-	-	-	-	30	-	-		-	-	- -	-	- -	-		1
30	2608302	15.4N 146.5E	P	2 1 700	180	35	80	60	3	50	50		993	304	15 15	CTHC		3		1
31	2609202	15.4N 147.4E	SAT	(IR DATA					)	PCN 4	OMSP									
32	2609252	14.8N 147.0E	SAT	(IR DATA					)	PCN 4	OMSP									

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FIX POSITIONS FOR CYCLONE NO. 19
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FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL	BRG RNG	MAX OBS SFC WIND VEL BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
33	2611322	15.0N 147.2E	SAT	(IR DATA			)	PCN 3 DMSP									
34	2611322	15.7N 147.3E	SAT	(IR DATA			)	PCN 3 DMSP									
35	2613402	15.8N 147.1E	SAT	(IR DATA			)	PCN 6 DMSP									
36	2617002	15.0N 146.3E	P	5 5 700	320	32 240	40	- -	-	991	299	12 -	-	- -	-		3
37	2620272	16.0N 146.0E	SAT	(IR DATA			)	PCN 3 DMSP									
38	2620362	16.0N 146.2E	P	1 2 700	320	40 240	30	3 290	30	989	299	12 11	-	- -	-		4
39	2622322	16.0N 146.0E	SAT	(T4.0/4.0 /D1.5/24HRS)			PCN 3 DMSP										
40	2622322	15.8N 146.2E	SAT	(T4.0/4.0 /D2.0/24HRS)			PCN 3 DMSP										
41	2700152	16.2N 146.0E	P	- - 700	-	60 -	-	60 -	-	-	296	- -	-	- -	-		4
42	2706222	16.7N 146.2E	SAT	(IR DATA			)	PCN 1 DMSP									
43	2706222	16.4N 145.6E	SAT	(IR DATA			)	PCN 4 DMSP									
44	2706452	16.5N 145.7E	P	1 2 700	280	50 200	30	45 310	30	981	296	14 12	EYE	SW-NE	18X10		5
45	2708402	16.8N 145.5E	P	1 2 700	170	75 120	50	65 120	60	977	290	16 12	CIRC		10		5
46	2708252	17.0N 145.4E	P	10 3 700	10	70 270	30	35 270	100	976	289	16 12	CIRC		12		5
47	2709102	17.0N 144.9E	SAT	(IR DATA			)	PCN 4 DMSP									
48	2711132	17.7N 145.0E	SAT	(IR DATA			)	PCN 3 DMSP									
49	2711132	18.1N 144.8E	SAT	(IR DATA			)	PCN 3 DMSP									
50	2715032	18.2N 144.9E	SAT	(IR DATA			)	PCN 3 DMSP									
51	2721002	19.5N 143.3E	AC R	-									-	- -	-	19.5N 143.3E	-
52	2721592	19.8N 143.7E	P	2 2 700	260	60 180	30	5 180	90	964	279	14 13	CIRC		30		6
53	2722132	19.9N 143.9E	SAT	(T5.0/5.0 /D1.0/24HRS)			PCN 1 DMSP										
54	2722132	19.7N 143.2E	SAT	(T5.0/5.0 /D1.0/24HRS)			PCN 1 DMSP										
55	2723312	19.6N 143.0E	SAT	(T5.0/5.0 /D0.5/23HRS)			NOAA-2		(CONF 01)								
56	2802032	20.4N 142.8E	SAT	(IR DATA			)	PCN 1 DMSP									
57	2803112	20.3N 142.9E	P	5 2 700	190	80 90	40	100 90	20	959	275	17 13	CIRC		20		6
58	2810362	21.4N 142.1E	SAT	(IR DATA			)	PCN 2 DMSP									
59	2810362	22.0N 142.7E	SAT	(IR DATA			)	PCN 2 DMSP									
60	2810552	21.5N 142.0E	SAT	(IR DATA			)	PCN 1 DMSP									
61	2810552	21.7N 141.8E	SAT	(IR DATA			)	PCN 2 DMSP									
62	2812132	22.9N 142.0E	SAT	(IR DATA			)	NOAA-2									
63	2813352	22.0N 141.5E	P	5 2 700	270	105 170	35	- -	-	948	264	18 13	CIRC		20		7
64	2814442	22.0N 141.3E	SAT	(IR DATA			)	PCN 1 DMSP									
65	2821382	23.4N 141.6E	SAT	(IR DATA			)	PCN 1 DMSP									
66	2821552	23.2N 141.3E	SAT	(T6.0/6.0 /D1.0/24HRS)			PCN 1 DMSP										
67	2823372	23.0N 141.3E	SAT	(T5.5/5.5-/S0.5/25HRS)			PCN 1 DMSP										
68	2823372	23.8N 141.2E	SAT	(IR DATA			)	PCN 1 DMSP									
69	2901452	23.9N 140.3E	SAT	(IR DATA			)	PCN 1 DMSP									
70	2903372	25.0N 141.1E	P	2 2 700	280	80 150	50	100 150	50	950	266	17 11	CIRC		20		8
71	2909022	25.5N 141.3E	P	2 5 700	270	80 250	40	80 250	40	952	267	17 11	CIRC		20		8
72	2910212	25.4N 141.1E	SAT	(IR DATA			)	PCN 2 DMSP									
73	2910212	25.6N 141.2E	SAT	(IR DATA			)	PCN 2 DMSP									
74	2911142	26.0N 141.0E	SAT	(IR DATA			)	NOAA-2		(CONF 01)							
75	2912182	26.0N 141.1E	SAT	(IR DATA			)	PCN 1 DMSP									
76	2912182	26.1N 141.4E	SAT	(IR DATA			)	PCN 1 DMSP									
77	2914262	26.4N 141.2E	SAT	(IR DATA			)	PCN 1 DMSP									
78	2916352	27.0N 140.7E	P	3 3 700	260	85 180	45	- -	-	954	269	15 12	CIRC		38		9
79	2918402	27.4N 140.6E	P	3 4 700	70	85 360	40	- -	-	955	270	15 13	CIRC		40		9
80	2921222	28.2N 140.5E	SAT	(IR DATA			)	PCN 2 DMSP									
81	2923182	28.3N 140.1E	SAT	(T4.5/5.5 /W1.0/24HRS)			PCN 1 DMSP										
82	2923182	28.3N 140.2E	SAT	(T5.5/6.5 /D0.5/24HRS)			PCN 1 DMSP										
83	3001262	28.4N 139.9E	SAT	(IR DATA			)	PCN 1 DMSP									
84	3004402	29.1N 139.6E	P	5 5 700	330	65 270	30	70 360	15	960	274	14 13	CIRC		30		10
85	3008302	29.6N 139.3E	P	5 5 700	360	40 300	10	60 280	40	959	273	14 13	CIRC		30		10
86	3012002	30.1N 138.7E	SAT	(IR DATA			)	PCN 1 DMSP									
87	3015482	30.3N 137.7E	P	5 5 700	340	70 240	25	- -	-	954	271	17 14	CIRC		40		11
88	3021002	30.0N 137.2E	LNDR	- 2////												35.0N 138.7E	
89	3021282	30.0N 137.2E	P	5 3 700	40	75 310	30	60 310	17	956	271	15 14	EYE	SW-NE	45X30		11
90	3022002	30.0N 137.1E	LNDR	- 2////												35.0N 138.7E	
91	3023002	30.7N 136.6E	SAT	(T5.5/6.5 /W1.0/24HRS)			PCN 1 DMSP										
92	3023002	30.0N 136.7E	SAT	(T4.5/5.5 /W2.0/24HRS)			PCN 1 DMSP										
93	3023002	30.7N 137.0E	LNDR	- 2////												35.0N 138.7E	
94	3100002	30.7N 136.9E	LNDR	- 2////												35.0N 138.7E	
95	3101002	30.8N 136.7E	LNDR	- 2////												35.0N 138.7E	
96	3102002	30.8N 136.5E	LNDR	- 5////												35.0N 138.7E	
97	3102302	30.8N 136.3E	P	3 3 700	320	80 200	30	70 200	40	-	-	15 12	EYE	SW-NE	30X20		12
98	3102492	31.0N 136.9E	SAT	(IR DATA			)	PCN 1 DMSP									
99	3103002	30.7N 136.2E	LNDR	- 5////												33.3N 134.2E	
100	3103002	30.7N 136.2E	LNDR	- 5////												35.0N 138.7E	
101	3104002	30.8N 136.0E	P	- - 700	10	85 270	35	- -	-	-	-	- 14	CIRC		20		12
102	3104002	30.9N 135.8E	LNDR	-									-	- -	-	35.0N 139.4E	-
103	3104002	30.8N 136.1E	LNDR	- 5////												35.0N 138.7E	
104	3104002	30.8N 135.9E	LNDR	- 5////												33.3N 134.2E	
105	3105002	30.9N 135.7E	LNDR	-									-	- -	-	35.0N 139.4E	-
106	3105002	30.8N 135.8E	LNDR	- 5////												33.3N 134.2E	
107	3105002	30.7N 135.8E	LNDR	- 5////												35.0N 138.7E	
108	3106002	30.7N 135.6E	LNDR	- 5////												35.0N 138.7E	
109	3108322	30.9N 135.3E	P	5 7 700	350	75 230	50	60 360	30	950	266	17 14	EYE	SE-NW	35X15		13
110	3110002	30.8N 135.3E	LNDR	- 16911												33.3N 134.2E	
111	3111002	30.9N 135.2E	LNDR	- 11911												33.3N 134.2E	
112	3111422	30.8N 134.8E	SAT	(IR DATA			)	PCN 1 DMSP									
113	3111422	30.8N 134.6E	SAT	(IR DATA			)	PCN 1 DMSP									
114	3114002	30.9N 134.6E	LNDR	- 25/11												33.3N 134.2E	
115	3114002	31.0N 134.5E	LNDR	- 6////												30.6N 131.0E	
116	3115002	31.0N 134.5E	LNDR	- 25/11												33.3N 134.2E	
117	3115002	31.0N 134.4E	LNDR	- 5////												30.6N 131.0E	
118	3115302	30.9N 134.4E	SAT	(IR DATA			)	PCN 1 DMSP									
119	3116002	31.0N 134.4E	LNDR	- 25/11												33.3N 134.2E	
120	3117002	31.0N 134.3E	LNDR	- 6////												30.6N 131.0E	
121	3117002	31.0N 134.3E	LNDR	- 6000 FIX												33.0N 130.5E	
122	3117002	31.0N 134.3E	LNDR	- 25/11												33.3N 134.2E	
123	3118002	31.1N 134.2E	LNDR	- 25/11												33.3N 134.2E	
124	3119002	31.1N 134.1E	LNDR	- 25/12												33.3N 134.2E	
125	3119002	31.1N 134.1E	LNDR	- 6////												30.6N 131.0E	
126	3120002	31.0N 134.0E	LNDR	- 6////												30.6N 131.0E	
127	3120002	31.2N 133.9E	LNDR	- 25/12												33.3N 134.2E	
128	3120352	31.4N 133.9E	P	5 1 700	320	75 230	25	30 160	20	956	271	17 13	CIRC		30		14
129	3121002	31.2N 133.8E	LNDR	- 6////												30.6N 131.0E	

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FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TT/TD	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
130	3121002	31.3N 133.8E	LNDR		- 25/12									33.3N 134.2E	
131	3122002	31.2N 133.6E	LNDR		- 0////2									30.6N 131.0E	
132	3122002	31.4N 133.7E	LNDR		- 25/12									33.3N 134.2E	
133	3122422	31.6N 133.7E	SAT	(T5.0/5.0-/D1.5/24HRS)		PCN 1 DMSP									
134	3122422	31.7N 133.8E	SAT	(T3.5/4.5 /W1.0/24HRS)		PCN 1 DMSP									
135	3123002	31.5N 133.8E	LNDR		- GOOD FIX									33.6N 130.5E	
136	3123002	31.3N 133.5E	LNDR		- 0////2									30.6N 131.0E	
137	3123002	31.5N 133.7E	LNDR		- 10912									33.3N 134.2E	
138	0100002	31.5N 133.6E	LNDR		- 0////2									30.6N 131.0E	
139	0100002	31.6N 133.7E	LNDR		- GOOD FIX, 70 KM DIAM									33.6N 130.5E	
140	0101002	31.7N 133.7E	LNDR		- GOOD FIX, 70 KM DIAM									33.6N 130.5E	
141	0101002	31.6N 133.7E	LNDR		- 62902									30.6N 131.0E	
142	0101002	31.8N 133.5E	LNDR		- 10912									33.3N 134.2E	
143	0102002	31.9N 133.4E	LNDR		- 10922									33.3N 134.2E	
144	0102002	31.8N 133.6E	LNDR		- 32912									30.6N 131.0E	
145	0102002	31.8N 133.6E	LNDR		- GOOD FIX, 70 KM DIAM									33.6N 130.5E	
146	0102302	32.2N 133.6E	SAT	(IR DATA)		PCN 1 DMSP									
147	0103002	31.9N 133.5E	LNDR		- 21912									30.6N 131.0E	
148	0103002	31.9N 133.6E	LNDR		- GOOD FIX, 70 KM DIAM									33.6N 130.5E	
149	0104002	32.1N 133.5E	LNDR		- 21912									30.6N 131.0E	
150	0104002	32.0N 133.5E	LNDR		- GOOD FIX, 70 KM DIAM									33.6N 130.5E	
151	0104002	32.0N 133.3E	LNDR		- 15//2									33.3N 134.2E	
152	0105002	32.3N 133.6E	LNDR		- 20972									30.6N 131.0E	
153	0105002	32.3N 133.5E	LNDR		- GOOD FIX, 70 KM DIAM									33.6N 130.5E	
154	0106002	32.4N 133.6E	LNDR		- 55942									30.6N 131.0E	
155	0106002	32.3N 133.2E	LNDR		- 65//4									34.3N 132.6E	
156	0107002	32.6N 133.5E	LNDR		- GOOD FIX, 80 KM DIAM									33.6N 130.5E	
157	0107002	32.6N 133.6E	LNDR		- 51912									30.6N 131.0E	
158	0107002	32.7N 133.4E	LNDR		- 1////2									33.3N 134.2E	
159	0107002	32.6N 133.2E	LNDR		- 7////2									34.3N 132.6E	
160	0108002	33.0N 133.3E	LNDR		- 65//4									33.3N 134.2E	
161	0108002	33.0N 133.4E	LNDR		- GOOD FIX, 80 KM DIAM									33.6N 130.5E	
162	0108002	33.0N 133.4E	LNDR		- 51911									30.6N 131.0E	
163	0109002	33.3N 133.3E	LNDR		- 20//3									35.5N 133.1E	
164	0109002	33.2N 133.3E	LNDR		- 1////2									33.3N 134.2E	
165	0109002	33.2N 133.4E	LNDR		- GOOD FIX, 60 KM DIAM									33.6N 130.5E	
166	0110002	33.6N 133.0E	LNDR		- GOOD FIX, 30 KM DIAM									33.3N 134.2E	
167	0110002	33.4N 133.2E	LNDR		- 2////2									34.3N 132.6E	
168	0110002	33.4N 133.1E	LNDR		- 65//3									35.5N 133.1E	
169	0110202	33.4N 133.3E	LNDR		- 20//3									33.6N 130.5E	
170	0111002	33.8N 133.1E	LNDR		- 20//3									35.5N 133.1E	
171	0111242	33.7N 132.9E	SAT	(IR DATA)		PCN 5 DMSP									
172	0111242	33.8N 133.3E	SAT	(IR DATA)		PCN 5 DMSP									
173	0111252	33.7N 133.1E	LNDR		- POOR FIX									33.6N 130.5E	
174	0112002	34.3N 133.2E	LNDR		- 20202									35.5N 133.1E	
175	0112002	34.2N 133.0E	LNDR		- POOR FIX									33.6N 130.5E	
176	0113002	34.5N 132.8E	LNDR		- 20312									35.5N 133.1E	
177	0113002	34.5N 132.8E	LNDR		- 65//2									34.3N 132.6E	
178	0113002	34.6N 132.8E	LNDR		- POOR FIX									33.6N 130.5E	
179	0113052	34.2N 132.7E	SAT	(IR DATA)		PCN 5 DMSP									
180	0113452	34.7N 132.6E	LNDR		- POOR FIX, 20 KM DIAM									34.7N 134.9E	
181	0114002	34.7N 132.6E	LNDR		- 20342									35.5N 133.1E	
182	0114002	34.7N 132.6E	LNDR		- POOR FIX									33.6N 130.5E	
183	0114002	35.0N 132.6E	LNDR		- 65//1									34.3N 132.6E	
184	0114452	34.9N 132.5E	LNDR		- POOR FIX, 15 KM DIAM									34.7N 134.9E	
185	0115002	35.3N 132.6E	LNDR		- 20312									35.5N 133.1E	
186	0115002	35.5N 132.6E	LNDR		- 21632									34.3N 132.6E	
187	0115002	35.2N 132.5E	LNDR		- POOR FIX									33.6N 130.5E	
188	0115112	35.2N 132.3E	SAT	(IR DATA)		PCN 5 DMSP									
189	0115452	35.2N 132.4E	LNDR		- POOR FIX, 15 KM DIAM									34.7N 134.9E	
190	0116002	35.7N 132.5E	LNDR		- 20152									33.5N 133.1E	
191	0116002	36.0N 132.4E	LNDR		- 21832									34.3N 132.6E	
192	0116002	35.4N 132.3E	LNDR		- POOR FIX									33.6N 130.5E	
193	0116452	35.6N 132.2E	LNDR		- POOR FIX, 15 KM DIAM									34.7N 134.9E	
194	0117002	35.9N 132.3E	LNDR		- 20172									35.5N 133.1E	
195	0117002	36.2N 132.2E	LNDR		- POOR FIX									33.6N 130.5E	
196	0120002	36.3N 131.6E	LNDR		-					-	- -	-		35.8N 139.4E	-
197	0122242	37.5N 132.4E	SAT	(T3.0/4.0 /W2.0/24HRS)		PCN 3 DMSP									
198	0122242	37.6N 132.5E	SAT	(T2.0/3.0 /W1.5/24HRS)		PCN 3 DMSP									
199	0200052	37.6N 132.7E	SAT	(IR DATA)		PCN 3 DMSP									
200	0200102	37.1N 132.0E	SAT	(T3.0/4.5 /W1.5/24HRS)		NOAA-2	(CONF U2)								
201	0212472	41.0N 132.7E	SAT	(IR DATA)		PCN 5 DMSP									

TROPICAL DEPRESSION 20
FIX POSITIONS FOR CYCLONE NO. 20
0000Z 27 AUG TO 0600Z 28 AUG

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TT/TD	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	2522242	22.7N 127.4E	SAT	(T1.0/1.0 / / HRS)		PCN 5 DMSP									
2	2602402	23.2N 126.5E	SAT	(IR DATA)		PCN 5 DMSP									
3	2611072	24.6N 128.2E	SAT	(IR DATA)		PCN 6 DMSP									
4	2700132	24.7N 131.3E	SAT	(T2.0/2.0 /D1.0/24HRS)		PCN 3 DMSP									
5	2702222	24.9N 131.6E	SAT	(IR DATA)		PCN 3 DMSP									
6	2702222	25.2N 131.5E	SAT	(T2.0/2.0 / / HRS)		PCN 4 DMSP									
7	2710512	25.0N 131.6E	SAT	(IR DATA)		PCN 5 DMSP									
8	2710522	25.0N 131.8E	SAT	(IR DATA)		PCN 6 DMSP									
9	2712552	26.0N 131.0E	SAT	(IR DATA)		PCN 3 DMSP									
10	2712552	26.2N 130.9E	SAT	(IR DATA)		PCN 6 DMSP									
11	2715032	26.2N 130.8E	SAT	(IR DATA)		PCN 5 DMSP									
12	2721532	26.5N 129.7E	SAT	(T1.5/2.0 /W0.5/24HRS)		PCN 3 DMSP									
13	2723552	27.0N 129.5E	SAT	(IR DATA)		PCN 3 DMSP									
14	2723552	27.2N 129.7E	SAT	(T1.0/2.0 /W1.0/21HRS)		PCN 5 DMSP									
15	2802032	27.4N 128.9E	SAT	(IR DATA)		PCN 3 DMSP									
16	2804302	27.1N 128.7E	P	2 8 1500	80 20 90	25	20 110	30	994	-	25 24	-	- -	-	1
17	2812372	28.8N 126.9E	SAT	(IR DATA)		PCN 3 DMSP									

TROPICAL STORM ROSE
FIX POSITIONS FOR CYCLONE NO. 21
0600Z 28 AUG TO 0600Z 31 AUG

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TT/TD	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	272153Z	22.5N 122.5E	SAT	(I1.0/1.0 /	/	HRS)				PCN 5	OMSP									
2	272355Z	23.0N 122.5E	SAT	(IR DATA		)				PCN 5	OMSP									
3	272355Z	23.0N 122.1E	SAT	(I2.0/2.0 /	/	HRS)				PCN 5	OMSP									
4	280100Z	22.6N 123.9E	LRDR	- 6////															24.8N 125.3E	
5	280125Z	23.0N 123.1E	SAT	(I2.0/2.0 /D1.0/24HRS)						NOAA-2			(CONF 01)							
6	280300Z	22.7N 124.0E	LRDR	- 6////															24.3N 124.2E	
7	280300Z	23.0N 124.1E	LRDR	- 6////															24.8N 125.3E	
8	280400Z	22.9N 124.4E	LRDR	- 6////															24.8N 125.3E	
9	280400Z	22.7N 124.2E	LRDR	- 5////															24.3N 124.2E	
10	280500Z	22.8N 124.8E	LRDR	- 6////															24.8N 125.3E	
11	280625Z	23.0N 124.9E	P	2 2	700	110	30	350	35	3	3.0	40	986	298	13 11	ELIP	SW-NE	15X10		1
12	280800Z	22.8N 125.5E	LRDR	- 6////															24.8N 125.3E	
13	280925Z	23.1N 125.7E	P	2 3	700	290	50	200	40	40	50	25	987	298	16 12	ELIP	SW-NE	15X10		1
14	281000Z	23.2N 125.9E	LRDR	- 6////															24.8N 125.3E	
15	281000Z	23.1N 125.9E	LRDR	- 6////															24.3N 124.2E	
16	281036Z	23.1N 125.0E	SAT	(IR DATA		)				PCN 6	OMSP									
17	281036Z	23.3N 125.8E	SAT	(IR DATA		)				PCN 6	OMSP									
18	281100Z	23.3N 125.9E	LRDR	- 6////															24.3N 124.2E	
19	281100Z	23.2N 126.2E	LRDR	- 6////															24.8N 125.3E	
20	281200Z	23.4N 126.3E	LRDR	- 6////															24.8N 125.3E	
21	281200Z	23.3N 126.2E	LRDR	- 6////															24.3N 124.2E	
22	281213Z	24.0N 126.0E	SAT	(IR DATA		)				NOAA-2			(CONF 02)							
23	281237Z	23.2N 126.5E	SAT	(IR DATA		)				PCN 3	OMSP									
24	281237Z	23.1N 126.7E	SAT	(IR DATA		)				PCN 3	OMSP									
25	281300Z	23.5N 126.4E	LRDR	- 6////															24.3N 124.2E	
26	281300Z	23.4N 126.5E	LRDR	- 6////															24.8N 125.3E	
27	281400Z	23.6N 126.5E	LRDR	- 6////															24.3N 124.2E	
28	281400Z	23.4N 126.7E	LRDR	- 6////															24.8N 125.3E	
29	281500Z	23.6N 126.8E	LRDR	- 6////															24.8N 125.3E	
30	281550Z	23.9N 126.8E	P	5 30	700	190	45	120	30	-	-	-	987	298	14 13	CTHC		30		2
31	281600Z	23.7N 127.0E	LRDR	- 6////															24.8N 125.3E	
32	281700Z	23.7N 127.1E	LRDR	- 6////															24.8N 125.3E	
33	281800Z	23.9N 127.3E	LRDR	- 6////															24.8N 125.3E	
34	281900Z	23.9N 127.4E	LRDR	- 6////															24.8N 125.3E	
35	281900Z	24.0N 127.6E	LRDR	- 5////															26.1N 127.8E	
36	282130Z	24.5N 127.7E	P	10 10	700	270	30	180	40	40	180	30	989	298	14 13	CTHC		30		2
37	282138Z	24.3N 127.4E	SAT	(IR DATA		)				PCN 3	OMSP									
38	282337Z	24.3N 127.5E	SAT	(I1.0/1.0 /S	/26HRS)					PCN 3	OMSP									
39	282337Z	24.4N 128.1E	SAT	(I1.5/2.0 /W0.5/24HRS)						PCN 5	OMSP									
40	290000Z	24.5N 128.2E	LRDR	- 55///															26.1N 127.8E	
41	290145Z	24.9N 128.2E	LRDR	- FAIR FIX, 20 DEG SPIRAL OVERLAY															26.4N 127.8E	
42	290200Z	24.8N 128.3E	LRDR	- 5////															26.1N 127.8E	
43	290210Z	25.0N 128.2E	LRDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY															26.4N 127.8E	
44	290310Z	25.4N 128.2E	LRDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY															26.4N 127.8E	
45	290340Z	25.0N 128.4E	LRDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY															26.4N 127.8E	
46	290400Z	25.0N 128.2E	LRDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY															26.4N 127.8E	
47	290442Z	25.5N 128.4E	LRDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY															26.4N 127.8E	
48	290500Z	25.2N 128.6E	LRDR	- 5////															26.1N 127.8E	
49	290510Z	25.8N 128.3E	LRDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY															26.4N 127.8E	
50	290540Z	25.2N 128.5E	P	2 5	700	230	45	130	30	50	130	30	986	299	16 14	-	- -	-		3
51	290542Z	25.8N 128.3E	LRDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY															26.4N 127.8E	
52	290545Z	25.3N 128.9E	LRDR	- POOR FIX															26.2N 127.7E	
53	290700Z	25.5N 128.7E	LRDR	- 5////															26.1N 127.8E	
54	290710Z	25.5N 128.7E	LRDR	- FAIR FIX															26.4N 127.8E	
55	290745Z	25.8N 128.8E	LRDR	- FAIR FIX, 15 DEG SPIRAL OVERLAY															26.4N 127.8E	
56	290800Z	25.7N 128.8E	LRDR	- 5////															26.1N 127.8E	
57	290810Z	25.7N 128.3E	LRDR	- FAIR FIX, 15 DEG SPIRAL OVERLAY															26.4N 127.8E	
58	290840Z	25.7N 128.9E	LRDR	- POOR FIX															26.2N 127.7E	
59	290844Z	25.8N 128.9E	LRDR	- FAIR FIX, 15 DEG SPIRAL OVERLAY															26.4N 127.8E	
60	290900Z	25.7N 128.8E	LRDR	- 5////															26.1N 127.8E	
61	290900Z	25.7N 129.0E	LRDR	- POOR FIX															26.2N 127.7E	
62	290910Z	25.8N 129.0E	LRDR	- FAIR FIX, 15 DEG SPIRAL OVERLAY															26.4N 127.8E	
63	290911Z	25.6N 128.8E	P	2 5	700	240	60	120	25	60	120	25	985	298	16 16	-	- -	-		3
64	290940Z	25.8N 129.1E	LRDR	- FAIR FIX, MVY ATTN, 15 DEG SPIRAL OVERLAY															26.4N 127.8E	
65	291000Z	25.9N 128.8E	LRDR	- 5////															26.1N 127.8E	
66	291000Z	26.0N 128.9E	LRDR	- 55///															28.4N 129.5E	
67	291000Z	25.8N 129.0E	LRDR	- GOOD FIX, 15 DEG SPIRAL OVERLAY															26.2N 127.7E	
68	291010Z	25.9N 129.0E	LRDR	- POOR FIX															26.4N 127.8E	
69	291021Z	26.0N 128.8E	SAT	(IR DATA		)				PCN 4	OMSP									
70	291042Z	26.4N 128.8E	SAT	(IR DATA		)				PCN 4	OMSP									
71	291040Z	26.0N 128.8E	LRDR	- FAIR FIX, 15 DEG SPIRAL OVERLAY															26.4N 127.8E	
72	291100Z	26.2N 129.0E	LRDR	- 5////															28.4N 129.5E	
73	291100Z	26.1N 128.9E	LRDR	- 5////															26.1N 127.8E	
74	291113Z	25.8N 128.8E	SAT	(IR DATA		)				NOAA-2			(CONF 02)							
75	291140Z	26.3N 129.1E	LRDR	- FAIR FIX, 15 DEG SPIRAL OVERLAY															26.4N 127.8E	
76	291200Z	26.3N 128.9E	LRDR	- 5////															26.1N 127.8E	
77	291200Z	26.3N 128.9E	LRDR	- 65/6/															28.4N 129.5E	
78	291200Z	25.0N 129.1E	LRDR	- FAIR FIX, 15 DEG SPIRAL OVERLAY															26.2N 127.7E	
79	291210Z	26.1N 129.1E	LRDR	- POOR FIX															26.4N 127.8E	
80	291218Z	26.3N 128.9E	SAT	(IR DATA		)				PCN 3	OMSP									
81	291218Z	26.4N 129.1E	SAT	(IR DATA		)				PCN 5	OMSP									
82	291245Z	26.2N 129.1E	LRDR	- FAIR FIX, 15 DEG SPIRAL OVERLAY															26.4N 127.8E	
83	291300Z	26.4N 128.9E	LRDR	- 5////															26.1N 127.8E	
84	291300Z	26.4N 129.0E	LRDR	- 55///															28.4N 129.5E	
85	291309Z	26.4N 129.1E	LRDR	- FAIR FIX, 15 DEG SPIRAL OVERLAY															26.4N 127.8E	
86	291340Z	26.5N 129.1E	LRDR	- FAIR FIX, 15 DEG SPIRAL OVERLAY															26.4N 127.8E	
87	291400Z	26.5N 129.0E	LRDR	- 55///															28.4N 129.5E	
88	291400Z	26.5N 128.9E	LRDR	- 5////															26.1N 127.8E	
89	291400Z	26.5N 129.0E	LRDR	-												-	- -	-	26.2N 127.7E	-
90	291409Z	26.5N 129.1E	LRDR	- FAIR FIX, 20 DEG SPIRAL OVERLAY															26.4N 127.8E	
91	291447Z	26.5N 129.0E	LRDR	- FAIR FIX, 20 DEG SPIRAL OVERLAY															26.4N 127.8E	
92	291500Z	26.6N 128.8E	LRDR	- 55///															28.4N 129.5E	
93	291500Z	26.5N 128.8E	LRDR	-															26.2N 127.7E	
94	291503Z	26.7N 128.9E	LRDR	- FAIR FIX, 15 DEG SPIRAL OVERLAY															26.4N 127.8E	
95	291543Z	26.7N 128.9E	LRDR	- FAIR FIX, 15 DEG SPIRAL OVERLAY															26.4N 127.8E	
96	291600Z	26.6N 128.8E	LRDR	- POOR FIX															26.2N 127.7E	
97	291600Z	26.7N 128.7E	LRDR	- 55///															28.4N 129.5E	
98	291605Z	26.7N 128.9E	LRDR	- FAIR FIX, 15 DEG SPIRAL OVERLAY															26.4N 127.8E	
99	291640Z	26.7N 128.5E	LRDR	- FAIR FIX															26.4N 127.8E	
100	291700Z	26.9N 128.7E	LRDR	- 55///															28.4N 129.5E	

TROPICAL STORM ROSE
FIX POSITIONS FOR CYCLONE NO. 21
0600Z 28 AUG TO 0600Z 31 AUG

FIX NO.	TIME	POSIT	FIX CAT	ACCMY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL	BRG	RNG	MAX OBS SFC WIND VEL	CHG	RNG	OBS MIN SLP	MIN /OOMB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF NADAR	MSN NMBR
101	2917002	26.9N 128.7E	LNDK	- 5////														26.1N 127.8E	
102	2917052	26.8N 128.8E	LNDK	- FAIR FIX, 10 DEG SPIRAL OVERLAY														26.4N 127.8E	
103	2917302	26.8N 128.7E	LNDK	- POOR FIX														26.2N 127.7E	
104	2917372	26.8N 128.8E	LNDK	- FAIR FIX, 15 DEG SPIRAL OVERLAY														26.4N 127.8E	
105	2918002	26.9N 128.8E	LNDK	- 55///														28.4N 129.5E	
106	2918052	26.8N 128.8E	LNDK	- FAIR FIX, 20 DEG SPIRAL OVERLAY														26.4N 127.8E	
107	2918442	26.9N 128.8E	LNDK	- FAIR FIX, 20 DEG SPIRAL OVERLAY														26.4N 127.8E	
108	2919002	27.0N 128.8E	LNDK	- 55///														28.4N 129.5E	
109	2919002	27.0N 128.5E	LNDK	- 5////														26.1N 127.8E	
110	2920002	27.1N 128.6E	LNDK	- 5////														26.1N 127.8E	
111	2921102	26.9N 128.6E	LNDK	- FAIR FIX, 10 DEG SPIRAL OVERLAY														26.4N 127.8E	
112	2921222	27.1N 128.6E	SAT	(IR DATA) PCN 4 DMSP															
113	2921392	27.0N 128.6E	LNDK	- POOR FIX, 10 DEG SPIRAL OVERLAY														26.4N 127.8E	
114	2921412	27.0N 128.8E	LNDK	- FAIR FIX, 10 DEG SPIRAL OVERLAY														26.4N 127.8E	
115	2922102	27.0N 128.6E	LNDK	- POOR FIX, 10 DEG SPIRAL OVERLAY														26.4N 127.8E	
116	2922382	26.9N 128.6E	LNDK	- POOR FIX, 10 DEG SPIRAL OVERLAY														26.4N 127.8E	
117	2923082	27.0N 128.8E	LNDK	- POOR FIX, 20 DEG SPIRAL OVERLAY														26.4N 127.8E	
118	2923182	27.2N 128.5E	SAT	(12.0/2.0 /D1.0/24HRS) PCN 5 DMSP															
119	2923182	27.1N 128.5E	SAT	(T2.0/2.0 /D0.5/24HRS) PCN 5 DMSP															
120	2923402	27.0N 128.9E	LNDK	- POOR FIX, 20 DEG SPIRAL OVERLAY														26.4N 127.8E	
121	3000002	27.3N 128.4E	LNDK	- 6////														26.1N 127.8E	
122	3000102	27.2N 128.5E	LNDK	- POOR FIX, 10 DEG SPIRAL OVERLAY														26.4N 127.8E	
123	3000462	27.3N 128.6E	LNDK	- POOR FIX, 10 DEG SPIRAL OVERLAY														26.4N 127.8E	
124	3001002	27.4N 128.2E	LNDK	- 65///														28.4N 129.5E	
125	3001122	27.2N 128.5E	LNDK	- POOR FIX, 10 DEG SPIRAL OVERLAY														26.4N 127.8E	
126	3001402	27.3N 128.6E	LNDK	- POOR FIX, 10 DEG SPIRAL OVERLAY														26.4N 127.8E	
127	3002002	27.3N 128.9E	LNDK	- 6////														26.1N 127.8E	
128	3002002	27.4N 128.5E	LNDK	- 65///														28.4N 129.5E	
129	3002132	27.3N 128.9E	LNDK	- POOR FIX, 10 DEG SPIRAL OVERLAY														26.4N 127.8E	
130	3002432	27.4N 128.8E	LNDK	- POOR FIX, 10 DEG SPIRAL OVERLAY														26.4N 127.8E	
131	3003002	27.4N 128.4E	LNDK	- 65///														28.4N 129.5E	
132	3003002	27.3N 128.9E	LNDK	- 5////														26.1N 127.8E	
133	3003072	27.4N 128.8E	LNDK	- POOR FIX, EXTRAPOLATED, NO WELL DEFINED SPIRAL BANDS														26.4N 127.8E	
134	3003082	27.1N 128.9E	SAT	(IR DATA) PCN 5 DMSP															
135	3003472	27.5N 128.9E	LNDK	- POOR FIX, 10 DEG SPIRAL OVERLAY, WALL CLOUD NOT VISIBLE														26.4N 127.8E	
136	3004002	27.5N 128.8E	LNDK	- 6////														26.1N 127.8E	
137	3004002	27.3N 128.8E	LNDK	- 65///														28.4N 129.5E	
138	3004052	27.5N 128.9E	LNDK	- POOR FIX, 10 DEG SPIRAL OVERLAY, NO WALL CLOUD														26.4N 127.8E	
139	3004262	27.2N 128.8E	P 1	2 700 310 52 220 45 40 40					20			986	299	15 12	CIRC		60		4
140	3004402	27.5N 128.9E	LNDK	- POOR FIX, 10 DEG SPIRAL OVERLAY, NO WALL CLOUD														26.4N 127.8E	
141	3005002	27.5N 128.8E	LNDK	- 6////														26.1N 127.8E	
142	3005152	27.5N 128.9E	LNDK	- POOR FIX, 15 DEG SPIRAL OVERLAY														26.4N 127.8E	
143	3005402	27.5N 129.0E	LNDK	- POOR FIX, 15 DEG SPIRAL OVERLAY														26.4N 127.8E	
144	3006102	27.5N 129.0E	LNDK	- POOR FIX, 15 DEG SPIRAL OVERLAY, NO WELL DEFINED SPIRAL BANDS														26.4N 127.8E	
145	3006372	27.5N 129.0E	LNDK	-											-	- -	-	26.4N 127.8E	-
146	3007002	27.1N 129.1E	LNDK	- 6////														26.1N 127.8E	
147	3007002	27.1N 129.0E	LNDK	- 659//														28.4N 129.5E	
148	3007102	27.2N 129.1E	LNDK	- FAIR FIX, 15 DEG SPIRAL OVERLAY														26.4N 127.8E	
149	3007402	27.2N 129.3E	LNDK	- FAIR FIX, 15 DEG SPIRAL OVERLAY														26.4N 127.8E	
150	3008052	27.2N 129.3E	LNDK	- FAIR FIX														26.4N 127.8E	
151	3008322	27.1N 129.4E	LNDK	- FAIR FIX, 15 DEG SPIRAL OVERLAY														26.4N 127.8E	
152	3009002	27.0N 129.3E	LNDK	- 31912														28.4N 129.5E	
153	3009002	26.9N 129.4E	LNDK	- 6////														26.1N 127.8E	
154	3009082	27.1N 129.5E	LNDK	- 15 DEG SPIRAL OVERLAY														26.4N 127.8E	
155	3009462	27.0N 129.5E	LNDK	- POOR FIX, 15 DEG SPIRAL OVERLAY														26.4N 127.8E	
156	3010102	27.0N 129.2E	LNDK	- POOR FIX, 15 DEG SPIRAL OVERLAY														26.4N 127.8E	
157	3010402	27.1N 129.3E	LNDK	- BY XINAP, NO SPIRAL BAND														26.4N 127.8E	
158	3012002	26.9N 129.8E	SAT	(IR DATA) PCN 3 DMSP															
159	3012402	26.7N 129.3E	LNDK	- POOR FIX, 10 DEG SPIRAL OVERLAY, NO WALL CLOUD														26.4N 127.8E	
160	3013002	26.5N 129.9E	LNDK	- 6////														28.4N 129.5E	
161	3014002	26.5N 130.3E	LNDK	- 6////														26.1N 127.8E	
162	3015492	26.7N 130.3E	SAT	(IR DATA) PCN 3 DMSP															
163	3016002	26.5N 130.3E	LNDK	- 65///														28.4N 129.5E	
164	3016002	26.5N 130.3E	LNDK	- 6////														26.1N 127.8E	
165	3016502	26.1N 130.6E	P 1	2 700 290 40 260 40					-			990	302	17 13	-	- -	-		5
166	3017002	26.5N 130.4E	LNDK	- 65///														28.4N 129.5E	
167	3022282	25.8N 131.5E	P 2	2 700 290 50 220 50					30		110	30	990	303	17 13	-	- -	-		5
168	3023002	25.5N 131.6E	SAT	(12.5/2.5 /S0.5/24HRS) PCN 3 DMSP															
169	3023002	25.4N 131.5E	SAT	(12.5/2.5 /D0.5/24HRS) PCN 3 DMSP															
170	3102492	25.4N 133.0E	SAT	(IR DATA) PCN 3 DMSP															
171	3111422	25.5N 137.1E	SAT	(IR DATA) PCN 5 DMSP															
172	3115302	25.6N 137.9E	SAT	(IR DATA) PCN 3 DMSP															
173	3122422	27.7N 139.6E	SAT	(IR DATA) PCN 3 DMSP															
174	0102302	29.5N 139.8E	SAT	(IR DATA) PCN 3 DMSP															
175	0111242	31.3N 140.5E	SAT	(IR DATA) PCN 3 DMSP															
176	0119112	32.7N 140.2E	SAT	(IR DATA) PCN 3 DMSP															

TYPHOON SHIRLEY
FIX POSITIONS FOR CYCLONE NO. 22
0000Z 04 SEP TO 0000Z 09 SEP

FIX NO.	TIME	POSIT	FIX CAT	ACCHY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	040011Z	23.9N 130.5E	SAT	(T2.0/2.0 /D1.0/24HRS)						NOAA-2			(CONF 01)							
2	041100Z	25.8N 131.9E	SAT	(IR DATA)						NOAA-2			(CONF 01)							
3	050107Z	26.0N 131.0E	SAT	(T3.0/3.0 /D1.0/24HRS)						NOAA-2			(CONF 01)							
4	051157Z	26.6N 131.1E	SAT	(IR DATA)						NOAA-2			(CONF 01)							
5	060005Z	26.2N 129.2E	SAT	(T3.5/3.5 /D0.5/24HRS)						NOAA-2			(CONF 01)							
6	061055Z	27.7N 128.8E	SAT	(IR DATA)						NOAA-2			(CONF 01)							
7	070059Z	28.2N 127.3E	SAT	(T3.0/3.0 /W0.5/24HRS)						NOAA-2			(CONF 01)							
8	071152Z	28.9N 128.0E	SAT	(IR DATA)						NOAA-2			(CONF 02)							
9	081152Z	32.3N 130.5E	SAT	(IR DATA)						NOAA-2			(CONF 02)							
10	021247Z	23.4N 128.1E	SAT	(IR DATA)						PCN 5	DMSP									
11	021247Z	23.2N 127.7E	SAT	(IR DATA)						PCN 5	DMSP									
12	022344Z	24.0N 128.6E	SAT	(T1.5/1.5 / / HRS)						PCN 5	DMSP									
13	022347Z	23.6N 129.0E	SAT	(T1.5/1.5 / / HRS)						PCN 5	DMSP									
14	030335Z	24.3N 129.0E	SAT	(IR DATA)						PCN 5	DMSP									
15	031229Z	24.0N 130.0E	SAT	(IR DATA)						PCN 5	DMSP									
16	031229Z	24.4N 129.4E	SAT	(IR DATA)						PCN 5	DMSP									
17	032326Z	24.2N 130.8E	SAT	(T2.0/2.0 /D0.5/24HRS)						PCN 5	DMSP									
18	032329Z	24.4N 130.7E	SAT	(T2.0/2.0 /D0.5/24HRS)						PCN 5	DMSP									
19	040316Z	24.9N 130.8E	SAT	(IR DATA)						PCN 5	DMSP									
20	041210Z	24.7N 131.4E	SAT	(IR DATA)						PCN 3	DMSP									
21	041210Z	25.3N 131.5E	SAT	(IR DATA)						PCN 6	DMSP									
22	041555Z	25.4N 131.3E	P	5 10 700 / - 50 50						15	-	-	-	991	301	12 11	CIRC		25			1
23	041557Z	25.4N 131.7E	SAT	(IR DATA)						PCN 3	DMSP									
24	041800Z	25.7N 131.6E	SAT	(IR DATA)						PCN 8	DMSP									
25	042100Z	25.7N 131.1E	P	5 10 700 270 50 170						40	5	190	40	-	-	12 11	CIRC		20			1
26	042310Z	25.5N 131.3E	SAT	(T3.0/3.0 /D1.0/24HRS)						PCN 3	DMSP									
27	042310Z	26.0N 131.5E	SAT	(T2.5/2.5 /D0.5/24HRS)						PCN 3	DMSP									
28	050200Z	26.1N 131.2E	LNDR	- 65/12															28.4N 129.5E	
29	050258Z	25.7N 131.0E	SAT	(IR DATA)						PCN 3	DMSP									
30	050300Z	26.1N 131.6E	LNDR	- 65/13															28.4N 129.5E	
31	050400Z	26.2N 131.4E	LNDR	- 65/13															28.4N 129.5E	
32	050700Z	26.3N 131.3E	LNDR	- 20972															28.4N 129.5E	
33	050800Z	26.4N 131.2E	LNDR	- 21912															28.4N 129.5E	
34	050830Z	26.7N 131.2E	P	4 7 700 170 60 140						60	75	140	50	980	293	15 11	EYE	N-S	40X25			3
35	050900Z	26.3N 131.2E	LNDR	- 21912															28.4N 129.5E	
36	051000Z	26.5N 131.2E	LNDR	- 21912															28.4N 129.5E	
37	051100Z	26.4N 131.0E	LNDR	- 21912															28.4N 129.5E	
38	051152Z	26.4N 130.6E	SAT	(IR DATA)						PCN 1	DMSP									
39	051152Z	26.7N 130.5E	SAT	(IR DATA)						PCN 3	DMSP									
40	051200Z	26.3N 131.0E	LNDR	- 6////															26.2N 127.8E	
41	051300Z	26.6N 130.9E	LNDR	- 21912															28.4N 129.5E	
42	051300Z	26.5N 131.0E	LNDR	- 6////															26.2N 127.8E	
43	051400Z	26.5N 130.9E	LNDR	- 21912															28.4N 129.5E	
44	051400Z	26.5N 131.0E	LNDR	- 6////															26.2N 127.8E	
45	051430Z	26.5N 130.6E	P	1 2 700 270 60 160						50	-	-	-	979	291	16 12	EYE	N-S	45X20			3
46	051500Z	26.6N 130.8E	LNDR	- 22912															28.4N 129.5E	
47	051500Z	26.7N 130.9E	LNDR	- 6////															26.2N 127.8E	
48	051539Z	26.7N 130.7E	SAT	(IR DATA)						PCN 1	DMSP									
49	051600Z	26.7N 130.6E	LNDR	- 21913															28.4N 129.5E	
50	051600Z	26.7N 130.6E	LNDR	- 5////															26.2N 127.8E	
51	051633Z	26.5N 130.5E	LNDR	- POOR FIX, 10 DEG SPIRAL OVERLAY															26.4N 127.8E	
52	051700Z	26.7N 130.5E	LNDR	- 10912															28.4N 129.5E	
53	051700Z	26.9N 130.6E	LNDR	- 6////															26.2N 127.8E	
54	051800Z	26.7N 130.4E	LNDR	- 21913															28.4N 129.5E	
55	051800Z	26.9N 130.5E	LNDR	- 6////															26.2N 127.8E	
56	051900Z	26.7N 130.3E	LNDR	- 21913															28.4N 129.5E	
57	051900Z	27.1N 130.2E	LNDR	- 6////															26.2N 127.8E	
58	051900Z	26.9N 130.3E	LNDR	- GOOD FIX															26.2N 127.7E	
59	051910Z	26.4N 130.2E	LNDR	- 30 PERCENT WALL CLOUD															26.4N 127.8E	
60	052000Z	26.8N 130.2E	LNDR	- 21913															28.4N 129.5E	
61	052000Z	27.1N 130.2E	LNDR	- 6////															26.2N 127.8E	
62	052005Z	26.9N 130.2E	LNDR	- FAIR FIX, 20 DEG SPIRAL OVERLAY, NO VISIBLE WALL CLOUD															26.4N 127.8E	
63	052040Z	26.9N 130.0E	LNDR	- 20 DEG SPIRAL OVERLAY, 20 PERCENT WALL CLOUD															26.4N 127.8E	
64	052100Z	26.8N 130.1E	LNDR	- 21912															28.4N 129.5E	
65	052100Z	27.1N 130.2E	LNDR	- 6////															26.2N 127.8E	
66	052105Z	26.8N 130.2E	LNDR	- 20 DEG SPIRAL OVERLAY, 15 PERCENT WALL CLOUD															26.4N 127.8E	
67	052200Z	26.8N 130.0E	LNDR	- 21912															28.4N 129.5E	
68	052200Z	26.9N 129.9E	LNDR	- 6////															26.2N 127.8E	
69	052205Z	26.7N 129.8E	LNDR	- FAIR FIX, ELLIPTICAL EYE, 20 DEG SPIRAL OVERLAY, 60 PERCENT WALL CLOUD															26.4N 127.8E	
70	052240Z	26.8N 129.8E	LNDR	- FAIR FIX, ELLIPTICAL EYE, 70 DEG SPIRAL OVERLAY, 60 PERCENT WALL CLOUD															26.4N 127.8E	
71	052252Z	26.9N 129.7E	SAT	(T3.5/3.5-/D0.5/24HRS)						PCN 1	DMSP									
72	052252Z	26.8N 129.7E	SAT	(T3.0/3.0 /D0.5/24HRS)						PCN 3	DMSP									
73	052300Z	26.8N 129.9E	LNDR	- 22912															28.4N 129.5E	
74	052300Z	26.8N 129.8E	LNDR	- 22903															26.2N 127.8E	
75	052310Z	26.7N 129.8E	LNDR	- GOOD FIX, ELLIPTICAL EYE, 20 DEG SPIRAL OVERLAY, 75 PERCENT WALL CLOUD															26.4N 127.8E	
76	052340Z	26.8N 129.8E	LNDR	- GOOD FIX, EYE 29 NM DIAM, 20 DEG SPIRAL OVERLAY, 60 PERCENT WALL CLOUD															26.4N 127.8E	
77	060000Z	26.9N 129.7E	LNDR	- 22933															28.4N 129.5E	
78	060000Z	26.8N 129.7E	LNDR	- 32942															26.2N 127.8E	
79	060010Z	26.7N 129.7E	LNDR	- GOOD FIX, CIRCULAR EYE 28 NM DIAM, 60 PERCENT WALL CLOUD															26.4N 127.8E	
80	060030Z	27.0N 129.6E	LNDR	-															26.2N 127.7E	-
81	060040Z	26.8N 129.7E	LNDR	- CIRCULAR EYE 30 NM DIAM, 20 DEG SPIRAL OVERLAY, 50 PERCENT WALL CLOUD															26.4N 127.8E	
82	060100Z	26.9N 129.5E	LNDR	- 22973															28.4N 129.5E	
83	060100Z	26.9N 129.5E	LNDR	- 3294/															26.2N 127.8E	
84	060110Z	26.8N 129.6E	LNDR	- CIRCULAR EYE 29 NM DIAM, 20 DEG SPIRAL OVERLAY, 40 PERCENT WALL CLOUD															26.4N 127.8E	
85	060130Z	27.1N 129.4E	LNDR	-															26.2N 127.7E	-
86	060140Z	26.7N 129.6E	LNDR	- CIRCULAR EYE 31 NM DIAM, 20 DEG SPIRAL OVERLAY, 59 PERCENT WALL CLOUD															26.4N 127.8E	
87	060200Z	27.0N 129.4E	LNDR	- 21913															28.4N 129.5E	
88	060200Z	27.0N 129.4E	LNDR	- 5294/															26.2N 127.8E	
89	060208Z	27.0N 129.5E	LNDR	- GOOD FIX, CIRCULAR EYE 35 NM DIAM, 60 PERCENT WALL CLOUD															26.4N 127.8E	
90	060230Z	27.3N 129.2E	LNDR	- POOR FIX															26.4N 127.7E	
91	060239Z	26.9N 129.4E	SAT	(IR DATA)						PCN 1	DMSP									
92	060242Z	27.1N 129.5E	LNDR	- FAIR FIX, CIRCULAR EYE 35 NM DIAM, 50 PERCENT WALL CLOUD															26.4N 127.8E	-
93	060300Z	27.0N 129.2E	LNDR	- 21913															28.4N 129.5E	
94	060300Z	27.1N 129.3E	LNDR	- 5294/															26.2N 127.8E	
95	060305Z	26.9N 129.3E	P	5 2 700 320 75 240						15	70	10	14	980	291	13 9	CIRC		50			4
96	060308Z	27.3N 129.4E	LNDR	- GOOD FIX, CIRCULAR EYE 30 NM DIAM, 50 PERCENT WALL CLOUD															26.4N 127.8E	
97	060330Z	26.9N 129.2E	LNDR	- POOR FIX															26.2N 127.7E	
98	060342Z	27.3N 129.4E	LNDR	- FAIR FIX, 20 DEG SPIRAL OVERLAY, 50 PERCENT WALL CLOUD															26.4N 127.8E	
99	060400Z	27.1N 129.1E	LNDR	- 32723															28.4N 129.5E	
100	060400Z	27.3N 129.2E	LNDR	- 5295/															26.2N 127.8E	

TYPHOON SHIRLEY
FIX POSITIONS FOR CYCLONE NO. 22
0000Z 04 SEP TO 0000Z 09 SEP

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN /OUMB MGT	FLT LVL TI/TO	EYE FORM	ORIENTATION	EYE DIA	POSIT OF RADAR	MSN NMBR
101	0604102	27.1N 129.1E	LNDR		- FAIR FIX, 20 DEG SPIRAL OVERLAY, 50 PERCENT WALL CLOUD														26.4N 127.8E	
102	0604302	26.8N 128.9E	LNDR		-															
103	0604352	27.1N 129.0E	LNDR		- FAIR FIX, 20 DEG SPIRAL OVERLAY											-	- -	-	26.2N 127.7E	-
104	0605002	27.1N 129.1E	LNDR		- 30423														26.4N 127.8E	
105	0605002	27.0N 129.0E	LNDR		- 5587/														28.4N 129.5E	
106	0605062	27.1N 129.0E	LNDR		- FAIR FIX, 20 DEG SPIRAL OVERLAY, 50 PERCENT WALL CLOUD														26.2N 127.8E	
107	0605302	27.1N 128.8E	LNDR		- GOOD FIX														26.4N 127.8E	
108	0605392	27.1N 129.0E	LNDR		- FAIR FIX, 20 DEG SPIRAL OVERLAY, 40 PERCENT WALL CLOUD														26.2N 127.7E	
109	0606002	27.1N 129.1E	LNDR		- 5////														26.4N 127.8E	
110	0606092	27.0N 129.0E	LNDR		- FAIR FIX, 20 DEG SPIRAL OVERLAY, 50 PERCENT WALL CLOUD														26.2N 127.8E	
111	0606302	27.3N 128.9E	LNDR		- POOR FIX														26.4N 127.8E	
112	0606392	27.0N 129.0E	LNDR		- FAIR FIX, 20 DEG SPIRAL OVERLAY, 40 PERCENT WALL CLOUD														26.2N 127.7E	
113	0607002	27.1N 128.9E	LNDR		- 32943														26.4N 127.8E	
114	0607002	27.2N 128.9E	LNDR		- 5////														28.4N 129.5E	
115	0607102	27.0N 129.0E	LNDR		- POOR FIX, 30 PERCENT WALL CLOUD														26.2N 127.8E	
116	0607302	27.2N 128.8E	LNDR		- POOR FIX														26.4N 127.8E	
117	0607392	27.0N 129.0E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY, 50 PERCENT WALL CLOUD														26.2N 127.7E	
118	0608002	27.1N 128.9E	LNDR		- 2047/														26.4N 127.8E	
119	0608002	27.3N 128.8E	LNDR		- 5////														28.4N 129.5E	
120	0608092	27.0N 128.9E	LNDR		- GOOD FIX, 10 DEG SPIRAL OVERLAY, 50 PERCENT WALL CLOUD														26.2N 127.8E	
121	0608302	27.1N 128.6E	LNDR		- POOR FIX														26.4N 127.8E	
122	0608352	27.2N 128.6E	P	3 5	700 70 70 230 40 80 330 20 979 291 13 11											CTHC		40	26.2N 127.7E	4
123	0608392	27.1N 128.9E	LNDR		- GOOD FIX, 10 DEG SPIRAL OVERLAY, 60 PERCENT WALL CLOUD														26.4N 127.8E	
124	0609102	27.0N 128.8E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY, 40 PERCENT WALL CLOUD														26.4N 127.8E	
125	0609402	27.0N 128.8E	LNDR		- GOOD FIX, 10 DEG SPIRAL OVERLAY, 50 PERCENT WALL CLOUD														26.4N 127.8E	
126	0610002	27.1N 128.7E	LNDR		- 55/3/														28.4N 129.5E	
127	0610002	27.3N 128.6E	LNDR		- 5////														26.2N 127.8E	
128	0610092	27.0N 128.8E	LNDR		- GOOD FIX, 10 DEG SPIRAL OVERLAY, 50 PERCENT WALL CLOUD														26.4N 127.8E	
129	0610392	27.2N 128.6E	LNDR		- GOOD FIX, 10 DEG SPIRAL OVERLAY, 50 PERCENT WALL CLOUD														26.4N 127.8E	
130	0611002	27.2N 128.7E	LNDR		- 55/1/														28.4N 129.5E	
131	0611002	27.3N 128.5E	LNDR		- 5////														26.2N 127.8E	
132	0611092	27.1N 128.7E	LNDR		- GOOD FIX, 10 DEG SPIRAL OVERLAY, 60 PERCENT WALL CLOUD														26.4N 127.8E	
133	0611342	27.1N 128.9E	SAT	(IR DATA) PCN 5 DMSP																
134	0611342	27.2N 129.0E	SAT	(IR DATA) PCN 3 DMSP																
135	0611412	27.1N 128.6E	LNDR		- GOOD FIX, 10 DEG SPIRAL OVERLAY, 50 PERCENT WALL CLOUD														26.4N 127.8E	
136	0612002	27.2N 128.6E	LNDR		- 55//2														28.4N 129.5E	
137	0612422	27.2N 128.5E	LNDR		- GOOD FIX, 10 DEG SPIRAL OVERLAY, 60 PERCENT WALL CLOUD														26.4N 127.8E	
138	0613002	27.3N 128.5E	LNDR		- 55/32														28.4N 129.5E	
139	0613002	27.4N 128.4E	LNDR		- 5////														26.2N 127.8E	
140	0613152	27.1N 128.5E	SAT	(IR DATA) PCN 3 DMSP																
141	0613402	27.3N 128.3E	LNDR		- GOOD FIX, 10 DEG SPIRAL OVERLAY, 50 PERCENT WALL CLOUD														26.4N 127.8E	
142	0614002	27.4N 128.4E	LNDR		- 55/1/														28.4N 129.5E	
143	0614002	27.4N 128.3E	LNDR		- 5////														26.2N 127.8E	
144	0614402	27.5N 128.3E	LNDR		- GOOD FIX, 10 DEG SPIRAL OVERLAY, 50 PERCENT WALL CLOUD														26.4N 127.8E	
145	0615002	27.5N 128.2E	LNDR		- 55//2														28.4N 129.5E	
146	0615002	27.4N 128.1E	LNDR		- 20902														26.2N 127.8E	
147	0615102	27.5N 128.3E	LNDR		- GOOD FIX														26.4N 127.8E	
148	0615202	27.4N 128.5E	SAT	(IR DATA) PCN 3 DMSP																
149	0615422	27.5N 128.3E	LNDR		- GOOD FIX, 20 DEG SPIRAL OVERLAY, 60 PERCENT WALL CLOUD														26.4N 127.8E	
150	0616002	27.5N 128.3E	LNDR		- 55/12														28.4N 129.5E	
151	0616002	27.5N 128.1E	LNDR		- 20822														26.2N 127.8E	
152	0616082	27.5N 128.3E	LNDR		- GOOD FIX, 10 DEG SPIRAL OVERLAY														26.4N 127.8E	
153	0617002	27.6N 128.2E	LNDR		- 55/1/														28.4N 129.5E	
154	0617002	27.6N 128.0E	LNDR		- 20932														26.2N 127.8E	
155	0618052	27.6N 128.2E	LNDR		- GOOD FIX, 10 DEG SPIRAL OVERLAY														26.4N 127.8E	
156	0618402	27.7N 128.3E	LNDR		- FAIR FIX, 15 DEG SPIRAL OVERLAY, 50 PERCENT WALL CLOUD														26.4N 127.8E	
157	0619002	27.7N 128.0E	LNDR		- 55/1/														28.4N 129.5E	
158	0619002	27.7N 127.9E	LNDR		- 5///2														26.2N 127.8E	
159	0619122	27.8N 128.1E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY, 40 PERCENT WALL CLOUD														26.4N 127.8E	
160	0620002	27.8N 128.0E	LNDR		- 55/1/														28.4N 129.5E	
161	0620002	27.7N 127.9E	LNDR		- 5////														26.2N 127.8E	
162	0620082	27.8N 128.1E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY, 40 PERCENT WALL CLOUD														26.4N 127.8E	
163	0620402	27.9N 127.9E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY, 40 PERCENT WALL CLOUD														26.4N 127.8E	
164	0621002	27.8N 127.8E	LNDR		- 14/8/														28.4N 129.5E	
165	0621002	27.8N 127.9E	LNDR		- 5////														26.2N 127.8E	
166					- FAIR FIX, 10 DEG SPIRAL OVERLAY, 40 PERCENT WALL CLOUD														26.4N 127.8E	
167	0621422	27.8N 127.9E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY, 50 PERCENT WALL CLOUD														26.4N 127.8E	
168	0622002	27.9N 128.0E	LNDR		- 1412														28.4N 129.5E	
169	0622002	27.8N 127.8E	LNDR		- 5////														26.2N 127.8E	
170	0622102	27.9N 127.9E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY, 40 PERCENT WALL CLOUD OPEN N														26.4N 127.8E	
171	0622502	27.8N 127.9E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY, 40 PERCENT WALL CLOUD OPEN N														26.4N 127.8E	
172	0623002	28.0N 127.9E	LNDR		- 5//4/														28.4N 129.5E	
173	0623002	28.0N 127.8E	LNDR		- 5////														26.2N 127.8E	
174	0623102	27.1N 127.1E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY, 40 PERCENT WALL CLOUD OPEN N														26.4N 127.8E	
175	0623302	27.1N 126.1E	LNDR		- POOR FIX														26.2N 127.7E	
176	0700002	28.0N 127.8E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY, 30 PERCENT WALL CLOUD OPEN N														26.4N 127.8E	
177	0700152	28.1N 127.9E	SAT	(13.0/3.0-/S /25HRS) PCN 3 DMSP																
178	0700152	28.2N 128.3E	SAT	(13.0/3.0 / / HRS) PCN 3 DMSP																
179	0700412	28.1N 127.8E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY, 30 PERCENT WALL CLOUD														26.4N 127.8E	
180	0701002	28.2N 127.8E	LNDR		- 21013														28.4N 129.5E	
181	0701002	28.2N 127.8E	LNDR		- 5////														26.2N 127.8E	
182	0701102	28.2N 127.7E	LNDR		- POOR FIX, 10 DEG SPIRAL OVERLAY														26.4N 127.8E	
183	0701302	28.3N 127.6E	LNDR		- POOR FIX														26.2N 127.7E	
184	0701402	28.2N 127.7E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY,														26.4N 127.8E	
185	0702002	28.3N 127.6E	LNDR		- 31033														28.4N 129.5E	
186	0702002	28.4N 127.6E	LNDR		- 0////														26.2N 127.8E	
187	0702102	28.2N 127.7E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY														26.4N 127.8E	
188	0702212	28.0N 127.5E	SAT	(14.0/4.0-/DT0.5/27HRS) PCN 1 DMSP																
189	0702382	28.2N 127.6E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY, 40 PERCENT WALL CLOUD OPEN N														26.4N 127.8E	
190	0703002	28.4N 127.5E	LNDR		- 0////														26.2N 127.8E	
191	0703102	28.2N 127.8E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY, 40 PERCENT WALL CLOUD OPEN N														26.4N 127.8E	
192	0703202	28.4N 127.5E	P	5 2	700 160 80 90 35 90 90 35 982 295 18 12											CTHC		35		5
193	0703432	28.2N 127.8E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY, 30 PERCENT WALL CLOUD OPEN N														26.4N 127.8E	
194	0704002	28.3N 127.6E	LNDR		- 21013														28.4N 129.5E	
195	0704002	28.5N 127.6E	LNDR		- 0////														26.2N 127.8E	
196	0704102	28.3N 127.8E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY, 30 PERCENT WALL CLOUD OPEN N														26.4N 127.8E	
197	0704302	28.5N 127.7E	LNDR		- GOOD FIX														26.2N 127.7E	
198	0704432	28.3N 127.8E	LNDR		- FAIR FIX, 10 DEG SPIRAL OVERLAY, 30 PERCENT WALL CLOUD OPEN N														26.2N 127.8E	
199	0705002	28.4N 127.6E	LNDR		- 35012														28.4N 129.5E	
200	0705002	28.6N 127.6E	LNDR		- 0////														26.2N 127.8E	

TYPHOON SHIRLEY
FIX POSITIONS FOR CYCLONE NO. 22
0000Z 04 SEP TO 0000Z 09 SEP

FIX NO.	TIME	POSIT	FIX CAT	ACCMY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN /100MB HGT	FLT LVL T1/T0	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
201	0705102	28.4N 127.8E	LNDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY, 30 PERCENT WALL CLOUD OPEN N															26.4N 127.8E	
202	0705302	28.5N 127.6E	LNDR	- POOR FIX															26.2N 127.7E	
203	0705402	28.5N 127.8E	LNDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY, 30 PERCENT WALL CLOUD OPEN N															26.4N 127.8E	
204	0706002	28.7N 127.7E	LNDR	- 6////															26.2N 127.8E	
205	0706052	28.7N 127.8E	LNDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY, 30 PERCENT WALL CLOUD OPEN N															26.4N 127.8E	
206	0707002	28.5N 127.6E	LNDR	- 32643															28.4N 129.5E	
207	0707002	28.7N 127.6E	LNDR	- 6////															26.2N 127.8E	
208	0707052	28.8N 127.6E	LNDR	- FAIR FIX, 10 DEG SPIRAL OVERLAY, 30 PERCENT WALL CLOUD OPEN N															26.4N 127.8E	
209	0708002	28.6N 127.6E	LNDR	- 62813															28.4N 129.5E	
210	0708562	28.6N 127.6E	P 1	3 700	130	70	40	30	90	40	35	972	285	10 12	CIRC		40			6
211	0709002	28.7N 127.6E	LNDR	- 21523															28.4N 129.5E	
212	0710002	28.8N 127.6E	LNDR	- 65/42															28.4N 129.5E	
213	0712002	28.9N 127.6E	LNDR	- 65/44															28.4N 129.5E	
214	0712572	28.3N 127.9E	SAT	(IR DATA)				PCN 3	DMSP											
215	0713002	29.0N 127.5E	LNDR	- 65/44															28.4N 129.5E	
216	0714002	29.9N 127.4E	LNDR	- 65/14															28.4N 129.5E	
217	0714152	29.0N 127.5E	P 1	5 700	140	60	60	30	-	-	-	974	288	19 11	-	- -	-			6
218	0715002	29.0N 127.5E	LNDR	- 65/14															28.4N 129.5E	
219	0715022	29.7N 127.9E	SAT	(IR DATA)				PCN 5	DMSP											
220	0716002	29.0N 127.6E	LNDR	- 65/14															28.4N 129.5E	
221	0719002	29.2N 127.8E	LNDR	- 65/43															28.4N 129.5E	
222	0720002	29.3N 127.8E	LNDR	- 65/13															28.4N 129.5E	
223	0721002	29.5N 128.1E	LNDR	- 65/12															28.4N 129.5E	
224	0722002	29.5N 128.2E	LNDR	- 65/14															28.4N 129.5E	
225	0722152	29.4N 127.7E	P 10	3 700	140	80	50	20	80	340	10	983	299	21 -	CIRC		12			7
226	0723002	29.7N 128.2E	LNDR	- 65/43															28.4N 129.5E	
227	0723572	29.7N 127.6E	SAT	(IR DATA)				PCN 3	DMSP											
228	0723572	30.1N 128.4E	SAT	(14.0/4.0-/S1.0/24HRS)				PCN 3	DMSP											
229	0800002	29.9N 128.4E	LNDR	- 6////															30.0N 131.0E	
230	0800302	29.6N 127.6E	P -	- 700	240	70	170	20	70	170	20	-	-	21 18	-	- -	-			7
231	0801002	30.0N 128.5E	LNDR	- 6////															30.0N 131.0E	
232	0801002	30.0N 128.5E	LNDR	- 65/12															28.4N 129.5E	
233	0802002	30.2N 128.6E	LNDR	- 6////															30.0N 131.0E	
234	0802002	30.1N 128.5E	LNDR	- 21822															28.4N 129.5E	
235	0802022	30.5N 128.8E	SAT	(13.0/4.0-/W1.0/24HRS)				PCN 5	DMSP											
236	0802402	29.8N 127.5E	P 5	3 700	260	55	180	20	75	300	10	983	297	21 18	CIRC		10			7
237	0803002	30.3N 128.6E	LNDR	- 20402															33.4N 130.4E	
238	0803002	30.4N 128.7E	LNDR	- 14202															30.0N 131.0E	
239	0803002	30.3N 128.8E	LNDR	- 22522															28.4N 129.5E	
240	0804002	30.6N 128.7E	LNDR	- 20412															33.4N 130.4E	
241	0804002	30.5N 128.8E	LNDR	- 45/42															30.0N 131.0E	
242	0804002	30.6N 128.8E	LNDR	- 22712															28.4N 129.5E	
243	0805002	30.6N 128.8E	LNDR	- 40412															33.4N 128.8E	
244	0805002	30.6N 128.9E	LNDR	- 55/42															30.0N 131.0E	
245	0805002	30.7N 128.9E	LNDR	- 22712															28.4N 129.5E	
246	0806002	30.8N 129.0E	LNDR	- 55/72															33.4N 130.4E	
247	0806002	30.7N 129.1E	LNDR	- 75/72															30.0N 131.0E	
248	0806002	30.7N 128.9E	LNDR	- 75542															28.4N 129.5E	
249	0807002	31.0N 129.3E	LNDR	- 10472															33.4N 130.4E	
250	0807002	30.7N 129.4E	LNDR	- 25/72															30.0N 131.0E	
251	0807002	30.9N 129.3E	LNDR	- 22303															28.4N 129.5E	
252	0808002	31.0N 129.6E	LNDR	- 5////															30.0N 130.4E	
253	0808002	30.9N 129.6E	LNDR	- 32812															30.0N 131.0E	
254	0808002	30.9N 129.4E	LNDR	- 55/63															28.4N 129.5E	
255	0809002	31.1N 129.7E	LNDR	- 5////															33.4N 130.4E	
256	0809002	31.0N 129.7E	LNDR	- 10712															30.0N 131.0E	
257	0809002	31.1N 129.6E	LNDR	- 65/73															28.4N 129.5E	
258	0810002	31.1N 129.9E	LNDR	- 10901															33.4N 130.4E	
259	0810002	31.2N 130.0E	LNDR	- 11813															30.0N 131.0E	
260	0810002	31.3N 129.9E	LNDR	- 55/63															28.4N 129.5E	
261	0811002	31.3N 129.9E	LNDR	- 55/63															28.4N 129.5E	
262	0811002	31.3N 130.1E	LNDR	- 10811															33.4N 130.4E	
263	0811002	31.3N 130.1E	LNDR	- 11813															30.0N 131.0E	
264	0811002	31.3N 130.3E	LNDR	- 55/13															28.4N 129.5E	
265	0812002	31.5N 130.4E	LNDR	-												- - -			33.0N 130.5E	-
266	0812002	31.4N 130.4E	LNDR	- 10911															33.4N 130.4E	
267	0812002	31.5N 130.4E	LNDR	- 21933															30.0N 131.0E	
268	0812002	31.4N 130.4E	LNDR	- 65/65															28.4N 129.5E	
269	0812392	31.6N 130.6E	SAT	(IR DATA)				PCN 3	DMSP											
270	0813002	31.7N 130.7E	LNDR	- 10651															33.4N 130.4E	
271	0813002	31.8N 130.6E	LNDR	- 20823															30.0N 131.0E	
272	0813002	31.6N 130.5E	LNDR	- GOOD FIX															33.0N 130.5E	
273	0814002	31.9N 130.8E	LNDR	- 21943															33.4N 130.4E	
274	0814002	32.0N 130.8E	LNDR	- 34763															30.0N 131.0E	
275	0814002	32.2N 130.9E	LNDR	- POOR FIX															33.0N 130.5E	
276	0815002	32.2N 131.2E	LNDR	- 5////															33.4N 130.4E	
277	0816002	32.7N 131.5E	LNDR	- 5////															33.4N 130.4E	
278	0816002	32.7N 131.7E	LNDR	- 25/72															33.3N 134.2E	
279	0817002	33.1N 131.4E	LNDR	- 65///															34.3N 132.6E	
280	0817002	33.0N 131.7E	LNDR	- 55/71															33.4N 130.4E	
281	0817002	32.8N 131.7E	LNDR	- 75/72															33.3N 134.2E	
282	0818002	33.3N 131.9E	LNDR	- 75/72															33.3N 134.2E	
283	0823392	34.2N 135.0E	SAT	(12.0/3.0-/S2.0/24HRS)				PCN 5	DMSP											
284	0823402	27.8N 127.8E	LNDR	-												- - -			26.4N 127.8E	-

TROPICAL STORM TRIX
FIX POSITIONS FOR CYCLONE NO. 23
1200Z 05 SEP TO 1200Z 06 SEP

FIX NO.	TIME	POSIT	FIX CAT	ACCNY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TD	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	0508522	20.1N 115.9E	SAT	(T3.0/3.0 / / HRS)			PCN 3 DMSP								
2	0509002	20.6N 115.1E	LNDR	-							-	- -	-	22.3N 114.2E	-
3	0512002	20.6N 114.7E	LNDR	-							-	- -	-	22.3N 114.2E	-
4	0513342	20.0N 115.5E	SAT	(IR DATA)			PCN 5 DMSP								
5	0514122	20.0N 115.0E	SAT	(IR DATA)			NOAA-2								
6	0515002	20.7N 114.1E	LNDR	-											
7	0518002	20.7N 113.5E	LNDR	-							-	- -	-	22.3N 114.2E	-
8	0521002	20.8N 113.3E	LNDR	-							-	- -	-	22.3N 114.2E	-
9	0600002	20.9N 113.1E	LNDR	-							-	- -	-	22.3N 114.2E	-
10	0600342	20.5N 112.8E	SAT	(T3.0/3.0-/S /24HRS)			PCN 5 DMSP								
11	0602022	21.4N 112.4E	SAT	(T3.0/3.0-/D1.0/24HRS)			NOAA-2								
12	0603102	21.4N 112.4E	LNDR	-							-	- -	-	22.3N 114.2E	-
13	0606002	21.7N 112.1E	LNDR	-							-	- -	-	22.3N 114.2E	-
14	0609002	21.9N 111.4E	LNDR	-							-	- -	-	22.3N 114.2E	-
15	0613152	22.3N 109.9E	SAT	(IR DATA)			PCN 5 DMSP								
16	0613152	22.5N 110.8E	SAT	(IR DATA)			PCN 5 DMSP								
17	0700152	22.6N 107.9E	SAT	(IR DATA)			PCN 5 DMSP								

TYPHOON VIRGINIA
FIX POSITIONS FOR CYCLONE NO. 24
1200Z 12 SEP TO 0000Z 16 SEP

FIX NO.	TIME	POSIT	FIX CAT	ACCNY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TD	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	0921392	22.0N 153.4E	SAT	(T1.0/1.0 / / HRS)			PCN 6 DMSP								
2	1010212	23.0N 152.8E	SAT	(IR DATA)			PCN 6 DMSP								
3	1023022	24.5N 150.8E	SAT	(T1.0/1.0 /S /24HRS)			PCN 5 DMSP								
4	1111442	27.2N 149.8E	SAT	(IR DATA)			PCN 5 DMSP								
5	1122432	28.9N 149.1E	SAT	(T2.0/2.0 /D1.0/24HRS)			PCN 5 DMSP								
6	1211262	30.1N 150.6E	SAT	(IR DATA)			PCN 3 DMSP								
7	1211262	30.5N 150.7E	SAT	(IR DATA)			PCN 5 DMSP								
8	1215102	31.1N 151.2E	SAT	(IR DATA)			PCN 5 DMSP								
9	1218452	31.0N 151.0E	SAT	(IR DATA)			NOAA-2 -		(CONF 01)						
10	1221532	32.0N 152.2E	P	10 2 700 270 80 240			25 70 190	20	980	293	14 11	CIRC		40	1
11	1222262	32.3N 152.3E	SAT	(T4.0/4.0 / / HRS)			PCN 3 DMSP								
12	1302112	32.7N 153.0E	SAT	(IR DATA)			PCN 3 DMSP								
13	1302202	32.6N 152.8E	P	10 3 700 300 75 230			30 80 230	25	980	294	15 11	CIRC		40	1
14	1307502	32.3N 151.6E	SAT	(T3.5/3.5 /S /25HRS)			NON DMSP								
15	1311072	33.8N 153.8E	SAT	(IR DATA)			NOAA-2		(CONF 01)						
16	1311072	33.7N 153.9E	SAT	(IR DATA)			PCN 3 DMSP								
17	1314522	34.2N 154.4E	SAT	(IR DATA)			PCN 5 DMSP								
18	1314572	34.5N 154.2E	P	5 5 700 30 50 320			35 - -	-	975	286	17 10	EYE IR	N-S	60X30	2
19	1320052	34.1N 154.0E	SAT	(IR DATA)			NON DMSP								
20	1322072	35.3N 155.1E	SAT	(T4.0/4.0-/S /24HRS)			PNOAA-2		(CONF 01)						
21	1322072	35.2N 155.2E	SAT	(T4.0/4.0-/ /48HRS)			PCN 1 DMSP								
22	1401522	35.7N 155.7E	SAT	(IR DATA)			PCN 1 DMSP								
23	1403302	35.9N 155.8E	P	10 4 700 330 80 280			30 80 280	70	971	282	16 6	CIRC		40	3
24	1405452	35.3N 155.0E	SAT	(T3.5/3.5 /S /23HRS)			NON DMSP								
25	1407302	36.8N 156.3E	P	- - 700 280 90 180			NOAA-2		(CONF 01)						
26	1410492	37.0N 156.1E	SAT	(IR DATA)			PCN 2 DMSP								
27	1410492	37.0N 156.4E	SAT	(IR DATA)			PCN 3 DMSP								
28	1420392	39.1N 155.8E	SAT	(T3.0/4.0 /W1.0/23HRS)			PCN 1 DMSP								
29	1421492	38.8N 155.4E	SAT	(IR DATA)			PCN 1 DMSP								
30	1501342	39.6N 155.1E	SAT	(IR DATA)			PCN 1 DMSP								
31	1505402	38.2N 154.5E	SAT	(T3.0/3.5 /W0.5/23HRS)			NOAA-2		(CONF 01)						
32	1510312	39.5N 153.5E	SAT	(IR DATA)			PCN 4 DMSP								
33	1520102	40.0N 154.5E	SAT	(IR DATA)			NOAA-2		(CONF 02)						
34	1601152	41.6N 154.5E	SAT	(T1.5/1.5 / / HRS)			PCN 4 DMSP								

TROPICAL STORM WENDY
FIX POSITIONS FOR CYCLONE NO. 25
0600Z 24 SEP TO 0000Z 30 SEP

FIX NO.	TIME	POSIT	FIX CAT	ACCNY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TD	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	1901422	15.6N 145.9E	SAT	(IR DATA)			PCN 5 DMSP								
2	1921042	15.5N 145.6E	SAT	(T1.0/1.0 / / HRS)			PCN 5 DMSP								
3	1921592	15.5N 145.5E	SAT	(IR DATA)			PCN 5 DMSP								
4	2010412	14.5N 144.8E	SAT	(IR DATA)			PCN 6 DMSP								
5	2014232	14.3N 144.6E	SAT	(IR DATA)			PCN 6 DMSP								
6	2020492	15.1N 140.5E	SAT	(T1.0/1.0 /S /24HRS)			PCN 5 DMSP								
7	2023422	16.0N 139.6E	SAT	(IR DATA)			PCN 5 DMSP								
8	2103052	16.0N 139.3E	SAT	(IR DATA)			PCN 5 DMSP								
9	2112042	13.3N 136.6E	SAT	(IR DATA)			PCN 6 DMSP								
10	2123042	13.2N 137.3E	SAT	(IR DATA)			PCN 5 DMSP								
11	2211462	14.2N 132.9E	SAT	(IR DATA)			PCN 6 DMSP								
12	2300272	15.1N 129.3E	SAT	(T1.0/1.0 / / HRS)			PCN 5 DMSP								
13	2400092	17.6N 124.1E	SAT	(T2.0/2.0 / / HRS)			PCN 5 DMSP								
14	2400092	17.8N 124.0E	SAT	(T2.0/2.0 / / HRS)			PCN 5 DMSP								
15	2400092	17.8N 123.9E	SAT	(T2.0/2.0 /D1.0/24HRS)			PCN 5 DMSP								
16	2405532	17.7N 124.1E	P	3 5 700 40 30 320			60 25 20	60	1001	306	8 9	-	- -	-	3
17	2412512	16.5N 122.9E	SAT	(IR DATA)			PCN 3 DMSP								
18	2412512	14.3N 123.0E	SAT	(IR DATA)			PCN 6 DMSP								
19	2412512	16.2N 123.3E	SAT	(IR DATA)			PCN 3 DMSP								
20	2417002	17.8N 122.6E	P	5 5 700 160 50 40			40 - -	-	1003	308	11 10	-	- -	-	4
21	2421522	19.0N 122.7E	P	5 2 700 140 40 40			50 25 40	50	999	304	12 10	-	- -	-	4
22	2423512	16.0N 122.0E	SAT	(T1.5/2.0+/W1.0/24HRS)			PCN 5 DMSP								
23	2423512	16.3N 121.9E	SAT	(T3.0/3.0+/D1.0/24HRS)			PCN 3 DMSP								
24	2423512	14.4N 121.8E	SAT	(T2.0/2.0+/S /24HRS)			PCN 3 DMSP								
25	2503322	19.0N 121.0E	SAT	(IR DATA)			PCN 1 DMSP								
26	2509252	19.1N 120.9E	P	1 2 600 290 40 220			25 30 220	25	995	430	2 -	-	- -	-	5
27	2512322	19.4N 120.7E	SAT	(IR DATA)			PCN 5 DMSP								
28	2512322	19.5N 121.0E	SAT	(IR DATA)			PCN 3 DMSP								
29	2512322	19.3N 120.9E	SAT	(IR DATA)			PCN 5 DMSP								
30	2514522	19.2N 121.2E	P	1 3 600 140 37 50			120 - -	-	998	431	- -	-	- -	-	5
31	2523322	19.2N 120.9E	SAT	(T1.5/2.5-/W1.5/24HRS)			PCN 5 DMSP								
32	2523332	19.9N 120.3E	SAT	(T2.0/2.0+/S /24HRS)			PCN 3 DMSP								

TROPICAL STORM WENDY
FIX POSITIONS FOR CYCLONE NO. 25
0600Z 24 SEP TO 0000Z 30 SEP

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN /DOMN HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
33	2601142	19.8N 119.4E	SAT	(I2.0/2.0 /D0.5/24HRS)						PCN 5	DMSP									
34	2603142	19.8N 120.5E	SAT	(IR DATA)						PCN 3	DMSP									
35	2603362	19.8N 120.9E	P	2 1 700	230	40	130	15	3	140	15	997	-	-	-	CIRC		25		6
36	2609142	20.0N 120.9E	P	2 1 700	170	55	90	35	50	290	15	993	303	14	12	CIRC		30		6
37	2612002	20.1N 120.2E	SAT							NOAA-3		(CONF U1)								
38	2612142	20.6N 120.3E	SAT	(IR DATA)						PCN 4	DMSP									
39	2612142	20.6N 120.7E	SAT	(IR DATA)						PCN 5	DMSP									
40	2615552	21.0N 120.5E	SAT	(IR DATA)						PCN 3	DMSP									
41	2620002	21.2N 120.5E	LMDM	- 6////															22.6N 120.3E	
42	2621002	21.3N 120.6E	LMDM	- 6////															22.6N 120.3E	
43	2622002	21.3N 120.5E	LMDM	- 51111															22.6N 120.3E	
44	2622202	21.0N 120.4E	P	1 1 700	310	50	200	33	4	90	20	992	303	12	10	-	- -	-		7
45	2700002	21.4N 120.5E	LMDM	- /////															22.6N 120.3E	
46	2700562	21.2N 121.1E	SAT	(I3.0/3.0 /D0.5/24HRS)						PCN 3	DMSP									
47	2702562	21.3N 121.0E	SAT	(I4.0/4.0 /D2.0/24HRS)						PCN 3	DMSP									
48	2711002	22.2N 121.8E	LMDM	- 24922															23.9N 121.6E	
49	2712492	22.8N 121.8E	P	2 1 700	270	65	170	20	-	-	-	984	296	17	10	CIRC		20		8
50	2712562	23.0N 122.0E	SAT	(IR DATA)						NOAA-3		(CONF U1)								
51	2713372	22.6N 121.7E	SAT	(IR DATA)						PCN 5	DMSP									
52	2713372	22.8N 122.1E	SAT	(IR DATA)						PCN 3	DMSP									
53	2715362	23.2N 122.1E	SAT	(IR DATA)						PCN 3	DMSP									
54	2715442	23.2N 122.2E	P	2 2 700	290	75	180	25	-	-	-	986	296	17	11	CIRC		35		8
55	2716002	23.3N 122.1E	LMDM	- 7////															24.8N 125.3E	
56	2717002	23.5N 122.1E	LMDM	- 6////															24.3N 124.2E	
57	2717002	23.4N 122.2E	LMDM	- 7////															24.8N 125.3E	
58	2718002	23.4N 122.2E	LMDM	- 10932															23.9N 121.6E	
59	2718002	23.6N 122.1E	LMDM	- 5////															24.3N 124.2E	
60	2718002	23.5N 122.3E	LMDM	- /////															24.8N 125.3E	
61	2719002	23.6N 122.2E	LMDM	-												-	- -	-	24.8N 125.3E	-
62	2719002	23.6N 122.2E	LMDM	- 5////															24.3N 124.2E	
63	2719002	23.7N 122.3E	LMDM	- /////															24.8N 125.3E	
64	2719502	23.7N 122.2E	LMDM	- 21912															23.9N 121.6E	
65	2720002	23.7N 122.2E	LMDM	- 30903															24.3N 124.2E	
66	2720002	23.8N 122.5E	LMDM	- /////															24.8N 125.3E	
67	2720502	23.7N 122.3E	LMDM	- 21922															23.9N 121.6E	
68	2721002	23.8N 122.3E	LMDM	- 7////															24.8N 125.3E	
69	2722002	24.0N 122.5E	LMDM	- 5////															24.8N 125.3E	
70	2722172	23.7N 122.6E	P	1 2 700	290	50	210	35	5	90	10	987	298	14	-	-	- -	-		9
71	2723002	24.0N 122.2E	LMDM	- 5////															24.3N 124.2E	
72	2723002	23.9N 122.5E	LMDM	- 5////															24.8N 125.3E	
73	2800002	24.1N 122.4E	LMDM	- 5////															24.3N 124.2E	
74	2800002	24.0N 122.5E	LMDM	- 5////															24.8N 125.3E	
75	2800382	24.3N 122.8E	SAT	(I3.5/3.5 /D0.5/24HRS)						PCN 3	DMSP									
76	2801002	24.2N 122.5E	LMDM	- 5////															24.3N 124.2E	
77	2801002	24.2N 122.7E	LMDM	- 5////															24.8N 125.3E	
78	2802002	24.3N 122.2E	LMDM	- POOR FIX															26.2N 127.7E	
79	2802002	24.4N 122.6E	LMDM	- 5////															24.3N 124.2E	
80	2802002	24.2N 122.3E	LMDM	- 5////															24.8N 125.3E	
81	2802372	24.5N 122.2E	SAT	(I3.0/4.0 /W1.0/24HRS)						PCN 3	DMSP									
82	2802472	24.5N 122.2E	P	1 3 700	230	70	140	25	-	-	-	986	297	13	-	-	- -	-		9
83	2803002	24.5N 122.6E	LMDM	- 5////															24.3N 124.2E	
84	2803002	24.6N 122.4E	LMDM	- 5////															24.8N 125.3E	
85	2806002	24.8N 122.1E	LMDM	- 5////															24.3N 124.2E	
86	2807002	24.8N 122.1E	LMDM	- 22853															23.9N 121.6E	
87	2807002	24.8N 122.2E	LMDM	- 5////															24.3N 124.2E	
88	2807002	24.7N 122.3E	LMDM	- 5////															24.8N 125.3E	
89	2808002	24.8N 122.2E	LMDM	- 22914															24.3N 124.2E	
90	2808002	24.8N 122.2E	LMDM	- 5////															24.8N 125.3E	
91	2809002	24.9N 122.2E	LMDM	- 20733															23.9N 121.6E	
92	2809002	24.8N 122.3E	LMDM	- 5////															24.8N 125.3E	
93	2809002	24.9N 122.2E	LMDM	- 21874															24.3N 124.2E	
94	2809002	24.8N 122.1E	LMDM	- POOR FIX															26.2N 127.7E	
95	2810002	24.9N 122.1E	LMDM	- 55//4															24.3N 124.2E	
96	2810002	24.9N 122.2E	LMDM	- 6///															24.8N 125.3E	
97	2811002	24.9N 121.8E	LMDM	- POOR FIX															26.2N 127.7E	
98	2811002	25.1N 121.9E	LMDM	- 5////															24.8N 125.3E	
99	2811572	25.0N 123.0E	SAT	(IR DATA)						NOAA-3		(CONF U1)								
100	2812002	25.0N 121.9E	LMDM	-												-	- -	-	24.3N 124.2E	-
101	2812002	25.0N 121.7E	LMDM	- 5////															24.8N 125.3E	
102	2813002	25.0N 121.6E	LMDM	- 5////															24.3N 124.2E	
103	2813192	24.9N 121.8E	SAT	(IR DATA)						PCN 3	DMSP									
104	2813592	25.5N 122.5E	P	5 10 700	160	45	70	40	-	-	-	-	-	-	-	-	- -	-		10
105	2900192	25.2N 120.9E	SAT	(IR DATA)						PCN 3	DMSP									
106	2900192	25.1N 120.8E	SAT	(T1.5/2.5 /W1.0/24HRS)						PCN 3	DMSP									
107	2900192	25.2N 120.6E	SAT	(I3.0/3.0 / / HRS)						PCN 3	DMSP									
108	2903592	24.8N 120.7E	SAT	(I1.5/3.0 / / HRS)						PCN 3	DMSP									
109	2903592	25.0N 120.6E	SAT	(IR DATA)						PCN 3	DMSP									
110	2913012	25.4N 120.7E	SAT	(IR DATA)						PCN 5	DMSP									
111	2913012	25.5N 120.6E	SAT	(IR DATA)						PCN 5	DMSP									
112	2913012	25.4N 121.1E	SAT	(IR DATA)						PCN 5	DMSP									
113	3000012	26.0N 120.1E	SAT	(T1.0/1.5 /W0.5/24HRS)						PCN 5	DMSP									
114	3000012	25.9N 121.2E	SAT	(I1.5/2.5 /W1.5/24HRS)						PCN 5	DMSP									
115	3000012	26.0N 121.0E	SAT	(T1.5/2.5-/W1.5/24HRS)						PCN 3	DMSP									
116	3003412	25.9N 121.5E	SAT	(IR DATA)						PCN 3	DMSP									
117	3003412	25.8N 121.4E	SAT	(IR DATA)						PCN 3	DMSP									

TYPHOON AGNES
FIX POSITIONS FOR CYCLONE NO. 26
1800Z 24 SEP TO 0000Z 02 OCT

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN RDOMB MGT	FLT LVL TI/TD	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	2010172	14.5N 145.0E	SAT	(IR DATA		)				NOAA-3			(CONF 01)							
2	2010412	15.8N 159.0E	SAT	(IR DATA		)				PCN 6	OMSP									
3	2020492	16.0N 160.0E	SAT	(IR DATA		)				PCN 5	OMSP									
4	2021412	16.1N 159.6E	SAT	(11.0/1.0 /	/	HRS)				PCN 5	OMSP									
5	2100302	15.0N 140.0E	SAT	(11.5/2.5 /W1.5/25HRS)						NOAA-3			(CONF 02)							
6	2101242	17.6N 162.1E	SAT	(IR DATA		)				PCN 5	OMSP									
7	2110222	16.2N 159.3E	SAT	(IR DATA		)				PCN 6	OMSP									
8	2111132	15.0N 138.0E	SAT	(IR DATA		)				NOAA-3			(CONF 02)							
9	2120332	17.2N 157.0E	SAT	(IR DATA		)				PCN 5	OMSP									
10	2121332	17.2N 157.0E	SAT	(11.0/1.0 /S	/24HRS)					PCN 5	OMSP									
11	2210042	21.0N 158.3E	SAT	(IR DATA		)				PCN 6	OMSP									
12	2220182	22.3N 158.6E	SAT	(IR DATA		)				PCN 6	OMSP									
13	2221042	22.3N 158.4E	SAT	(T 0/2.0 /	/	HRS)				PCN 4	OMSP									
14	2222272	22.2N 157.8E	SAT	(11.5/1.5 /D0.5/25HRS)						NOAA-3			(CONF 01)							
15	2300462	22.5N 157.9E	SAT	(IR DATA		)				PCN 3	OMSP									
16	2309152	22.0N 156.2E	SAT	(IR DATA		)				NOAA-3			(CONF 02)							
17	2309462	22.5N 157.8E	SAT	(IR DATA		)				PCN 6	OMSP									
18	2320022	22.5N 154.8E	SAT	(12.0/2.0 /S	/23HRS)					PCN 3	OMSP									
19	2322282	22.3N 155.3E	SAT	(12.0/2.0 /	/	HRS)				PCN 3	OMSP									
20	2322282	22.4N 155.0E	SAT	(IR DATA		)				PCN 3	OMSP									
21	2323222	22.8N 156.1E	SAT	(T2.5/2.5 /D0.5/24HRS)						NOAA-3			(CONF 01)							
22	2400002	22.4N 155.4E	P	10	10	700	20	25	340	40	20	90	20	999	308	25	-	-	- -	-	2
23	2411092	23.1N 156.2E	SAT	(IR DATA		)				PCN 5	OMSP									
24	2411092	22.7N 154.9E	SAT	(IR DATA		)				PCN 3	OMSP									
25	2419472	22.9N 153.9E	SAT	(T2.5/2.5 /D0.5/24HRS)						PCN 5	OMSP									
26	2422092	23.0N 153.5E	SAT	(T2.5/2.5 /D0.5/24HRS)						PCN 5	OMSP									
27	2422092	23.4N 154.0E	SAT	(IR DATA		)				PCN 3	OMSP									
28	2423222	23.9N 154.9E	SAT	(T3.5/3.5 /D1.0/23HRS)						NOAA-3			(CONF 01)							
29	2508302	23.6N 154.0E	SAT	(IR DATA		)				PCN 2	OMSP									
30	2509112	23.9N 155.0E	SAT	(IR DATA		)				NOAA-3			(CONF 02)							
31	2510512	24.3N 153.9E	SAT	(IR DATA		)				PCN 6	OMSP									
32	2510512	23.7N 153.9E	SAT	(IR DATA		)				PCN 5	OMSP									
33	2516502	23.9N 153.2E	P	3	7	700	360	40	260	50	-	-	-	997	307	18	15	-	- -	-	3
34	2520002	24.0N 153.0E	P	5	5	700	150	45	250	100	30	60	70	996	306	18	14	-	- -	-	3
35	2521512	24.5N 152.6E	SAT	(T4.0/4.0+/D1.5/24HRS)						PCN 3	OMSP									
36	2521512	24.5N 152.7E	SAT	(T3.5/3.5 /D1.0/26HRS)						PCN 3	OMSP									
37	2523172	24.2N 152.6E	SAT	(T4.0/4.0 /D0.5/23HRS)						NOAA-3			(CONF 01)							
38	2601322	24.6N 152.3E	SAT	(IR DATA		)				PCN 3	OMSP									
39	2610062	25.0N 152.2E	SAT	(IR DATA		)				NOAA-3			(CONF 01)							
40	2610332	24.6N 151.7E	SAT	(IR DATA		)				PCN 4	OMSP									
41	2610332	24.6N 151.8E	SAT	(IR DATA		)				PCN 5	OMSP									
42	2614502	24.5N 151.9E	P	3	5	700	40	70	270	15	-	-	-	984	296	18	12	-	- -	-	5
43	2620582	24.7N 151.4E	SAT	(IR DATA		)				PCN 5	OMSP									
44	2621332	24.7N 150.9E	SAT	(T4.5/4.5 /D1.0/24HRS)						PCN 3	OMSP									
45	2621342	24.6N 151.0E	SAT	(T4.5/4.5 /D0.5/24HRS)						PCN 3	OMSP									
46	2622172	24.8N 150.9E	SAT	(T5.0/5.0 /D1.0/23HRS)						NOAA-3			(CONF 01)							
47	2701142	24.9N 150.9E	SAT	(IR DATA		)				PCN 3	OMSP									
48	2702312	25.2N 150.8E	P	20	3	700	40	60	330	18	70	330	30	978	292	17	14	CIRC	30		6
49	2709412	25.2N 150.0E	SAT	(IR DATA		)				PCN 5	OMSP									
50	2709412	25.4N 150.6E	SAT	(IR DATA		)				PCN 5	OMSP									
51	2710142	25.4N 150.7E	SAT	(IR DATA		)				PCN 5	OMSP									
52	2711562	25.2N 150.4E	SAT	(IR DATA		)				PCN 5	OMSP									
53	2711562	25.3N 150.6E	SAT	(IR DATA		)				PCN 5	OMSP									
54	2713552	25.7N 150.3E	SAT	(IR DATA		)				PCN 5	OMSP									
55	2718272	26.3N 150.5E	P	7	5	700	330	65	240	40	-	-	-	970	285	20	11	CIRC	40		7
56	2720432	26.3N 151.0E	SAT	(T4.0/4.5 /W0.5/23HRS)						PCN 3	OMSP									
57	2722562	26.2N 150.7E	SAT	(T4.0/4.5 /W0.5/25HRS)						PCN 3	OMSP									
58	2722562	26.2N 150.8E	SAT	(IR DATA		)				PCN 3	OMSP									
59	2723112	26.0N 150.1E	SAT	(T5.0/5.0 /S	/24HRS)					NOAA-3			(CONF 01)							
60	2800332	26.5N 150.5E	SAT	(IR DATA		)				PCN 3	OMSP									
61	2803502	26.9N 150.3E	P	10	5	700	290	65	190	50	60	190	50	968	283	16	16	-	- -	-	8
62	2809252	28.1N 150.9E	SAT	(IR DATA		)				PCN 6	OMSP									
63	2809252	27.6N 150.5E	SAT	(IR DATA		)				PCN 4	OMSP									
64	2811382	27.8N 150.5E	SAT	(IR DATA		)				PCN 5	OMSP									
65	2811382	27.8N 150.5E	SAT	(IR DATA		)				PCN 5	OMSP									
66	2813362	28.3N 150.5E	SAT	(IR DATA		)				PCN 5	OMSP									
67	2817152	28.7N 150.4E	P	5	10	700	260	75	180	45	-	-	-	970	285	16	12	-	- -	-	9
68	2820272	28.9N 150.8E	SAT	(T4.0/4.0-/S	/24HRS)					PCN 3	OMSP									
69	2822112	29.2N 150.5E	SAT	(T4.5/5.0 /W0.5/24HRS)						NOAA-3			(CONF 02)							
70	2822382	29.2N 151.7E	SAT	(T4.5/4.5-/D1.0/24HRS)						PCN 4	OMSP									
71	2823382	29.2N 151.6E	SAT	(IR DATA		)				PCN 5	OMSP									
72	2900362	29.6N 151.6E	SAT	(IR DATA		)				PCN 3	OMSP									
73	2903182	29.8N 152.2E	P	10	2	700	290	65	240	105	50	10	60	968	284	16	17	-	- -	-	10
74	2909092	30.2N 153.3E	SAT	(IR DATA		)				PCN 6	OMSP									
75	2909102	29.9N 153.2E	SAT	(IR DATA		)				PCN 6	OMSP									
76	2911192	29.7N 153.4E	SAT	(IR DATA		)				PCN 5	OMSP									
77	2911192	29.9N 153.5E	SAT	(IR DATA		)				PCN 5	OMSP									
78	2914592	30.1N 154.2E	SAT	(IR DATA		)				PCN 5	OMSP									
79	2915152	30.0N 154.0E	P	2	2	700	350	65	260	90	-	-	-	-	-	16	-	- -	-		11
80	2920122	30.7N 155.0E	SAT	(T3.0/4.0 /W1.0/24HRS)						PCN 3	OMSP									
81	2922192	30.4N 155.7E	SAT	(T5.0/5.0 /D0.5/24HRS)						PCN 3	OMSP									
82	2922192	30.7N 155.4E	SAT	(IR DATA		)				PCN 3	OMSP									
83	3003032	30.7N 156.5E	P	20	2	700	300	105	210	75	100	190	55	961	277	16	14	CIRC	20		12
84	3008542	32.3N 158.6E	SAT	(IR DATA		)				PCN 6	OMSP									
85	3008542	31.9N 158.7E	SAT	(IR DATA		)				PCN 6	OMSP									
86	3009582	32.6N 159.8E	SAT	(IR DATA		)				NOAA-3			(CONF 01)							
87	3011012	32.3N 159.5E	SAT	(IR DATA		)				PCN 3	OMSP									
88	3011012	32.2N 159.1E	SAT	(IR DATA		)				PCN 3	OMSP									
89	3014412	32.5N 160.9E	SAT	(IR DATA		)				PCN 5	OMSP									
90	3014412	32.5N 160.4E	SAT	(IR DATA		)				PCN 3	OMSP									
91	3014472	33.3N 161.8E	P	5	5	700	330	85	250	130	60	250	130	963	276	17	14	-	- -	-	13
92	3019562	33.8N 161.5E	SAT	(T4.0/5.0-/W1.0/24HRS)						PCN 4	OMSP									
93	3019562	34.1N 162.8E	SAT	(IR DATA		)				PCN 3	OMSP									
94	3020252	33.9N 162.1E	SAT	(T2.5/2.5 /	/	HRS)				PCN 4	OMSP									
95	3022012	34.3N 163.3E	SAT	(T3.0/4.0-/W2.0/24HRS)						PCN 5	OMSP									
96	3022012	34.4N 163.6E	SAT	(T4.0/4.0 /S	/26HRS)					PCN 3	OMSP									
97	3022052	34.8N 162.6E	SAT	(T4.0/4.0 /W0.5/23HRS)						NOAA-3			(CONF 01)							
98	0104152	36.3N 164.5E	P	2	3	700	270	110	210	60	110	10	60	970	277	13	17	-	- -	-	14
99	0108392	36.5N 166.5E	SAT	(IR DATA		)				PCN 6	OMSP									
100	0109012	37.0N 168.0E	SAT	(IR DATA		)				NOAA-3			(CONF 01)							
101	0110432	38.4N 167.8E	SAT	(IR DATA		)				PCN 6	OMSP									
102	0114222	39.8N 169.4E	SAT	(IR DATA		)				PCN 6	OMSP									

TYPHOON BESS
FIX POSITIONS FOR CYCLONE NO. 27
0600Z 08 OCT TO 0600Z 14 OCT

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN /100MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	052258Z	10.0N 149.0E	SAT	(T1.5/1.5 /D0.5/24HRS)						NOAA-3			(CONF 01)							
2	061132Z	11.0N 146.0E	SAT	(IR DATA					)	NOAA-3			(CONF 03)							
3	062335Z	10.0N 143.7E	SAT	(T1.0/1.0 / / HRS)						PCN 5 DMSP										
4	062353Z	10.5N 142.4E	SAT	(T2.0/2.0 /D0.5/25HRS)						NOAA-3			(CONF 01)							
5	070131Z	10.0N 143.2E	SAT	(IR DATA					)	PCN 5 DMSP										
6	071034Z	11.0N 139.0E	SAT	(IR DATA					)	NOAA-3			(CONF 01)							
7	071216Z	10.6N 136.5E	SAT	(IR DATA					)	PCN 5 DMSP										
8	071332Z	11.8N 136.9E	SAT	(T1.5/1.5 /D0.5/22HRS)						PCN 5 DMSP										
9	072253Z	11.0N 136.0E	SAT	(T2.5/2.5 /D0.5/24HRS)						NOAA-3			(CONF 02)							
10	072316Z	12.0N 136.5E	SAT	(IR DATA					)	PCN 5 DMSP										
11	072316Z	11.8N 135.1E	SAT	(T1.5/1.5 / / HRS)						PCN 5 DMSP										
12	080254Z	11.9N 135.9E	SAT	(IR DATA					)	PCN 3 DMSP										
13	080440Z	11.9N 135.3E	P	3 3 1500	140	30	70	30	30	30	20	999	-	25	25	-	- -	-		1
14	080920Z	12.0N 134.1E	P	2 8 700	140	45	40	100	35	70	100	1003	308	10	11	-	- -	-		1
15	081014Z	13.1N 133.0E	SAT	(IR DATA					)	PCN 6 DMSP										
16	081015Z	12.1N 133.6E	SAT	(IR DATA					)	PCN 6 DMSP										
17	081127Z	13.2N 133.5E	SAT	(IR DATA					)	NOAA-3			(CONF 02)							
18	081158Z	12.3N 133.4E	SAT	(IR DATA					)	PCN 5 DMSP										
19	081535Z	12.6N 133.2E	SAT	(IR DATA					)	PCN 5 DMSP										
20	081740Z	12.7N 131.6E	P	2 5 700	320	20	100	20	-	-	-	1002	307	8	8	CIRC		35		2
21	082058Z	13.0N 130.2E	P	2 2 700	320	30	120	30	-	-	-	999	308	10	9	CIRC		30		2
22	082116Z	13.5N 130.7E	SAT	(IR DATA					)	PCN 5 DMSP										
23	082258Z	15.4N 132.3E	SAT	(T2.5/2.5 /D1.0/24HRS)						PCN 5 DMSP										
24	082300Z	15.7N 131.8E	SAT	(T2.0/2.0 /D0.5/26HRS)						PCN 5 DMSP										
25	082347Z	13.5N 130.6E	SAT	(T2.5/2.5 /S /23HRS)						NOAA-3			(CONF 02)							
26	090235Z	16.0N 130.7E	SAT	(IR DATA					)	PCN 5 DMSP										
27	090235Z	16.4N 131.1E	SAT	(IR DATA					)	PCN 5 DMSP										
28	090320Z	16.0N 130.3E	P	15 10 700	170	50	120	57	35	120	30	998	306	11	10	ELIP	SE-NW	40X15		3
29	090830Z	16.2N 128.8E	P	10 40 700	-	-	-	-	40	340	72	995	305	12	-	-	- -	-		3
30	090959Z	16.7N 128.1E	SAT	(IR DATA					)	PCN 6 DMSP										
31	090959Z	16.1N 128.4E	SAT	(IR DATA					)	PCN 5 DMSP										
32	091139Z	16.3N 127.6E	SAT	(IR DATA					)	PCN 5 DMSP										
33	091139Z	15.9N 127.6E	SAT	(IR DATA					)	PCN 5 DMSP										
34	091225Z	16.0N 128.0E	SAT	(IR DATA					)	NOAA-3			(CONF 02)							
35	091517Z	16.3N 126.8E	SAT	(IR DATA					)	PCN 5 DMSP										
36	091517Z	16.2N 126.7E	SAT	(IR DATA					)	PCN 5 DMSP										
37	091730Z	15.9N 127.6E	P	5 5 700	190	30	90	47	-	-	-	987	297	13	-	-	- -	-		4
38	092224Z	16.7N 126.5E	P	5 5 700	160	60	80	100	5	80	100	986	298	13	-	-	- -	-		4
39	100021Z	16.6N 126.4E	SAT	(T3.0/3.0 /D1.0/25HRS)						PCN 3 DMSP										
40	100345Z	16.7N 125.5E	P	3 1 700	140	60	70	85	65	70	100	985	297	13	13	-	- -	-		5
41	100358Z	15.6N 126.3E	SAT	(T3.0/3.0 / / HRS)						PCN 5 DMSP										
42	100907Z	17.2N 125.2E	P	2 2 700	160	65	50	50	75	130	70	980	293	14	12	CIRC		20		5
43	101303Z	17.1N 124.6E	SAT	(IR DATA					)	PCN 5 DMSP										
44	101319Z	16.0N 124.0E	SAT	(IR DATA					)	NOAA-3			(CONF 01)							
45	101645Z	17.6N 123.3E	P	10 25 700	190	35	90	20	-	-	-	981	288	17	15	-	- -	-		6
46	102227Z	17.5N 122.7E	SAT	(T5.0/5.0-/D2.0/22HRS)						PCN 3 DMSP										
47	102227Z	17.1N 122.5E	SAT	(T5.5/5.5 / / HRS)						PCN 2 DMSP										
48	102227Z	17.5N 122.5E	SAT	(T3.5/3.5-/D0.5/18HRS)						PCN 4 DMSP										1
49	110003Z	18.1N 122.1E	SAT	(IR DATA					)	PCN 3 DMSP										
50	110003Z	18.0N 122.2E	SAT	(T5.0/5.0-/ / HRS)						PCN 3 DMSP										
51	110003Z	17.8N 122.2E	SAT	(IR DATA					)	PCN 2 DMSP										
52	110136Z	18.0N 121.3E	SAT	(T4.0/4.0 /D1.5/25HRS)						NOAA-3			(CONF 01)							
53	110340Z	17.9N 121.0E	SAT	(IR DATA					)	PCN 5 DMSP										
54	110340Z	17.7N 121.3E	SAT	(IR DATA					)	PCN 2 DMSP										
55	110340Z	18.0N 121.9E	SAT	(IR DATA					)	PCN 4 DMSP										
56	111110Z	19.5N 119.9E	SAT	(IR DATA					)	PCN 6 DMSP										
57	111110Z	18.5N 119.4E	SAT	(IR DATA					)	PCN 6 DMSP										
58	111221Z	18.0N 120.0E	SAT	(IR DATA					)	NOAA-3			(CONF 02)							
59	111244Z	18.6N 119.6E	SAT	(IR DATA					)	PCN 3 DMSP										
60	111621Z	19.0N 119.1E	SAT	(IR DATA					)	PCN 5 DMSP										
61	111645Z	19.2N 119.5E	P	2 2 700	230	60	170	50	-	-	-	982	293	13	13	-	- -	-		7
62	112212Z	19.0N 118.5E	SAT	(IR DATA					)	PCN 5 DMSP										
63	112233Z	18.8N 118.5E	P	2 1 700	130	75	30	80	5	30	30	980	293	13	13	-	- -	-		7
64	112344Z	18.5N 118.0E	SAT	(T3.5/4.5+/W1.5/25HRS)						PCN 5 DMSP										
65	120036Z	19.0N 118.0E	SAT	(T3.5/4.0+/W0.5/25HRS)						NOAA-3			(CONF 01)							
66	120126Z	19.3N 119.0E	SAT	(T4.5/4.5+/D0.5/24HRS)						PCN 5 DMSP										
67	120321Z	19.1N 117.8E	SAT	(IR DATA					)	PCN 3 DMSP										
68	120321Z	19.0N 118.1E	SAT	(IR DATA					)	PCN 5 DMSP										
69	120941Z	19.1N 117.1E	P	5 3 700	230	75	120	40	5	120	45	982	294	15	13	-	- -	-		8
70	121055Z	19.0N 117.5E	SAT	(IR DATA					)	PCN 6 DMSP										
71	121055Z	19.8N 116.9E	SAT	(IR DATA					)	PCN 6 DMSP										
72	121055Z	17.8N 116.3E	SAT	(IR DATA					)	PCN 6 DMSP										
73	121226Z	19.0N 117.3E	SAT	(IR DATA					)	PCN 5 DMSP										
74	121226Z	19.3N 116.8E	SAT	(IR DATA					)	PCN 5 DMSP										
75	121316Z	19.5N 114.8E	SAT	(IR DATA					)	NOAA-3			(CONF 02)							
76	121602Z	19.4N 116.1E	SAT	(IR DATA					)	PCN 5 DMSP										
77	121602Z	19.2N 114.5E	SAT	(IR DATA					)	PCN 6 DMSP										
78	121602Z	20.0N 114.0E	SAT	(IR DATA					)	PCN 5 DMSP										
79	122338Z	19.2N 112.5E	SAT	(IR DATA					)	PCN 5 DMSP										
80	122338Z	20.0N 112.9E	SAT	(T2.5/3.0 /W2.0/22HRS)						PCN 6 DMSP										
81	130108Z	19.1N 113.2E	SAT	(T3.0/3.0 / / HRS)						PCN 3 DMSP										
82	130108Z	19.9N 112.2E	SAT	(IR DATA					)	PCN 5 DMSP										
83	130130Z	19.2N 111.1E	SAT	(T2.0/3.0 /W1.0/23HRS)						NOAA-3			(CONF 02)							
84	130444Z	19.0N 112.8E	SAT	(IR DATA					)	PCN 3 DMSP										
85	130444Z	18.9N 112.6E	SAT	(IR DATA					)	PCN 3 DMSP										
86	131217Z	20.2N 110.0E	SAT	(IR DATA					)	NOAA-3			(CONF 02)							
87	131221Z	19.3N 110.6E	SAT	(IR DATA					)	PCN 6 DMSP										
88	131221Z	19.8N 110.0E	SAT	(IR DATA					)	PCN 6 DMSP										
89	131349Z	18.6N 109.9E	SAT	(IR DATA					)	PCN 5 DMSP										
90	131725Z	19.0N 108.2E	SAT	(IR DATA					)	PCN 5 DMSP										
91	132333Z	19.1N 107.2E	SAT	(T1.0/1.5-/W1.0/24HRS)						PCN 5 DMSP										
92	140033Z	12.8N 133.5E	SAT	(T2.0/2.0 /D0.5/24HRS)						NOAA-3			(CONF 02)							
93	140050Z	19.1N 106.6E	SAT	(T1.5/2.5 /W1.5/24HRS)						PCN 5 DMSP										
94	140050Z	19.1N 107.1E	SAT	(IR DATA					)	PCN 5 DMSP										
95	140425Z	19.1N 107.1E	SAT	(IR DATA					)	PCN 5 DMSP										
96	141114Z	11.7N 131.5E	SAT	(IR DATA					)	NOAA-3			(CONF 02)							

TYPHOON CARMEN
FIX POSITIONS FOR CYCLONE NO. 28
1200Z 14 OCT TO 1200Z 19 OCT

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/ID	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF HAVAR	MSN NMBR
1	1223Z6Z	12.2N 132.8E	SAT	(T1.0/1.0 / / HRS)			PCN 5 DMSP								
2	1303UZZ	12.2N 132.4E	SAT	(IR DATA)			PCN 5 DMSP								
3	1310U9Z	11.5N 132.9E	SAT	(IR DATA)			PCN 6 DMSP								
4	1311S7Z	21.2N 114.5E	SAT	(IR DATA)			NOAA-3 (CONF 01)								
5	1312U8Z	11.5N 132.3E	SAT	(IR DATA)			PCN 6 DMSP								
6	1315U4Z	11.5N 133.0E	SAT	(IR DATA)			PCN 6 DMSP								
7	1321U1Z	11.7N 131.6E	SAT	(T1.5/1.5 /D0.5/22HRS)			PCN 5 DMSP								
8	1323U8Z	11.3N 133.1E	SAT	(T1.0/1.0 / / HRS)			PCN 5 DMSP								
9	1323U8Z	11.7N 131.6E	SAT	(IR DATA)			PCN 5 DMSP								
10	1402U4Z	12.5N 131.5E	SAT	(IR DATA)			PCN 5 DMSP								
11	1410U4Z	11.7N 130.3E	SAT	(IR DATA)			PCN 6 DMSP								
12	1411U9Z	12.1N 130.2E	SAT	(IR DATA)			PCN 5 DMSP								
13	1415U5Z	12.0N 129.0E	SAT	(IR DATA)			PCN 6 DMSP								
14	1415U5Z	12.2N 129.8E	SAT	(IR DATA)			PCN 5 DMSP								
15	1423U7Z	12.4N 126.0E	SAT	(IR DATA)			PCN 6 DMSP								
16	1500U1Z	11.6N 126.8E	SAT	(T2.5/2.5 / / HRS)			PCN 5 DMSP								
17	1500U1Z	11.8N 128.1E	SAT	(T3.0/3.0-/D1.5/27HRS)			PCN 5 DMSP								
18	1502U5Z	12.5N 128.0E	SAT	(IR DATA)			PCN 5 DMSP								
19	1510U9Z	13.4N 126.9E	SAT	(IR DATA)			PCN 5 DMSP								
20	1512Z8Z	13.4N 125.3E	P	5 20 700 - - -			- - -	993	303	14 -	-	- -	-		2
21	1515U7Z	14.4N 125.7E	SAT	(IR DATA)			PCN 5 DMSP								
22	1515U7Z	14.7N 125.2E	SAT	(IR DATA)			PCN 5 DMSP								
23	1515Z8Z	14.3N 125.0E	P	5 5 700 110 55 30			80 - - -	985	300	12 8	-	- -	-		2
24	1522U0Z	14.7N 123.8E	LMDR	- 1450Z											
25	1522S2Z	16.0N 123.6E	SAT	(IR DATA)			PCN 6 DMSP							13.1N 123.7E	
26	1600I3Z	15.4N 123.7E	SAT	(T4.5/4.5-/ / HRS)			PCN 1 DMSP								
27	1600I3Z	15.5N 123.8E	SAT	(T4.5/4.5-/D1.5/24HRS)			PCN 1 DMSP								
28	1602I0Z	15.5N 123.4E	LMDR	- CIRCULAR EYE 40 NM DIAM, 90 PERCENT WALL CLOUD										18.1N 120.5E	
29	1603O0Z	15.6N 123.1E	LMDR	- ELLIPTICAL EYE NW-SE, 60 PERCENT WALL CLOUD										18.1N 120.5E	
30	1603H8Z	15.4N 123.6E	SAT	(T5.0/5.0 / / HRS)			PCN 1 DMSP								
31	1604O0Z	15.6N 122.9E	LMDR	- ELLIPTICAL EYE, 50 PERCENT WALL CLOUD										18.1N 120.5E	
32	1604H8Z	15.4N 122.9E	P	5 5 700 170 62 100			80 60 100 110	974	289	14 10	ELIP	N-S	50X40		3
33	1607I0Z	16.3N 122.7E	LMDR	- CIRCULAR EYE, 40 NM DIAM, 80 PERCENT WALL CLOUD										18.1N 120.5E	
34	1608I0Z	16.6N 122.6E	LMDR	- ELLIPTICAL EYE, NEG WALL WALL CLOUD										18.1N 120.5E	
35	1609I0Z	16.3N 122.3E	LMDR	- POSSIBLE EYE, HEAVY ATTENUATION										18.1N 120.5E	
36	1611I1Z	17.0N 121.8E	SAT	(IR DATA)			NOAA-3 (CONF 02)								
37	1611I5Z	16.4N 121.1E	SAT	(IR DATA)			PCN 4 DMSP								
38	1612S4Z	16.3N 121.9E	SAT	(IR DATA)			PCN 6 DMSP								
39	1612S4Z	16.9N 121.4E	SAT	(IR DATA)			PCN 5 DMSP								
40	1616I0Z	16.9N 120.1E	SAT	(IR DATA)			PCN 1 DMSP								
41	1619I0Z	17.4N 119.8E	LMDR	- CIRCULAR EYE, 30 NM DIAM, 60 PERCENT WALL CLOUD										16.6N 120.3E	
42	1622I7Z	17.3N 119.1E	SAT	(T4.0/5.0-/D1.0/24HRS)			PCN 1 DMSP								
43	1622I7Z	18.0N 118.6E	SAT	(IR DATA)			PCN 3 DMSP								
44	1622I7Z	17.8N 118.4E	SAT	(T4.5/5.0-/W0.5/19HRS)			PCN 1 DMSP								
45	1623S5Z	18.5N 118.6E	SAT	(T2.5/3.5-/W1.0/24HRS)			PCN 5 DMSP								
46	1623S5Z	18.0N 118.3E	SAT	(T4.5/4.5+/W0.5/24HRS)			PCN 1 DMSP								
47	1703Z9Z	18.4N 117.2E	SAT	(T5.0/5.5+/D0.5/24HRS)			PCN 1 DMSP								
48	1703U0Z	18.4N 117.8E	SAT	(T2.5/3.5-/W1.0/24HRS)			PCN 3 DMSP								
49	1703U0Z	18.4N 117.8E	SAT	(IR DATA)			PCN 3 DMSP								
50	1703U0Z	18.4N 117.9E	SAT	(IR DATA)			PCN 1 DMSP								
51	1703U0Z	18.1N 117.6E	SAT	(IR DATA)			PCN 3 DMSP								
52	1705I1Z	18.4N 117.5E	P	3 5 700 170 45 70			100 50 70 85	980	292	14 13	-	- -	-		4
53	1709U8Z	18.6N 116.9E	P	5 5 700 130 48 50			60 55 50 80	979	291	14 12	ELIP	N-S	70X40		4
54	1711U0Z	18.7N 116.8E	SAT	(IR DATA)			PCN 2 DMSP								
55	1711U0Z	18.5N 116.8E	SAT	(IR DATA)			PCN 4 DMSP								
56	1712I6Z	18.9N 116.5E	SAT				PCN 2 DMSP								
57	1712I6Z	19.2N 116.4E	SAT	(IR DATA)			PCN 1 DMSP								
58	1712I6Z	18.9N 116.6E	SAT	(IR DATA)			PCN 1 DMSP								
59	1712H3Z	20.0N 117.0E	SAT	(IR DATA)			NOAA-3 (CONF 01)								
60	1716I1Z	19.0N 116.0E	SAT				PCN 2 DMSP								
61	1716I1Z	19.6N 116.2E	SAT	(IR DATA)			PCN 6 DMSP								
62	1716I1Z	19.3N 116.1E	SAT	(IR DATA)			PCN 3 DMSP								
63	1716I1Z	19.1N 115.8E	SAT	(IR DATA)			PCN 5 DMSP								
64	1718U0Z	19.8N 115.9E	LMDR	- /////											
65	1722I1Z	19.7N 115.6E	SAT	(IR DATA)			PCN 3 DMSP							22.3N 114.2E	
66	1722I1Z	19.4N 115.3E	SAT	(T5.5/5.5 /D1.0/24HRS)			PCN 2 DMSP								
67	1800U0Z	20.2N 115.3E	LMDR	- 20974										22.3N 114.2E	
68	1802U0Z	20.1N 114.7E	LMDR	- 35774										22.3N 114.2E	
69	1803U0Z	20.1N 114.8E	LMDR	- /////										22.3N 114.2E	
70	1803I1Z	20.1N 115.4E	SAT	(T4.5/4.5 /D2.0/27HRS)			PCN 3 DMSP								
71	1803I1Z	19.9N 115.3E	SAT	(T5.0/5.0-/D0.5/27HRS)			PCN 1 DMSP								
72	1803I1Z	19.9N 115.5E	SAT	(IR DATA)			PCN 3 DMSP								
73	1804U0Z	20.3N 114.9E	LMDR	- /////										22.3N 114.2E	
74	1806U0Z	20.5N 115.1E	LMDR	- /////										22.3N 114.2E	
75	1807U0Z	20.3N 115.0E	LMDR	- /////										22.3N 114.2E	
76	1808U0Z	20.3N 114.9E	LMDR	- /////										22.3N 114.2E	
77	1809U0Z	20.3N 114.9E	LMDR	- /////										22.3N 114.2E	
78	1810U0Z	20.4N 114.8E	LMDR	- 20974										22.3N 114.2E	
79	1811U0Z	20.5N 114.8E	LMDR	- 20974										22.3N 114.2E	
80	1811U4Z	20.0N 114.2E	SAT				PCN 2 DMSP								
81	1811U4Z	20.3N 114.8E	SAT	(IR DATA)			PCN 2 DMSP								
82	1811U4Z	20.3N 114.6E	SAT	(IR DATA)			PCN 2 DMSP								
83	1812U0Z	20.5N 114.5E	LMDR	- 20973											
84	1813U0Z	20.5N 114.3E	LMDR	- 20974										22.3N 114.2E	
85	1814U0Z	20.5N 114.6E	LMDR	- 21914										22.3N 114.2E	
86	1815U0Z	20.5N 114.5E	LMDR	- 21923										22.3N 114.2E	
87	1815S2Z	20.8N 114.5E	SAT	(IR DATA)			PCN 1 DMSP							22.3N 114.2E	
88	1815S2Z	20.6N 114.3E	SAT	(IR DATA)			PCN 1 DMSP								
89	1815S2Z	20.6N 114.0E	SAT	(IR DATA)			PCN 3 DMSP								
90	1816U0Z	20.6N 114.4E	LMDR	- 21923											
91	1817U0Z	20.6N 114.3E	LMDR	- 21923										22.3N 114.2E	
92	1818U0Z	20.7N 114.2E	LMDR	- 21923										22.3N 114.2E	
93	1819U0Z	20.8N 114.2E	LMDR	- 21923										22.3N 114.2E	
94	1820U0Z	20.9N 114.2E	LMDR	- 20983										22.3N 114.2E	
95	1823U0Z	21.2N 113.8E	LMDR	- 20923										22.3N 114.2E	
96	1823H8Z	21.4N 114.7E	SAT	(IR DATA)			PCN 5 DMSP								
97	1900I9Z	20.5N 112.8E	SAT	(T4.0/4.0 / /23HRS)			NOAA-3 (CONF 01)								
98	1901U0Z	21.2N 113.0E	LMDR	- 20913										22.3N 114.2E	
99	1901U0Z	21.1N 113.4E	SAT	(T5.5/5.5-/S /27HRS)			PCN 3 DMSP								
100	1904I3Z	20.5N 113.0E	SAT	(IR DATA)			PCN 1 DMSP								

TYPHOON CARMEN
FIX POSITIONS FOR CYCLONE NO. 28
1200Z 14 OCT TO 1200Z 19 OCT

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN /00MB HGT	FLT LVL T1/T0	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
101	1904342	21.4N 113.3E	SAT	(IR DATA	)		PCN 3 DMSP								
102	1905002	21.4N 112.9E	LNDR	- 20913											
103	1907002	21.4N 112.7E	LNDR	- 20913										22.3N 114.2E	
104	1912312	21.3N 111.9E	SAT	(IR DATA	)		PCN 4 DMSP							22.3N 114.2E	
105	1913082	22.0N 112.0E	SAT	(IR DATA	)		NOAA-3	(CONF 01)							

TYPHOON BELLA
FIX POSITIONS FOR CYCLONE NO. 29
0000Z 21 OCT TO 0000Z 27 OCT

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN /00MB HGT	FLT LVL T1/T0	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	1721552	9.3N 150.8E	SAT	(T1.0/1.0 / / HRS)			PCN 5 DMSP								
2	1822062	9.8N 143.1E	SAT	(IR DATA	)		PCN 5 DMSP								
3	1822252	11.0N 142.0E	SAT	(T1.5/1.5 /D0.5/24HRS)			NOAA-3	(CONF 02)							
4	1823182	11.3N 142.9E	SAT	(T1.5/1.5 /D0.5/25HRS)			PCN 5 DMSP								
5	1902522	11.0N 141.6E	SAT	(IR DATA	)		PCN 5 DMSP								
6	1909072	11.2N 139.7E	SAT	(IR DATA	)		PCN 6 DMSP								
7	1910492	12.0N 139.3E	SAT	(IR DATA	)		PCN 6 DMSP								
8	1911102	13.5N 137.5E	SAT	(IR DATA	)		NOAA-3	(CONF 02)							
9	1912002	12.2N 138.8E	SAT	(IR DATA	)		PCN 6 DMSP								
10	1915342	13.0N 137.6E	SAT	(IR DATA	)		PCN 6 DMSP								
11	1921502	11.8N 135.0E	SAT	(T2.0/2.5+/ / HRS)			PCN 6 DMSP								
12	1921502	13.5N 135.8E	SAT	(T1.5/1.5 /S /22HRS)			PCN 3 DMSP								
13	1923002	13.4N 135.1E	SAT	(T1.5/1.5 / / HRS)			PCN 5 DMSP								
14	1923002	13.7N 135.5E	SAT	(IR DATA	)		PCN 3 DMSP								
15	1923352	12.0N 134.6E	SAT	(T2.0/2.0 /D0.5/25HRS)			NOAA-3	(CONF 01)							
16	2002342	13.7N 133.7E	SAT	(IR DATA	)		PCN 5 DMSP								
17	2010332	12.0N 132.8E	SAT	(IR DATA	)		PCN 6 DMSP								
18	2011412	12.4N 132.8E	SAT	(IR DATA	)		PCN 5 DMSP								
19	2012192	11.5N 131.5E	SAT	(IR DATA	)		NOAA-3	(CONF 01)							
20	2015152	12.5N 132.0E	SAT	(IR DATA	)		PCN 5 DMSP								
21	2021352	12.0N 128.9E	SAT	(IR DATA	)		PCN 5 DMSP								
22	2100232	13.8N 129.6E	SAT	(T2.5/3.0+/D0.5/ HRS)			PCN 3 DMSP								
23	2100232	12.8N 129.3E	SAT	(T3.0/3.0 /D1.5/25HRS)			PCN 3 DMSP								
24	2100232	12.9N 129.3E	SAT	(T2.5/2.5 /D1.0/20HRS)			PCN 3 DMSP								
25	2100462	12.6N 129.1E	SAT	(T3.5/3.5 /D2.0/25HRS)			NOAA-3	(CONF 01)							
26	2102152	13.4N 129.0E	SAT	(IR DATA	)		PCN 5 DMSP								
27	2103202	13.3N 128.3E	P	2 5 700 150 40 70			40 40 70	30 996	305	11 -	-	- -	-		2
28	2108412	14.0N 127.7E	P	- 4 700 180 48 90			50 40 90	80 992	300	11 -	-	- -	-		2
29	2110182	14.0N 127.2E	SAT	(IR DATA	)		PCN 6 DMSP								
30	2110182	14.2N 127.6E	SAT	(IR DATA	)		PCN 4 DMSP								
31	2111362	15.0N 127.3E	SAT	(IR DATA	)		NOAA-3	(CONF 02)							
32	2114572	15.0N 126.0E	SAT	(IR DATA	)		PCN 4 DMSP								
33	2114572	14.8N 126.7E	SAT	(IR DATA	)		PCN 3 DMSP								
34	2118252	15.6N 125.5E	P	15 15 700 190 55 110			70 - - -	991	300	13 12	-	- -	-		3
35	2122102	16.1N 125.3E	P	5 5 700 120 60 30			55 60 40	65 989	299	13 12	EYETP	N-S	50X20		3
36	2200052	16.4N 125.5E	SAT	(T4.0/4.0+/D1.0/24HRS)			PCN 3 DMSP								
37	2200052	16.2N 125.3E	SAT	(T3.5/3.5 /D1.0/24HRS)			PCN 3 DMSP								
38	2203382	16.6N 124.9E	SAT	(T2.0/2.0 / / HRS)			PCN 5 DMSP								
39	2203382	16.9N 124.7E	SAT	(IR DATA	)		PCN 3 DMSP								
40	2203382	16.9N 125.2E	SAT	(IR DATA	)		PCN 3 DMSP								
41	2203402	16.5N 123.7E	LNDR	-							-	- -	-	13.1N 123.7E	-
42	2209002	17.8N 124.7E	P	- 2 700 60 50 330			40 65 330	40 982	293	12 11	CIRC		20		4
43	2211442	18.4N 123.8E	SAT	(IR DATA	)		PCN 6 DMSP								
44	2212462	19.1N 124.2E	SAT	(IR DATA	)		PCN 4 DMSP								
45	2212462	18.7N 123.8E	SAT	(IR DATA	)		PCN 1 DMSP								
46	2212472	14.0N 123.8E	SAT	(IR DATA	)		NOAA-3	(CONF 02)							
47	2214422	18.6N 123.7E	P	2 2 700 180 68 90			28 - -	- 983	293	13 11	-	- -	-		4
48	2216202	19.4N 124.0E	SAT	(IR DATA	)		PCN 5 DMSP								
49	2216202	19.2N 124.2E	SAT	(IR DATA	)		PCN 5 DMSP								
50	2216202	19.2N 123.9E	SAT	(IR DATA	)		PCN 3 DMSP								
51	2222462	19.4N 122.9E	SAT	(T4.0/4.0+/D2.0/24HRS)			PCN 3 DMSP								
52	2222462	19.2N 122.7E	SAT	(T4.5/4.5 /D1.0/19HRS)			PCN 3 DMSP								
53	2223472	19.3N 122.0E	SAT	(T4.5/4.5 /D0.5/24HRS)			PCN 3 DMSP								
54	2223472	19.3N 122.5E	SAT	(IR DATA	)		PCN 3 DMSP								
55	2301092	19.0N 122.0E	SAT	(T4.5/4.5 /D0.5/25HRS)			NOAA-3	(CONF 01)							
56	2302302	19.4N 121.7E	P	- 2 700 110 65 60			40 75 60	35 971	286	10 13	CIRC		20		5
57	2303202	19.3N 121.8E	SAT	(IR DATA	)		PCN 3 DMSP								
58	2303202	19.2N 121.9E	SAT	(IR DATA	)		PCN 3 DMSP								
59	2304002	19.4N 121.7E	LNDR	- CIRCULAR EYE, OPEN NE, 11 NM DIAM										18.1N 120.5E	
60	2305052	19.3N 121.5E	LNDR	- CIRCULAR EYE, OPEN SE, 15 NM DIAM, 90 PERCENT WALL CLOUD										18.1N 120.5E	
61	2305302	19.1N 121.6E	P	1 2 700 40 70 20			22 75 270 90	971	284	10 11	CIRC		25		5
62	2306002	19.2N 121.4E	LNDR	- CIRCULAR EYE, 18 NM DIAM, 100 PERCENT WALL CLOUD										18.1N 120.5E	
63	2307002	19.2N 121.2E	LNDR	- CIRCULAR EYE, 22 NM DIAM, 100 PERCENT WALL CLOUD										18.1N 120.5E	
64	2308002	19.2N 121.0E	LNDR	- CIRCULAR EYE, 15 NM DIAM, 100 PERCENT WALL CLOUD										18.1N 120.5E	
65	2308302	19.2N 121.3E	P	- 2 700 340 65 200			50 85 290 60	972	283	17 13	CONC	-	12		5
66	2309002	19.2N 121.2E	LNDR	- CIRCULAR OPEN EYE, 15 NM DIAM, 100 PERCENT WALL CLOUD										18.1N 120.5E	
67	2310002	19.2N 121.1E	LNDR	- CIRCULAR EYE, 07 NM DIAM, 100 PERCENT WALL CLOUD										18.1N 120.5E	
68	2311002	19.2N 121.0E	LNDR	- CIRCULAR EYE, 15 NM DIAM, 100 PERCENT WALL CLOUD										18.1N 120.5E	
69	2311292	18.7N 120.9E	SAT	(IR DATA	)		PCN 2 DMSP								
70	2311292	19.3N 121.1E	SAT	(IR DATA	)		PCN 2 DMSP								
71	2312002	19.3N 120.1E	LNDR	- CIRCULAR EYE, 13 NM DIAM, 100 PERCENT WALL CLOUD										18.1N 120.5E	
72	2312012	20.0N 120.7E	SAT	(IR DATA	)		NOAA-3	(CONF 01)							
73	2312282	19.2N 120.7E	SAT	(IR DATA	)		PCN 2 DMSP								
74	2312282	19.0N 120.6E	SAT	(IR DATA	)		PCN 1 DMSP								
75	2314002	19.0N 120.9E	LNDR	- CIRCULAR EYE, 15 NM DIAM, 100 PERCENT WALL CLOUD										18.1N 120.5E	
76	2314002	18.3N 120.8E	LNDR	- CIRCULAR EYE, 10 NM DIAM, 100 PERCENT WALL CLOUD										18.6N 120.3E	
77	2314332	18.8N 120.7E	P	- 1 700 - - - -			- - - -	972	285	14 9	CIRC		20		6
78	2315302	18.3N 120.5E	LNDR	- CIRCULAR EYE, 30 NM DIAM, 100 PERCENT WALL CLOUD										18.6N 120.3E	
79	2316012	18.8N 120.7E	SAT	(IR DATA	)		PCN 1 DMSP								
80	2316012	18.8N 120.6E	SAT	(IR DATA	)		PCN 1 DMSP								
81	2316302	18.3N 120.3E	LNDR	- CIRCULAR EYE, 20 NM DIAM, 100 PERCENT WALL CLOUD										18.6N 120.3E	
82	2317302	18.5N 120.2E	LNDR	- CIRCULAR EYE, 20 NM DIAM, 100 PERCENT WALL CLOUD										18.6N 120.3E	
83	2318302	18.2N 120.3E	LNDR	- CIRCULAR EYE, 25 NM DIAM, 100 PERCENT WALL CLOUD										18.6N 120.3E	
84	2321012	18.3N 120.0E	P	- 2 700 100 70 20			19 - - -	987	281	14 7	CIRC		20		6
85	2321252	18.3N 120.0E	LNDR	- CIRCULAR EYE, 17 NM DIAM, 100 PERCENT WALL CLOUD										18.6N 120.3E	
86	2322312	18.3N 119.6E	SAT	(T4.5/4.5 /S /24HRS)			PCN 1 DMSP								

TYPHOON DELLA
FIX POSITIONS FOR CYCLONE NO. 29
0000Z 21 OCT TO 0000Z 27 OCT

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TT/TD	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
87	2323282	18.3N 119.5E	SAT	(IR DATA)						PCN 1 DMSP										
88	2400242	18.0N 119.2E	SAT	(T5.0/5.0 /D0.5/23HRS)						NOAA-3				(CONF U2)						
89	2401102	18.1N 119.7E	SAT	(T5.0/5.0 /D2.0/27HRS)						PCN 1 DMSP										
90	2401102	18.1N 119.7E	SAT	(T5.0/5.0 / / HRS)						PCN 1 DMSP										
91	2403012	18.0N 119.3E	SAT	(T5.0/5.0-/D0.5/27HRS)						PCN 1 DMSP										
92	2403012	18.0N 119.4E	SAT	(IR DATA)						PCN 1 DMSP										
93	2407002	17.9N 119.1E	LHDR	- CIRCULAR EYE OPEN N, 13 NM DIAM, 60 PERCENT WALL CLOUD															16.6N 120.3E	
94	2408002	18.1N 118.9E	LHDR	- CIRCULAR EYE OPEN N, 18 NM DIAM, 60 PERCENT WALL CLOUD															16.6N 120.3E	
95	2408382	18.1N 118.7E	P	2 3 700 140 75 70		30	30	70	25	967	283	10 14	CIRC				18			7
96	2409002	17.9N 118.8E	LHDR	- CIRCULAR EYE OPEN N, 18 NM DIAM, 60 PERCENT WALL CLOUD															16.6N 120.3E	
97	2410002	17.9N 118.5E	LHDR	- CIRCULAR EYE,25 NM DIAM, 60 PERCENT WALL CLOUD															16.6N 120.3E	
98	2411002	17.9N 118.4E	LHDR	- CIRCULAR EYE,25 NM DIAM, 60 PERCENT WALL CLOUD															16.6N 120.3E	
99	2411132	17.9N 118.1E	SAT	(IR DATA)						PCN 3 DMSP										
100	2411142	18.0N 118.2E	SAT	(IR DATA)						PCN 3 DMSP										
101	2412002	17.9N 118.1E	LHDR	- CIRCULAR EYE OPEN N, 23 NM DIAM, 60 PERCENT WALL CLOUD															16.6N 120.3	
102	2413002	17.8N 118.0E	LHDR	- CIRCULAR EYE OPEN NM, 23 M DIAM, 60 PERCENT WALL CLOUD															16.6N 120.3	
103	2413512	17.8N 117.8E	SAT	(IR DATA)						PCN 1 DMSP										
104	2414302	17.9N 117.6E	P	3 4 700 90 85 240		17	-	-	-	967	281	17 11	CIRC				20			7
105	2415432	18.1N 117.4E	SAT	(IR DATA)						PCN 3 DMSP										
106	2415432	17.9N 117.3E	SAT	(IR DATA)						PCN 1 DMSP										
107	2422152	17.9N 116.3E	SAT	(T5.0/5.0 /D0.5/24HRS)						PCN 1 DMSP										
108	2500512	18.0N 115.7E	SAT	(T6.0/6.0 /S /24HRS)						PCN 1 DMSP										
109	2500522	18.1N 115.7E	SAT	(T5.0/5.0 /S /24HRS)						PCN 1 DMSP										
110	2501342	17.8N 115.0E	SAT	(T5.0/5.0 /S /25HRS)						NOAA-3				(CONF U1)						
111	2504242	18.0N 115.1E	SAT	(IR DATA)						PCN 1 DMSP										
112	2504562	18.2N 114.4E	P	3 - 700 110 90 90		60	100	30	12	958	275	15 11	CONC	-			15			8
113	2510582	18.4N 113.3E	SAT	(IR DATA)						PCN 2 DMSP										
114	2510582	18.4N 113.3E	SAT	(IR DATA)						PCN 1 DMSP										
115	2510582	18.3N 113.3E	SAT	(IR DATA)						PCN 1 DMSP										
116	2513332	18.3N 113.0E	SAT	(IR DATA)						PCN 1 DMSP										
117	2517062	18.6N 112.3E	SAT	(IR DATA)						PCN 1 DMSP										
118	2523412	18.9N 111.6E	SAT	(T6.0/6.0-/S /24HRS)						PCN 2 DMSP										
119	2600332	19.0N 110.5E	SAT	(T5.0/5.0-/S /24HRS)						PCN 1 DMSP										
120	2604052	19.2N 109.7E	SAT	(IR DATA)						PCN 5 DMSP										
121	2612252	19.6N 108.3E	SAT	(IR DATA)						PCN 4 DMSP										
122	2612262	19.5N 113.1E	SAT	(IR DATA)						NOAA-3				(CONF U1)						
123	2613152	20.1N 108.1E	SAT	(IR DATA)						PCN 1 DMSP										
124	2613362	20.5N 107.0E	SAT	(IR DATA)						NOAA-3				(CONF U1)						
125	2616472	19.5N 107.3E	SAT	(IR DATA)						PCN 3 DMSP										
126	2623262	19.6N 106.1E	SAT	(IR DATA)						PCN 5 DMSP										

TYPHOON ELAINE
FIX POSITIONS FOR CYCLONE NO. 30
0600Z 24 OCT TO 0600Z 31 OCT

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TT/TD	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	2122232	11.2N 147.5E	SAT	(T1.0/1.0 / / HRS)						PCN 5 DMSP										
2	2201572	12.1N 147.5E	SAT	(IR DATA)						PCN 5 DMSP										
3	2210032	13.8N 148.3E	SAT	(IR DATA)						PCN 6 DMSP										
4	2211052	14.2N 147.7E	SAT	(IR DATA)						PCN 6 DMSP										
5	2214382	14.5N 147.6E	SAT	(IR DATA)						PCN 6 DMSP										
6	2222052	15.0N 146.9E	SAT	(T1.5/1.5 /D0.5/24HRS)						PCN 5 DMSP										
7	2222052	15.1N 146.8E	SAT	(T1.0/1.0 / / HRS)						PCN 5 DMSP										
8	2223152	15.1N 146.1E	SAT	(T1.5/1.5 /D0.5/24HRS)						NOAA-3				(CONF U2)						
9	2301382	15.8N 146.1E	SAT	(IR DATA)						PCN 5 DMSP										
10	2309472	16.4N 144.6E	SAT	(IR DATA)						PCN 6 DMSP										
11	2314202	17.0N 143.3E	SAT	(IR DATA)						PCN 6 DMSP										
12	2314202	17.4N 142.9E	SAT	(IR DATA)						PCN 6 DMSP										
13	2320492	17.3N 141.8E	SAT	(T2.0/2.0 /D0.5/23HRS)						PCN 3 DMSP										
14	2323282	17.3N 141.3E	SAT	(IR DATA)						PCN 5 DMSP										
15	2323282	16.6N 141.5E	SAT	(T2.0/2.0 /D1.0/25HRS)						PCN 5 DMSP										
16	2323282	16.8N 141.7E	SAT	(T1.5/1.5 / / HRS)						PCN 5 DMSP										
17	2403012	17.6N 141.1E	SAT	(IR DATA)						PCN 5 DMSP										
18	2403012	17.9N 140.0E	SAT	(IR DATA)						PCN 5 DMSP										
19	2406582	17.9N 140.2E	P	5 2 700 340 25 250		30	30	240	20	-	308	13 12	CIRC				10			1
20	2408552	18.1N 140.0E	P	5 2 700 140 20 50		20	35	40	40	999	308	13 12	CIRC				15			1
21	2409322	17.9N 139.8E	SAT	(IR DATA)						PCN 5 DMSP										
22	2412102	18.1N 139.7E	SAT	(IR DATA)						PCN 5 DMSP										
23	2412102	18.7N 139.5E	SAT	(IR DATA)						PCN 5 DMSP										
24	2412302	17.6N 139.7E	P	5 2 700 360 25 280		40	-	-	-	1001	308	14 12	CIRC				15			1
25	2415432	18.5N 139.0E	SAT	(IR DATA)						PCN 5 DMSP										
26	2415432	18.5N 138.4E	SAT	(IR DATA)						PCN 5 DMSP										
27	2422152	18.5N 137.9E	SAT	(IR DATA)						PCN 5 DMSP										
28	2423102	18.1N 137.5E	SAT	(T3.0/3.0 /D1.0/25HRS)						PCN 3 DMSP										
29	2423102	17.7N 137.9E	SAT	(T2.5/2.5 /D0.5/24HRS)						PCN 5 DMSP										
30	2423102	18.3N 137.7E	SAT	(T2.0/2.0+/D0.5/24HRS)						PCN 5 DMSP										
31	2423382	17.5N 138.1E	SAT	(T3.0/3.0 /D1.0/25HRS)						NOAA-3				(CONF U1)						
32	2500422	17.6N 137.1E	SAT	(IR DATA)						PCN 5 DMSP										
33	2500422	16.9N 137.4E	SAT	(IR DATA)						PCN 5 DMSP										
34	2509082	17.3N 135.9E	P	10 10 700 120 30 150		90	35	150	120	994	302	12 12	EYE	E-W			18X15			3
35	2510092	17.0N 133.9E	SAT	(IR DATA)						NOAA-3				(CONF U1)						
36	2510582	17.4N 135.9E	SAT	(IR DATA)						PCN 5 DMSP										
37	2510582	17.9N 135.6E	SAT	(IR DATA)						PCN 3 DMSP										
38	2510582	17.6N 135.7E	SAT	(IR DATA)						PCN 6 DMSP										
39	2511512	17.6N 135.5E	SAT	(IR DATA)						PCN 3 DMSP										
40	2511512	17.9N 135.4E	SAT	(IR DATA)						PCN 3 DMSP										
41	2515242	17.4N 134.7E	SAT	(IR DATA)						PCN 5 DMSP										
42	2515252	17.5N 134.6E	SAT	(IR DATA)						PCN 3 DMSP										
43	2521232	17.0N 133.8E	P	5 10 700 90 70 340		55	60	340	55	983	295	15 12	-	- -	-					4
44	2522002	17.0N 133.0E	SAT	(IR DATA)						PCN 3 DMSP										
45	2522512	17.1N 134.0E	SAT	(IR DATA)						PCN 3 DMSP										
46	2522522	17.3N 134.2E	SAT	(T3.5/3.5 /D1.0/24HRS)						PCN 3 DMSP										
47	2602242	16.8N 132.1E	SAT	(T4.5/4.5 /D1.5/27HRS)						PCN 3 DMSP										
48	2602242	16.9N 132.1E	SAT	(IR DATA)						PCN 1 DMSP										
49	2609202	16.6N 130.8E	P	3 2 700 320 80 240		50	60	240	70	989	283	15 15	CIRC				30			5
50	2610432	16.8N 130.5E	SAT	(IR DATA)						PCN 2 DMSP										

TYPHOON ELAINE
FIX POSITIONS FOR CYCLONE NO. 30
0600Z 24 OCT TO 0600Z 31 OCT

FIX NO.	TIME	POSIT	FIX CAT	ACCHY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG				MAX OBS SFC WIND VEL BRG RNG			OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
51	2810432	16.8N 130.4E	SAT	(IR DATA					)	PCN 1	DMSP									
52	2811332	17.0N 130.3E	SAT	(IR DATA					)	PCN 1	DMSP									
53	2811332	16.9N 130.4E	SAT	(IR DATA					)	PCN 1	DMSP									
54	2811402	16.0N 130.0E	SAT	(IR DATA					)	NOAA-3		(CONF 01)								
55	2814402	16.7N 129.4E	P	3 10	700	190	85	120	60	-	-	-	986	279	16 12	ELIP	N-S	40X15		5
56	2815052	17.1N 129.1E	SAT	(IR DATA					)	PCN 1	DMSP									
57	2815052	17.0N 130.1E	SAT	(IR DATA					)	PCN 1	DMSP									
58	2821442	17.0N 127.7E	SAT	(IR DATA					)	PCN 1	DMSP									
59	2700152	16.9N 127.3E	SAT	(T5.0/5.0 /D0.5/22HRS)						PCN 1	DMSP									
60	2700152	16.6N 127.2E	SAT	(T5.0/5.0 /S /24HRS)						PCN 1	DMSP									
61	2703452	16.7N 126.9E	SAT	(T5.0/5.5 / / HRS)						PCN 1	DMSP									
62	2703462	17.0N 126.7E	SAT	(IR DATA					)	PCN 1	DMSP									
63	2703472	16.8N 126.7E	SAT	(T6.0/6.0 / / HRS)						PCN 1	DMSP									
64	2704002	16.8N 126.6E	P	5 3	700	190	90	100	25	70	100	40	947	265	17 11	-	- -	-		6
65	2708302	17.0N 125.5E	P	5 3	700	30	110	300	30	80	300	30	-	259	19 13	CIRC		35		6
66	2710272	17.0N 124.9E	SAT	(IR DATA					)	PCN 2	DMSP									
67	2710272	17.0N 124.9E	SAT	(IR DATA					)	PCN 1	DMSP									
68	2712492	18.5N 124.0E	SAT	(IR DATA					)	NOAA-3		(CONF 01)								
69	2712562	17.1N 124.4E	SAT	(IR DATA					)	PCN 1	DMSP									
70	2712562	17.4N 124.4E	SAT	(IR DATA					)	PCN 1	DMSP									
71	2714302	17.3N 123.7E	P	4 2	700	330	95	240	60	-	-	-	943	258	20 13	CIRC		35		7
72	2716282	17.3N 123.1E	SAT	(IR DATA					)	PCN 1	DMSP									
73	2723112	17.3N 122.4E	SAT	(IR DATA					)	PCN 2	DMSP									
74	2723572	17.6N 121.7E	SAT	(T4.5/5.0+/W0.5/24HRS)						PCN 1	DMSP									
75	2723572	17.6N 121.5E	SAT	(T5.0/5.0 /S /24HRS)						PCN 1	DMSP									
76	2801132	16.8N 120.8E	SAT	(T5.0/5.5 /W0.5/25HRS)						NOAA-3		(CONF 01)								
77	2803282	17.6N 120.9E	SAT	(IR DATA					)	PCN 3	DMSP									
78	2803282	17.7N 120.6E	SAT	(IR DATA					)	PCN 3	DMSP									
79	2809402	17.8N 119.8E	P	3 5	700	100	70	30	70	65	30	60	967	282	15 11	CIRC		40		8
80	2811542	17.9N 118.8E	SAT	(IR DATA					)	PCN 4	DMSP									
81	2812042	18.6N 119.4E	SAT	(IR DATA					)	NOAA-3		(CONF 01)								
82	2812382	18.1N 118.7E	SAT	(IR DATA					)	PCN 3	DMSP									
83	2812382	18.3N 118.6E	SAT	(IR DATA					)	PCN 3	DMSP									
84	2814302	17.9N 118.6E	P	3 5	700	50	90	330	100	-	-	-	-	284	14 10	CIRC		40		6
85	2816102	17.9N 118.4E	SAT	(IR DATA					)	PCN 3	DMSP									
86	2816102	18.0N 118.5E	SAT	(IR DATA					)	PCN 3	DMSP									
87	2816102	18.0N 118.5E	SAT	(IR DATA					)	PCN 3	DMSP									
88	2816102	18.0N 118.4E	SAT	(IR DATA					)	PCN 4	DMSP									
89	2822552	18.2N 117.6E	SAT	(T4.5/5.5+/W1.5/42HRS)						PCN 3	DMSP									
90	2900272	18.7N 116.4E	SAT	(T4.0/5.0 /W1.0/24HRS)						NOAA-3		(CONF 02)								
91	2901202	19.1N 115.3E	SAT	(T4.0/4.0 / / HRS)						PCN 5	DMSP									
92	2901202	18.1N 116.9E	SAT	(T5.5/5.5 / / HRS)						PCN 1	DMSP									
93	2903102	18.9N 117.1E	SAT	(T4.5/4.5 /S /27HRS)						PCN 1	DMSP									
94	2903102	18.9N 117.3E	SAT	(T5.0/5.0+/S /27HRS)						PCN 1	DMSP									
95	2909352	19.4N 116.0E	P	10 5	700	200	60	110	100	40	120	120	977	290	13 10	-	- -	-		9
96	2911382	19.2N 115.2E	SAT	(IR DATA					)	PCN 6	DMSP									
97	2912002	20.1N 115.5E	LNDR	- /////																
98	2913152	19.2N 114.2E	SAT	(IR DATA					)	NOAA-3		(CONF 01)							22.3N 114.2E	
99	2914012	20.4N 115.1E	SAT	(IR DATA					)	PCN 6	DMSP									
100	2915002	20.2N 115.2E	LNDR	- /////																
101	2915512	20.9N 114.9E	SAT	(IR DATA					)	PCN 5	DMSP								22.3N 114.2E	
102	2915512	21.5N 115.0E	SAT	(IR DATA					)	PCN 4	DMSP									
103	2921102	20.6N 114.3E	LNDR	- 30///																
104	2922402	21.2N 114.1E	SAT	(T3.0/4.5-/W1.5/22HRS)						PCN 5	DMSP								22.3N 114.2E	
105	2922402	21.2N 113.3E	SAT	(T4.5/4.5-/S /24HRS)						PCN 5	DMSP									
106	2923002	20.7N 114.2E	LNDR	- 20///																
107	3000002	20.8N 114.1E	LNDR	- 2591/															22.3N 114.2E	
108	3001002	20.9N 114.0E	LNDR	- 2591/															22.3N 114.2E	
109	3001022	20.8N 113.6E	SAT	(T3.0/4.0-/W1.0/24HRS)						PCN 3	DMSP								22.3N 114.2E	
110	3001022	20.9N 113.6E	SAT	(IR DATA					)	PCN 5	DMSP									
111	3001372	20.8N 113.0E	SAT	(T3.0/4.0 /W1.0/25HRS)						NOAA-3		(CONF 02)								
112	3003002	21.0N 113.9E	LNDR	- 2591/																
113	3004002	21.0N 113.8E	LNDR	- 2591/															22.3N 114.2E	
114	3004322	21.1N 113.8E	SAT	(IR DATA					)	PCN 5	DMSP								22.3N 114.2E	
115	3005202	20.7N 113.8E	LNDR	- 55///																
116	3006002	20.9N 113.8E	LNDR	- 55///															22.3N 114.2E	
117	3007002	20.9N 113.8E	LNDR	- /////															22.3N 114.2E	
118	3011232	21.0N 113.3E	SAT	(IR DATA					)	PCN 6	DMSP								22.3N 114.2E	
119	3011232	21.2N 113.6E	SAT	(IR DATA					)	PCN 6	DMSP									
120	3012002	21.0N 113.5E	LNDR	- 3002/																
121	3013432	21.5N 113.2E	SAT	(IR DATA					)	PCN 3	DMSP								22.3N 114.2E	
122	3014502	20.8N 113.5E	LNDR	- 2061/																
123	3017142	21.0N 113.7E	SAT	(IR DATA					)	PCN 6	DMSP								22.3N 114.2E	
124	3021002	20.9N 113.3E	LNDR	- 20///																
125	3022242	21.9N 113.6E	SAT	(T1.5/2.5-/W1.5/24HRS)						PCN 5	DMSP								22.3N 114.2E	
126	3100002	20.8N 113.0E	LNDR	- 20///																
127	3100432	20.7N 113.0E	SAT	(T2.0/3.0 /W1.0/24HRS)						PCN 3	DMSP								22.3N 114.2E	
128	3100432	20.6N 112.6E	SAT	(T2.5/3.5-/W2.0/24HRS)						PCN 5	DMSP									
129	3103002	20.7N 112.7E	LNDR	- 1521/																
130	3104142	20.5N 112.7E	SAT	(IR DATA					)	PCN 4	DMSP								22.3N 114.2E	
131	3106252	17.8N 110.2E	SAT	(T1.5/1.5 /S /20HRS)						PCN 3	DMSP									
132	3106552	17.3N 109.8E	SAT	(IR DATA					)	PCN 3	DMSP									

TROPICAL STORM FAYE
FIX POSITIONS FOR CYCLONE NO. 31
0600Z 01 NOV TO 0600Z 04 NOV

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	3022242	11.4N 129.4E	SAT	(II.5/1.5 / / HRS)			PCN 5 DMSP								
2	3102322	11.8N 128.8E	SAT	(IR DATA)			PCN 5 DMSP								
3	3102322	11.5N 128.7E	SAT	(T2.0/2.0 / / HRS)			PCN 3 DMSP								
4	3111072	12.1N 126.4E	SAT	(IR DATA)			PCN 6 DMSP								
5	3113142	12.5N 125.0E	SAT	(IR DATA)			PCN 5 DMSP								
6	3122092	13.1N 124.5E	SAT	(T1.5/1.5 /S /24HRS)			PCN 3 DMSP								
7	0100082	12.8N 124.0E	SAT	(T2.0/2.0 /D0.5/23HRS)			NOAA-3		(CONF 02)						
8	0100262	13.2N 124.1E	SAT	(IR DATA)			PCN 3 DMSP								
9	0100252	13.0N 123.9E	SAT	(T2.0/2.0 / / HRS)			PCN 5 DMSP								
10	0103552	13.5N 123.0E	SAT	(T1.5/1.5 / / HRS)			PCN 5 DMSP								
11	0110522	12.9N 122.5E	SAT	(IR DATA)			PCN 6 DMSP								
12	0112522	13.8N 122.3E	SAT	(IR DATA)			NOAA-3		(CONF 02)						
13	0116372	13.6N 119.9E	SAT	(IR DATA)			PCN 5 DMSP								
14	0200072	13.9N 119.4E	SAT	(T2.5/2.5 /D1.0/26HRS)			PCN 5 DMSP								
15	0200072	13.8N 118.5E	SAT	(T3.0/3.0-/D1.0/24HRS)			PCN 5 DMSP								
16	0203362	13.5N 119.0E	SAT	(T3.0/3.5 / / HRS)			PCN 3 DMSP								
17	0203372	13.9N 118.9E	SAT	(T2.5/2.5+/D1.0/24HRS)			PCN 5 DMSP								
18	0203372	14.0N 119.0E	SAT	(IR DATA)			PCN 5 DMSP								
19	0210372	14.5N 116.7E	SAT	(IR DATA)			PCN 6 DMSP								
20	0210402	14.4N 116.9E	P	5 5 700 160 20 120			40 - - -	990	299	15 13	-	- -	-		1
21	0212072	14.3N 116.1E	SAT	(IR DATA)			NOAA-3		(CONF 02)						
22	0212182	14.5N 116.5E	SAT	(IR DATA)			PCN 5 DMSP								
23	0212482	14.4N 116.5E	SAT	(IR DATA)			PCN 5 DMSP								
24	0214302	14.2N 116.2E	P	5 5 700 100 55 360			100 - - -	987	298	14 12	CIRC		20		1
25	0216182	14.5N 116.2E	SAT	(IR DATA)			PCN 5 DMSP								
26	0223202	14.6N 114.4E	SAT	(T3.5/3.5 /D1.0/20HRS)			PCN 5 DMSP								
27	0300222	14.8N 113.0E	SAT	(T3.5/3.5 /D0.5/23HRS)			NOAA-3		(CONF 02)						
28	0301302	14.9N 114.2E	SAT	(T4.0/4.0 /D1.0/25HRS)			PCN 3 DMSP								
29	0303172	14.9N 112.2E	SAT	(IR DATA)			NOAA-3		(CONF 02)						
30	0303182	15.0N 113.6E	SAT	(IR DATA)			PCN 6 DMSP								
31	0303182	15.0N 113.2E	SAT	(T3.5/3.5 /D1.0/27HRS)			PCN 3 DMSP								
32	0312032	15.2N 112.4E	SAT	(IR DATA)			PCN 5 DMSP								
33	0316002	15.5N 111.3E	SAT	(IR DATA)			PCN 5 DMSP								
34	0323042	14.0N 109.9E	SAT	(T1.5/2.5-/W2.0/24HRS)			PCN 5 DMSP								
35	0401122	15.9N 109.1E	SAT	(T3.0/4.0-/W1.0/24HRS)			PCN 5 DMSP								
36	0404412	14.6N 109.1E	SAT	(IR DATA)			PCN 5 DMSP								
37	0411482	14.7N 106.8E	SAT	(IR DATA)			PCN 3 DMSP								

TYPHOON GLORIA
FIX POSITIONS FOR CYCLONE NO. 32
0000Z 03 NOV TO 1200Z 09 NOV

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	2923202	7.5N 148.9E	SAT	(T1.0/1.0 / / HRS)			PCN 5 DMSP								
2	0109102	5.9N 142.1E	SAT	(IR DATA)			PCN 6 DMSP								
3	0121532	6.4N 142.1E	SAT	(T2.0/2.0 /D1.0/22HRS)			PCN 5 DMSP								
4	0122252	6.5N 142.0E	SAT	(IR DATA)			PCN 5 DMSP								
5	0123242	5.5N 141.2E	SAT	(T2.0/2.0 /D1.0/24HRS)			NOAA-3		(CONF 01)						
6	0201552	6.4N 141.4E	SAT	(IR DATA)			PCN 3 DMSP								
7	0208552	5.7N 141.8E	SAT	(IR DATA)			PCN 6 DMSP								
8	0211062	6.3N 141.8E	SAT	(IR DATA)			PCN 5 DMSP								
9	0214372	6.4N 141.8E	SAT	(IR DATA)			PCN 5 DMSP								
10	0221382	7.0N 140.9E	SAT	(IR DATA)			PCN 5 DMSP								
11	0222392	7.0N 141.0E	SAT	(T2.5/2.5 /D0.5/23HRS)			NOAA-3		(CONF 02)						
12	0223482	7.8N 141.0E	SAT	(T2.5/2.5 / / HRS)			PCN 3 DMSP								
13	0223482	7.8N 140.6E	SAT	(T2.5/2.5 /D0.5/23HRS)			PCN 5 DMSP								
14	0300452	7.4N 141.3E	P	5 5 700 40 35 280			75 40 330	30	990	301 17 11	-	- -	-		1
15	0303182	7.6N 140.7E	SAT	(IR DATA)			PCN 5 DMSP								
16	0303452	7.6N 140.9E	P	5 5 700 180 54 90			20 65 90	20	986	299 17 12	-	- -	-		1
17	0310212	7.7N 140.0E	SAT	(IR DATA)			PCN 6 DMSP								
18	0311182	7.7N 139.4E	SAT	(IR DATA)			NOAA-3		(CONF 02)						
19	0314182	7.8N 139.3E	SAT	(IR DATA)			PCN 6 DMSP								
20	0321232	9.9N 138.3E	SAT	(IR DATA)			PCN 3 DMSP								
21	0323242	10.0N 138.0E	SAT	(T4.0/4.0 /D1.5/25HRS)			NOAA-3		(CONF 02)						
22	0323302	9.9N 137.8E	SAT	(T3.5/3.5+/D1.0/24HRS)			PCN 5 DMSP								
23	0323302	9.9N 138.2E	SAT	(T4.0/4.0 /D1.5/24HRS)			PCN 5 DMSP								
24	0400002	11.2N 137.1E	SAT	(IR DATA)			PCN 5 DMSP								
25	0409102	12.8N 136.2E	P	5 5 700 170 90 70			10 75 100 100		978	290 14 12	-	- -	-		5
26	0410062	12.9N 136.0E	SAT	(IR DATA)			PCN 4 DMSP								
27	0412112	13.4N 135.7E	SAT	(IR DATA)			PCN 5 DMSP								
28	0414522	14.1N 134.3E	P	5 3 700 170 80 60			40 - - -	987	282	15 -	CIRC		7		5
29	0415412	14.6N 134.5E	SAT	(IR DATA)			PCN 5 DMSP								
30	0421072	15.2N 132.7E	SAT	(IR DATA)			PCN 5 DMSP								
31	0422492	15.3N 132.6E	SAT	(IR DATA)			PCN 5 DMSP								
32	0423122	15.6N 131.5E	SAT	(T5.0/5.0 /D1.5/24HRS)			PCN 1 DMSP								
33	0423122	15.5N 131.5E	SAT	(T5.0/5.0 /D1.0/24HRS)			PCN 1 DMSP								
34	0500582	15.4N 131.0E	SAT	(T4.0/4.0 /S /24HRS)			NOAA-3		(CONF 02)						
35	0502412	15.8N 130.7E	SAT	(IR DATA)			PCN 1 DMSP								
36	0503532	15.8N 130.7E	P	5 2 700 180 120 90			10 130 270	3	937	257 18 15	CIRC		4		6
37	0500442	16.0N 129.3E	P	5 2 700 - - -			- 110 180	10	949	266 21 -	CIRC		3		6
38	0509502	16.1N 128.9E	SAT	(IR DATA)			PCN 3 DMSP								
39	0511322	16.0N 128.5E	SAT	(IR DATA)			PCN 6 DMSP								
40	0511452	16.0N 129.0E	SAT	(IR DATA)			NOAA-3		(CONF 01)						
41	0511532	16.3N 128.8E	SAT	(IR DATA)			PCN 5 DMSP								
42	0515232	16.3N 127.7E	SAT	(IR DATA)			PCN 5 DMSP								
43	0515352	15.8N 127.9E	P	10 2 700 130 75 40			15 - - -		955	270 17 15	CONC	-	20		7
44	0520302	15.7N 127.0E	P	10 3 700 120 85 30			15 - - -		954	272 18 14	CIRC		20		7
45	0522342	15.7N 126.9E	SAT	(T5.5/5.5 /D0.5/23HRS)			PCN 1 DMSP								
46	0600102	16.1N 126.0E	SAT	(T4.5/4.5 /D0.5/24HRS)			NOAA-3		(CONF 01)						
47	0600352	15.9N 126.7E	SAT	(T5.5/5.5-/D0.5/25HRS)			PCN 1 DMSP								
48	0602222	16.1N 126.6E	SAT	(IR DATA)			PCN 1 DMSP								
49	0604042	16.3N 126.6E	SAT	(T6.0/6.0 / / HRS)			PCN 1 DMSP								
50	0604502	16.3N 126.2E	P	5 3 700 110 100 20			15 130 60	15	936	255 18 12	CIRC		20		6

TYPHOON GLORIA
FIX POSITIONS FOR CYCLONE NO. 32
0000Z 03 NOV TO 1200Z 09 NOV

FIX NO.	TIME	POSIT	FIX CAT	ACCMY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN /00MB HGT	FLT LVL T1/T0	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
51	0609162	17.0N 125.2E	P	5 5	700	130 120 60	15 140 60 15	931	250	20 10	CIRC		20		8
52	0611172	17.1N 124.7E	SAT	(IR DATA	)		PCN 1 DMSP								
53	0613162	17.2N 124.3E	SAT	(IR DATA	)		PCN 1 DMSP								
54	0615042	17.2N 123.7E	SAT	(IR DATA	)		PCN 1 DMSP								
55	0616462	17.1N 124.0E	SAT	(IR DATA	)		PCN 3 DMSP								
56	0622182	16.0N 122.0E	SAT	(IR DATA	)		PCN 1 DMSP								
57	0700172	16.0N 121.4E	SAT	(T4.0/5.0 /W1.5/24HRS)			PCN 3 DMSP								
58	0700172	16.1N 121.2E	SAT	(T4.0/5.0+/W1.5/20HRS)			PCN 3 DMSP								
59	0701202	16.0N 121.0E	SAT	(T6.0/6.0 /D1.5/25HRS)			NOAA-3	(CONF 02)							
60	0701442	17.9N 120.9E	LHUR	- 80 PERCENT WALL CLOUD, ELLIPTICAL EYE N#S											
61	0702302	17.9N 120.5E	LHUR	- 80 PERCENT WALL CLOUD, ELLIPTICAL EYE N#S										16.6N 120.3E	
62	0703202	18.0N 120.5E	LHUR	-										16.6N 120.3E	
63	0703452	16.2N 120.4E	SAT	(T6.0/6.0 /S /24HRS)			PCN 3 DMSP				-	- -	-	16.6N 120.3E	-
64	0703452	16.2N 120.6E	SAT	(IR DATA	)		PCN 3 DMSP								
65	0703452	17.9N 120.4E	LHUR	-							-	- -	-	16.6N 120.3E	-
66	0704002	18.0N 120.3E	LHUR	-							-	- -	-	16.6N 120.3E	-
67	0704302	18.0N 120.1E	LHUR	-							-	- -	-	16.6N 120.3E	-
68	0705002	18.0N 120.0E	LHUR	- ECHOES DISORGANIZED										16.6N 120.3E	
69	0706302	18.0N 119.5E	LHUR	- 75 PERCENT WALL CLOUD, CIRCULAR EYE										16.6N 120.3E	
70	0709002	14.2N 119.2E	LHUR	-										16.6N 120.3E	
71	0711012	14.7N 119.5E	SAT	(IR DATA	)		PCN 3 DMSP				-	- -	-	16.6N 120.3E	-
72	0711012	14.7N 119.3E	SAT	(IR DATA	)		PCN 3 DMSP								
73	0712112	14.4N 119.5E	SAT	(IR DATA	)		NOAA-3	(CONF 01)							
74	0716582	14.6N 119.1E	SAT	(IR DATA	)		PCN 3 DMSP								
75	0716272	14.5N 118.1E	SAT	(IR DATA	)		PCN 3 DMSP								
76	0723442	14.0N 118.3E	SAT	(IR DATA	)		PCN 6 DMSP								
77	0723582	20.1N 117.7E	SAT	(T4.0/4.0 /S /24HRS)			PCN 3 DMSP								
78	0723582	14.6N 118.0E	SAT	(T4.0/4.0 /S /24HRS)			PCN 3 DMSP								
79	0800332	14.8N 117.9E	SAT	(T4.5/5.5 /W1.5/24HRS)			NOAA-3	(CONF 01)							
80	0801302	20.0N 117.8E	P	10 10 700 140 35 50			30 45 240	20 986	298	15 13	-	- -	-		10
81	0803272	20.2N 117.5E	SAT	(T4.0/5.0-/W2.0/24HRS)			PCN 1 DMSP								
82	0803272	20.5N 117.6E	SAT	(IR DATA	)		PCN 1 DMSP								
83	0804492	20.4N 117.6E	P	10 6 700 210 36 100			80 40 240	35 987	298	14 13	-	- -	-		10
84	0810462	21.9N 117.4E	SAT	(IR DATA	)		PCN 3 DMSP								
85	0812282	21.1N 116.8E	SAT	(IR DATA	)		PCN 5 DMSP								
86	0812402	22.1N 117.2E	SAT	(IR DATA	)		PCN 3 DMSP								
87	0813232	22.2N 116.5E	SAT	(IR DATA	)		NOAA-3	(CONF 01)							
88	0818082	22.3N 116.9E	SAT	(IR DATA	)		PCN 5 DMSP								
89	0818092	22.2N 116.6E	SAT	(IR DATA	)		PCN 5 DMSP								
90	0823292	21.9N 116.9E	SAT	(IR DATA	)		PCN 3 DMSP								
91	0823402	22.4N 116.7E	SAT	(T2.5/3.5 /W1.5/24HRS)			PCN 3 DMSP								
92	0900102	22.2N 116.8E	LHUR	- 51///										22.3N 114.2E	
93	0901222	22.4N 116.7E	SAT	(T2.5/3.5-/W1.5/25HRS)			PCN 3 DMSP								
94	0901432	22.5N 116.5E	SAT	(T3.0/4.0 /W1.5/25HRS)			NOAA-3	(CONF 01)							
95	0903002	22.3N 116.4E	LHUR	- 51///										22.3N 114.2E	
96	0903082	22.7N 116.7E	SAT	(IR DATA	)		PCN 3 DMSP								
97	0906002	22.3N 116.4E	LHUR	- 55/// QSTNRY										22.3N 114.2E	
98	0909002	22.1N 116.2E	LHUR	- 55///										22.3N 114.2E	
99	0912122	22.5N 116.0E	SAT	(IR DATA	)		PCN 5 DMSP								
100	0912372	22.7N 116.0E	SAT	(IR DATA	)		NOAA-3	(CONF 02)							

TROPICAL STORM HESTER
FIX POSITIONS FOR CYCLONE NO. 33
1200Z 14 NOV TO 1200Z 15 NOV

FIX NO.	TIME	POSIT	FIX CAT	ACCMY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN /00MB HGT	FLT LVL T1/T0	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	1123292	12.5N 122.9E	SAT	(T1.5/1.5 /D0.5/24HRS)			NOAA-3	(CONF 02)							
2	1300082	14.3N 121.2E	SAT	(T1.5/1.5 / / HRS)			PCN 5 DMSP								
3	1300402	13.1N 121.8E	SAT	(T2.0/1.5 /D0.5/25HRS)			NOAA-3	(CONF 02)							
4	1303352	14.3N 121.3E	SAT	(IR DATA	)		PCN 5 DMSP								
5	1311112	14.0N 119.1E	SAT	(IR DATA	)		PCN 5 DMSP								
6	1311302	14.5N 118.0E	SAT	(IR DATA	)		NOAA-3	(CONF 02)							
7	1312502	14.1N 119.1E	SAT	(IR DATA	)		PCN 5 DMSP								
8	1323502	14.8N 117.3E	SAT	(T1.5/1.5 /S /24HRS)			PCN 5 DMSP								
9	1401322	14.6N 116.6E	SAT	(T1.5/1.5 / / HRS)			PCN 5 DMSP								
10	1401502	13.5N 116.0E	SAT	(T2.5/2.5 /D0.5/25HRS)			NOAA-3	(CONF 02)							
11	1403172	13.4N 116.2E	SAT	(IR DATA	)		PCN 3 DMSP								
12	1410552	13.4N 114.2E	SAT	(IR DATA	)		PCN 5 DMSP								
13	1410552	13.4N 114.4E	SAT	(IR DATA	)		PCN 5 DMSP								
14	1412382	13.5N 114.0E	SAT	(IR DATA	)		NOAA-3	(CONF 02)							
15	1415582	13.4N 113.7E	SAT	(IR DATA	)		PCN 5 DMSP								
16	1423382	13.2N 111.1E	SAT	(IR DATA	)		PCN 3 DMSP								
17	1501132	13.2N 110.9E	SAT	(T3.5/3.5 / / HRS)			PCN 1 DMSP								
18	1501132	13.1N 110.9E	SAT	(T3.0/3.0-/D1.5/24HRS)			PCN 1 DMSP								
19	1504402	13.0N 110.0E	SAT	(IR DATA	)		PCN 1 DMSP								
20	1512222	12.5N 107.9E	SAT	(IR DATA	)		PCN 1 DMSP								

TYPHOON IRMA
FIX POSITIONS FOR CYCLONE NO. 34
1200Z 21 NOV TO 0600Z 02 DEC

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T1/T0	EYE FORM	ORIEN-TATION	EYE DIA	POSIT UF RADAR	MSN NMBR
1	162138Z	7.0N 154.9E	SAT	(T2.0/2.0 /D1.0/24HRS)			NOAA-3	(CONF 02)							
2	170827Z	9.1N 155.0E	SAT	(IR DATA		)	PGN 6 DMSP								
3	171019Z	10.0N 155.0E	SAT	(IR DATA		)	NOAA-3	(CONF 02)							
4	171321Z	9.4N 154.8E	SAT	(IR DATA		)	PGN 6 DMSP								
5	172110Z	10.0N 153.7E	SAT	(T1.0/1.0 / / HRS)			PGN 5 DMSP								
6	172337Z	10.1N 153.4E	SAT	(IR DATA		)	PGN 5 DMSP								
7	180954Z	10.5N 152.7E	SAT	(IR DATA		)	PGN 5 DMSP								
8	190938Z	9.0N 147.2E	SAT	(IR DATA		)	PGN 6 DMSP								
9	192039Z	8.6N 146.0E	SAT	(T1.0/1.0 / / HRS)			PGN 5 DMSP								
10	200923Z	7.7N 143.1E	SAT	(IR DATA		)	PGN 6 DMSP								
11	202228Z	7.9N 141.8E	SAT	(T2.5/2.5 /D1.5/24HRS)			NOAA-3	(CONF 01)							
12	202323Z	8.8N 143.0E	SAT	(T1.5/1.5 /D0.5/24HRS)			PGN 5 DMSP								
13	210248Z	9.5N 143.3E	SAT	(IR DATA		)	PGN 5 DMSP								
14	210907Z	9.6N 142.0E	SAT	(IR DATA		)	PGN 6 DMSP								
15	211109Z	8.5N 139.5E	SAT	(IR DATA		)	NOAA-3	(CONF 02)							
16	211205Z	9.5N 141.8E	SAT	(IR DATA		)	PGN 5 DMSP								
17	211530Z	9.5N 141.5E	SAT	(IR DATA		)	PGN 5 DMSP								
18	212133Z	11.2N 140.8E	P	10 3 1500 120 35 70			80 25 70	80 997	-	24 -	-	- -	-		1
19	212150Z	11.5N 140.8E	SAT	(IR DATA		)	PGN 5 DMSP								
20	212305Z	11.7N 140.5E	SAT	(T1.5/1.5 /S /24HRS)			PGN 5 DMSP								
21	212305Z	11.2N 140.6E	SAT	(T1.5/1.5 / / HRS)			PGN 5 DMSP								
22	212305Z	10.2N 140.0E	SAT	(T1.5/1.5 / / HRS)			PGN 5 DMSP								
23	212338Z	11.0N 140.7E	SAT	(T2.5/2.5 /S /24HRS)			NOAA-3	(CONF 02)							
24	220043Z	10.3N 140.3E	P	3 5 1500 260 36 150			18 40 150	18 997	37	23 -	-	- -	-		1
25	220230Z	11.2N 140.2E	SAT	(IR DATA		)	PGN 5 DMSP								
26	220304Z	10.3N 140.0E	P	5 - 1500 30 25 300			15 20 300	10 996	37	23 -	-	- -	-		1
27	220933Z	11.1N 140.5E	P	10 20 700 100 30 360			40 20 340	30 994	304	13 12	-	- -	-		2
28	221024Z	11.5N 140.0E	SAT	(IR DATA		)	NOAA-3	(CONF 02)							
29	221147Z	11.3N 140.3E	SAT	(IR DATA		)	PGN 5 DMSP								
30	221511Z	11.1N 140.2E	SAT	(IR DATA		)	PGN 3 DMSP								
31	221511Z	11.8N 140.3E	SAT	(IR DATA		)	PGN 5 DMSP								
32	222447Z	12.6N 139.8E	SAT	(T3.0/3.0 /D1.5/24HRS)			PGN 6 DMSP								
33	222550Z	12.2N 139.0E	SAT	(T3.5/3.5 /D1.0/24HRS)			NOAA-3	(CONF 02)							
34	230211Z	11.9N 139.3E	SAT	(T3.0/3.0+/D1.5/27HRS)			PGN 1 DMSP								
35	230211Z	12.0N 139.2E	SAT	(IR DATA		)	PGN 1 DMSP								
36	230506Z	12.3N 139.1E	P	5 5 700 160 55 80			90 50 80	90 983	296	14 11 -	- -	-			3
37	230835Z	12.7N 137.9E	P	5 5 700 110 78 20			150 65 20	60 985	295	15 -	EYE	N-S	40X20		-
38	231018Z	13.2N 138.5E	SAT	(IR DATA		)	PGN 3 DMSP								
39	231128Z	13.9N 138.2E	SAT	(IR DATA		)	PGN 3 DMSP								
40	231134Z	13.0N 138.0E	SAT	(IR DATA		)	NOAA-3	(CONF 01)							
41	231453Z	12.9N 137.3E	SAT	(IR DATA		)	PGN 1 DMSP								
42	231455Z	13.0N 137.6E	SAT	(IR DATA		)	PGN 3 DMSP								
43	232119Z	13.6N 136.7E	SAT	(IR DATA		)	PGN 3 DMSP								
44	232140Z	13.3N 136.0E	SAT	(T4.0/4.0+/D1.0/19HRS)			PGN 3 DMSP								
45	232230Z	13.7N 136.5E	P	1 2 700 170 82 70			35 70 80	40 975	288	14 11	CTHC		15		4
46	240001Z	13.2N 135.5E	SAT	(T4.5/4.5 /D1.0/24HRS)			NOAA-3	(CONF 01)							
47	240010Z	13.5N 136.9E	SAT	(IR DATA		)	PGN 3 DMSP								
48	240010Z	14.0N 136.4E	SAT	(T4.5/4.5 /D1.5/24HRS)			PGN 3 DMSP								
49	240152Z	13.8N 136.4E	SAT	(IR DATA		)	PGN 3 DMSP								
50	240328Z	13.9N 135.6E	P	2 2 700 190 75 90			80 75 90	60 973	285	13 11	CTHC		15		4
51	240354Z	14.0N 135.7E	SAT	(IR DATA		)	PGN 1 DMSP								
52	241003Z	14.5N 134.5E	SAT	(IR DATA		)	PGN 1 DMSP								
53	241003Z	14.4N 134.7E	SAT	(IR DATA		)	PGN 1 DMSP								
54	241050Z	14.5N 134.5E	SAT	(IR DATA		)	NOAA-3	(CONF 01)							
55	241108Z	14.4N 134.6E	SAT	(IR DATA		)	PGN 2 DMSP								
56	241434Z	14.7N 133.7E	SAT	(IR DATA		)	PGN 1 DMSP								
57	242246Z	14.9N 133.4E	SAT	(IR DATA		)	PGN 1 DMSP								
58	242314Z	15.0N 133.5E	SAT	(T5.5/5.5 /D1.0/23HRS)			NOAA-3	(CONF 01)							
59	242352Z	15.0N 133.3E	SAT	(T5.0/5.0 /D1.0/22HRS)			PGN 1 DMSP								
60	242352Z	15.0N 133.2E	SAT	(T5.0/5.0 /D0.5/24HRS)			PGN 1 DMSP								
61	250315Z	15.0N 133.0E	SAT	(T5.5/5.5 / / HRS)			PGN 1 DMSP								
62	250315Z	15.0N 133.1E	SAT	(IR DATA		)	PGN 1 DMSP								
63	250315Z	15.1N 133.2E	SAT	(T5.0/5.0 / / HRS)			PGN 1 DMSP								
64	250947Z	15.3N 132.1E	SAT	(IR DATA		)	PGN 1 DMSP								
65	250947Z	15.4N 131.9E	SAT	(IR DATA		)	PGN 1 DMSP								
66	251000Z	15.4N 132.6E	P	4 1 700 270 106 160			50 90 70	25 949	266	18 13	CTHC		20		6
67	251200Z	15.5N 132.3E	SAT	(IR DATA		)	NOAA-3	(CONF 01)							
68	251233Z	15.6N 132.3E	SAT	(IR DATA		)	PGN 1 DMSP								
69	251233Z	15.5N 132.5E	SAT	(IR DATA		)	PGN 1 DMSP								
70	251557Z	15.7N 131.8E	SAT	(IR DATA		)	PGN 1 DMSP								
71	251557Z	15.6N 131.9E	SAT	(IR DATA		)	PGN 1 DMSP								
72	251557Z	15.6N 131.9E	SAT	(IR DATA		)	PGN 1 DMSP								
73	251557Z	15.7N 132.0E	SAT	(IR DATA		)	PGN 1 DMSP								
74	252230Z	15.6N 131.4E	SAT	(IR DATA		)	PGN 1 DMSP								
75	252230Z	15.8N 131.3E	SAT	(IR DATA		)	PGN 2 DMSP								
76	252333Z	15.8N 130.9E	SAT	(T6.0/6.0 /D0.5/23HRS)			PGN 1 DMSP								
77	252333Z	15.5N 130.8E	SAT	(T6.0/6.0+/D1.0/24HRS)			PGN 1 DMSP								
78	252333Z	16.1N 131.0E	SAT	(IR DATA		)	PGN 1 DMSP								
79	260024Z	15.6N 130.8E	SAT	(T5.5/5.5 /S /25HRS)			NOAA-3	(CONF 01)							
80	260257Z	15.6N 130.1E	SAT	(IR DATA		)	PGN 1 DMSP								
81	260257Z	15.5N 130.3E	SAT	(IR DATA		)	PGN 1 DMSP								
82	260257Z	15.6N 130.2E	SAT	(IR DATA		)	PGN 1 DMSP								
83	260350Z	15.6N 130.3E	P	20 5 700 150 130 80			80 90 70	90 940	258	15 -	EYE	E-W	45X20		7
84	260635Z	15.7N 130.1E	P	20 5 700 - - -			- - -	- 939	257	15 -	EYE	E-W	45X20		7
85	261113Z	15.8N 128.9E	SAT	(IR DATA		)	PGN 1 DMSP								
86	261114Z	15.9N 129.1E	SAT	(IR DATA		)	PGN 1 DMSP								
87	261114Z	15.6N 128.9E	SAT	(IR DATA		)	PGN 2 DMSP								
88	261115Z	15.5N 128.7E	SAT	(IR DATA		)	NOAA-3	(CONF 02)							
89	261215Z	15.8N 128.7E	SAT	(IR DATA		)	PGN 1 DMSP								
90	261215Z	15.8N 128.6E	SAT	(IR DATA		)	PGN 1 DMSP								
91	261215Z	15.7N 128.6E	SAT	(IR DATA		)	PGN 1 DMSP								
92	261538Z	15.9N 127.9E	SAT	(IR DATA		)	PGN 1 DMSP								
93	261538Z	15.9N 127.8E	SAT	(IR DATA		)	PGN 1 DMSP								
94	262202Z	15.7N 127.0E	P	1 2 700 290 137 190			40 - -	- 943	259	17 13	CTHC		20		8
95	262215Z	15.8N 126.8E	SAT	(IR DATA		)	PGN 1 DMSP								
96	262215Z	16.2N 126.9E	SAT	(T6.0/6.0 /S /23HRS)			PGN 1 DMSP								
97	262315Z	15.8N 126.5E	SAT	(T6.0/6.0-/S /24HRS)			PGN 1 DMSP								
98	262315Z	16.0N 126.2E	SAT	(T5.0/6.0 /W1.0/24HRS)			PGN 1 DMSP								
99	262339Z	15.3N 126.1E	SAT	(T5.5/5.5 /S /23HRS)			NOAA-3	(CONF 01)							
100	270238Z	15.7N 126.1E	SAT	(IR DATA		)	PGN 1 DMSP								

TYPHOON IRMA
FIX POSITIONS FOR CYCLONE NO. 34
1200Z 21 NOV TO 0600Z 02 DEC

FIX NO.	TIME	POSIT	FIX CAT	ACCHY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN /00MB HGT	FLT LVL T1/T0	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
101	270238Z	15.7N 125.9E	SAT	(IR DATA	)	PCN 1 DMSP													
102	270238Z	15.8N 126.0E	SAT	(IR DATA	)	PCN 1 DMSP													
103	270245Z	15.7N 126.2E	P	10 5 700	280	162	180	30	-	-	-	940	256	19 13	CTRC		30			
104	270800Z	15.6N 125.0E	LMDR	- 8493/																8
105	271030Z	15.7N 124.5E	LMDR	- OPEN CIRCULAR EYE														13.4N 123.7E	
106	271058Z	15.5N 124.4E	SAT	(IR DATA	)	PCN 1 DMSP												18.1N 120.5E	
107	271058Z	15.9N 124.5E	SAT	(IR DATA	)	PCN 3 DMSP													
108	271100Z	15.6N 124.3E	LMDR	- 848//															
109	271156Z	15.6N 124.4E	SAT	(IR DATA	)	PCN 1 DMSP												13.4N 123.7E	
110	271157Z	15.7N 124.2E	SAT	(IR DATA	)	PCN 3 DMSP													
111	271200Z	15.6N 124.3E	LMDR	- CIRCULAR EYE, 25 NM DIAM															
112	271245Z	15.5N 124.0E	SAT	(IR DATA	)	NOAA-3								(CONF 01)				18.1N 120.5E	
113	271300Z	15.8N 124.2E	LMDR	- CIRCULAR EYE, 35 NM DIAM															
114	271400Z	15.6N 123.5E	LMDR	- 84742														18.1N 120.5E	
115	271400Z	15.6N 123.8E	LMDR	- CIRCULAR EYE, SEVERE ATTENUATION, 50 NM DIAM														13.4N 123.7E	
116	271500Z	15.7N 123.5E	LMDR	- CIRCULAR EYE, SEVERE ATTENUATION, 50 NM DIAM														18.1N 120.5E	
117	271520Z	15.5N 123.7E	SAT	(IR DATA	)	PCN 3 DMSP												18.1N 120.5E	
118	271520Z	15.7N 123.1E	SAT	(IR DATA	)	PCN 1 DMSP													
119	271600Z	15.5N 123.5E	LMDR	- SEVERE ATTENUATION															
120	271700Z	15.6N 123.4E	LMDR	- ELLIPTICAL AXIS E&W														18.1N 120.5E	
121	271800Z	15.5N 123.1E	LMDR	- ELLIPTICAL														18.1N 120.5E	
122	271900Z	15.5N 123.0E	LMDR	- ELLIPTICAL														18.1N 120.5E	
123	272000Z	15.5N 122.7E	LMDR	- ELLIPTICAL														18.1N 120.5E	
124	272105Z	15.6N 122.5E	LMDR	- CIRCULAR EYE, 50 NM DIAM														18.1N 120.5E	
125	272200Z	15.6N 121.9E	SAT	(IR DATA	)	PCN 5 DMSP												18.1N 120.5E	
126	272200Z	15.6N 122.2E	LMDR	- ELLIPTICAL EYE, 50 NM DIAM															
127	272300Z	15.5N 122.1E	LMDR	- CIRCULAR EYE, 50 NM DIAM														18.1N 120.5E	
128	280030Z	15.3N 121.6E	LMDR	- CIRCULAR EYE, 50 NM DIAM, 50 PERCENT WALL CLOUD														18.1N 120.5E	
129	280038Z	15.5N 121.3E	SAT	(T5.0/6.0-/W1.0/24HRS)				PCN 5 DMSP										15.2N 120.6E	
130	280050Z	15.4N 121.9E	SAT	(T3.5/3.5 /S /23HRS)				NON DMSP											
131	280100Z	15.4N 121.6E	LMDR	-															
132	280138Z	15.4N 121.4E	LMDR	- GOOD FIX, 15 DEG SPIRAL OVERLAY											-	- -	-	18.1N 120.5E	-
133	280210Z	15.3N 121.2E	LMDR	- 15 DEG SPIRAL OVERLAY														15.2N 120.6E	
134	280330Z	15.2N 121.0E	LMDR	- CIRCULAR EYE, 60 PERCENT WALL CLOUD, 27 NM DIAM														15.2N 120.6E	
135	280338Z	15.2N 121.0E	LMDR	- GOOD FIX, 60 PERCENT WALL CLOUD, CIRCULAR EYE, 27 NM DIAM														15.2N 120.6E	
136	280401Z	15.4N 120.7E	SAT	(IR DATA	)	PCN 6 DMSP												15.2N 120.6E	
137	280600Z	15.4N 120.6E	LMDR	- 2093/															
138	280900Z	15.5N 120.1E	LMDR	- 1190/														14.0N 121.0E	
139	281130Z	15.3N 119.7E	LMDR	- CIRCULAR EYE, 45 PERCENT WALL CLOUD, 45 NM DIAM														14.0N 121.0E	
140	281130Z	15.2N 119.8E	LMDR	- CIRCULAR EYE, 50 PERCENT WALL CLOUD, 40 NM DIAM														16.0N 120.3E	
141	281140Z	15.0N 118.0E	SAT	(IR DATA	)	NOAA-3								(CONF 01)				15.2N 120.6E	
142	281230Z	15.4N 119.4E	LMDR	- CIRCULAR EYE, 55-60 PERCENT WALL CLOUD, 35&45 NM DIAM															
143	281500Z	15.7N 118.2E	LMDR	- CIRCULAR EYE, OPEN E, 50 PERCENT WALL CLOUD, 25 NM DIAM														16.0N 120.3E	
144	281600Z	15.4N 118.2E	LMDR	- CIRCULAR EYE, 60 PERCENT WALL CLOUD, 28 NM DIAM														16.0N 120.3E	
145	281643Z	15.3N 117.7E	SAT	(IR DATA	)	PCN 6 DMSP												16.0N 120.3E	
146	281715Z	15.3N 118.5E	LMDR	- ELLIPTICAL EYE, 5M PERCENT WALL CLOUD															
147	281739Z	15.1N 118.6E	P	2 1 700 90 50 300	58	-	-	-	986	295	17 13	CTRC		25				16.0N 120.3E	
148	281810Z	15.3N 118.2E	LMDR	- CIRCULAR EYE, OPEN E, 50 PERCENT WALL CLOUD, 18 NM DIAM															9
149	282205Z	15.5N 117.8E	P	3 5 700 200 65 150	40	-	-	-	980	293	19 -	CTRC		30				16.0N 120.3E	
150	290006Z	15.3N 117.8E	SAT	(T4.0/4.0 /D0.5/25HRS)				NOAA-3						(CONF 02)					11
151	290020Z	15.4N 117.5E	SAT	(T3.0/4.0 / / HRS)				PCN 5 DMSP											
152	290020Z	15.3N 117.6E	SAT	(T3.0/4.0 /W1.0/24HRS)				PCN 3 DMSP											
153	290342Z	16.0N 116.8E	SAT	(IR DATA	)	PCN 3 DMSP													
154	290342Z	15.2N 116.4E	SAT	(T5.0/5.0 / / HRS)				PCN 3 DMSP											
155	291005Z	15.8N 115.7E	P	1 3 700 360 65 250	33	50	30	44	982	292	17 14	ELIP	SE-NW	20X25					
156	291500Z	16.9N 115.0E	SAT	(IR DATA	)	NOAA-3								(CONF 01)					12
157	291302Z	15.9N 115.0E	SAT	(IR DATA	)	PCN 5 DMSP													
158	291302Z	15.4N 114.1E	SAT	(IR DATA	)	PCN 6 DMSP													
159	291624Z	15.9N 114.4E	SAT	(IR DATA	)	PCN 4 DMSP													
160	300002Z	16.4N 113.4E	SAT	(T4.0/4.0 /D1.0/24HRS)				PCN 1 DMSP											
161	300002Z	16.4N 113.5E	SAT	(T4.0/4.0-/D1.0/24HRS)				PCN 1 DMSP											
162	300114Z	15.8N 113.0E	SAT	(T4.5/4.5 /D0.5/24HRS)				NOAA-3						(CONF 01)					
163	300324Z	16.3N 113.1E	SAT	(IR DATA	)	PCN 1 DMSP													
164	300324Z	16.2N 112.9E	SAT	(T5.0/5.0 /S /24HRS)				PCN 1 DMSP											
165	300505Z	16.3N 113.0E	SAT	(IR DATA	)	PCN 2 DMSP													
166	301205Z	17.4N 112.2E	SAT	(IR DATA	)	NOAA-3								(CONF 02)					
167	301243Z	17.3N 112.3E	SAT	(IR DATA	)	PCN 1 DMSP													
168	301243Z	17.0N 112.2E	SAT	(IR DATA	)	PCN 1 DMSP													
169	301606Z	17.6N 112.1E	SAT	(IR DATA	)	PCN 1 DMSP													
170	301606Z	17.6N 111.8E	SAT	(IR DATA	)	PCN 1 DMSP													
171	310028Z	18.8N 111.9E	SAT	(T5.0/5.0-/D0.5/23HRS)				NOAA-3						(CONF 02)					
172	310125Z	18.7N 112.1E	SAT	(T4.0/4.0-/S /25HRS)				PCN 1 DMSP											
173	310447Z	19.2N 111.8E	SAT	(T6.0/6.0-/D1.0/24HRS)				PCN 1 DMSP											
174	311316Z	20.8N 112.0E	SAT	(IR DATA	)	NOAA-3								(CONF 02)					
175	311407Z	20.5N 112.0E	SAT	(IR DATA	)	PCN 4 DMSP													
176	311500Z	20.5N 111.7E	LMDR	- 55//4															
177	311728Z	20.9N 112.4E	SAT	(IR DATA	)	PCN 5 DMSP												22.3N 114.2E	
178	311800Z	20.8N 112.2E	LMDR	- 55//3															
179	020107Z	21.7N 113.6E	SAT	(IR DATA	)	PCN 5 DMSP												22.3N 114.2E	

TROPICAL STORM JUDY
FIX POSITIONS FOR CYCLONE NO. 35
0000Z 18 DEC TO 0000Z 19 DEC

FIX NO.	TIME	POSIT	FIX CAT	ACCNY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T/TD	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	1400502	8.0N 127.7E	SAT	(T2.0/2.0 / / HRS)			PCN 5 DMSP								
2	1500322	12.4N 122.5E	SAT	(T1.5/1.5 / / HRS)			PCN 5 DMSP								
3	1513132	12.3N 121.6E	SAT	(IR DATA)			PCN 6 DMSP								
4	1600132	12.0N 119.7E	SAT	(T1.5/1.5 /S /24HRS)			PCN 5 DMSP								
5	1613252	13.5N 116.8E	SAT	(IR DATA)			NOAA-4	(CONF 02)							
6	1623552	14.8N 115.8E	SAT	(IR DATA)			PCN 5 DMSP								
7	1701502	13.8N 116.0E	SAT	(T2.5/2.5 /D1.0/25HRS)			NOAA-4	(CONF 02)							
8	1712372	15.1N 113.5E	SAT	(IR DATA)			PCN 6 DMSP								
9	1713112	16.0N 113.5E	SAT	(IR DATA)			NOAA-4	(CONF 02)							
10	1801292	13.2N 112.5E	SAT	(T3.0/3.0 /D0.5/24HRS)			NOAA-4	(CONF 01)							
11	1804362	12.9N 112.0E	SAT	(T2.0/2.0 / / HRS)			PCN 5 DMSP								
12	1814102	12.5N 109.8E	SAT	(IR DATA)			NOAA-4	(CONF 03)							
13	1817172	12.7N 109.1E	SAT	(IR DATA)			PCN 5 DMSP								

TROPICAL STORM KIT
FIX POSITIONS FOR CYCLONE NO. 36
0600Z 19 DEC TO 0600Z 24 DEC

FIX NO.	TIME	POSIT	FIX CAT	ACCNY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR VEL BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T/TD	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	SN NBR
1	1710552	5.5N 143.0E	SAT	(IR DATA)			PCN 6 DMSP								
2	1723372	4.6N 140.9E	SAT	(T1.5/1.5 / / HRS)			PCN 5 DMSP								
3	1806542	6.6N 136.2E	SAT	(IR DATA)			PCN 5 DMSP								
4	1812182	11.0N 135.5E	SAT	(IR DATA)			PCN 6 DMSP								
5	1823182	10.2N 134.4E	SAT	(T2.0/2.0 /D0.5/24HRS)			PCN 3 DMSP								
6	1900292	12.0N 132.9E	SAT	(T1.5/1.5 /D0.5/24HRS)			NOAA-4	(CONF 02)							
7	1902552	10.6N 133.4E	SAT	(IR DATA)			PCN 3 DMSP								
8	1902552	10.9N 133.0E	SAT	(T2.0/2.0 / / HRS)			PCN 5 DMSP								
9	1912002	11.3N 130.3E	SAT	(IR DATA)			PCN 6 DMSP								
10	1913162	11.6N 129.2E	SAT	(IR DATA)			PCN 5 DMSP								
11	1913172	11.5N 129.0E	SAT	(IR DATA)			PCN 6 DMSP								
12	2000422	11.9N 128.0E	SAT	(T1.5/1.5 / / HRS)			PCN 5 DMSP								
13	2001252	11.0N 127.5E	SAT	(T2.5/2.5 /D1.0/25HRS)			NOAA-4	(CONF 02)							
14	2003582	11.0N 127.4E	SAT	(IR DATA)			PCN 5 DMSP								
15	2009552	10.6N 125.2E	F	5 5 /00 250 30 160		60 - - -		1001	308	12 -	-	- -	-		2
16	2012062	13.0N 124.0E	SAT	(IR DATA)			NOAA-4	(CONF 02)							
17	2013232	10.6N 123.9E	SAT	(IR DATA)			PCN 5 DMSP								
18	2018402	11.5N 124.1E	SAT	(IR DATA)			PCN 5 DMSP								
19	2100232	11.3N 122.7E	SAT	(T 0/1.5 / / HRS)			PCN 5 DMSP								
20	2100242	14.2N 122.8E	SAT	(T2.5/2.5+/S /24HRS)			NOAA-4	(CONF 02)							
21	2103402	11.3N 121.9E	SAT	(IR DATA)			PCN 3 DMSP								
22	2103402	11.3N 121.9E	SAT	(T1.0/1.0 / / HRS)			PCN 3 DMSP								
23	2113222	14.0N 118.0E	SAT	(IR DATA)			NOAA-4	(CONF 02)							
24	2200052	10.2N 117.1E	SAT	(T1.0/1.5 /W0.5/24HRS)			PCN 5 DMSP								
25	2212012	13.0N 115.0E	SAT	(IR DATA)			NOAA-4	(CONF 01)							
26	2212472	10.1N 114.3E	SAT	(IR DATA)			PCN 6 DMSP								
27	2300282	9.1N 112.5E	SAT	(T2.0/2.0 / / HRS)			PCN 3 DMSP								
28	2301282	9.5N 112.7E	SAT	(T2.0/2.0 / / HRS)			PCN 3 DMSP								
29	2312552	9.6N 109.0E	SAT	(IR DATA)			NOAA-4	(CONF 02)							
30	2314142	9.5N 110.1E	SAT	(IR DATA)			PCN 5 DMSP								
31	2317252	9.8N 109.3E	SAT	(IR DATA)			PCN 5 DMSP								
32	2400102	9.0N 109.0E	SAT	(T2.0/2.0 / / HRS)			PCN 3 DMSP								
33	2401102	9.1N 109.0E	SAT	(T2.0/2.0-/S /24HRS)			PCN 3 DMSP								
34	2401152	9.1N 106.5E	SAT	(T1.5/1.5-/W0.5/25HRS)			NOAA-4	(CONF 01)							
35	2406262	9.0N 107.1E	SAT	(IR DATA)			PCN 5 DMSP								

CHAPTER V — SUMMARY OF FORECAST VERIFICATION DATA

1. ANNUAL FORECAST VERIFICATION

a. POSITION FORECAST VERIFICATION

Forecast positions for the warning, 24-, 48-, and 72-hour forecasts are verified against the best track using two criteria:

(1) Only those forecasts for tropical cyclones which reach typhoon intensity and the best track winds are 35 kts or greater are verified; and

(2) All forecasts for which best track positions exist are verified.

The position verification statistics for tropical cyclones meeting criteria (1) above are found in Table 5-1. The 24- and 48-hour errors are essentially the same as the long term mean, however the unusually large 72-hour error is attributable to several extremely erratic storms during the 1974 season. The major problem was failure to correctly forecast recurvature (or non-recurvature) in these storms, resulting in anomalously large 72-hour errors. This same information is depicted graphically in Figure 5-1, with a five year cumulative mean shown which eliminates short term variations. It

TABLE 5-1. JTWC ANNUAL AVERAGE POSITION FORECAST ERROR FOR TYPHOONS WHILE WIND OVER 35 KNOTS

	24-HR	48-HR	72-HR
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	98	181	272
1971	99	203	308
1972	116	245	382
1973	102	193	245
1974	114	218	351

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

TABLE 5-2. 1974 JTWC ERROR SUMMARY

(Average errors given in nautical miles)

	CYCLONE	WARNING POSIT ERROR	WARNING RT ANGLE ERROR	WARNING # WRNGS	24 HOUR FCST ERROR	24 HOUR RT ANGLE ERROR	24 HOUR # CASES	48 HOUR FCST ERROR	48 HOUR RT ANGLE ERROR	48 HOUR # CASES	72 HOUR FCST ERROR	72 HOUR RT ANGLE ERROR	72 HOUR # CASES
1.	TS WANDA	43	33	13	195	117	9	404	189	5	475	270	1
2.	TS AMY	31	20	19	136	54	15	---	---	---	---	---	---
3.	TS BABE	19	15	21	112	82	17	---	---	---	---	---	---
4.	TY CARLA	17	12	20	87	38	16	182	75	11	196	136	7
5.	TD 05	31	11	5	73	33	1	---	---	---	---	---	---
6.	TY DINAH	29	23	26	126	86	21	193	154	18	343	316	11
7.	TS EMMA	26	14	21	115	72	17	240	180	7	371	302	3
8.	TS FREDA	36	16	7	114	61	3	---	---	---	---	---	---
9.	TY GILDA	20	15	28	66	42	24	65	34	18	109	75	14
10.	TS HARRIET	24	16	13	143	117	9	187	98	3	182	41	1
11.	TS JEAN	14	11	13	86	51	9	194	194	1	---	---	---
12.	TY IVY	13	10	22	107	61	18	225	190	11	465	422	7
13.	TS KIM	47	39	6	103	24	2	---	---	---	---	---	---
14.	TS LUCY	47	27	10	126	98	6	---	---	---	---	---	---
15.	TY MARY	32	23	46	138	98	38	242	186	24	368	267	15
16.	TD 16	49	42	5	203	186	1	---	---	---	---	---	---
17.	TS NADINE	47	23	13	229	84	9	316	41	2	---	---	---
18.					(CENTRAL PACIFIC HURRICANE CENTER)								
19.	TY POLLY	17	13	31	160	106	27	320	215	19	367	233	11
20.	TD 20	36	23	6	375	275	2	---	---	---	---	---	---
21.	TS ROSE	19	12	13	198	105	9	315	261	4	---	---	---
22.	TY SHIRLEY	14	10	20	116	75	16	265	137	9	521	350	5
23.	TS TRIX	15	12	5	114	38	1	---	---	---	---	---	---
24.	TY VIRGINIA	18	12	15	169	145	11	640	616	1	---	---	---
25.	TS WENDY	19	14	24	136	104	20	310	279	11	526	452	4
26.	TY AGNES	19	12	24	100	73	20	231	140	16	410	249	12
27.	TY BESS	24	9	20	81	42	16	149	85	12	243	85	8
28.	TY CARMEN	18	12	21	103	40	17	172	115	10	249	186	7
29.	TY DELLA	13	9	25	127	89	21	373	250	16	714	477	7
30.	TY ELAINE	14	9	29	94	75	25	158	97	18	250	152	14
31.	TS FAYE	22	11	13	92	30	9	181	69	2	---	---	---
32.	TY GLORIA	17	12	27	160	103	23	220	166	18	275	197	14
33.	TS HESTER	22	16	5	48	48	1	---	---	---	---	---	---
34.	TY IRMA	15	9	44	90	62	40	217	168	30	459	318	26
35.	TS JUDY	48	37	5	146	146	2	---	---	---	---	---	---
36.	TS KIT	34	24	14	71	55	10	128	124	5	206	196	5
	ALL FORECASTS	23	15	627	120	78	483	226	157	271	348	245	172
	*TYPHOONS	19	13	364	114	75	324	218	150	222	351	243	151

*Includes only forecasts on cyclones that became typhoons and only when verifying best track wind was 35 kt.

can be seen from the five year mean that position forecast errors have asymptotically approached the 100-200-300 nm plateaus for the forecast intervals. Error statistics for individual cases are listed in detail in sections 3 and 4 below for various categories of storms, and are summarized in Table 5-2.

In addition to the methods described above for verifying absolute error distance (vector error), a computation of closest distance to the best track (right angle error) is also calculated. Right angle error, graphically depicted in Figure 5-2, is a measure of ability to forecast the path of motion without regard to speed.

b. INTENSITY FORECAST VERIFICATION

Intensity verification statistics for tropical cyclones meeting criteria (1) above are found in Table 5-3. Increased understanding of relationships between minimum sea level pressure and surface winds and improvements in estimating surface wind from measured flight level wind have resulted in a significantly lower error for the initial (warning position) error for 1974. The more accurate initial intensity, combined with careful application of the Dvorak model and known intensity trends, resulted in significantly reduced intensity errors at all forecast intervals for the past season.

TABLE 5-3. JTWC ANNUAL AVERAGE INTENSITY FORECAST ERROR FOR TYPHOONS WHILE WIND OVER 35 KNOTS

	WARNING POSITION	24-HR	48-HR	72-HR
1971	7.1	15.8	20.7	23.8
1972	8.6	13.5	19.7	23.8
1973	6.5	16.0	20.4	28.4
1974	4.4	11.0	15.4	19.5
AVG	7.0	14.0	19.2	23.4

2. COMPARISON OF OBJECTIVE TECHNIQUES

a. GENERAL

Objective techniques have been verified annually since 1967, however year-to-year modifications and improvements prevent any long term comparisons of the various techniques. The dynamic objective forecast techniques all employ the steering concept of a point vortex in a smoothed large-scale flow field. The analog technique provides two movement forecasts, one for those analog storms which recurved and another for non-recurvers as well as an intensity forecast for each. An intensity forecast scheme based on statistical regression equations was evaluated during 1974, and will be used operationally in 1975.

b. DISCUSSION OF OBJECTIVE TECHNIQUES:

(1) EXTRAPOLATION - Past 12-hour movement derived from current warning position and 12-hour old preliminary best track position is linearly extrapolated to 24 and 48 hours.

(2) MOHATT 700/500 - Steering program which advects a point vortex on a pre-selected analysis or prognostic SR (space mean) field at the designated upper levels in six-hour time steps through 72 hours. Utilizing the previous 12-hour history position, MOHATT computes the 12-hour forecast error and applies a bias correction to the forecast position.

(3) TYMOD 12/24 - Steering program which advects a point vortex using FNWC Monterey's global band upper-air prognostic fields out to 72 hours. Forecasts are provided for no history, 12-hour history and 24-hour history. Bias corrections are applied based on 12-hour and 24-hour forecast errors determined from the history positions.

(4) TYFOON - 73 - Analog program which scans history tapes for storms similar (within a specified acceptance envelope) to the storm in question. The history tapes are divided into storms which recurved and those which moved generally towards the west. Two 72 hour forecasts are thus provided, and, based on many other considerations, the appropriate one chosen. The TYFOON 73 program also provides analog intensities out to 72 hours.

(5) FCSTINT - Intensity forecast program which utilizes statistical regression equations to provide forecasts out to 72 hours.

c. TESTING AND RESULTS:

It is of some interest to compare the performance of the objective techniques to each other and to the official forecast as well. This information is listed in Table 5-4 for typhoons only and in Table 5-5 for all forecasts. Care must be exercised in interpreting the results for the TYFS and TYFR (TYFOON-73 for straight and recurve data tapes), since both outputs were considered for each forecast. Because of procedural changes in the numerical model that TYMOD and MOHATT employ, these techniques continue to exhibit poor performance in the mean at each forecast interval. Research is currently planned to develop a new steering technique designed to eliminate these problems.

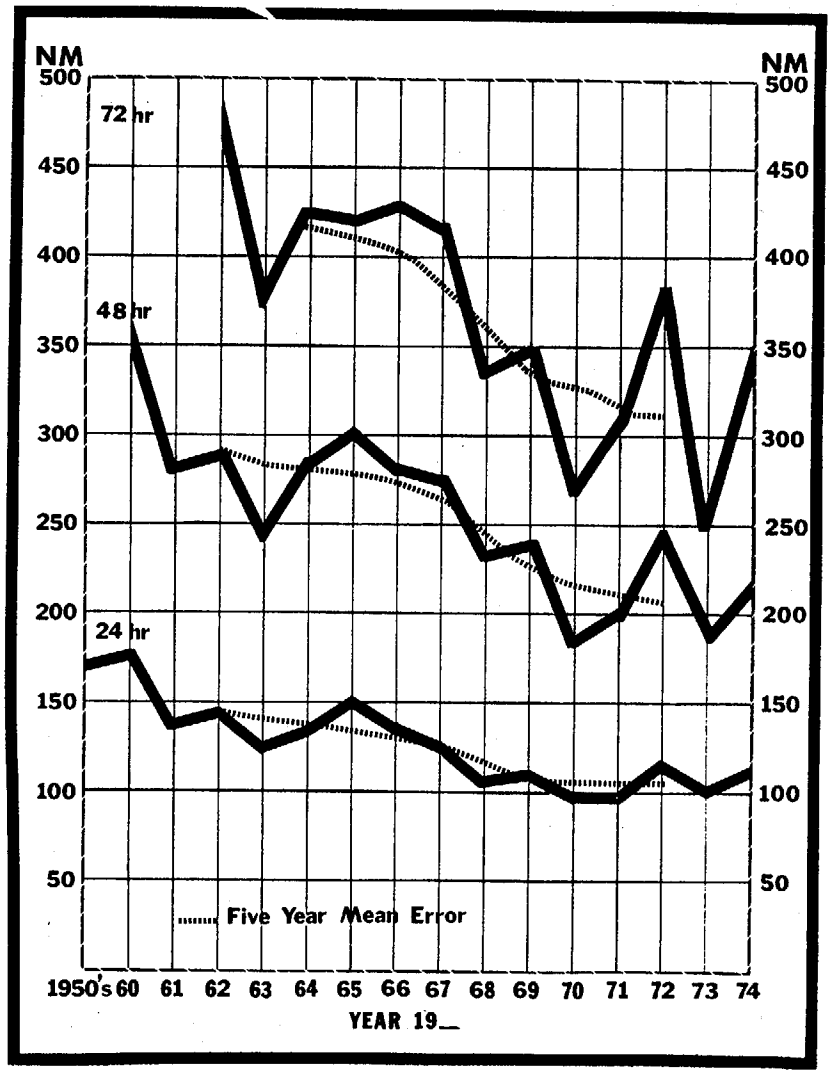


FIGURE 5-1. *Mean vector error.*

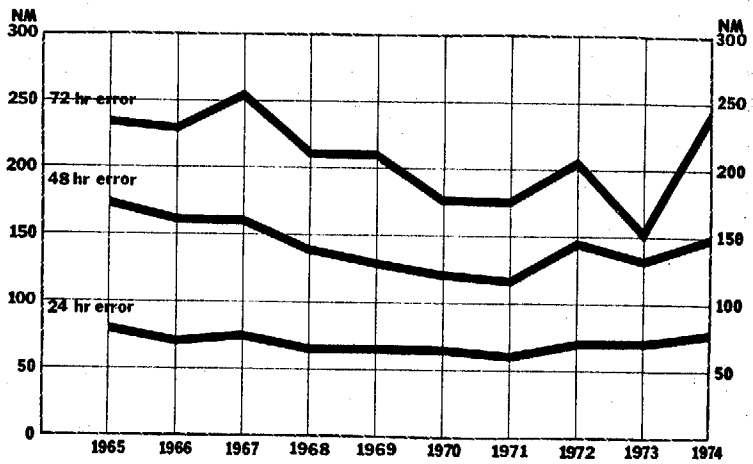


FIGURE 5-2. *Mean right angle error.*

TABLE 5-4. 1974 OBJECTIVE TECHNIQUES FOR TYPHOONS ONLY (see criterion a)

24-HOUR

	JTWC	XTRP	TY12	TY24	TYFS	TYFR	MH70	MH50
JTWC	324 114 114 0							
XTRP	308 116 123 7	308 123 123 0						
TY12	189 120 189 69	179 126 182 56	189 189 189 0					
TY24	181 120 204 84	171 126 201 75	179 182 204 22	181 204 204 0				
TYFS	283 112 124 12	268 121 122 2	177 186 128 -57	168 205 123 -82	283 124 124 0			
TYFR	288 118 144 26	273 124 144 20	181 189 145 -43	172 207 144 -63	272 125 143 18	288 144 144 0		
MH70	242 119 150 32	230 125 147 22	164 191 149 -42	157 211 144 -67	224 127 148 22	229 146 152 6	242 150 150 0	
MH50	233 120 149 29	222 127 146 19	161 189 147 -43	154 211 142 -69	217 128 148 19	221 146 149 3	231 152 147 -4	235 149 149 0

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

48-HOUR

	JTWC	XTRP	TY12	TY24	TYFS	TYFR	MH70	MH50
JTWC	222 218 218 0							
XTRP	222 217 226 9	231 228 228 0						
TY12	135 214 412 197	133 229 394 165	147 407 407 0					
TY24	127 217 409 192	129 229 405 176	138 387 408 21	141 405 405 0				
TYFS	217 217 213 -4	215 228 214 -14	142 401 231 -171	134 402 223 -179	233 223 223 0			
TYFR	215 220 283 63	213 230 287 56	145 410 299 -111	137 410 300 -110	226 221 286 65	233 292 292 0		
MH70	176 221 316 95	175 234 313 79	128 405 315 -89	121 421 316 -105	183 224 316 93	185 297 319 22	191 317 317 0	
MH50	166 225 382 157	166 237 382 146	124 403 388 -15	118 420 386 -35	174 225 380 155	177 298 388 90	181 319 384 65	181 384 384 0

JTWC - OFFICIAL JTWC SUBJECTIVE FORECAST
XTRP - EXTRAPOLATION
TY12 - TYMOD WITH 12-HR HISTORY
TY24 - TYMOD WITH 24-HR HISTORY
TYFS - TYFOON (WEIGHTED CLIMO) STRAIGHT
TYFR - TYFOON (WEIGHTED CLIMO) RECURVE
MH70 - MOHATT 700-MB PROG
MH50 - MOHATT 500-MB PROG

72-HOUR

	JTWC	TY12	TY24	TYFS	TYFR	MH70	MH50
JTWC	151 351 351 0						
TY12	93 351 588 237	105 615 615 0					
TY24	88 365 612 247	97 592 600 7	102 613 615 0				
TYFS	146 348 271 -77	103 621 325 -296	98 620 314 -306	173 296 296 0			
TYFR	144 350 442 91	101 628 500 -128	96 624 507 -117	169 294 495 201	170 493 493 0		
MH70	121 352 525 173	91 638 580 -58	86 640 590 -50	134 316 577 261	134 492 579 88	139 575 576 0	
MH50	113 360 747 387	88 639 744 105	84 645 751 106	127 308 750 442	127 470 752 282	130 569 749 180	130 749 749 0

TABLE 5-5. 1974 OBJECTIVE TECHNIQUES FOR ALL FORECASTS (see criterion b)

24-HOUR

	JTWC	XTRP	TY12	TY24	TYFS	TYFR	MH70	MH50
JTWC	481 120 120 0							
XTRP	425 117 132 14	425 132 132 0						
TY12	267 130 197 67	253 137 192 55	267 197 197 0					
TY24	258 131 218 87	247 137 208 71	255 191 219 27	258 218 218 0				
TYFS	362 117 154 17	342 128 129 0	233 192 135 -57	223 212 131 -81	362 154 154 0			
TYFR	372 122 152 30	352 131 148 17	242 194 149 -45	231 215 149 -65	330 136 151 16	372 152 152 0		
MH70	323 125 160 35	306 132 157 25	228 195 157 -38	219 222 154 -68	286 130 159 28	296 147 161 13	325 160 160 0	
MH50	307 125 151 25	292 132 148 16	219 194 148 -46	210 222 145 -79	278 132 149 17	287 149 150 2	305 161 149 12	307 151 151 0

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

48-HOUR

	JTWC	XTRP	TY12	TY24	TYFS	TYFR	MH70	MH50
JTWC	272 226 226 0							
XTRP	257 225 243 20	288 249 249 0						
TY12	159 225 438 215	174 257 450 172	192 435 435 0					
TY24	149 225 456 215	168 259 445 184	180 419 445 26	184 440 440 0				
TYFS	241 222 222 -0	256 258 225 -15	176 425 257 -188	166 430 230 -200	279 238 238 0			
TYFR	244 225 284 59	257 242 288 46	183 433 303 -130	172 439 303 -136	272 237 294 57	283 299 299 0		
MH70	201 227 355 108	215 245 354 88	164 425 342 -83	154 448 343 -105	219 227 337 110	225 296 338 42	235 339 339 0	
MH50	190 230 384 154	203 244 377 153	157 422 368 -54	148 445 365 -79	210 228 375 147	217 297 381 83	222 341 379 38	222 379 379 0

JTWC - OFFICIAL JTWC SUBJECTIVE FORECAST
XTRP - EXTRAPOLATION
TY12 - TYMOD WITH 12-HR HISTORY
TY24 - TYMOD WITH 24-HR HISTORY
TYFS - TYFCON (WEIGHTED CLIMO) STRAIGHT
TYFR - TYFCON (WEIGHTED CLIMO) RECURVE
MH70 - MOHATT 700-MB PROG
MH50 - MOHATT 500-MB PROG

72-HOUR

	JTWC	TY12	TY24	TYFS	TYFR	MH70	MH50
JTWC	172 348 348 0						
TY12	99 350 595 246	129 646 646 0					
TY24	94 362 616 253	120 626 629 3	125 639 639 0				
TYFS	156 351 288 -64	123 648 330 -318	118 646 321 -326	199 319 319 0			
TYFR	153 352 441 89	123 660 505 -154	117 652 511 -141	194 316 497 181	197 497 497 0		
MH70	130 353 579 226	113 670 618 -53	107 669 626 -43	157 332 622 290	158 496 606 110	165 620 620 0	
MH50	122 361 737 376	109 672 700 28	104 674 704 30	150 326 732 407	151 478 730 252	155 616 731 115	155 731 731 0

3. TROPICAL STORM AND DEPRESSION DATA

TROPICAL STORM WANDA

0000Z 10 JAN TO 1200Z 13 JAN

	BEST TRACK			WARNING				24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS				ERRORS				ERRORS				ERRORS	
	POSIT	WIND		POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
1000002	9.9N	130.9E	45	10.0N	131.0E	45	8	0	12.0N	130.6E	55	176	10	14.8N	131.8E	60	352	30	17.6N 134.8E 55	475	30
1006002	10.4N	131.6E	50	10.4N	131.9E	50	18	0	11.4N	130.6E	60	246	20	14.0N	129.8E	60	522	30	--.- ---.- --	--	--
1012002	11.0N	132.3E	50	11.1N	131.6E	50	41	0	13.4N	131.0E	60	268	30	15.7N	133.0E	60	396	30	--.- ---.- --	--	--
1018002	11.7N	132.9E	55	11.9N	131.7E	50	71	-5	13.9N	132.7E	60	234	30	15.5N	135.5E	60	330	30	--.- ---.- --	--	--
1100002	12.3N	133.6E	45	12.5N	131.7E	50	111	5	14.5N	132.9E	60	287	30	16.5N	135.5E	55	419	30	--.- ---.- --	--	--
1106002	12.7N	134.6E	40	13.1N	134.1E	45	38	5	16.1N	138.1E	35	115	5	--.-	---.-	--	--	--	--.- ---.- --	--	--
1112002	13.1N	135.6E	30	15.0N	136.0E	40	116	10	18.4N	142.0E	30	254	0	--.-	---.-	--	--	--	--.- ---.- --	--	--
1118002	13.4N	136.7E	30	12.5N	137.3E	30	64	0	13.7N	142.4E	20	100	-10	--.-	---.-	--	--	--	--.- ---.- --	--	--
1200002	13.8N	137.8E	30	13.7N	138.2E	30	24	0	15.4N	143.6E	25	71	0	--.-	---.-	--	--	--	--.- ---.- --	--	--
1206002	14.3N	138.8E	30	14.1N	138.8E	30	12	0	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.- ---.- --	--	--
1212002	14.7N	139.8E	30	14.8N	139.8E	30	6	0	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.- ---.- --	--	--
1218002	14.9N	141.2E	30	15.0N	140.5E	30	41	0	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.- ---.- --	--	--
1300002	14.9N	142.6E	25	15.0N	142.6E	30	6	5	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.- ---.- --	--	--

TROPICAL STORM AMY

1200Z 14 MAR TO 1200Z 19 MAR

	BEST TRACK			WARNING				24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS				ERRORS				ERRORS				ERRORS	
	POSIT	WIND		POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
1412002	8.4N	142.6E	25	8.3N	142.3E	30	19	5	8.4N	139.2E	40	48	15	--.-	---.-	--	--	--	--.- ---.- --	--	--
1418002	8.5N	142.3E	25	8.4N	141.9E	30	24	5	9.0N	138.6E	40	21	15	--.-	---.-	--	--	--	--.- ---.- --	--	--
1500002	8.7N	141.7E	25	8.6N	141.3E	30	24	5	9.4N	139.1E	40	103	15	--.-	---.-	--	--	--	--.- ---.- --	--	--
1506002	9.1N	140.9E	25	8.7N	140.6E	30	30	5	9.2N	138.4E	25	134	0	--.-	---.-	--	--	--	--.- ---.- --	--	--
1512002	9.2N	139.9E	25	9.0N	140.1E	30	17	5	9.7N	138.0E	25	147	0	--.-	---.-	--	--	--	--.- ---.- --	--	--
1518002	9.3N	138.8E	25	9.3N	139.4E	30	35	5	10.2N	137.4E	25	146	0	--.-	---.-	--	--	--	--.- ---.- --	--	--
1600002	9.8N	137.4E	25	9.6N	137.6E	25	17	0	10.1N	133.7E	35	260	5	--.-	---.-	--	--	--	--.- ---.- --	--	--
1606002	10.7N	136.7E	25	9.6N	136.6E	30	66	5	10.4N	132.7E	40	359	5	--.-	---.-	--	--	--	--.- ---.- --	--	--
1612002	11.5N	136.3E	25	11.6N	136.5E	30	13	5	15.1N	135.6E	40	150	5	--.-	---.-	--	--	--	--.- ---.- --	--	--
1618002	12.4N	136.3E	25	12.2N	136.3E	30	12	5	15.3N	135.7E	40	210	0	--.-	---.-	--	--	--	--.- ---.- --	--	--
1700002	13.4N	136.6E	30	13.2N	136.8E	30	17	0	16.5N	139.1E	35	85	-5	--.-	---.-	--	--	--	--.- ---.- --	--	--
1706002	14.4N	137.3E	35	14.3N	137.4E	30	8	-5	17.5N	141.5E	30	53	-10	--.-	---.-	--	--	--	--.- ---.- --	--	--
1712002	15.3N	138.2E	35	15.3N	138.4E	35	12	0	18.5N	143.0E	30	54	-15	--.-	---.-	--	--	--	--.- ---.- --	--	--
1718002	16.3N	139.2E	40	16.0N	139.3E	35	19	-5	19.0N	144.0E	30	131	-15	--.-	---.-	--	--	--	--.- ---.- --	--	--
1800002	17.2N	140.4E	40	17.5N	140.4E	35	18	-5	20.3N	146.3E	25	139	-15	--.-	---.-	--	--	--	--.- ---.- --	--	--
1806002	18.3N	141.9E	40	18.4N	141.7E	35	13	-5	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.- ---.- --	--	--
1812002	19.2N	143.6E	45	20.0N	144.6E	35	74	-10	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.- ---.- --	--	--
1818002	20.4N	145.8E	45	19.7N	145.2E	35	54	-10	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.- ---.- --	--	--
1900002	21.8N	148.2E	40	22.6N	150.1E	45	115	5	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.- ---.- --	--	--

TROPICAL STORM BABE

0000Z 26 APR TO 0600Z 02 MAY

	BEST TRACK			WARNING				24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS				ERRORS				ERRORS				ERRORS	
	POSIT	WIND		POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
2600002	9.5N	147.2E	20	9.3N	147.4E	25	17	5	12.0N	144.0E	40	84	15	--.-	---.-	--	--	--	--.- ---.- --	--	--
2606002	10.3N	146.4E	20	10.3N	146.5E	25	6	5	13.6N	143.6E	40	112	15	--.-	---.-	--	--	--	--.- ---.- --	--	--
2612002	11.3N	145.7E	25	11.4N	145.2E	25	30	0	14.8N	142.0E	40	224	15	--.-	---.-	--	--	--	--.- ---.- --	--	--
2618002	12.1N	145.4E	25	12.4N	145.1E	30	25	5	16.4N	142.8E	45	197	15	--.-	---.-	--	--	--	--.- ---.- --	--	--
2700002	12.6N	145.3E	25	12.5N	145.3E	30	6	5	14.9N	144.8E	40	75	10	--.-	---.-	--	--	--	--.- ---.- --	--	--
2706002	13.3N	145.5E	25	13.2N	145.3E	30	13	5	16.0N	145.4E	35	21	5	--.-	---.-	--	--	--	--.- ---.- --	--	--
2712002	14.1N	145.8E	25	14.0N	145.6E	30	13	5	17.5N	147.0E	35	93	5	--.-	---.-	--	--	--	--.- ---.- --	--	--
2718002	15.0N	145.9E	30	15.0N	145.9E	30	0	0	18.5N	147.6E	35	136	5	--.-	---.-	--	--	--	--.- ---.- --	--	--
2800002	15.7N	145.8E	30	16.3N	146.2E	30	43	0	20.7N	148.2E	25	222	-10	--.-	---.-	--	--	--	--.- ---.- --	--	--
2806002	16.3N	145.6E	30	16.4N	145.4E	30	13	0	19.7N	144.9E	30	61	-10	--.-	---.-	--	--	--	--.- ---.- --	--	--
2812002	16.9N	145.5E	30	17.0N	145.4E	30	8	0	20.4N	145.6E	25	82	-20	--.-	---.-	--	--	--	--.- ---.- --	--	--
2818002	17.6N	145.4E	30	18.0N	145.6E	30	26	0	22.1N	146.6E	25	175	-25	--.-	---.-	--	--	--	--.- ---.- --	--	--
2900002	18.3N	145.2E	35	18.2N	145.0E	30	13	-5	21.3N	144.7E	35	72	-20	--.-	---.-	--	--	--	--.- ---.- --	--	--
2906002	18.7N	145.1E	40	18.9N	145.2E	40	13	0	22.5N	146.1E	50	135	-10	--.-	---.-	--	--	--	--.- ---.- --	--	--
2912002	19.2N	144.9E	45	19.2N	145.1E	40	11	-5	21.4N	145.6E	45	60	-15	--.-	---.-	--	--	--	--.- ---.- --	--	--
2918002	19.7N	144.8E	50	20.1N	145.3E	45	37	-5	23.4N	146.6E	50	97	-10	--.-	---.-	--	--	--	--.- ---.- --	--	--
3000002	20.1N	144.6E	55	20.4N	145.3E	45	43	-10	23.7N	146.8E	35	55	-20	--.-	---.-	--	--	--	--.- ---.- --	--	--
3006002	20.8N	144.5E	60	20.7N	144.1E	45	23	-15	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.- ---.- --	--	--
3012002	21.5N	144.6E	60	21.8N	144.5E	55	19	-5	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.- ---.- --	--	--
3018002	22.4N	145.2E	60	22.4N	145.3E	55	6	-5	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.- ---.- --	--	--
0100002	23.2N	145.8E	55	22.9N	146.4E	50	38	-5	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.- ---.- --	--	--

TROPICAL DEPRESSION 05

0600Z 07 JUN TO 0600Z 08 JUN

	BEST TRACK		WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
0700Z	20.3N 112.9E	30	20.1N 113.2E	30	21	0	21.4N 112.4E	45	73	25	---.- ---.-	--	--	--	---.- ---.-	--	--	--
0712Z	20.7N 112.6E	30	20.2N 112.8E	30	32	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
0718Z	21.2N 112.2E	30	20.6N 112.5E	30	29	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
0800Z	21.6N 111.7E	30	21.2N 112.4E	30	46	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
0806Z	22.0N 111.1E	20	21.6N 111.9E	30	29	10	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

TROPICAL STORM EMMA

0600Z 13 JUN TO 0600Z 18 JUN

	BEST TRACK		WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
1306Z	11.9N 134.7E	25	12.1N 135.2E	25	32	0	14.3N 130.9E	35	75	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1312Z	12.3N 133.3E	30	12.7N 132.9E	30	33	0	13.9N 128.1E	40	66	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1318Z	12.9N 131.9E	30	12.9N 131.8E	30	6	0	14.1N 126.8E	40	93	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1400Z	13.7N 130.7E	35	13.3N 130.5E	30	27	-5	14.7N 125.9E	40	88	-10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1406Z	14.4N 129.6E	35	14.5N 129.4E	30	13	-5	16.2N 124.2E	40	92	-15	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1412Z	14.9N 128.6E	40	15.1N 128.7E	30	13	-10	18.2N 125.0E	40	90	-20	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1418Z	15.4N 127.7E	45	15.5N 127.6E	35	8	-10	18.1N 124.3E	50	54	-10	21.5N 122.5E	65	153	20	25.5N 122.7E	75	262	45
1500Z	15.9N 126.8E	50	15.7N 127.0E	40	17	-10	18.3N 124.2E	55	42	0	22.3N 122.3E	70	172	30	26.6N 123.1E	75	307	50
1506Z	16.3N 125.8E	55	16.3N 125.6E	50	34	-5	19.0N 121.4E	65	149	15	22.2N 119.8E	75	299	35	25.6N 120.2E	85	543	45
1512Z	16.7N 125.0E	60	17.1N 125.0E	55	24	-5	20.3N 121.9E	75	143	30	23.9N 122.1E	70	235	35	---.- ---.-	--	--	--
1518Z	17.2N 124.4E	60	17.3N 124.2E	60	13	0	20.2N 121.4E	75	150	30	23.5N 121.9E	70	307	40	---.- ---.-	--	--	--
1600Z	17.6N 124.2E	55	17.8N 124.1E	55	13	0	20.7N 123.8E	50	45	10	24.4N 125.9E	45	210	20	---.- ---.-	--	--	--
1606Z	18.2N 123.9E	50	18.2N 124.0E	50	6	0	21.0N 124.0E	45	56	5	24.8N 125.5E	40	301	20	---.- ---.-	--	--	--
1612Z	18.7N 123.8E	45	19.2N 123.5E	55	34	10	22.4N 123.8E	55	117	20	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1618Z	19.3N 123.9E	45	19.5N 123.5E	50	26	5	22.7N 124.0E	45	190	15	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1700Z	20.1N 124.3E	40	20.1N 124.0E	50	17	10	23.1N 125.4E	45	257	20	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1706Z	20.9N 125.0E	40	21.1N 124.4E	45	36	5	24.7N 127.2E	35	237	15	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1712Z	22.1N 125.9E	35	22.0N 125.5E	40	23	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1718Z	23.9N 127.2E	30	23.1N 126.4E	40	65	10	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1800Z	26.1N 128.8E	25	26.1N 128.7E	30	5	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1806Z	27.7N 130.1E	20	26.4N 129.1E	25	94	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

TROPICAL STORM FREDA

0000Z 21 JUN TO 1200Z 22 JUN

	BEST TRACK		WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
2100Z	25.9N 151.5E	35	26.0N 151.7E	25	12	-10	26.0N 158.2E	30	61	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2106Z	25.6N 153.0E	45	25.8N 153.0E	45	12	0	26.0N 160.0E	40	100	10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2112Z	25.2N 154.4E	40	25.0N 155.2E	40	25	0	24.3N 163.1E	30	182	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2118Z	25.0N 156.8E	35	25.0N 156.8E	35	0	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2200Z	25.2N 158.9E	35	25.3N 158.1E	35	44	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2206Z	25.6N 161.8E	30	25.2N 160.9E	30	54	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2212Z	26.6N 165.3E	25	25.3N 164.0E	30	104	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

TROPICAL STORM HARRIET

0600Z 15 JUL TO 0600Z 18 JUL

	BEST TRACK		WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
1506Z	18.2N 138.9E	35	18.0N 139.0E	35	13	0	21.5N 136.2E	50	103	10	24.3N 134.9E	60	168	30	27.3N 133.8E	65	182	45
1512Z	19.2N 137.7E	40	19.3N 138.1E	40	23	0	22.9N 135.4E	55	106	15	26.2N 134.4E	65	99	40	---.- ---.-	--	--	--
1518Z	20.2N 136.5E	45	20.0N 135.8E	30	41	-15	22.4N 130.9E	30	153	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1600Z	21.2N 135.4E	45	21.0N 135.5E	40	13	-5	23.9N 132.0E	50	100	15	26.8N 130.2E	40	295	20	---.- ---.-	--	--	--
1606Z	22.2N 134.5E	40	22.1N 134.2E	40	18	0	25.4N 130.6E	30	127	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1612Z	23.2N 133.5E	40	23.5N 133.8E	40	24	0	28.0N 131.9E	30	68	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1618Z	24.3N 133.0E	35	24.2N 132.4E	35	33	0	28.0N 129.7E	25	222	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1700Z	25.4N 132.8E	35	25.1N 132.8E	35	18	0	29.5N 131.8E	20	180	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1706Z	26.6N 132.8E	30	26.9N 132.6E	30	21	0	32.5N 134.5E	20	230	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1712Z	27.6N 133.1E	25	27.4N 132.9E	30	16	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1718Z	28.4N 133.9E	25	28.8N 134.4E	30	35	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1800Z	29.0N 135.2E	20	29.3N 135.2E	25	18	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1806Z	29.1N 136.6E	20	29.3N 136.0E	20	33	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

TROPICAL STORM JEAN

0000Z 17 JUL TO 0600Z 20 JUL

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS				ERRORS				ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
1700Z	19.7N 127.2E	25	19.8N 127.2E	30	6	5	22.5N 125.3E	40	85	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1706Z	20.1N 126.8E	25	19.9N 126.7E	30	13	5	22.3N 124.8E	35	58	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1712Z	20.3N 126.3E	30	20.3N 126.3E	30	0	0	22.4N 124.7E	40	73	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1718Z	20.7N 125.7E	35	20.5N 126.0E	30	21	-5	22.6N 124.7E	35	102	-10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1800Z	21.1N 125.0E	40	21.4N 125.1E	35	19	-5	24.6N 124.0E	35	95	5	29.2N 125.7E	55	194	30	---.- ---.-	--	--	--
1806Z	21.5N 124.2E	40	21.8N 124.3E	45	19	5	25.4N 122.8E	60	45	20	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1812Z	22.1N 123.5E	45	22.3N 123.7E	50	16	5	25.4N 122.0E	60	61	25	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1818Z	22.9N 122.9E	45	22.9N 122.7E	50	11	5	26.5N 121.4E	45	104	15	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1900Z	23.8N 122.5E	45	23.6N 122.4E	50	13	5	27.6N 122.2E	45	149	20	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1906Z	25.0N 122.1E	40	24.9N 122.1E	55	6	15	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1912Z	26.4N 121.8E	35	26.3N 122.2E	50	22	15	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1918Z	28.2N 121.8E	30	28.3N 121.9E	45	8	15	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2000Z	30.1N 122.1E	25	30.5N 122.2E	35	24	10	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

TROPICAL STORM KIM

0000Z 23 JUL TO 0600Z 24 JUL

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS				ERRORS				ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
2300Z	23.2N 166.0E	30	23.4N 167.2E	30	67	0	25.5N 168.3E	35	74	-10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2306Z	23.7N 166.0E	30	23.9N 166.3E	30	20	0	26.3N 168.1E	35	132	-15	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2312Z	24.3N 167.2E	35	24.1N 168.1E	35	50	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2318Z	25.2N 167.8E	40	24.2N 168.8E	35	81	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2400Z	26.5N 167.5E	45	26.6N 167.3E	35	12	-10	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2406Z	27.1N 165.8E	50	27.9N 166.1E	50	50	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

TROPICAL STORM LUCY

0000Z 09 AUG TO 0600Z 11 AUG

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS				ERRORS				ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
0900Z	18.5N 118.7E	25	18.1N 117.3E	30	83	5	19.7N 115.3E	40	270	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
0906Z	19.4N 119.2E	30	19.1N 119.1E	30	19	0	21.5N 118.9E	40	58	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
0912Z	20.5N 119.6E	35	20.2N 119.6E	35	21	0	23.3N 120.0E	45	50	10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
0918Z	21.3N 119.5E	35	21.0N 120.1E	40	38	5	24.3N 119.4E	45	68	15	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1000Z	22.1N 119.4E	35	22.5N 119.4E	40	24	5	26.3N 118.0E	20	170	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1006Z	22.4N 119.3E	35	23.2N 119.1E	40	49	5	26.5N 117.8E	20	142	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1012Z	22.9N 119.2E	35	24.0N 119.5E	35	68	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1018Z	23.2N 119.1E	30	25.2N 119.5E	35	121	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1100Z	23.6N 119.0E	25	23.7N 118.7E	30	17	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1106Z	24.3N 118.8E	25	24.7N 119.0E	25	26	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

TROPICAL DEPRESSION 16

0600Z 14 AUG TO 0600Z 15 AUG

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS				ERRORS				ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
1400Z	17.7N 110.4E	25	18.7N 110.5E	30	62	5	19.9N 107.2E	35	203	20	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1412Z	17.5N 110.0E	25	19.1N 109.6E	30	98	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1418Z	17.2N 109.2E	30	18.0N 109.9E	30	62	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1500Z	16.9N 108.1E	30	16.9N 107.9E	30	11	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1506Z	16.5N 107.0E	15	16.7N 106.9E	20	13	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

TROPICAL STORM NADINE

0600Z 15 AUG TO 1200Z 18 AUG

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS				ERRORS				ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
1500Z	16.0N 128.7E	35	16.5N 126.6E	30	124	-5	17.4N 124.4E	40	761	-10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1512Z	15.7N 130.8E	40	16.5N 129.0E	30	114	-10	16.5N 129.0E	30	600	-10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1518Z	15.5N 133.2E	45	16.5N 132.5E	30	40	-15	20.5N 138.4E	30	138	-15	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1600Z	15.7N 135.7E	50	15.7N 135.7E	50	0	0	19.5N 141.6E	60	114	15	24.2N 142.3E	70	367	40	---.- ---.-	--	--	--
1606Z	16.6N 137.7E	50	16.7N 137.7E	50	6	0	22.4N 141.8E	60	66	20	27.0N 140.3E	70	265	45	---.- ---.-	--	--	--
1612Z	18.0N 139.4E	40	18.1N 139.6E	45	13	5	24.7N 141.4E	45	55	10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1618Z	19.7N 140.7E	45	19.4N 140.8E	45	19	0	26.3N 140.6E	35	92	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1700Z	21.4N 141.5E	45	21.4N 141.5E	40	0	-5	28.1N 139.7E	30	125	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1706Z	23.5N 141.7E	40	23.2N 141.7E	50	18	10	29.7N 138.8E	40	112	15	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1712Z	25.6N 141.2E	35	24.5N 141.3E	40	66	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1718Z	27.8N 141.0E	30	26.8N 140.4E	40	182	10	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1800Z	30.1N 140.4E	30	30.0N 140.4E	30	6	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1806Z	31.4N 139.7E	25	31.0N 139.8E	30	24	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

TROPICAL DEPRESSION 20

0000Z 27 AUG TO 0600Z 28 AUG

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS			ERRORS				ERRORS		
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
2700Z	24.6N 131.3E	30	24.7N 131.3E	30	6	0	27.7N 135.5E	40	334	15	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2706Z	25.3N 131.6E	30	25.2N 132.5E	30	49	0	28.7N 136.0E	40	416	20	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2712Z	25.9N 131.2E	30	25.1N 132.0E	30	64	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2718Z	26.3N 130.4E	30	26.5N 131.3E	30	50	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2800Z	26.8N 129.3E	25	27.0N 129.5E	25	16	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2806Z	27.6N 128.2E	20	27.4N 128.7E	20	29	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

TROPICAL STORM ROSE

0600Z 28 AUG TO 0600Z 31 AUG

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS			ERRORS				ERRORS		
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
2806Z	22.9N 124.8E	45	23.1N 124.8E	35	12	-10	26.4N 127.7E	45	192	-5	32.4N 128.8E	50	311	5	---.- ---.-	--	--	--
2812Z	23.3N 126.3E	45	23.4N 126.3E	40	6	-5	26.6N 129.9E	45	96	-5	30.6N 127.4E	35	273	-10	---.- ---.-	--	--	--
2818Z	23.9N 127.3E	45	24.0N 127.2E	40	8	-5	24.8N 128.5E	35	120	-15	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2900Z	24.6N 128.0E	45	24.4N 127.6E	35	25	-10	25.7N 129.3E	30	97	-20	27.6N 133.3E	20	141	-15	---.- ---.-	--	--	--
2906Z	25.4N 128.6E	50	25.3N 128.0E	45	6	-5	28.4N 130.3E	45	96	0	33.6N 130.5E	25	534	-5	---.- ---.-	--	--	--
2912Z	26.3N 128.9E	50	25.9N 129.0E	50	24	0	29.1N 129.4E	45	152	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2918Z	26.8N 128.7E	50	27.1N 129.0E	50	24	0	31.5N 127.8E	50	321	10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
3000Z	27.2N 128.6E	50	27.3N 128.5E	50	8	0	30.4N 127.0E	45	395	10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
3006Z	27.2N 129.1E	45	27.4N 128.5E	50	34	5	29.5N 127.1E	45	447	15	---.- ---.-	--	--	--	---.- ---.-	--	--	--
3012Z	26.6N 129.9E	45	26.6N 129.8E	40	5	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
3018Z	26.8N 130.8E	40	26.2N 130.8E	40	36	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
3100Z	25.6N 131.9E	35	25.7N 131.8E	30	8	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
3106Z	25.2N 134.0E	30	25.5N 133.7E	30	45	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

TROPICAL STORM IRIX

1200Z 05 SEP TO 1200Z 06 SEP

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS			ERRORS				ERRORS		
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
0512Z	20.5N 114.7E	30	20.7N 114.5E	30	16	0	20.7N 112.2E	40	114	15	---.- ---.-	--	--	--	---.- ---.-	--	--	--
0518Z	20.7N 113.8E	35	20.7N 113.6E	30	11	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
0600Z	21.0N 113.0E	40	20.8N 113.0E	40	12	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
0606Z	21.6N 112.0E	40	21.3N 112.0E	35	18	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
0612Z	22.0N 110.7E	25	22.3N 110.8E	25	19	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

TROPICAL STORM WENDY

0600Z 24 SEP TO 0000Z 30 SEP

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS			ERRORS				ERRORS		
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
2400Z	17.7N 124.1E	30	17.7N 124.1E	25	0	-5	20.5N 120.5E	35	94	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2412Z	18.1N 123.2E	35	18.4N 123.0E	30	21	-5	20.9N 119.7E	45	165	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2418Z	18.3N 122.4E	40	18.3N 122.6E	35	11	-5	20.0N 119.8E	50	71	10	21.0N 117.0E	55	206	5	23.3N 114.2E	30	439	-30
2500Z	18.6N 121.6E	40	18.8N 122.0E	40	26	0	20.5N 119.0E	55	114	15	22.1N 115.9E	70	266	20	24.1N 113.2E	25	502	-35
2506Z	19.0N 121.0E	40	19.2N 120.6E	40	26	0	20.5N 117.5E	60	183	15	22.3N 114.7E	75	356	20	24.5N 112.2E	25	548	-25
2512Z	19.2N 121.0E	40	19.4N 120.4E	35	36	-5	20.4N 117.3E	55	190	5	21.3N 114.2E	65	416	5	22.3N 110.9E	25	614	-5
2518Z	19.4N 120.9E	40	19.0N 120.9E	30	24	-10	19.8N 119.1E	50	103	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2600Z	19.6N 120.8E	40	19.5N 120.3E	30	29	-10	20.2N 119.2E	40	98	-10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2606Z	19.9N 120.7E	45	20.0N 120.9E	30	13	-15	21.0N 120.0E	40	78	-15	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2612Z	20.3N 120.7E	50	20.3N 120.8E	45	6	-5	21.9N 119.7E	65	111	5	24.2N 117.2E	40	250	10	---.- ---.-	--	--	--
2618Z	20.8N 120.6E	50	21.0N 120.3E	50	21	0	23.0N 118.8E	65	188	5	25.6N 116.1E	25	282	-5	---.- ---.-	--	--	--
2700Z	21.2N 120.6E	50	21.2N 120.3E	50	17	0	23.1N 119.0E	60	195	0	25.7N 117.5E	30	191	0	---.- ---.-	--	--	--
2706Z	21.8N 121.1E	55	21.6N 121.1E	60	12	5	23.7N 122.0E	65	68	15	26.0N 124.0E	70	180	45	---.- ---.-	--	--	--
2712Z	22.5N 121.6E	60	22.2N 121.8E	60	21	0	24.8N 123.7E	70	110	40	27.2N 125.8E	65	284	40	---.- ---.-	--	--	--
2718Z	23.4N 122.2E	60	23.5N 122.3E	60	8	0	27.1N 123.6E	70	172	40	29.7N 128.1E	65	449	45	---.- ---.-	--	--	--
2800Z	24.1N 122.4E	60	24.0N 122.6E	60	12	0	26.8N 125.1E	70	240	40	29.3N 130.1E	55	525	35	---.- ---.-	--	--	--
2806Z	24.8N 122.3E	50	25.0N 122.4E	60	13	10	28.5N 123.6E	60	259	35	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2812Z	25.1N 121.7E	50	25.1N 122.1E	60	22	30	27.6N 123.3E	55	184	30	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2818Z	25.1N 121.3E	50	25.3N 121.5E	50	16	20	27.3N 120.9E	55	96	35	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2900Z	25.2N 121.0E	50	25.0N 120.8E	35	16	5	26.0N 120.0E	30	48	10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2906Z	24.9N 120.9E	25	25.0N 120.3E	35	33	10	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2912Z	25.4N 120.9E	25	25.0N 120.4E	25	36	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2918Z	25.7N 120.9E	20	25.4N 120.4E	25	32	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
3000Z	26.0N 120.9E	20	26.0N 121.0E	20	5	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

TROPICAL STORM FAYE

0600Z 01 NOV TO 0600Z 04 NOV

	BEST TRACK		WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
010600Z	13.1N	123.8E	25	13.0N 123.8E	30	6	-5	13.0N 120.7E	35	175	-10	---.-	---.-	--	--	--	---.-	---.-	--	--	--
011200Z	13.3N	122.3E	30	13.2N 122.3E	30	6	0	13.6N 119.1E	40	153	-10	---.-	---.-	--	--	--	---.-	---.-	--	--	--
011800Z	13.5N	120.9E	35	13.5N 121.5E	30	35	-5	13.9N 118.2E	40	167	-15	---.-	---.-	--	--	--	---.-	---.-	--	--	--
020000Z	13.8N	119.4E	40	14.2N 119.8E	40	33	0	15.3N 115.7E	55	86	0	16.7N	112.3E	65	175	20	---.-	---.-	--	--	--
020600Z	14.1N	117.9E	45	14.0N 118.5E	45	35	0	14.3N 114.6E	50	91	0	15.6N	111.6E	50	188	20	---.-	---.-	--	--	--
021200Z	14.4N	116.6E	50	14.5N 116.5E	50	8	0	15.2N 112.0E	60	13	10	---.-	---.-	--	--	--	---.-	---.-	--	--	--
021800Z	14.6N	115.4E	55	14.4N 115.4E	50	12	-5	15.1N 111.0E	60	6	15	---.-	---.-	--	--	--	---.-	---.-	--	--	--
030000Z	14.8N	114.3E	55	14.7N 114.1E	50	13	-5	15.6N 109.3E	40	54	-5	---.-	---.-	--	--	--	---.-	---.-	--	--	--
030600Z	15.0N	113.2E	50	15.0N 112.6E	45	35	-5	15.5N 107.0E	20	86	-10	---.-	---.-	--	--	--	---.-	---.-	--	--	--
031200Z	15.0N	112.1E	50	15.1N 112.3E	45	13	-5	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
031800Z	15.0N	111.0E	45	15.5N 111.0E	45	30	0	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
040000Z	14.9N	109.9E	45	14.8N 109.5E	35	24	-10	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
040600Z	15.0N	108.4E	30	14.6N 108.8E	30	33	0	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--

TROPICAL STORM HESTER

1200Z 14 NOV TO 1200Z 15 NOV

	BEST TRACK		WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
141200Z	13.1N	114.2E	30	13.4N 114.0E	30	21	0	13.5N 107.9E	20	48	0	---.-	---.-	--	--	--	---.-	---.-	--	--	--
141800Z	13.1N	112.7E	35	13.4N 113.3E	30	39	-5	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
150000Z	13.1N	111.3E	35	13.2N 111.1E	40	13	5	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
150600Z	12.9N	109.5E	35	13.2N 109.8E	40	25	5	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
151200Z	12.7N	107.8E	20	12.7N 108.0E	30	12	10	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--

TROPICAL STORM JUDY

0000Z 18 DEC TO 0000Z 19 DEC

	BEST TRACK		WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
180000Z	13.2N	112.5E	30	15.0N 112.5E	30	108	0	15.8N 109.3E	25	213	-5	---.-	---.-	--	--	--	---.-	---.-	--	--	--
180600Z	12.8N	111.8E	35	13.0N 111.6E	30	17	-5	12.8N 108.4E	20	80	0	---.-	---.-	--	--	--	---.-	---.-	--	--	--
181200Z	12.5N	111.2E	40	12.4N 111.9E	30	41	-10	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
181800Z	12.4N	110.6E	40	12.2N 110.9E	40	21	0	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
190000Z	12.3N	110.0E	30	11.6N 109.5E	35	51	5	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
190600Z	12.0N	109.5E	20	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--

TROPICAL STORM KIT

0600Z 19 DEC TO 0600Z 24 DEC

	BEST TRACK		WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
190600Z	11.1N	132.2E	30	11.0N 132.0E	30	13	0	12.6N 126.3E	50	72	15	---.-	---.-	--	--	--	---.-	---.-	--	--	--
191200Z	11.3N	130.6E	35	11.6N 130.3E	35	25	0	13.3N 124.4E	50	119	20	14.4N	119.2E	35	187	10	15.0N	114.3E	45	318	20
191800Z	11.3N	129.2E	40	11.8N 128.8E	35	38	-5	13.7N 123.2E	45	139	20	15.4N	118.1E	40	269	15	15.6N	113.6E	45	365	15
200000Z	11.3N	127.8E	40	11.0N 127.3E	40	34	0	11.0N 122.4E	30	25	5	11.0N	116.5E	35	55	10	11.0N	112.5E	35	104	0
200600Z	11.4N	126.4E	35	11.0N 125.7E	40	47	5	11.0N 119.5E	35	85	10	11.0N	115.0E	35	80	10	11.0N	110.0E	35	155	-5
201200Z	11.4N	125.0E	30	10.6N 124.6E	35	53	5	10.5N 119.1E	35	59	10	10.5N	114.5E	35	51	10	10.5N	110.5E	35	87	-5
201800Z	11.4N	123.6E	25	10.6N 123.4E	30	49	5	10.5N 118.6E	35	27	10	---.-	---.-	--	--	--	---.-	---.-	--	--	--
210000Z	11.4N	122.3E	25	11.2N 122.7E	25	26	0	11.3N 117.8E	25	72	0	---.-	---.-	--	--	--	---.-	---.-	--	--	--
210600Z	11.4N	120.9E	25	11.3N 121.5E	25	36	0	11.3N 116.5E	20	85	-5	---.-	---.-	--	--	--	---.-	---.-	--	--	--
211200Z	11.3N	119.7E	25	---.-	---.-	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
211800Z	10.9N	118.4E	25	---.-	---.-	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
220000Z	10.3N	117.1E	25	---.-	---.-	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
220600Z	10.0N	115.9E	25	---.-	---.-	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
221200Z	9.7N	114.8E	25	---.-	---.-	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
221800Z	9.5N	113.8E	30	---.-	---.-	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
230000Z	9.3N	112.9E	35	---.-	---.-	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
230600Z	9.2N	111.9E	40	9.3N 111.8E	35	8	-5	8.6N 107.8E	50	30	25	---.-	---.-	--	--	--	---.-	---.-	--	--	--
231200Z	9.1N	110.9E	40	9.5N 110.3E	45	43	5	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
231800Z	9.0N	110.0E	35	9.5N 109.3E	50	51	15	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
240000Z	9.0N	108.8E	30	9.2N 109.1E	35	21	5	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
240600Z	9.0N	107.5E	25	8.9N 106.9E	25	36	0	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--

4. TYPHOON DATA

TYPHOON CARLA

0000Z 02 MAY TO 0600Z 07 MAY

	BEST TRACK			WARNING			ERRORS		24 HOUR FORECAST			ERRORS		48 HOUR FORECAST			ERRORS		72 HOUR FORECAST			ERRORS	
	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
020000Z	12.4N	149.8E	30	11.9N	149.9E	30	30	0	14.2N	146.7E	45	6	0	---.-	---.-	--	--	--	---.-	---.-	--	--	--
020600Z	12.8N	148.8E	35	13.0N	149.0E	40	17	5	16.3N	145.7E	55	90	15	19.5N	144.3E	65	169	5	23.1N	144.8E	75	211	-5
021200Z	13.1N	148.0E	40	12.9N	147.8E	45	17	5	13.6N	143.2E	65	146	25	15.7N	139.6E	75	253	10	18.0N	136.8E	80	460	5
021800Z	13.6N	147.4E	45	13.6N	147.4E	45	0	0	15.4N	144.2E	65	29	20	18.5N	141.8E	75	116	5	22.5N	141.3E	80	221	10
030000Z	14.2N	146.6E	45	14.2N	146.5E	50	6	5	16.5N	143.9E	65	25	10	19.5N	142.8E	75	70	-5	23.2N	144.3E	75	90	15
030600Z	14.8N	145.8E	40	14.6N	145.8E	50	12	10	17.1N	143.5E	65	33	5	20.2N	142.9E	75	59	-5	23.8N	144.7E	75	141	20
031200Z	15.3N	145.2E	40	15.5N	145.0E	45	17	5	18.8N	143.7E	60	90	-5	22.2N	145.4E	50	100	-25	25.5N	149.7E	35	100	-10
031800Z	15.7N	144.6E	45	16.0N	144.7E	45	19	0	19.4N	143.8E	60	96	-10	22.5N	145.7E	50	25	-20	25.5N	149.7E	35	152	-5
040000Z	16.2N	144.2E	55	16.3N	144.0E	50	13	-5	18.9N	142.1E	45	91	-35	22.4N	143.9E	40	176	-20	---.-	---.-	--	--	--
040600Z	16.7N	143.9E	60	16.4N	144.0E	60	19	0	18.1N	142.4E	75	124	-5	20.8N	142.1E	65	370	10	---.-	---.-	--	--	--
041200Z	17.3N	143.7E	65	17.3N	143.7E	65	0	0	19.8N	143.0E	75	99	0	23.1N	144.3E	65	301	20	---.-	---.-	--	--	--
041800Z	17.8N	143.7E	70	17.9N	143.6E	65	8	-5	20.5N	143.7E	70	140	0	23.5N	145.7E	60	362	20	---.-	---.-	--	--	--
050000Z	18.7N	143.7E	80	18.3N	143.7E	80	24	0	21.5N	144.4E	80	166	20	---.-	---.-	--	--	--	---.-	---.-	--	--	--
050600Z	19.7N	143.8E	80	19.6N	143.9E	85	8	5	23.6N	145.2E	75	132	20	---.-	---.-	--	--	--	---.-	---.-	--	--	--
051200Z	20.8N	144.4E	75	21.2N	144.2E	80	26	5	26.3N	147.8E	65	32	20	---.-	---.-	--	--	--	---.-	---.-	--	--	--
051800Z	22.3N	145.3E	70	21.9N	145.3E	70	24	0	26.5N	150.0E	50	90	10	---.-	---.-	--	--	--	---.-	---.-	--	--	--
060000Z	24.0N	145.7E	60	23.9N	146.2E	65	28	5	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
060600Z	25.4N	146.6E	55	25.4N	145.8E	60	43	5	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
061200Z	26.6N	148.3E	45	26.8N	147.7E	55	34	10	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
061800Z	28.0N	150.2E	40	28.0N	150.2E	50	0	10	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--

	TYPHOONS WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	17NM	87NM	182NM	196NM	17NM	87NM	182NM	196NM
AVERAGE RIGHT ANGLE ERROR	11NM	38NM	75NM	136NM	12NM	38NM	75NM	136NM
AVERAGE MAGNITUDE OF WIND ERROR	4KTS	13KTS	13KTS	10KTS	4KTS	13KTS	13KTS	10KTS
AVERAGE BIAS OF WIND ERROR	3KTS	0KTS	-0KTS	4KTS	3KTS	0KTS	-0KTS	4KTS
NUMBER OF FORECASTS	19	16	11	7	20	16	11	7

TYPHOON DINAH

0000Z 08 JUN TO 0600Z 14 JUN

	BEST TRACK			WARNING			ERRORS		24 HOUR FORECAST			ERRORS		48 HOUR FORECAST			ERRORS		72 HOUR FORECAST			ERRORS	
	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
080000Z	12.9N	128.7E	40	13.0N	128.5E	45	13	5	14.7N	123.3E	65	107	10	17.1N	120.0E	50	166	-20	20.1N	117.3E	65	216	10
080600Z	13.2N	127.6E	45	13.0N	127.2E	60	26	15	14.0N	122.6E	70	100	10	16.4N	119.2E	50	127	-10	19.2N	116.3E	65	165	5
081200Z	13.6N	126.7E	50	13.7N	126.7E	55	6	5	15.6N	123.3E	70	61	5	18.1N	120.1E	50	97	0	21.2N	117.5E	65	297	0
081800Z	14.1N	125.9E	50	13.9N	126.1E	55	17	5	16.1N	122.6E	70	68	0	18.7N	119.5E	55	135	5	22.1N	117.2E	70	344	5
090000Z	14.3N	125.1E	55	14.4N	125.3E	55	13	0	17.2N	122.3E	65	108	-5	20.4N	120.2E	60	273	5	24.0N	118.5E	60	462	-10
090600Z	14.3N	124.3E	60	15.2N	124.4E	55	54	-5	18.4N	121.6E	55	132	-5	22.0N	119.9E	60	367	0	25.9N	119.3E	45	563	-25
091200Z	14.6N	123.5E	65	14.3N	123.4E	60	19	-5	15.1N	119.7E	55	84	5	17.8N	116.7E	70	93	5	21.4N	115.3E	70	213	0
091800Z	15.0N	122.9E	70	14.7N	122.5E	65	29	-5	16.4N	119.3E	55	42	5	18.7N	115.9E	70	130	5	21.8N	113.3E	70	167	0
100000Z	15.4N	122.3E	70	15.2N	122.4E	70	13	0	17.4N	119.8E	55	131	0	20.3N	117.9E	65	259	-5	23.3N	115.6E	65	357	5
100600Z	16.2N	121.4E	60	15.9N	121.5E	65	19	5	18.4N	118.5E	60	146	0	21.4N	116.5E	65	256	-5	24.7N	115.2E	30	443	-25
101200Z	16.5N	119.8E	50	16.8N	120.0E	55	21	5	19.8N	117.4E	65	217	0	22.9N	115.8E	70	300	0	26.4N	115.9E	30	550	-20
101800Z	16.6N	118.6E	50	17.9N	118.3E	60	80	10	21.7N	115.8E	70	298	5	26.3N	114.9E	30	438	-40	---.-	---.-	--	--	--
110000Z	16.5N	117.7E	55	16.6N	117.7E	55	6	0	18.3N	113.8E	70	58	0	21.1N	110.8E	65	81	5	---.-	---.-	--	--	--
110600Z	16.5N	116.9E	60	16.6N	116.7E	55	13	-5	17.8N	112.4E	70	71	0	20.7N	109.0E	55	42	0	---.-	---.-	--	--	--
111200Z	16.5N	115.8E	65	16.5N	116.3E	60	29	-5	17.8N	112.4E	70	62	0	20.5N	109.2E	50	84	0	---.-	---.-	--	--	--
111800Z	16.8N	114.8E	65	16.6N	115.0E	60	17	-5	17.5N	110.9E	70	126	0	20.4N	108.0E	50	77	0	---.-	---.-	--	--	--
120000Z	17.4N	114.2E	70	17.2N	113.1E	65	64	-5	19.7N	109.3E	50	62	-10	22.6N	107.9E	30	186	0	---.-	---.-	--	--	--
120600Z	18.1N	113.6E	70	17.7N	113.7E	70	25	0	20.1N	112.1E	65	174	10	22.7N	110.9E	30	361	10	---.-	---.-	--	--	--
121200Z	18.8N	112.7E	70	18.9N	113.0E	75	18	5	22.3N	111.6E	50	252	0	---.-	---.-	--	--	--	---.-	---.-	--	--	--
121800Z	19.5N	111.6E	70	20.0N	112.0E	70	37	0	23.0N	110.3E	25	269	-25	---.-	---.-	--	--	--	---.-	---.-	--	--	--
130000Z	19.8N	110.4E	60	20.8N	110.6E	65	61	5	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
130600Z	20.0N	109.0E	55	20.3N	109.1E	55	19	0	21.8N	104.0E	30	84	10	---.-	---.-	--	--	--	---.-	---.-	--	--	--
131200Z	20.0N	107.8E	50	20.5N	107.7E	45	30	-5	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
131800Z	20.0N	106.7E	50	20.4N	107.3E	40	41	-10	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
140000Z	20.1N	105.4E	30	20.8N	106.5E	35	74	5	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
140600Z	20.6N	104.4E	20	20.5N	104.4E	30	23	10	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--

	TYPHOONS WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	28NM	128NM	183NM	343NM	29NM	146NM	193NM	343NM
AVERAGE RIGHT ANGLE ERROR	22NM	86NM	152NM	316NM	23NM	86NM	159NM	316NM
AVERAGE MAGNITUDE OF WIND ERROR	5KTS	5KTS	7KTS	10KTS	5KTS	5KTS	6KTS	10KTS
AVERAGE BIAS OF WIND ERROR	0KTS	0KTS	-3KTS	-5KTS	1KTS	1KTS	-3KTS	-5KTS
NUMBER OF FORECASTS	24	20	16	11	26	21	18	11

TYPHOON GILDA

060000Z 30 JUN TO 000000Z 07 JUL

	BEST TRACK		WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
300600Z	19.5N 136.2E	30	21.6N 135.1E	30	140	0	25.2N 131.8E	40	358	-5	---.- ---.-	--	--	--	--.- ---.-	--	--	--
301200Z	19.5N 135.4E	30	20.3N 134.9E	30	55	0	22.3N 131.6E	45	198	-5	---.- ---.-	--	--	--	--.- ---.-	--	--	--
301800Z	19.5N 134.7E	35	19.9N 134.1E	40	41	5	20.3N 130.9E	50	132	-5	22.0N 128.0E	60	154	-10	24.4N 126.3E	80	87	-20
010000Z	19.5N 134.2E	40	19.8N 134.1E	45	19	5	20.1N 131.7E	65	46	5	21.2N 129.0E	75	33	0	23.5N 126.1E	80	58	0
010600Z	19.5N 133.8E	45	19.4N 133.6E	45	13	0	19.6N 131.7E	65	18	0	20.9N 129.1E	75	68	0	23.1N 126.5E	80	124	-5
011200Z	19.5N 133.5E	50	19.4N 133.8E	50	18	0	19.7N 131.9E	65	59	-5	21.3N 129.4E	75	112	-5	23.7N 127.2E	80	138	-10
011800Z	19.5N 133.1E	55	19.5N 133.2E	50	6	-5	20.7N 131.1E	65	45	-5	22.6N 128.4E	75	79	-5	25.1N 126.7E	80	105	-5
020000Z	19.7N 132.4E	60	19.5N 132.4E	65	12	5	21.0N 129.3E	75	21	0	23.4N 126.9E	85	61	5	26.4N 126.5E	85	81	5
020600Z	19.9N 131.7E	65	19.8N 131.6E	70	8	5	21.5N 128.7E	80	30	5	24.0N 126.5E	85	72	0	27.6N 126.6E	85	60	10
021200Z	20.2N 131.0E	70	20.1N 130.8E	70	13	0	22.2N 128.1E	80	36	0	24.7N 126.4E	85	72	-5	28.5N 126.8E	85	57	10
021800Z	20.6N 130.3E	70	20.6N 130.1E	75	16	5	23.4N 127.7E	85	19	5	26.7N 126.9E	85	12	0	29.6N 127.1E	85	54	10
030000Z	21.2N 129.6E	75	21.1N 129.8E	80	13	5	23.9N 127.8E	90	48	10	27.5N 127.6E	80	53	0	30.5N 129.9E	65	141	-5
030600Z	22.0N 128.8E	75	21.8N 128.9E	85	13	10	24.8N 127.1E	95	36	10	28.4N 127.9E	85	58	10	31.7N 131.9E	65	187	0
031200Z	22.8N 128.2E	80	23.0N 128.0E	90	16	10	26.6N 126.9E	95	50	5	30.4N 128.0E	75	106	0	34.1N 131.8E	45	187	-10
031800Z	23.7N 127.6E	80	23.6N 127.7E	90	8	10	26.8N 126.8E	95	32	10	30.7N 128.6E	75	84	0	34.5N 131.5E	45	123	-5
040000Z	24.4N 127.1E	80	24.4N 127.2E	90	5	10	27.7N 126.3E	85	8	5	31.5N 127.7E	65	41	-5	34.8N 132.2E	40	132	0
040600Z	25.2N 126.6E	85	25.3N 126.7E	90	8	5	28.7N 125.6E	80	41	5	32.5N 127.0E	60	28	-5	--.- ---.-	--	--	--
041200Z	25.9N 126.4E	90	25.9N 126.7E	90	16	0	29.7N 126.8E	75	32	0	34.1N 128.9E	50	53	-5	--.- ---.-	--	--	--
041800Z	26.8N 126.2E	85	26.7N 126.4E	95	12	10	30.2N 126.5E	75	13	0	34.7N 128.8E	50	10	0	--.- ---.-	--	--	--
050000Z	27.6N 126.2E	80	27.5N 126.3E	90	8	10	31.0N 126.9E	65	30	-5	34.9N 130.1E	40	84	0	--.- ---.-	--	--	--
050600Z	28.4N 126.3E	75	28.4N 126.2E	85	5	10	32.1N 127.4E	55	46	-10	---.- ---.-	--	--	--	--.- ---.-	--	--	--
051200Z	29.3N 126.4E	75	29.4N 126.7E	75	17	0	34.2N 129.9E	50	99	-5	---.- ---.-	--	--	--	--.- ---.-	--	--	--
051800Z	30.4N 126.8E	75	30.8N 127.4E	70	43	-5	34.4N 131.0E	45	98	-5	---.- ---.-	--	--	--	--.- ---.-	--	--	--
060000Z	31.5N 126.9E	70	31.7N 126.6E	70	19	0	36.7N 128.2E	35	99	-5	---.- ---.-	--	--	--	--.- ---.-	--	--	--
060600Z	32.7N 127.5E	65	32.6N 127.1E	65	21	0	--.- ---.-	--	--	--	---.- ---.-	--	--	--	--.- ---.-	--	--	--
061200Z	33.5N 128.1E	55	33.6N 128.1E	60	6	5	--.- ---.-	--	--	--	---.- ---.-	--	--	--	--.- ---.-	--	--	--
061800Z	34.7N 129.0E	50	34.5N 128.9E	55	13	5	--.- ---.-	--	--	--	---.- ---.-	--	--	--	--.- ---.-	--	--	--
070000Z	36.3N 130.2E	40	36.4N 130.2E	45	6	5	--.- ---.-	--	--	--	---.- ---.-	--	--	--	--.- ---.-	--	--	--

	TYPHOONS WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	14NM	66NM	65NM	109NM	20NM	66NM	65NM	109NM
AVERAGE RIGHT ANGLE ERROR	10NM	42NM	34NM	75NM	15NM	42NM	34NM	75NM
AVERAGE MAGNITUDE OF WIND ERROR	5KTS	5KTS	3KTS	7KTS	5KTS	5KTS	3KTS	7KTS
AVERAGE BIAS OF WIND ERROR	4KTS	0KTS	-1KTS	-2KTS	4KTS	0KTS	-1KTS	-2KTS
NUMBER OF FORECASTS	26	24	18	14	28	24	18	14

TYPHOON IVY

060000Z 17 JUL TO 180000Z 22 JUL

	BEST TRACK		WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
170600Z	11.8N 139.4E	30	11.9N 139.5E	30	8	0	12.4N 135.1E	50	168	-5	---.- ---.-	--	--	--	--.- ---.-	--	--	--
171200Z	12.3N 137.7E	30	12.1N 138.2E	30	32	0	13.2N 133.9E	45	182	-15	---.- ---.-	--	--	--	--.- ---.-	--	--	--
171800Z	12.8N 135.9E	40	12.7N 135.7E	30	13	-10	14.3N 131.3E	45	110	-20	---.- ---.-	--	--	--	--.- ---.-	--	--	--
180000Z	13.3N 134.1E	45	13.3N 134.4E	45	17	0	15.9N 129.8E	65	136	-10	18.7N 126.7E	75	329	-15	22.0N 124.4E	85	500	15
180600Z	13.8N 132.4E	55	13.5N 132.5E	55	19	0	16.0N 127.5E	75	100	-10	19.2N 124.3E	85	280	20	22.8N 122.3E	90	462	15
181200Z	14.1N 130.9E	60	14.2N 130.8E	60	8	0	17.6N 126.5E	80	175	-10	21.1N 123.7E	90	362	30	24.7N 122.2E	95	546	15
181800Z	14.4N 129.4E	65	14.6N 129.6E	65	17	0	17.8N 125.8E	85	204	-5	21.2N 123.8E	95	393	30	25.0N 122.3E	95	579	10
190000Z	14.7N 127.8E	75	14.8N 127.7E	75	8	0	17.5N 123.2E	100	138	10	21.3N 120.9E	85	316	15	25.5N 120.2E	45	515	-45
190600Z	14.8N 126.3E	85	15.2N 126.0E	90	30	5	18.2N 120.9E	65	137	0	21.9N 118.4E	70	258	-5	26.0N 117.5E	25	429	-70
191200Z	15.0N 125.1E	90	15.0N 125.1E	100	0	10	18.7N 120.2E	70	51	10	19.9N 117.3E	85	161	5	22.8N 115.2E	90	227	30
191800Z	15.2N 123.9E	90	15.2N 123.7E	100	12	10	17.1N 119.1E	70	71	5	20.0N 116.9E	90	137	5	--.- ---.-	--	--	--
200000Z	15.5N 122.9E	90	15.6N 122.0E	100	6	10	17.9N 117.2E	75	29	5	20.8N 114.3E	90	89	0	--.- ---.-	--	--	--
200600Z	15.9N 120.8E	65	15.9N 121.1E	80	17	15	17.8N 117.0E	80	92	5	20.3N 113.9E	85	89	-10	--.- ---.-	--	--	--
201200Z	16.7N 119.3E	60	16.4N 119.4E	65	19	5	19.0N 115.2E	80	40	0	22.0N 112.3E	75	60	15	--.- ---.-	--	--	--
201800Z	17.4N 117.9E	65	17.7N 117.9E	70	18	5	21.5N 114.1E	65	117	0	---.- ---.-	--	--	--	--.- ---.-	--	--	--
210000Z	17.8N 116.7E	70	17.8N 116.6E	70	6	0	20.9N 112.4E	65	55	-5	---.- ---.-	--	--	--	--.- ---.-	--	--	--
210600Z	18.4N 115.9E	75	18.2N 115.4E	75	13	0	21.4N 111.6E	65	45	-10	---.- ---.-	--	--	--	--.- ---.-	--	--	--
211200Z	19.0N 114.5E	80	19.2N 114.6E	80	13	0	22.8N 111.4E	35	72	-25	---.- ---.-	--	--	--	--.- ---.-	--	--	--
211800Z	19.6N 113.6E	85	19.6N 113.6E	85	0	0	--.- ---.-	--	--	--	---.- ---.-	--	--	--	--.- ---.-	--	--	--
220000Z	20.1N 112.9E	90	20.2N 112.8E	85	8	-5	--.- ---.-	--	--	--	---.- ---.-	--	--	--	--.- ---.-	--	--	--
220600Z	20.8N 112.1E	95	20.7N 112.1E	90	6	-5	--.- ---.-	--	--	--	---.- ---.-	--	--	--	--.- ---.-	--	--	--
221200Z	21.6N 111.3E	80	21.6N 111.6E	85	17	25	--.- ---.-	--	--	--	---.- ---.-	--	--	--	--.- ---.-	--	--	--

	TYPHOONS WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	12NM	107NM	225NM	465NM	13NM	107NM	225NM	465NM
AVERAGE RIGHT ANGLE ERROR	10NM	61NM	190NM	422NM	10NM	61NM	190NM	422NM
AVERAGE MAGNITUDE OF WIND ERROR	5KTS	8KTS	14KTS	29KTS	5KTS	8KTS	14KTS	29KTS
AVERAGE BIAS OF WIND ERROR	3KTS	-4KTS	8KTS	-4KTS	3KTS	-4KTS	8KTS	-4KTS
NUMBER OF FORECASTS	20	18	11	7	22	18	11	7

TYPHOON MARY

060002 11 AUG TO 060002 26 AUG

	BEST TRACK		WARNING				24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
					ERRORS				ERRORS				ERRORS				ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
110000Z	15.7N 150.0E	30	15.6N 151.2E	30	35	0	16.0N 148.6E	50	257	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
111200Z	16.3N 151.2E	30	15.7N 150.7E	30	46	0	15.9N 148.3E	45	255	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--
112000Z	16.9N 151.8E	35	16.3N 149.7E	30	125	-5	17.3N 146.7E	45	230	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
120000Z	17.7N 152.3E	40	17.5N 153.1E	40	47	0	18.7N 150.8E	60	128	10	20.3N 147.4E	85	230	35	21.5N 143.2E	110	306	55
120600Z	18.6N 152.2E	45	18.4N 153.5E	45	75	0	20.2N 151.1E	65	139	15	22.2N 147.7E	85	242	30	24.0N 143.0E	110	191	55
121200Z	19.3N 151.0E	45	19.4N 151.6E	45	49	0	22.4N 148.1E	65	71	15	24.7N 144.2E	90	57	35	25.7N 138.9E	110	116	55
121800Z	19.8N 149.8E	50	20.7N 150.4E	50	63	0	23.5N 146.6E	70	51	20	25.1N 142.6E	90	48	35	25.8N 137.3E	110	129	55
130000Z	20.3N 149.3E	50	22.7N 151.4E	60	185	10	25.6N 147.1E	80	166	30	28.5N 143.9E	100	156	45	31.6N 142.5E	110	354	55
130600Z	20.8N 148.7E	50	20.8N 147.9E	55	45	5	23.9N 144.5E	65	40	10	26.8N 141.5E	70	11	15	29.5N 139.9E	85	180	10
131200Z	21.8N 147.0E	50	21.6N 147.6E	50	12	0	24.2N 144.1E	55	74	0	26.3N 141.1E	65	53	10	28.7N 138.8E	80	129	10
131800Z	22.7N 146.3E	50	21.4N 147.0E	50	87	0	23.4N 144.1E	55	168	0	26.0N 141.5E	60	132	5	28.5N 139.4E	50	211	0
140000Z	23.5N 145.1E	50	22.5N 146.6E	50	102	0	25.7N 144.2E	55	127	0	28.3N 141.6E	60	196	5	30.4N 138.7E	50	278	-5
140600Z	24.4N 144.0E	55	24.5N 144.4E	50	23	-5	29.1N 141.5E	55	138	0	32.8N 138.2E	55	335	0	34.5N 135.6E	30	390	-30
141200Z	25.2N 143.3E	55	25.0N 143.7E	55	25	0	27.7N 141.6E	65	72	10	30.5N 139.9E	75	241	25	33.5N 138.6E	70	444	10
141800Z	25.9N 142.7E	55	25.7N 143.1E	55	25	0	28.6N 141.3E	65	139	10	31.4N 140.2E	75	329	25	34.4N 139.8E	70	570	10
150000Z	26.5N 142.0E	55	26.7N 142.3E	50	20	-5	30.3N 140.5E	45	231	-10	34.2N 140.5E	40	495	-15	38.2N 145.9E	30	976	-35
150600Z	26.8N 141.3E	55	27.2N 141.4E	50	24	-5	30.3N 139.5E	45	208	-10	34.0N 139.3E	40	488	-20	---.- ---.-	--	--	--
151200Z	27.0N 140.5E	55	26.9N 140.4E	55	8	0	28.6N 137.5E	60	73	10	32.1N 136.3E	60	302	0	35.9N 136.7E	30	647	-35
151800Z	27.0N 139.3E	55	27.1N 139.3E	55	6	0	28.4N 135.6E	60	42	10	31.6N 133.9E	60	242	0	34.8N 134.9E	30	608	-30
160000Z	27.0N 138.2E	55	27.0N 138.1E	55	5	0	28.3N 134.1E	60	24	5	31.7N 131.8E	55	207	-10	---.- ---.-	--	--	--
160600Z	27.2N 137.7E	55	27.2N 137.2E	50	27	-5	29.0N 133.3E	50	42	-10	32.3N 131.0E	30	240	-40	---.- ---.-	--	--	--
161200Z	27.6N 136.7E	50	27.9N 136.5E	50	21	0	30.6N 133.2E	45	139	-15	33.9N 130.8E	25	363	-40	---.- ---.-	--	--	--
161800Z	27.7N 135.5E	50	27.9N 135.1E	50	24	0	30.3N 131.7E	45	122	-15	33.9N 129.7E	25	385	-35	---.- ---.-	--	--	--
170000Z	27.9N 134.2E	55	27.7N 134.6E	45	24	-10	29.5N 130.2E	35	55	-30	32.4N 126.6E	30	250	-25	---.- ---.-	--	--	--
170600Z	28.3N 133.2E	60	28.2N 133.1E	45	8	-15	30.8N 129.2E	35	119	-35	33.9N 125.6E	30	322	-20	---.- ---.-	--	--	--
171200Z	28.4N 132.3E	60	28.6N 132.1E	55	16	-5	30.4N 128.1E	65	114	0	33.0N 123.8E	45	245	0	---.- ---.-	--	--	--
171800Z	28.3N 131.2E	60	28.4N 131.4E	55	37	-5	30.9N 127.4E	65	172	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
180000Z	28.6N 130.0E	65	28.6N 129.9E	60	5	-5	30.5N 125.5E	60	125	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
180600Z	28.9N 128.9E	70	29.2N 128.6E	65	19	-5	31.6N 123.5E	55	155	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
181200Z	28.7N 127.1E	65	29.2N 127.0E	65	30	0	31.3N 121.4E	30	114	-15	---.- ---.-	--	--	--	---.- ---.-	--	--	--
181800Z	28.6N 125.4E	60	28.8N 125.4E	55	12	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
190000Z	28.8N 124.1E	55	28.8N 124.2E	50	5	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
190600Z	29.1N 122.7E	50	29.1N 123.0E	50	16	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
191200Z	29.4N 121.9E	45	29.4N 121.4E	40	5	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
230000Z	27.2N 125.3E	25	27.3N 125.0E	25	17	0	29.2N 129.7E	35	181	-15	---.- ---.-	--	--	--	---.- ---.-	--	--	--
231200Z	27.6N 126.1E	25	27.6N 126.2E	25	5	0	30.0N 130.1E	35	239	-20	---.- ---.-	--	--	--	---.- ---.-	--	--	--
231800Z	27.1N 126.8E	30	27.7N 127.0E	25	37	-5	29.9N 130.4E	35	232	-25	---.- ---.-	--	--	--	---.- ---.-	--	--	--
240000Z	26.8N 127.4E	45	26.7N 127.3E	45	8	0	27.6N 131.3E	60	88	-10	31.2N 135.4E	70	226	20	---.- ---.-	--	--	--
240600Z	26.3N 128.7E	50	26.4N 128.3E	45	22	-5	27.3N 132.2E	60	114	-10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
241200Z	26.0N 130.0E	55	26.2N 129.7E	55	20	0	27.9N 134.6E	65	123	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--
241800Z	26.1N 131.3E	60	26.0N 131.4E	55	8	-5	28.8N 136.1E	65	199	10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
250000Z	26.8N 132.7E	70	26.5N 132.5E	65	21	-5	30.2N 136.5E	70	263	20	---.- ---.-	--	--	--	---.- ---.-	--	--	--
250600Z	28.0N 134.2E	70	27.7N 133.8E	65	28	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
251200Z	29.8N 135.9E	65	29.6N 135.5E	65	12	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
251800Z	32.1N 136.6E	55	31.9N 136.9E	55	19	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
260000Z	34.5N 137.6E	50	34.4N 137.2E	55	21	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

	TYPHOONS WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	33NM	138NM	242NM	368NM	32NM	138NM	242NM	368NM
AVERAGE RIGHT ANGLE ERROR	23NM	98NM	186NM	267NM	23NM	98NM	186NM	267NM
AVERAGE MAGNITUDE OF WIND ERROR	3KTS	11KTS	20KTS	30KTS	3KTS	11KTS	20KTS	30KTS
AVERAGE BIAS OF WIND ERROR	-2KTS	-1KTS	3KTS	12KTS	-2KTS	-1KTS	3KTS	12KTS
NUMBER OF FORECASTS	41	38	24	15	46	38	24	15

TYPHOON POLLY

1200Z 24 AUG TO 0000Z 02 SEP

	BEST TRACK			WARNING		ERRORS		24 HOUR FORECAST			ERRORS		48 HOUR FORECAST			ERRORS		72 HOUR FORECAST			ERRORS	
	POSIT	WIND		POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND		POSIT	WIND	DST	WIND		POSIT	WIND	DST	WIND	
2512Z	16.4N	148.7E	25	16.7N	148.7E	30	18	5	17.2N	143.8E	40	177	0	---.-	---.-	--	--	--	---.-	---.-	--	--	--
2518Z	15.8N	147.7E	25	16.6N	147.3E	30	53	5	17.4N	142.2E	40	253	0	---.-	---.-	--	--	--	---.-	---.-	--	--	--
2600Z	15.6N	146.5E	30	15.7N	146.6E	30	8	0	15.8N	142.2E	45	230	-10	---.-	---.-	--	--	--	---.-	---.-	--	--	--
2606Z	15.5N	146.8E	30	15.2N	146.7E	30	19	0	14.8N	143.6E	45	162	-15	---.-	---.-	--	--	--	---.-	---.-	--	--	--
2612Z	15.6N	146.4E	40	15.2N	146.2E	40	27	0	14.6N	144.3E	60	188	-10	14.5N	140.9E	75	433	-15	14.6N	137.6E	85	716	-5
2618Z	15.8N	146.3E	40	15.6N	146.2E	45	13	5	15.8N	144.1E	65	179	-10	16.1N	140.7E	80	397	-15	16.8N	137.4E	85	653	0
2700Z	16.2N	146.0E	55	16.2N	146.0E	55	0	0	17.2N	143.9E	75	159	-5	18.4N	140.8E	85	317	-10	19.8N	137.2E	95	537	15
2706Z	16.7N	145.6E	60	16.8N	145.5E	60	8	0	18.8N	143.2E	80	120	-5	20.7N	140.4E	90	261	-5	23.3N	137.1E	100	381	20
2712Z	17.7N	144.9E	70	17.3N	145.1E	65	26	-5	19.2N	142.7E	85	158	-5	21.1N	139.9E	95	307	5	23.7N	136.8E	105	389	20
2718Z	18.8N	144.2E	75	18.3N	144.3E	65	30	-10	20.9N	142.0E	85	111	-10	24.0N	139.4E	95	209	10	27.5N	137.5E	105	173	20
2800Z	19.8N	143.3E	80	19.8N	143.5E	75	11	-5	23.4N	140.3E	95	52	0	26.2N	137.2E	105	302	25	28.9N	134.1E	95	172	10
2806Z	20.7N	142.5E	85	20.7N	142.4E	80	6	-5	24.0N	138.6E	100	153	5	26.5N	134.8E	105	299	25	28.8N	131.2E	100	262	10
2812Z	21.7N	141.8E	90	21.6N	142.0E	90	13	0	25.3N	138.6E	110	148	20	28.3N	135.0E	110	211	25	30.8N	130.9E	95	195	5
2818Z	22.7N	141.5E	95	22.6N	140.9E	95	34	0	25.9N	137.2E	115	205	30	29.2N	133.4E	115	229	30	33.0N	130.8E	95	194	-30
2900Z	23.7N	141.2E	95	23.7N	141.1E	95	5	0	28.0N	140.0E	110	24	30	32.2N	137.8E	90	104	5	37.0N	137.7E	35	370	-50
2906Z	25.0N	141.2E	95	25.2N	140.2E	95	55	0	30.2N	138.4E	105	78	25	35.3N	137.2E	60	279	-30	---.-	---.-	--	--	--
2912Z	26.1N	141.2E	90	25.9N	141.1E	95	13	5	30.5N	140.9E	90	124	5	35.4N	141.9E	70	449	-20	---.-	---.-	--	--	--
2918Z	27.3N	140.7E	85	27.3N	140.8E	95	5	10	32.2N	140.5E	85	183	0	37.2N	144.6E	65	634	-20	---.-	---.-	--	--	--
3000Z	28.4N	140.1E	80	28.4N	140.2E	85	5	5	33.9N	140.1E	70	256	-15	39.5N	144.3E	45	693	-40	---.-	---.-	--	--	--
3006Z	29.3N	139.5E	80	29.3N	139.6E	80	5	0	34.2N	137.3E	65	218	-25	40.6N	138.0E	35	530	-45	---.-	---.-	--	--	--
3012Z	29.9N	138.8E	85	30.1N	138.8E	80	16	-5	33.8N	136.2E	65	189	-25	38.9N	133.9E	35	296	-25	---.-	---.-	--	--	--
3018Z	30.4N	137.8E	85	30.7N	137.3E	80	24	-5	33.9N	133.2E	50	166	-35	38.9N	130.8E	30	189	-20	---.-	---.-	--	--	--
3100Z	30.8N	136.8E	85	30.9N	136.8E	80	12	-5	33.3N	133.0E	50	95	-35	38.0N	131.6E	30	46	-15	---.-	---.-	--	--	--
3106Z	30.8N	135.7E	90	31.0N	135.6E	75	13	-15	32.7N	131.2E	45	116	-35	---.-	---.-	--	--	--	---.-	---.-	--	--	--
3112Z	30.9N	134.7E	90	30.9N	134.8E	90	5	0	31.6N	130.9E	60	178	0	---.-	---.-	--	--	--	---.-	---.-	--	--	--
3118Z	31.2N	134.0E	85	31.0N	133.9E	90	13	5	31.8N	130.4E	55	270	5	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0100Z	31.8N	133.6E	85	31.7N	133.5E	85	8	0	35.4N	132.3E	45	138	0	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0106Z	32.5N	133.5E	80	32.3N	133.2E	85	19	5	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0112Z	34.0N	133.0E	60	34.0N	133.1E	55	5	-5	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0118Z	36.0N	132.4E	50	36.3N	132.3E	50	19	0	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0200Z	37.7N	132.5E	45	38.1N	132.5E	45	24	0	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--

	TYPHOONS WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	15NM	160NM	320NM	367NM	17NM	160NM	320NM	367NM
AVERAGE RIGHT ANGLE ERROR	12NM	106NM	215NM	233NM	13NM	106NM	215NM	233NM
AVERAGE MAGNITUDE OF WIND ERROR	4KTS	13KTS	20KTS	17KTS	3KTS	13KTS	20KTS	17KTS
AVERAGE BIAS OF WIND ERROR	-1KTS	-4KTS	-7KTS	1KTS	-0KTS	-4KTS	-7KTS	1KTS
NUMBER OF FORECASTS	27	27	19	11	31	27	19	11

TYPHOON SHIRLEY

0000Z 04 SEP TO 0000Z 09 SEP

	BEST TRACK			WARNING		ERRORS		24 HOUR FORECAST			ERRORS		48 HOUR FORECAST			ERRORS		72 HOUR FORECAST			ERRORS	
	POSIT	WIND		POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND		POSIT	WIND	DST	WIND		POSIT	WIND	DST	WIND	
0400Z	24.4N	130.8E	25	24.4N	130.8E	25	0	0	25.6N	132.7E	30	87	-20	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0406Z	24.8N	130.9E	30	25.0N	131.2E	25	20	-5	27.2N	133.6E	30	161	-20	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0412Z	25.2N	131.1E	35	25.3N	131.6E	25	28	-10	27.4N	133.6E	30	166	-25	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0418Z	25.5N	131.1E	45	25.7N	131.6E	40	29	-5	27.7N	132.8E	50	150	-5	30.2N	134.4E	50	366	-20	32.9N	137.2E	45	538	-25
0500Z	25.8N	131.1E	50	25.6N	131.3E	40	16	-10	27.7N	131.6E	50	107	-10	30.6N	133.5E	50	332	-25	33.6N	136.7E	45	492	-20
0506Z	26.2N	130.8E	50	26.4N	131.3E	45	29	-5	28.7N	132.2E	60	185	-5	31.7N	134.4E	55	400	-20	34.2N	137.8E	45	488	-20
0512Z	26.4N	130.7E	55	26.4N	131.0E	60	16	5	27.8N	131.0E	65	133	0	31.2N	134.5E	55	387	-20	35.5N	143.8E	40	713	-20
0518Z	26.7N	130.2E	55	26.7N	130.5E	60	16	5	26.0N	130.0E	65	147	-5	28.5N	132.5E	60	260	-10	31.8N	139.5E	50	372	5
0600Z	26.9N	129.8E	60	26.8N	129.6E	60	12	0	26.4N	129.9E	65	151	-10	29.0N	132.5E	55	234	-10	---.-	---.-	--	--	--
0606Z	27.1N	129.2E	65	27.1N	129.0E	65	11	0	28.9N	128.5E	70	53	-5	31.1N	131.4E	55	122	-10	---.-	---.-	--	--	--
0612Z	27.4N	128.5E	65	27.3N	128.4E	65	8	0	29.3N	128.2E	70	44	-5	32.2N	132.7E	55	129	-5	---.-	---.-	--	--	--
0618Z	27.7N	128.0E	70	27.7N	128.0E	70	0	0	29.8N	129.8E	60	120	-10	32.7N	135.3E	50	156	5	---.-	---.-	--	--	--
0700Z	28.1N	127.8E	75	28.1N	127.9E	65	5	-10	31.1N	129.7E	55	113	-10	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0706Z	28.5N	127.6E	75	28.7N	127.4E	65	16	-10	31.8N	128.7E	55	75	-10	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0712Z	28.9N	127.5E	75	29.0N	127.6E	70	8	-5	31.7N	129.8E	55	28	-5	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0718Z	29.2N	127.8E	70	29.2N	127.6E	70	0	0	31.8N	129.5E	55	145	10	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0800Z	29.8N	128.1E	65	29.8N	128.1E	70	0	5	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0806Z	30.6N	129.1E	65	30.9N	129.1E	70	18	5	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0812Z	31.5N	130.3E	60	31.5N	130.1E	60	10	0	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0818Z	32.6N	132.2E	45	33.2N	132.2E	40	36	-5	---.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--

	TYPHOONS WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	14NM	116NM	265NM	521NM	14NM	116NM	265NM	521NM
AVERAGE RIGHT ANGLE ERROR	11NM	75NM	137NM	360NM	10NM	75NM	137NM	350NM
AVERAGE MAGNITUDE OF WIND ERROR	4KTS	10KTS	14KTS	18KTS	4KTS	10KTS	14KTS	18KTS
AVERAGE BIAS OF WIND ERROR	-2KTS	-8KTS	-13KTS	-16KTS	-2KTS	-8KTS	-13KTS	-16KTS
NUMBER OF FORECASTS	18	16	9	5	20	16	9	5

TYPHOON VIRGINIA

12UOZ 12 SEP TO 00OOZ 16 SEP

	BEST TRACK		WARNING		24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
					ERRORS				ERRORS				ERRORS			
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
1212OOZ	30.5N 150.9E	45	30.6N 150.8E	30	8	-15	34.4N 156.1E	35	113	-30	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1218OOZ	31.4N 151.0E	55	31.4N 151.7E	30	5	-25	35.0N 157.4E	35	138	-35	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1300OOZ	32.2N 152.4E	65	32.3N 152.6E	65	12	0	36.2N 156.8E	55	108	-15	40.5N 169.0E	40	640	-25	---.- ---.-	--	--	--
1306OOZ	33.1N 153.2E	65	33.1N 153.3E	65	5	0	37.6N 159.7E	50	190	-25	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1312OOZ	33.9N 153.9E	65	33.9N 154.0E	65	5	0	37.5N 158.2E	50	91	-25	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1318OOZ	34.8N 154.6E	70	34.8N 154.6E	70	0	0	39.2N 157.0E	50	74	-20	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1400OOZ	35.6N 155.4E	70	35.5N 155.4E	65	6	-5	39.4N 159.1E	45	188	-20	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1406OOZ	36.4N 156.0E	75	36.4N 156.2E	70	10	-5	40.1N 160.7E	50	290	-10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1412OOZ	37.3N 156.3E	75	37.2N 156.4E	80	8	5	41.4N 156.6E	55	211	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1418OOZ	38.3N 155.9E	70	38.3N 156.9E	75	47	5	43.2N 159.0E	50	260	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1500OOZ	39.3N 155.1E	65	39.3N 155.2E	65	5	0	43.7N 154.0E	40	137	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1506OOZ	39.7N 154.4E	60	40.3N 154.6E	60	37	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1512OOZ	40.2N 154.2E	55	40.5N 153.5E	55	53	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1518OOZ	40.7N 154.2E	50	40.7N 154.1E	50	60	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
1600OOZ	41.4N 154.5E	40	41.4N 154.4E	40	4	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

	TYPHOONS WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	18NM	169NM	640NM	0NM	18NM	169NM	640NM	0NM
AVERAGE RIGHT ANGLE ERROR	12NM	145NM	616NM	0NM	12NM	145NM	616NM	0NM
AVERAGE MAGNITUDE OF WIND ERROR	4KTS	10KTS	25KTS	0KTS	4KTS	10KTS	25KTS	0KTS
AVERAGE BIAS OF WIND ERROR	-3KTS	-10KTS	-25KTS	0KTS	-3KTS	-10KTS	-25KTS	0KTS
NUMBER OF FORECASTS	15	11	1	0	15	11	1	0

TYPHOON AGNES

18OOZ 24 SEP TO 00OOZ 02 OCT

	BEST TRACK		WARNING		24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
					ERRORS				ERRORS				ERRORS			
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
2500OOZ	23.3N 154.3E	35	23.5N 153.7E	35	35	0	25.6N 151.6E	50	84	0	29.3N 149.0E	65	283	5	34.1N 150.1E	65	442	-5
2506OOZ	23.5N 154.0E	35	24.0N 153.2E	40	53	5	26.0N 151.1E	50	108	-5	29.8N 148.6E	65	294	0	34.4N 150.6E	65	430	-10
2512OOZ	23.8N 153.6E	40	23.9N 153.8E	40	12	0	26.4N 152.3E	50	115	-10	30.7N 151.5E	60	305	-5	35.3N 154.2E	50	479	-25
2518OOZ	24.1N 153.2E	45	24.1N 153.1E	45	5	0	26.3N 151.1E	60	98	0	30.3N 149.5E	65	248	-5	34.9N 152.2E	60	373	-15
2600OOZ	24.4N 152.4E	50	24.2N 152.8E	50	25	0	25.6N 151.2E	60	43	0	27.5N 150.3E	65	48	-5	31.0N 149.8E	65	130	-10
2606OOZ	24.5N 152.2E	55	24.6N 152.1E	50	19	-5	26.4N 150.7E	60	72	-5	28.2N 150.0E	65	62	-10	31.4N 149.8E	65	174	-10
2612OOZ	24.5N 152.0E	60	24.9N 151.9E	50	25	-10	26.3N 150.5E	60	37	-5	28.4N 149.2E	65	63	-10	31.7N 149.4E	65	241	-15
2618OOZ	24.7N 151.9E	60	24.7N 151.7E	60	11	0	25.4N 149.8E	70	36	0	27.3N 147.7E	75	177	0	30.3N 147.2E	70	377	-15
2700OOZ	24.9N 151.0E	60	24.8N 150.7E	60	17	0	24.4N 147.8E	75	176	5	25.7N 144.2E	80	445	5	28.3N 142.2E	75	725	-20
2706OOZ	25.2N 150.6E	65	25.0N 150.4E	65	16	0	25.4N 147.1E	75	202	0	27.2N 144.6E	80	446	5	29.6N 143.8E	75	717	-30
2712OOZ	25.7N 150.3E	65	25.3N 150.3E	65	24	0	27.0N 148.6E	75	108	0	29.1N 147.3E	80	331	0	32.0N 148.0E	75	561	-30
2718OOZ	26.2N 150.3E	70	26.2N 150.2E	70	5	0	28.4N 150.0E	80	40	5	31.6N 151.7E	80	169	-5	34.0N 156.5E	75	266	-25
2800OOZ	26.7N 150.3E	70	26.5N 150.6E	75	20	5	29.1N 151.4E	75	39	0	31.9N 153.8E	60	132	-35	---.- ---.-	--	--	--
2806OOZ	27.2N 150.3E	75	27.2N 150.2E	70	5	-5	30.1N 150.9E	65	91	-10	33.3N 153.7E	50	250	-55	---.- ---.-	--	--	--
2812OOZ	28.0N 150.3E	75	28.0N 150.3E	70	0	-5	31.3N 152.1E	55	114	-25	34.4N 156.2E	40	215	-65	---.- ---.-	--	--	--
2818OOZ	28.8N 150.6E	75	28.7N 150.4E	70	12	-5	32.3N 152.2E	55	176	-30	35.2N 157.3E	40	247	-60	---.- ---.-	--	--	--
2900OOZ	29.4N 151.3E	75	29.4N 151.5E	65	0	-10	32.5N 155.1E	50	121	-45	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2906OOZ	29.7N 152.0E	75	30.2N 152.5E	60	30	-15	33.0N 157.0E	45	106	-60	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2912OOZ	29.9N 153.0E	80	30.5N 153.7E	60	36	-20	32.9N 159.7E	50	36	-55	---.- ---.-	--	--	--	---.- ---.-	--	--	--
2918OOZ	30.1N 154.5E	85	30.0N 154.5E	75	6	-10	30.3N 159.4E	70	222	-30	---.- ---.-	--	--	--	---.- ---.-	--	--	--
3000OOZ	30.6N 155.9E	95	30.8N 155.8E	70	13	-25	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
3006OOZ	31.3N 157.6E	105	30.9N 157.1E	105	35	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
3012OOZ	32.3N 159.7E	105	32.3N 159.5E	100	10	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
3018OOZ	33.4N 161.8E	100	33.6N 162.7E	100	46	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

	TYPHOONS WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	19NM	100NM	231NM	410NM	19NM	100NM	231NM	410NM
AVERAGE RIGHT ANGLE ERROR	12NM	73NM	140NM	249NM	12NM	73NM	140NM	249NM
AVERAGE MAGNITUDE OF WIND ERROR	5KTS	15KTS	17KTS	18KTS	5KTS	15KTS	17KTS	18KTS
AVERAGE BIAS OF WIND ERROR	-4KTS	-14KTS	-15KTS	-18KTS	-4KTS	-14KTS	-15KTS	-18KTS
NUMBER OF FORECASTS	24	20	16	12	24	20	16	12

TYPHOON BESS

0600Z 08 OCT TO 0600Z 14 OCT

	BEST TRACK		WARNING		24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
					ERRORS				ERRORS				ERRORS			
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
0906Z	16.1N 129.5E	40	16.3N 129.5E	40	12	0	18.0N 123.3E	55	137	-10	18.4N 118.3E	55	149	0	18.5N 113.7E	70	223	5
0912Z	16.1N 128.3E	45	16.4N 127.6E	50	44	5	17.5N 121.6E	50	101	-15	18.3N 116.6E	65	193	10	19.0N 111.7E	65	266	20
0918Z	16.1N 127.3E	55	16.2N 127.4E	55	8	0	16.4N 122.6E	70	50	5	17.4N 117.7E	70	108	5	18.0N 112.8E	90	151	30
1000Z	16.6N 126.3E	60	16.6N 126.3E	60	0	0	17.5N 121.5E	60	36	-5	18.5N 117.2E	70	72	5	19.9N 112.9E	90	70	35
1006Z	16.9N 125.4E	65	16.7N 125.0E	60	26	-5	17.5N 120.6E	55	34	0	18.5N 116.6E	70	67	5	19.7N 113.0E	90	49	40
1012Z	17.1N 124.4E	65	17.1N 124.6E	65	11	0	18.0N 121.5E	65	87	10	19.2N 118.9E	70	141	5	20.6N 116.3E	90	322	45
1018Z	17.4N 123.2E	65	17.7N 123.1E	70	19	5	19.0N 119.8E	60	45	-5	20.3N 117.3E	75	138	15	22.1N 115.1E	90	388	65
1100Z	17.7N 122.1E	65	17.7N 122.0E	75	6	10	19.2N 118.7E	75	25	10	20.8N 116.4E	95	178	40	22.9N 114.4E	65	476	40
1106Z	18.0N 120.9E	55	18.2N 120.6E	65	21	10	19.6N 116.4E	90	72	25	21.3N 112.5E	95	132	45	--.- ---.-	--	--	--
1112Z	18.3N 120.0E	55	18.5N 119.6E	65	26	10	19.7N 115.7E	85	49	20	21.1N 111.7E	90	130	45	--.- ---.-	--	--	--
1118Z	18.5N 119.2E	65	18.4N 119.2E	65	6	0	19.4N 115.2E	90	24	30	21.1N 111.5E	90	188	65	--.- ---.-	--	--	--
1200Z	18.9N 118.4E	65	18.8N 118.2E	65	13	0	20.4N 114.4E	90	85	35	22.4N 110.9E	40	298	15	--.- ---.-	--	--	--
1206Z	19.1N 117.6E	65	19.2N 117.3E	70	18	5	20.7N 114.0E	90	131	40	--.- ---.-	--	--	--	--.- ---.-	--	--	--
1212Z	19.2N 116.4E	65	19.3N 116.9E	70	29	5	20.6N 114.3E	70	214	25	--.- ---.-	--	--	--	--.- ---.-	--	--	--
1218Z	19.1N 115.2E	60	19.3N 114.0E	65	69	5	19.8N 107.7E	50	87	25	--.- ---.-	--	--	--	--.- ---.-	--	--	--
1300Z	19.1N 113.8E	55	19.3N 112.3E	55	85	0	19.7N 106.0E	40	62	15	--.- ---.-	--	--	--	--.- ---.-	--	--	--
1306Z	19.1N 112.4E	50	19.8N 112.4E	45	6	-5	--.- ---.-	--	--	--	--.- ---.-	--	--	--	--.- ---.-	--	--	--
1312Z	19.1N 110.8E	45	19.0N 110.4E	40	23	-5	--.- ---.-	--	--	--	--.- ---.-	--	--	--	--.- ---.-	--	--	--
1318Z	19.0N 109.0E	25	19.0N 108.1E	35	51	10	--.- ---.-	--	--	--	--.- ---.-	--	--	--	--.- ---.-	--	--	--
1400Z	19.1N 106.9E	25	19.1N 107.1E	30	11	5	--.- ---.-	--	--	--	--.- ---.-	--	--	--	--.- ---.-	--	--	--

	TYPHOONS WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	23NM	82NM	131NM	180NM	24NM	81NM	149NM	243NM
AVERAGE RIGHT ANGLE ERROR	9NM	40NM	71NM	46NM	9NM	42NM	85NM	85NM
AVERAGE MAGNITUDE OF WIND ERROR	4KTS	17KTS	18KTS	29KTS	4KTS	17KTS	21KTS	35KTS
AVERAGE BIAS OF WIND ERROR	2KTS	12KTS	18KTS	29KTS	3KTS	13KTS	21KTS	35KTS
NUMBER OF FORECASTS	18	14	10	6	20	16	12	8

TYPHOON CARMEN

1200Z 14 OCT TO 1200Z 19 OCT

	BEST TRACK		WARNING		24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
					ERRORS				ERRORS				ERRORS			
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
1412Z	12.0N 130.1E	30	12.2N 129.7E	30	26	0	13.0N 126.6E	45	76	-10	--.- ---.-	--	--	--	--.- ---.-	--	--	--
1418Z	11.9N 129.4E	40	12.3N 128.6E	30	42	-10	12.8N 126.8E	45	160	-15	--.- ---.-	--	--	--	--.- ---.-	--	--	--
1500Z	12.1N 128.0E	45	11.8N 128.1E	45	19	0	12.4N 124.7E	50	179	-15	13.4N 121.6E	45	423	-10	14.5N 118.5E	55	368	-15
1506Z	12.8N 126.8E	50	12.3N 127.6E	45	55	-5	13.3N 124.4E	60	184	-10	14.2N 121.3E	50	336	-10	15.2N 118.1E	55	347	-15
1512Z	13.7N 125.6E	55	13.4N 125.4E	50	19	-5	15.3N 121.2E	60	80	0	16.3N 117.2E	60	159	-5	16.8N 113.8E	80	222	5
1518Z	14.4N 124.6E	60	14.6N 124.5E	50	13	-10	16.5N 120.3E	50	48	0	17.7N 116.3E	65	110	0	18.3N 113.1E	80	158	10
1600Z	15.2N 123.6E	65	15.4N 123.8E	65	17	0	18.0N 120.0E	55	85	0	19.2N 115.6E	75	43	5	19.3N 111.0E	80	178	15
1606Z	15.9N 122.7E	70	15.6N 122.8E	70	19	0	16.9N 118.7E	65	116	5	17.7N 114.3E	85	154	15	17.7N 109.2E	75	295	20
1612Z	16.6N 121.9E	60	16.4N 121.7E	65	17	5	18.3N 117.8E	65	77	0	19.1N 114.1E	85	87	10	19.3N 110.3E	75	172	30
1618Z	17.2N 119.9E	50	17.2N 119.9E	55	0	5	18.9N 115.8E	75	36	10	19.8N 112.1E	85	134	15	--.- ---.-	--	--	--
1700Z	17.9N 118.5E	55	18.2N 118.2E	65	25	10	20.5N 112.4E	85	172	15	--.- ---.-	--	--	--	--.- ---.-	--	--	--
1706Z	18.4N 117.4E	60	18.6N 117.3E	65	13	5	20.6N 112.7E	85	131	15	22.1N 108.9E	25	222	-30	--.- ---.-	--	--	--
1712Z	18.9N 116.6E	65	18.8N 116.5E	65	8	0	20.4N 112.8E	80	112	5	21.6N 109.2E	50	156	5	--.- ---.-	--	--	--
1718Z	19.5N 115.9E	65	19.4N 115.8E	65	8	0	21.4N 112.6E	80	104	10	--.- ---.-	--	--	--	--.- ---.-	--	--	--
1800Z	19.9N 115.4E	70	19.8N 115.3E	70	8	0	22.1N 112.7E	70	83	5	--.- ---.-	--	--	--	--.- ---.-	--	--	--
1806Z	20.2N 115.0E	70	20.1N 115.1E	75	8	5	21.7N 113.5E	80	46	25	--.- ---.-	--	--	--	--.- ---.-	--	--	--
1812Z	20.4N 114.8E	75	20.4N 114.7E	75	6	0	22.0N 113.2E	75	69	30	--.- ---.-	--	--	--	--.- ---.-	--	--	--
1818Z	20.7N 114.3E	70	20.8N 114.3E	80	6	10	--.- ---.-	--	--	--	--.- ---.-	--	--	--	--.- ---.-	--	--	--
1900Z	21.0N 113.6E	65	21.3N 113.7E	75	19	10	--.- ---.-	--	--	--	--.- ---.-	--	--	--	--.- ---.-	--	--	--
1906Z	21.3N 112.8E	55	21.6N 113.1E	65	24	10	--.- ---.-	--	--	--	--.- ---.-	--	--	--	--.- ---.-	--	--	--
1912Z	21.7N 112.0E	45	22.2N 112.3E	45	34	0	--.- ---.-	--	--	--	--.- ---.-	--	--	--	--.- ---.-	--	--	--

	TYPHOONS WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	18NM	103NM	172NM	249NM	18NM	103NM	172NM	249NM
AVERAGE RIGHT ANGLE ERROR	11NM	40NM	115NM	186NM	12NM	40NM	115NM	186NM
AVERAGE MAGNITUDE OF WIND ERROR	5KTS	10KTS	11KTS	16KTS	4KTS	10KTS	11KTS	16KTS
AVERAGE BIAS OF WIND ERROR	2KTS	4KTS	-1KTS	7KTS	1KTS	4KTS	-1KTS	7KTS
NUMBER OF FORECASTS	20	17	10	7	21	17	10	7

TYPHOON DELLA

0000Z 21 OCT TO 0000Z 27 OCT

	BEST TRACK		WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
210000Z	12.8N 129.2E	35	12.9N 129.3E	30	8	-5	14.7N 124.4E	45	106	-10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
210600Z	13.6N 128.0E	40	13.4N 127.7E	40	21	0	16.0N 123.0E	65	129	5	19.1N 120.4E	50	63	-20	22.5N 119.0E	65	279	-10
211200Z	14.5N 126.8E	45	14.4N 127.2E	50	24	5	18.0N 124.7E	65	34	5	20.3N 124.1E	60	146	-10	24.6N 125.2E	50	562	-25
211800Z	15.4N 125.8E	50	15.5N 125.9E	55	8	5	19.3N 124.1E	70	43	5	24.4N 124.7E	75	429	5	29.0N 129.1E	65	933	-15
220000Z	16.3N 125.2E	55	16.4N 125.1E	55	8	0	20.7N 124.2E	75	132	5	24.7N 128.5E	70	628	-5	28.5N 136.0E	55	1271	-30
220600Z	17.3N 124.4E	60	17.1N 124.8E	60	12	0	20.8N 124.8E	75	206	5	25.0N 129.0E	65	694	-10	28.4N 136.9E	50	1376	-40
221200Z	18.3N 124.2E	60	18.3N 124.5E	65	17	5	22.4N 126.5E	75	373	5	26.2N 133.1E	55	966	-20	---.- ---.-	--	--	--
221800Z	19.0N 123.4E	65	19.3N 123.8E	65	29	0	23.7N 126.5E	70	464	0	27.0N 133.6E	55	1059	-25	---.- ---.-	--	--	--
230000Z	19.4N 122.3E	70	19.3N 122.5E	70	13	0	20.2N 118.8E	75	135	0	22.2N 116.6E	60	255	-25	---.- ---.-	--	--	--
230600Z	19.3N 121.5E	70	19.2N 121.5E	75	6	5	20.2N 118.4E	80	143	5	22.5N 116.7E	70	293	-20	---.- ---.-	--	--	--
231200Z	19.0N 120.9E	70	19.3N 121.0E	75	19	5	20.0N 118.6E	80	129	5	22.5N 116.6E	65	415	-25	---.- ---.-	--	--	--
231800Z	18.5N 120.3E	70	18.7N 120.2E	75	13	5	18.5N 117.8E	80	53	0	19.3N 114.7E	80	153	-5	21.3N 112.3E	65	308	25
240000Z	18.1N 119.7E	75	18.2N 119.6E	80	8	5	17.5N 116.5E	70	50	-15	17.3N 113.2E	60	165	-20	17.2N 109.9E	50	273	15
240600Z	17.9N 119.1E	75	17.9N 119.0E	75	6	0	17.4N 116.2E	65	108	-25	17.7N 112.8E	55	205	-5	---.- ---.-	--	--	--
241200Z	17.9N 118.1E	75	18.1N 118.3E	75	16	0	18.1N 115.3E	65	120	-25	18.2N 112.0E	55	218	5	---.- ---.-	--	--	--
241800Z	17.9N 117.1E	80	18.0N 116.9E	75	13	-5	18.0N 113.2E	65	72	-20	17.9N 109.8E	55	183	15	---.- ---.-	--	--	--
250000Z	18.0N 115.8E	85	18.0N 115.9E	75	6	-10	17.9N 111.7E	65	80	-15	17.6N 107.5E	50	153	15	---.- ---.-	--	--	--
250600Z	18.1N 114.4E	90	18.1N 114.2E	85	11	-5	18.2N 109.3E	70	68	10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
251200Z	18.3N 113.2E	90	18.4N 113.2E	85	6	-5	20.1N 106.5E	55	36	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
251800Z	18.6N 112.1E	85	18.7N 112.1E	85	6	0	20.3N 108.1E	55	70	15	---.- ---.-	--	--	--	---.- ---.-	--	--	--
260000Z	19.0N 110.9E	80	19.0N 111.3E	80	23	0	20.7N 107.5E	55	116	20	---.- ---.-	--	--	--	---.- ---.-	--	--	--
260600Z	19.3N 109.6E	60	19.4N 109.3E	65	18	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
261200Z	19.5N 108.4E	50	19.6N 108.3E	55	8	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
261800Z	19.6N 107.1E	40	19.6N 107.2E	45	13	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
270000Z	19.6N 105.8E	35	19.7N 105.7E	40	8	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

TYPHOONS WHILE WIND OVER 45KTS	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	13NM	127NM	313NM	714NM
AVERAGE RIGHT ANGLE ERROR	9NM	69NM	250NM	477NM
AVERAGE MAGNITUDE OF WIND ERROR	3KTS	10KTS	14KTS	23KTS
AVERAGE BIAS OF WIND ERROR	1KTS	-1KTS	-9KTS	-11KTS
NUMBER OF FORECASTS	25	21	16	7

ALL FORECASTS	WARNING	24-HR	48-HR	72-HR
	13NM	127NM	313NM	714NM
	9NM	69NM	250NM	477NM
	3KTS	10KTS	14KTS	23KTS
	1KTS	-1KTS	-9KTS	-11KTS
	25	21	16	7

TYPHOON ELAINE

0600Z 24 OCT TO 0600Z 31 OCT

	BEST TRACK		WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
240600Z	17.7N 140.9E	30	17.8N 140.3E	30	8	0	19.8N 136.7E	45	127	10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
241200Z	18.1N 139.5E	30	18.3N 139.5E	30	12	0	20.5N 136.0E	45	182	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
241800Z	18.1N 138.5E	30	18.5N 138.5E	30	24	0	20.4N 135.0E	45	212	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
250000Z	17.9N 137.4E	30	18.3N 137.4E	35	24	5	18.8N 133.4E	60	104	0	19.9N 129.9E	80	228	-5	21.5N 127.4E	90	400	10
250600Z	17.7N 136.4E	35	17.9N 136.7E	40	21	5	18.2N 132.9E	60	112	-5	19.4N 129.8E	80	259	-10	21.3N 127.1E	90	434	20
251200Z	17.5N 135.4E	40	17.5N 135.6E	45	11	5	17.3N 131.4E	65	83	-10	18.9N 128.0E	85	223	-10	20.5N 125.1E	95	372	20
251800Z	17.3N 134.4E	50	17.3N 134.3E	50	6	0	17.2N 130.0E	70	76	-10	18.5N 126.5E	90	209	-5	20.3N 123.0E	105	329	30
260000Z	17.1N 133.0E	60	17.0N 133.4E	60	24	0	16.7N 128.9E	80	87	-5	18.0N 125.0E	95	190	15	19.5N 121.5E	105	245	35
260600Z	16.8N 131.6E	65	16.8N 131.6E	65	0	0	16.5N 126.7E	85	50	-5	17.3N 122.6E	95	128	25	18.7N 118.7E	100	127	30
261200Z	16.9N 130.0E	75	16.6N 130.2E	70	21	-5	16.3N 125.4E	95	74	0	16.8N 121.3E	85	142	10	18.0N 117.9E	95	156	30
261800Z	16.9N 128.7E	80	16.8N 128.4E	80	18	0	17.1N 122.4E	105	39	10	17.3N 116.7E	105	85	30	19.9N 111.2E	120	194	65
270000Z	16.9N 127.4E	85	16.9N 127.1E	85	17	0	17.2N 121.0E	80	19	10	18.1N 116.6E	80	46	10	19.4N 112.0E	95	127	45
270600Z	17.0N 126.0E	90	16.8N 126.2E	90	17	0	16.5N 121.0E	80	79	10	17.0N 116.0E	90	129	20	18.2N 111.9E	100	198	60
271200Z	17.2N 124.5E	95	17.0N 124.5E	100	12	5	17.3N 119.3E	75	38	0	17.7N 115.1E	90	133	25	19.6N 111.4E	100	144	65
271800Z	17.4N 123.0E	95	17.3N 122.9E	100	8	5	17.9N 117.8E	85	29	10	18.9N 113.7E	95	108	40	21.2N 110.2E	85	178	55
280000Z	17.5N 121.7E	80	17.5N 121.7E	90	0	10	18.4N 116.4E	85	51	15	19.9N 111.9E	95	137	45	21.9N 108.3E	95	271	15
280600Z	17.7N 120.4E	70	17.7N 120.3E	70	6	0	18.6N 115.4E	95	65	25	20.3N 111.1E	85	157	45	22.7N 107.3E	90	328	5
281200Z	17.9N 119.1E	75	17.9N 119.3E	75	11	0	19.1N 114.7E	100	66	35	21.0N 111.1E	80	134	45	---.- ---.-	--	--	--
281800Z	18.2N 118.2E	75	18.1N 118.0E	75	13	0	19.6N 113.7E	95	74	40	21.8N 110.7E	55	154	25	---.- ---.-	--	--	--
290000Z	18.5N 117.4E	70	18.3N 117.0E	85	21	15	19.9N 113.2E	95	78	45	22.6N 110.1E	40	197	10	---.- ---.-	--	--	--
290600Z	19.1N 116.5E	70	19.0N 116.5E	80	6	10	21.1N 114.1E	65	18	25	23.3N 112.3E	30	191	5	---.- ---.-	--	--	--
291200Z	19.9N 115.5E	65	19.6N 115.6E	70	19	5	22.0N 113.0E	60	66	25	---.- ---.-	--	--	--	---.- ---.-	--	--	--
291800Z	20.5N 114.8E	55	21.0N 114.9E	60	34	5	24.4N 114.6E	25	244	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
300000Z	20.9N 114.1E	50	21.0N 114.0E	60	8	10	24.2N 111.9E	20	218	-10	---.- ---.-	--	--	--	---.- ---.-	--	--	--
300600Z	21.0N 113.4E	40	21.2N 113.6E	50	16	10	22.7N 111.8E	20	160	-5	---.- ---.-	--	--	--	---.- ---.-	--	--	--
301200Z	21.0N 113.5E	35	21.3N 113.5E	35	18	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
301800Z	20.9N 113.3E	30	21.1N 113.5E	35	16	5	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
310000Z	20.7N 113.0E	30	20.7N 113.0E	30	0	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--
310600Z	20.1N 112.5E	25	20.4N 112.6E	25	19	0	---.- ---.-	--	--	--	---.- ---.-	--	--	--	---.- ---.-	--	--	--

TYPHOONS WHILE WIND OVER 35KTS	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	14NM	79NM	154NM	248NM
AVERAGE RIGHT ANGLE ERROR	9NM	58NM	83NM	127NM
AVERAGE MAGNITUDE OF WIND ERROR	4KTS	13KTS	23KTS	37KTS
AVERAGE BIAS OF WIND ERROR	4KTS	10KTS	19KTS	37KTS
NUMBER OF FORECASTS	22	22	15	11

ALL FORECASTS	WARNING	24-HR	48-HR	72-HR
	14NM	94NM	158NM	250NM
	9NM	75NM	97NM	152NM
	3KTS	13KTS	21KTS	35KTS
	3KTS	8KTS	18KTS	35KTS
	29	25	18	14

TYPHOON GLORIA

00002 03 NOV TO 12002 09 NOV

	BEST TRACK		WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
030000Z	7.3N 141.3E	35	7.3N 141.2E	30	6	-5	8.4N 138.4E	45	94	-15	---.-	---	--	--	---.-	---	--	--
030600Z	7.5N 140.8E	45	7.7N 140.5E	45	13	0	8.4N 135.9E	65	210	0	8.9N 130.7E	85	420	-10	10.8N	125.9E	95	340 -5
031200Z	7.9N 139.7E	50	7.9N 139.7E	50	0	0	9.2N 135.9E	65	259	-5	10.7N 131.7E	85	362	0	12.4N	127.3E	100	316 -10
031800Z	9.0N 138.7E	55	8.2N 138.8E	50	48	-5	9.1N 134.9E	65	343	-20	10.2N 130.6E	85	378	0	11.9N	126.1E	100	374 -20
040000Z	10.3N 137.9E	60	10.1N 137.9E	55	12	-5	12.3N 133.5E	70	232	-30	13.8N 129.3E	85	196	-5	15.1N	125.4E	100	279 5
040600Z	11.8N 136.8E	65	11.1N 136.7E	60	42	-5	13.7N 131.9E	80	176	-15	15.5N 127.7E	95	119	-5	17.0N	123.9E	110	243 30
041200Z	13.5N 135.4E	70	13.3N 135.6E	75	17	5	17.4N 131.5E	110	199	25	19.8N 127.4E	115	231	5	21.1N	123.6E	90	316 15
041800Z	14.7N 133.6E	85	14.7N 133.5E	80	6	-5	17.4N 126.6E	115	111	30	18.9N 120.2E	95	190	-25	20.6N	115.8E	75	167 5
050000Z	15.6N 131.4E	100	15.6N 131.2E	85	12	-15	17.5N 124.6E	115	154	25	18.8N 119.3E	95	136	0	19.6N	114.9E	80	164 20
050600Z	16.0N 130.0E	95	16.1N 130.0E	105	6	10	18.2N 124.6E	125	126	25	19.2N 120.1E	100	68	20	19.5N	115.9E	85	111 30
051200Z	15.9N 128.5E	85	16.2N 128.4E	100	19	15	17.3N 121.4E	85	184	-25	18.5N 116.1E	70	159	-5	19.8N	111.3E	55	345 5
051800Z	15.7N 127.4E	85	16.0N 127.2E	90	21	5	16.8N 121.4E	80	136	-40	16.0N 116.0E	65	227	-5	16.8N	110.7E	50	468 10
060000Z	15.9N 126.7E	90	15.6N 126.3E	85	29	-5	15.4N 122.0E	80	152	-15	15.4N 117.9E	55	269	-5	15.8N	114.2E	70	409 35
060600Z	16.5N 125.9E	100	16.4N 125.7E	110	13	10	18.1N 122.0E	100	125	20	19.1N 118.4E	85	111	30	20.1N	115.2E	65	147 35
061200Z	17.0N 124.6E	110	17.2N 124.8E	110	17	0	19.3N 120.8E	100	120	25	20.4N 116.7E	90	71	40	21.4N	113.0E	70	178 40
061800Z	17.5N 123.2E	120	17.5N 123.1E	115	6	-5	18.4N 118.0E	75	45	5	19.3N 113.9E	85	233	45	---.-	---.-	--	-- --
070000Z	17.9N 121.5E	95	18.1N 121.5E	100	12	5	19.3N 116.2E	85	97	25	20.6N 112.3E	75	268	40	---.-	---.-	--	-- --
070600Z	18.1N 119.8E	80	18.4N 120.0E	85	21	5	19.8N 115.2E	90	140	35	21.2N 111.8E	65	264	35	---.-	---.-	--	-- --
071200Z	18.4N 118.9E	75	18.5N 119.0E	85	8	10	19.8N 114.8E	80	168	30	21.4N 111.7E	60	249	30	---.-	---.-	--	-- --
071800Z	19.1N 118.3E	70	18.7N 117.9E	90	33	20	20.1N 113.8E	75	208	35	---.-	---	--	--	--	---.-	--	-- --
080000Z	19.9N 117.8E	60	19.7N 117.8E	70	12	10	22.9N 117.1E	40	45	5	---.-	---.-	--	--	--	---.-	--	-- --
080600Z	20.7N 117.4E	55	20.5N 117.5E	60	13	5	23.8N 117.5E	40	108	10	---.-	---.-	--	--	--	---.-	--	-- --
081200Z	21.5N 117.2E	50	22.0N 117.2E	50	30	0	26.0N 117.4E	20	238	-10	---.-	---.-	--	--	--	---.-	--	-- --
081800Z	21.9N 117.0E	40	22.7N 116.7E	45	51	5	---.-	---.-	--	--	--	---.-	--	--	--	---.-	--	-- --
090000Z	22.2N 116.8E	35	22.4N 116.7E	35	13	0	---.-	---.-	--	--	--	---.-	--	--	--	---.-	--	-- --
090600Z	22.3N 116.4E	30	22.3N 116.4E	40	0	10	---.-	---.-	--	--	--	---.-	--	--	--	---.-	--	-- --
091200Z	22.2N 116.1E	30	22.2N 116.0E	30	6	0	---.-	---.-	--	--	--	---.-	--	--	--	---.-	--	-- --

	TYPHOONS WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	18NM	158NM	215NM	294NM	17NM	160NM	220NM	275NM
AVERAGE RIGHT ANGLE ERROR	13NM	97NM	156NM	204NM	12NM	103NM	166NM	197NM
AVERAGE MAGNITUDE OF WIND ERROR	6KTS	21KTS	15KTS	16KTS	6KTS	20KTS	17KTS	19KTS
AVERAGE BIAS OF WIND ERROR	2KTS	6KTS	8KTS	10KTS	2KTS	5KTS	10KTS	14KTS
NUMBER OF FORECASTS	25	21	16	12	27	23	18	14

TYPHOON IRMA

1200Z 21 NOV TO 0600Z 02 DEC

	BEST TRACK			WARNING			24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
						ERRORS			ERRORS				ERRORS				ERRORS	
	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
2112Z	9.7N	141.6E	25	9.7N	141.6E	25	0	0	11.0N	137.8E	40	142	5	---.-	---.-	--	--	--	---.-	---.-	--	--	--
2118Z	10.3N	141.0E	25	9.6N	141.2E	25	43	0	10.5N	138.1E	40	129	-5	---.-	---.-	--	--	--	---.-	---.-	--	--	--
2200Z	10.8N	140.5E	30	11.2N	140.3E	25	27	-5	13.5N	137.8E	40	138	-10	---.-	---.-	--	--	--	---.-	---.-	--	--	--
2206Z	11.1N	140.4E	30	10.8N	139.8E	25	39	-5	12.7N	137.2E	40	101	-15	---.-	---.-	--	--	--	---.-	---.-	--	--	--
2212Z	11.3N	140.2E	35	11.4N	140.2E	25	6	-10	13.8N	138.1E	40	54	-20	---.-	---.-	--	--	--	---.-	---.-	--	--	--
2218Z	11.6N	140.0E	45	12.1N	139.9E	30	30	-15	14.9N	138.1E	45	104	-20	---.-	---.-	--	--	--	---.-	---.-	--	--	--
2300Z	11.9N	139.5E	50	12.4N	139.3E	40	32	-10	14.7N	137.0E	60	76	-10	17.5N	135.1E	70	182	-15	21.0N	134.3E	75	374	-30
2306Z	12.4N	138.9E	55	12.4N	139.0E	50	6	-5	14.1N	136.5E	70	70	-5	16.1N	133.9E	80	83	-10	18.8N	131.4E	85	206	-25
2312Z	12.9N	138.1E	60	13.0N	137.4E	60	41	0	15.1N	133.6E	80	58	5	18.0N	130.7E	90	175	-5	21.2N	128.9E	90	329	-25
2318Z	13.4N	137.2E	65	13.6N	137.1E	60	13	-5	15.7N	133.6E	80	60	0	18.2N	130.3E	90	169	-10	21.1N	128.2E	90	324	-25
2400Z	13.7N	136.2E	70	13.9N	136.3E	70	13	0	15.9N	132.7E	90	64	5	18.9N	130.5E	100	192	-5	22.4N	130.8E	100	471	-15
2406Z	14.1N	135.3E	75	14.1N	135.3E	70	0	-5	16.0N	131.7E	80	79	-10	19.0N	129.6E	85	197	-25	22.7N	129.4E	80	478	-30
2412Z	14.5N	134.4E	75	14.6N	134.3E	70	8	-5	16.9N	130.9E	80	116	-15	20.0N	129.2E	85	258	-30	23.6N	129.8E	80	569	-25
2418Z	14.7N	133.7E	80	15.0N	133.2E	75	34	-5	17.3N	129.8E	85	145	-15	20.7N	128.6E	85	304	-30	24.1N	129.9E	75	636	-25
2500Z	15.0N	133.2E	85	15.0N	133.2E	80	6	-5	17.5N	131.0E	85	108	-20	20.5N	130.0E	80	352	-35	25.8N	134.3E	70	930	-20
2506Z	15.2N	132.8E	90	15.2N	132.7E	85	6	-5	17.5N	130.6E	90	117	-20	21.0N	130.1E	85	417	-25	25.7N	134.7E	70	1007	0
2512Z	15.5N	132.3E	95	15.5N	132.3E	90	0	-5	17.8N	130.1E	105	112	-10	19.8N	128.7E	100	354	-5	24.1N	132.4E	80	902	20
2518Z	15.7N	131.7E	100	15.8N	131.6E	95	8	-5	17.6N	129.5E	105	153	-10	20.5N	129.0E	100	445	0	24.5N	134.8E	80	1070	25
2600Z	15.7N	130.8E	105	16.0N	130.9E	100	19	-5	17.6N	128.8E	110	174	-5	20.0N	127.8E	100	434	10	24.3N	133.3E	80	1038	20
2606Z	15.7N	129.8E	110	15.7N	129.9E	100	6	-10	16.9N	126.9E	110	116	0	19.3N	125.0E	100	351	30	21.8N	125.6E	90	636	30
2612Z	15.7N	128.7E	115	15.8N	128.9E	110	13	-5	16.8N	125.5E	110	99	5	18.6N	122.7E	90	278	30	21.8N	124.5E	80	627	20
2618Z	15.7N	127.6E	115	16.0N	127.5E	110	19	-5	17.2N	124.4E	100	121	0	19.3N	122.8E	90	347	35	21.7N	124.4E	80	669	15
2700Z	15.7N	126.4E	115	15.8N	126.5E	115	8	0	16.5N	122.0E	100	66	10	17.6N	118.0E	75	129	15	18.9N	114.9E	60	182	10
2706Z	15.7N	125.3E	110	15.8N	125.5E	115	13	5	16.2N	121.0E	90	64	20	16.9N	116.9E	75	77	15	17.9N	113.3E	60	85	-15
2712Z	15.6N	124.3E	105	15.6N	124.3E	115	0	10	15.8N	119.8E	70	45	10	16.5N	115.7E	80	45	20	17.4N	112.0E	65	25	-10
2718Z	15.6N	123.1E	100	15.6N	123.1E	100	0	0	16.3N	118.4E	70	66	15	17.1N	114.3E	75	72	10	18.5N	110.8E	65	85	-5
2800Z	15.4N	121.9E	90	15.7N	121.6E	90	25	0	16.1N	116.9E	55	50	-5	17.2N	113.0E	40	64	-30	18.8N	109.6E	30	131	-35
2806Z	15.2N	120.6E	70	15.2N	120.5E	70	6	0	14.8N	115.7E	65	67	5	15.6N	111.7E	50	83	-25	17.2N	108.4E	40	233	-20
2812Z	15.1N	119.5E	60	15.4N	119.7E	70	21	10	15.4N	116.1E	65	47	5	16.0N	113.4E	50	91	-25	18.0N	111.6E	40	132	-15
2818Z	15.2N	118.5E	55	15.1N	118.6E	60	8	5	15.5N	114.5E	50	25	-15	17.1N	112.2E	40	42	-30	19.6N	111.0E	30	110	-20
2900Z	15.5N	117.5E	60	15.5N	117.4E	60	6	0	16.6N	113.4E	55	24	-15	17.9N	109.5E	45	142	-20	19.3N	106.4E	35	399	-5
2906Z	15.7N	116.4E	60	16.1N	116.3E	60	25	0	18.1N	112.2E	50	94	-25	20.0N	109.6E	35	129	-25	22.5N	108.1E	40	309	-15
2912Z	15.8N	115.4E	60	15.8N	115.2E	60	11	0	17.7N	111.4E	50	63	-25	21.3N	109.1E	30	170	-25	---.-	---.-	--	--	--
2918Z	15.9N	114.4E	65	16.0N	114.1E	60	18	-5	18.0N	110.3E	45	103	-25	21.7N	108.8E	25	206	-25	---.-	---.-	--	--	--
3000Z	16.2N	113.4E	70	16.4N	113.4E	60	12	-10	17.9N	110.2E	55	105	-10	19.8N	107.7E	35	220	-5	---.-	---.-	--	--	--
3006Z	16.6N	112.7E	75	16.3N	112.9E	60	21	-15	17.3N	110.2E	55	155	-5	18.4N	107.9E	45	407	10	---.-	---.-	--	--	--
3012Z	17.1N	112.3E	75	17.1N	112.3E	60	0	-15	19.4N	110.5E	50	92	-5	---.-	---.-	--	--	--	---.-	---.-	--	--	--
3018Z	17.8N	112.1E	70	17.8N	111.8E	60	17	-10	20.4N	110.7E	45	100	-5	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0100Z	18.6N	111.9E	65	18.6N	111.8E	70	6	5	21.4N	112.3E	55	46	15	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0106Z	19.4N	111.8E	60	19.4N	111.8E	60	0	0	22.3N	112.9E	35	46	0	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0112Z	20.2N	111.9E	55	20.2N	112.0E	55	6	0	--.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0118Z	20.9N	112.4E	50	20.9N	112.3E	55	6	5	--.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0200Z	21.6N	113.1E	40	21.6N	112.7E	40	22	0	--.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--
0206Z	22.5N	113.7E	35	22.4N	113.0E	35	39	0	--.-	---.-	--	--	--	---.-	---.-	--	--	--	---.-	---.-	--	--	--

TYPHOONS WHILE WIND OVER 35KTS				
	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	13NM	90NM	217NM	459NM
AVERAGE RIGHT ANGLE ERROR	9NM	62NM	168NM	318NM
AVERAGE MAGNITUDE OF WIND ERROR	5KTS	11KTS	19KTS	19KTS
AVERAGE BIAS OF WIND ERROR	-3KTS	-6KTS	-8KTS	-8KTS
NUMBER OF FORECASTS	40	40	30	26

ALL FORECASTS				
	WARNING	24-HR	48-HR	72-HR
	15NM	90NM	217NM	459NM
	9NM	62NM	168NM	318NM
	5KTS	11KTS	19KTS	19KTS
	-3KTS	-6KTS	-8KTS	-8KTS
	44	40	30	26

ANNEX A

SUMMARY OF TROPICAL CYCLONES IN THE CENTRAL NORTH PACIFIC

1. GENERAL RESUME

Fleet Weather Central, Pearl Harbor, issued warnings on three tropical cyclones in 1974 for the Central Pacific as shown in Table A-1. Warnings were coordinated with the Central Pacific Hurricane Center, Honolulu, and the Eastern Pacific Hurricane Center, San Francisco, in accordance with the National Hurricane Operations Plan.

TABLE A-1. COMPARISON OF CENTRAL PACIFIC ANNUAL WARNING AND CLIMATOLOGY DATA

	1970	1971	1972	1973	1974
TOTAL NUMBER OF WARNINGS	27	19	76	43	32
CALENDAR DAYS OF WARNINGS	8	8	21	13	9
TROPICAL DEPRESSIONS	1	1	0	1	1
TROPICAL STORMS	1	1	3	0	1
HURRICANES	1	1	1	1	1
TOTAL	3	3	4	2	3

2. CENTRAL PACIFIC'S HURRICANE SEASON[1]

The 1974 Hurricane Season in the Central Pacific followed a pattern similar to that of recent years-short but active. Between the 9th and 30th of August, 3 tropical cyclones posed a possible threat to the Hawaiian Islands.

The first of these, Tropical Depression #11, after formation near 12N 133W, drifted westward as a weak tropical depression, never reaching storm strength during its life, passed 140W on the 8th and died a few days later.

Tropical Storm Olive formed in the Intertropical Convergence Zone on the 21st near 10N 147W, 10 days after the end of Tropical Depression #11, and barely attained storm strength as she moved west-northwestward ending her short life 240 miles southeast of Johnston Island.

Hurricane Ione developed off Central America and travelled westward crossing 140W on the 23rd as a hurricane at 13N reaching maximum winds of 95 kts shortly after turning sharply northward on the 25th. She slowly curved northeastward and appeared to be heading for a quick ending over the colder Eastern Pacific waters but instead slowly turned northwestward as the high pressure ridge north of her strengthened. Ione weakened to tropical storm intensity and reached her highest latitude of 19.5N on the 27th before swinging southwestward and further weakening to a tropical depression before ending her career on the 30th, 170 miles southsoutheast of South Point, Hawaii.

[1] Extracted from report submitted by Meteorologist-in-Charge, NWS Forecast Office Honolulu, Hawaii.

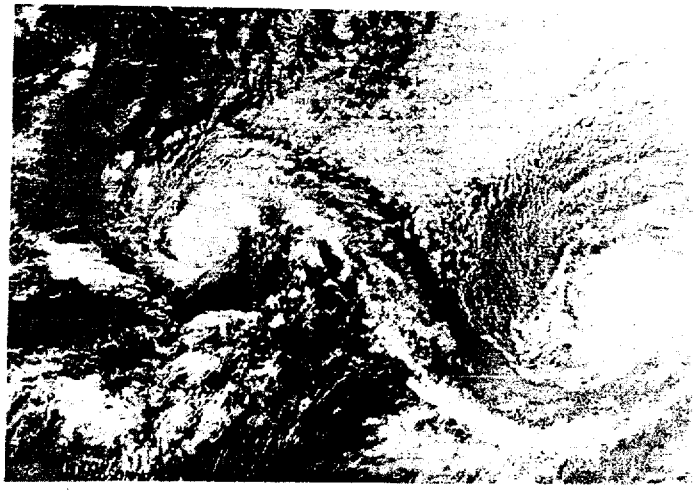
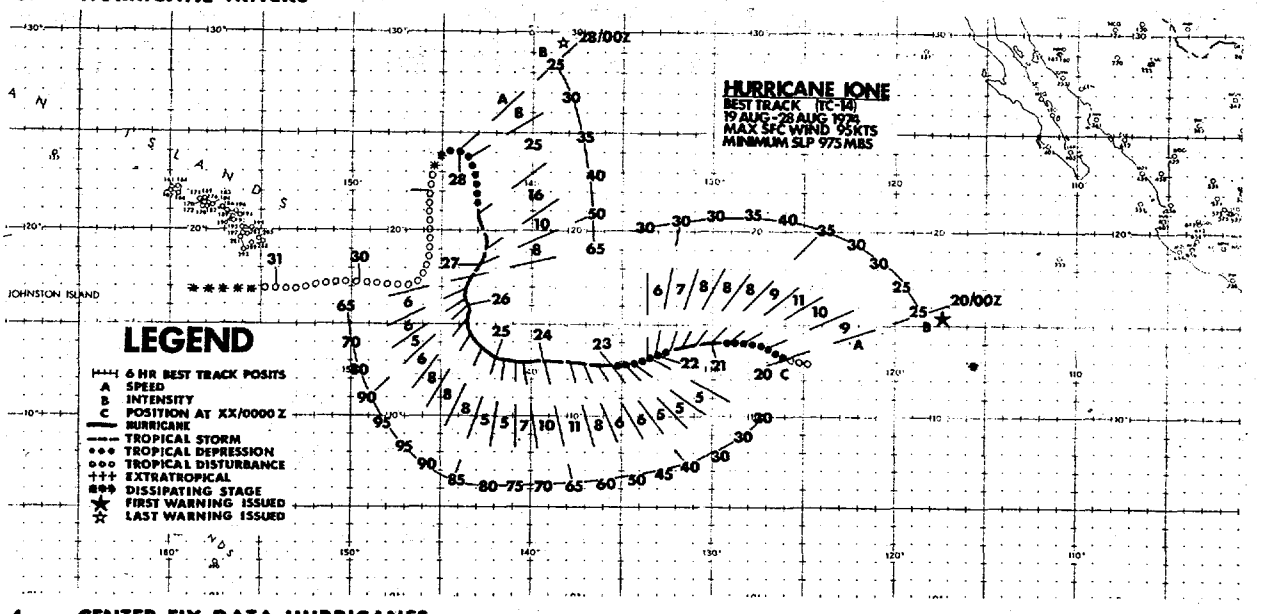


FIGURE A-1. *Hurricane Ione (right) and Tropical Storm Olive, 24 August 1974, 1827Z.*

3. HURRICANE TRACKS



4. CENTER FIX DATA-HURRICANES

HURRICANE IONE
FIX POSITIONS FOR CYCLONE NO. 14
0000Z 20 AUG TO 0600Z 28 AUG

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	FLT LVL WIND DIR	MAX OBS WIND VEL	MAX OBS WIND BRG	MAX OBS WIND RNG	MAX OBS SFC WIND VEL	MAX OBS SFC WIND BRG	MAX OBS SFC WIND RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL TT/TD	EYE FORM	EYE ORIENTATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	210540Z	14.0N 130.0W	SAT	(IR DATA		)				NON	DMSP									
2	211717Z	13.5N 132.2W	SAT							PCN 1	DMSP									
3	211803Z	13.5N 132.5W	SAT	(12.5/2.5+/S		/25HRS)				NON	DMSP									
4	221659Z	12.7N 134.5W	SAT							PCN 1	DMSP									
5	230311Z	12.9N 138.9W	SAT	(T4.0/4.0		/D2.0/27HRS)				PCN 1	DMSP									
6	241804Z	13.0N 141.5W	SAT	(T5.0/5.0		/S1.0/18HRS)				PCN 1	DMSP									
7	251630Z	14.5N 143.1W	P	5	2	700	10	95	10	12	100	210	10	958	270	15 11	CIRC	15		1
8	251745Z	14.5N 143.6W	SAT							PCN 1	DMSP									
9	261630Z	17.1N 143.4W	P	15	58	700	330	65	260	15	-	-	-	976	284	9 7	CIRC	15		2
10	261844Z	17.2N 143.5W	P	30	15	700	40	50	300	10	60	270	5	970	286	9 7	CIRC	18		2
11	261847Z	17.2N 144.0W	SAT	(15.0/5.0	/S	/24HRS)				NON	DMSP									
12	272117Z	17.8N 144.2W	SAT	(T3.0/3.0-	/W2.0/52HRS)					PCN 1	DMSP									

5. POSITION AND VERIFICATION DATA-HURRICANES

HURRICANE IONE

1200Z 24 AUG TO 0000Z 28 AUG

	BEST TRACK		WARNING		ERRORS		24 HOUR FORECAST		ERRORS		48 HOUR FORECAST		ERRORS		72 HOUR FORECAST		ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
241200Z	12.9N 140.7E	85	12.9N 141.2E	90	29	5	12.9N 146.0E	90	191	-5	12.9N 150.8E	95	466	15	12.9N 155.6E	95	818	35
241800Z	13.0N 141.5E	85	13.0N 141.5E	85	0	0	13.0N 144.8E	85	134	-15	13.0N 148.0E	85	357	5	13.0N 151.3E	80	603	30
250000Z	13.3N 142.1E	85	13.3N 142.2E	85	6	0	13.6N 145.3E	80	150	-10	14.1N 148.3E	75	354	0	14.6N 151.4E	75	538	30
250600Z	13.7N 142.6E	90	14.0N 142.2E	80	29	-10	15.2N 144.3E	75	64	-10	16.5N 147.0E	65	247	0	18.0N 149.7E	60	324	25
251200Z	14.2N 143.0E	95	14.4N 143.5E	80	31	-15	15.5N 145.7E	75	132	-5	17.0N 148.5E	65	345	5	18.5N 151.0E	60	346	25
251800Z	14.7N 143.3E	100	14.7N 143.2E	100	6	0	15.9N 144.8E	85	104	5	17.2N 146.5E	70	232	20	18.3N 148.9E	60	185	25
260000Z	15.4N 143.5E	90	15.8N 143.7E	90	27	0	19.3N 145.8E	70	166	-5	23.5N 144.8E	45	250	0	26.0N 140.5E	30	580	-5
260600Z	16.1N 143.7E	85	16.0N 143.8E	90	8	5	18.6N 145.3E	70	131	5	21.1N 146.2E	45	147	10	24.7N 142.9E	30	490	0
261200Z	16.6N 143.7E	80	16.6N 144.0E	90	17	10	19.3N 144.7E	70	118	10	22.2N 143.0E	45	219	10	24.0N 139.0E	30	633	5
261800Z	17.2N 143.6E	80	17.3N 143.5E	75	8	-5	19.7N 143.1E	65	30	15	21.7N 140.8E	35	326	0	23.4N 137.0E	25	749	0
270000Z	17.7N 143.4E	75	18.5N 143.3E	70	48	-5	21.3N 140.6E	50	195	5	24.0N 136.6E	30	646	-5	--.-	---.-	--	--
270600Z	18.1N 143.0E	65	19.2N 142.8E	70	67	5	22.0N 139.6E	50	297	15	24.6N 134.7E	30	798	0	--.-	---.-	--	--
271200Z	18.7N 142.7E	60	19.8N 142.2E	70	71	10	22.7N 138.5E	50	420	15	--.-	---.-	--	--	--.-	---.-	--	--
271800Z	19.2N 143.0E	50	19.2N 143.3E	50	17	0	--.-	---.-	--	--	--.-	---.-	--	--	--.-	---.-	--	--
280000Z	19.5N 143.5E	45	19.4N 143.5E	30	6	-15	--.-	---.-	--	--	--.-	---.-	--	--	--.-	---.-	--	--
280600Z	19.5N 144.2E	35	--.-	---	--	--	--.-	---.-	--	--	--.-	---.-	--	--	--.-	---.-	--	--
281200Z	19.0N 144.9E	35	--.-	---	--	--	--.-	---.-	--	--	--.-	---.-	--	--	--.-	---.-	--	--
281800Z	18.5N 145.5E	35	--.-	---	--	--	--.-	---.-	--	--	--.-	---.-	--	--	--.-	---.-	--	--
290000Z	17.8N 146.1E	35	--.-	---	--	--	--.-	---.-	--	--	--.-	---.-	--	--	--.-	---.-	--	--
290600Z	17.3N 146.7E	30	--.-	---	--	--	--.-	---.-	--	--	--.-	---.-	--	--	--.-	---.-	--	--
291200Z	17.1N 147.6E	25	--.-	---	--	--	--.-	---.-	--	--	--.-	---.-	--	--	--.-	---.-	--	--
291800Z	17.0N 148.5E	25	--.-	---	--	--	--.-	---.-	--	--	--.-	---.-	--	--	--.-	---.-	--	--

	HURRICANE WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	25NM	164NM	326NM	482NM	25NM	164NM	366NM	525NM
AVERAGE RIGHT ANGLE ERROR	13NM	131NM	221NM	249NM	13NM	131NM	249NM	283NM
AVERAGE MAGNITUDE OF WIND ERROR	6KTS	9KTS	6KTS	25KTS	6KTS	9KTS	6KTS	18KTS
AVERAGE BIAS OF WIND ERROR	-1KTS	2KTS	5KTS	24KTS	-1KTS	2KTS	5KTS	17KTS
NUMBER OF FORECASTS	15	13	11	7	15	13	12	10

ANNEX B

BAY OF BENGAL TROPICAL CYCLONE

1. TROPICAL CYCLONE TRACK [1]

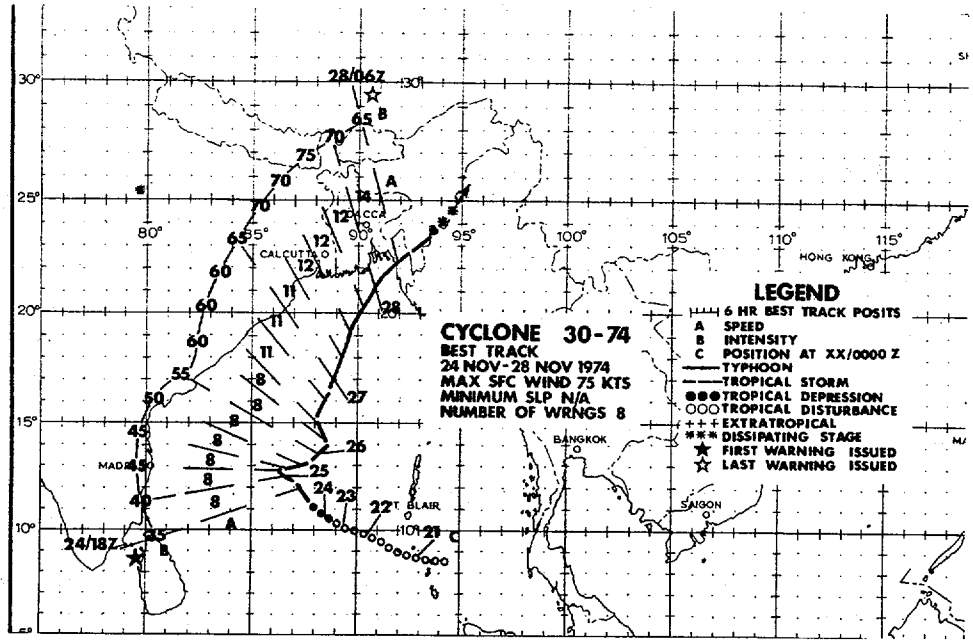


FIGURE B-1. *Best track chart for Tropical Cyclone 30-74*

FIGURE B-2. *DMSP imagery of Tropical Cyclone 30-74, 24 November 1974, 0515Z*

FIGURE B-3. *DMSP imagery of Tropical Cyclone 30-74, 28 November 1974, 0230Z*

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1 Tropical cyclones in the Bay of Bengal are numbered consecutively from the beginning of the calendar year and are included with those developing in the South Pacific and Indian Oceans.

2. CENTER FIX DATA

FIX POSITIONS FOR TROPICAL CYCLONE NO. 30-74
2000Z 24 NOV TO 0800Z 28 NOV

FIX NO.	TIME	POSIT		FIX CAT	ACCRY NAV-MET	FIX LVL	MAX OBS FLT LVL WIND DIR	MAX OBS FLT LVL WIND VEL	MAX OBS FLT LVL WIND RNG	MAX OBS SFC WIND VEL	MAX OBS SFC WIND RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T/TD	EYE FORM	ORIENTATION	EYE DIA	POSIT OF MAX/R	MSN NMBR
1	2100Z 7Z	9.0N	92.0E	SAT	(F1.0/1.0 /	/	-RS)			PCN 5	UNSP								
2	2200Z 8Z	10.0N	90.0E	SAT	(F1.0/1.0 /S	/24	-RS)			PCN 5	UNSP								
3	2300Z 3Z	11.0N	87.0E	SAT	(F1.5/1.5 /	/12	-RS)			PCN 5	UNSP								
4	2313Z 4Z	13.5N	87.0E	SAT	(IR DATA		)			PCN 3	UNSP								
5	2400Z 5Z	12.5N	87.9E	SAT	(F2.0/2.0 /	/	-RS)			PCN 5	UNSP								
6	2400Z 3Z	13.5N	87.0E	SAT	(F2.0/2.0 /	/24	-RS)			PCN 3	UNSP								
7	2413Z 6Z	11.5N	87.0E	SAT	(IR DATA		)			PCN 5	UNSP								
8	2414Z 1Z	12.5N	85.0E	SAT	(IR DATA		)			NUN	UNSP								
9	2417Z 7Z	12.5N	85.0E	SAT	(IR DATA		)			PCN 6	UNSP								
10	2417Z 7Z	12.0N	87.3E	SAT	(IR DATA		)			PCN 5	UNSP								
11	2500Z 8Z	12.0N	86.4E	SAT	(F3.0/3.0+/D1.0/24		-RS)			PCN 3	UNSP								
12	2513Z 1Z	12.7N	86.9E	SAT	(IR DATA		)			PCN 6	UNSP								
13	2513Z 1Z	12.8N	86.8E	SAT	(IR DATA		)			PCN 5	UNSP								
14	2513Z 6Z	12.8N	85.0E	SAT	(IR DATA		)			NUN	UNSP								
15	2513Z 6Z	12.9N	87.4E	SAT	(IR DATA		)			PCN 6	UNSP								
16	2000Z 2Z	13.9N	88.0E	SAT	(F3.5/3.5 /D0.5/2		-RS)			NUN	UNSP								
17	2006Z 6Z	13.9N	88.0E	SAT	(F4.0/4.0 /D1.0/2		-RS)			PCN 3	UNSP								
18	2006Z 0Z	14.0N	89.1E	SAT	(IR DATA		)			PCN 5	UNSP								
19	2612Z 5Z	15.0N	86.1E	SAT	(IR DATA		)			PCN 6	UNSP								
20	2612Z 6Z	14.5N	88.0E	SAT	(IR DATA		)			PCN 6	UNSP								
21	2612Z 0Z	16.0N	86.0E	SAT	(IR DATA		)			PCN 5	UNSP								
22	2700Z 8Z	17.7N	89.0E	SAT	(IR DATA		)			PCN 3	UNSP								
23	2703Z 1Z	17.0N	89.1E	SAT	(F4.0/4.0 /D0.5/2		-RS)			NUN	UNSP								
24	2706Z 1Z	18.0N	89.0E	SAT	(F4.5/4.5 /D0.5/2		-RS)			PCN 3	UNSP								
25	2706Z 1Z	19.0N	89.0E	SAT	(IR DATA		)			PCN 5	UNSP								
26	2714Z 3Z	20.0N	90.0E	SAT	(IR DATA		)			NUN	UNSP								
27	2713Z 0Z	19.5N	90.0E	SAT	(IR DATA		)			PCN 6	UNSP								
28	2800Z 0Z	21.2N	90.9E	ERUR	-									-	- -	-	20.7N	77.5E	-
29	2806Z 4Z	21.1N	91.0E	SAT	(F3.0/3.0 /W1.5/2		-RS)			NUN	UNSP								
30	2805Z 3Z	22.3N	92.0E	SAT	(F3.5/4.0-/W1.0/2		-RS)			PCN 3	UNSP								
31	2813Z 1Z	23.4N	93.9E	SAT	(IR DATA		)			PCN 6	UNSP								
32	2814Z 3Z	20.2N	91.0E	SAT	(IR DATA		)			PCN 3	UNSP								

3. POSITION AND VERIFICATION DATA

TROPICAL CYCLONE 30-74

2000Z 24 NOV TO 0800Z 28 NOV

	BEST TRACK			WARNING			ERRORS		24 HOUR FORECAST			ERRORS		48 HOUR FORECAST			ERRORS		72 HOUR FORECAST			ERRORS	
	POSIT		WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND	POSIT		WIND	DST	WIND
2418Z	11.9N	87.2E	35	12.0N	87.0E	35	13	0	13.8N	86.0E	50	99	0	15.8N	85.0E	70	161	10	--.-	---.-	--	--	--
2500Z	12.5N	86.9E	40	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--
2506Z	12.7N	85.4E	45	13.2N	86.2E	45	38	0	15.4N	85.5E	70	198	10	17.6N	85.3E	90	218	20	--.-	---.-	--	--	--
2512Z	12.8N	86.7E	45	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--
2518Z	13.0N	87.9E	50	13.2N	86.3E	50	71	0	15.1N	85.8E	70	170	10	17.5N	85.4E	90	320	15	--.-	---.-	--	--	--
2600Z	13.5N	88.2E	55	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--
2606Z	14.2N	88.6E	60	14.7N	88.1E	60	42	0	16.4N	89.3E	75	90	5	18.4N	90.3E	90	254	25	--.-	---.-	--	--	--
2612Z	14.9N	88.2E	60	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--
2618Z	16.0N	88.6E	60	15.3N	88.6E	60	30	0	17.4N	89.7E	75	171	0	--.-	---.-	--	--	--	--.-	---.-	--	--	--
2700Z	17.1N	88.9E	65	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--
2706Z	18.1N	89.3E	70	18.2N	90.0E	70	40	0	20.7N	91.8E	85	97	20	--.-	---.-	--	--	--	--.-	---.-	--	--	--
2712Z	19.2N	89.8E	70	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--
2718Z	20.2N	90.3E	75	20.5N	90.9E	75	34	0	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--
2800Z	21.3N	90.9E	70	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--
2806Z	22.3N	92.1E	65	22.9N	92.0E	65	36	0	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--
2812Z	23.2N	93.3E	25	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--	--.-	---.-	--	--	--

	ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	38NM	137NM	238NM	0NM
AVERAGE RIGHT ANGLE ERROR	22NM	81NM	146NM	0NM
AVERAGE MAGNITUDE OF WIND ERROR	0KTS	4KTS	10KTS	0KTS
AVERAGE BIAS OF WIND ERROR	0KTS	4KTS	10KTS	0KTS
NUMBER OF FORECASTS	8	6	4	0

APPENDIX

ABBREVIATIONS, ACRONYMS AND DEFINITIONS

Abbreviations, acronyms and definitions which follow apply for the purpose of this report.

1. ABBREVIATIONS AND ACRONYMS

AC&W	Aircraft Control and Warning
AIRREP	Aircraft Weather Reports (Commercial and Military)
AJTWC	Alternate Joint Typhoon Warning Center
APT	Automatic Picture Transmission
AWN	Automatic Weather Network
AWS	Air Weather Service
CINCPAC	Commander in Chief Pacific
CINCPACAF	Commander in Chief Pacific Air Force
CINCPACFLT	Commander in Chief U.S. Pacific Fleet
CINCUSARPAC	Commander in Chief U.S. Army Pacific
DMSP	Defense Meteorological Satellite Program
ENVPREDRSCHFAC	Environmental Prediction Research Facility
FLEWEACEN/JTWC	Fleet Weather Central/ Joint Typhoon Warning Center
NAVWEASERVCOM	Naval Weather Service Command
NESS	National Environmental Satellite Service
NOAA/NWS	National Oceanic and Atmospheric Administration, National Weather Service
PACOM	Pacific Command
SLP(MSLP)	Sea Level Pressure (Minimum Sea Level Pressure)
TCARC	Tropical Cyclone Aircraft Reconnaissance Coordinator
TC	Tropical Cyclone
TD	Tropical Depression
TS	Tropical Storm
TY	Typhoon
WMO	World Meteorological Organization

2. DEFINITIONS

ALTERNATE JOINT TYPHOON WARNING CENTER - The AJTWC is Detachment 17/Asian Tactical Forecast Unit, 20th Weather Squadron, Yokota, Japan operating in coordination with the Naval Weather Service Ficility, Yokosuka, Japan.

CYCLONE - A closed atmospheric circulation rotating counterclockwise (clockwise) in the Northern (Southern) Hemisphere.

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 source from release of latent heat of condensation to baroclinic processes. The term carries no implication as to strength or size.

EYE/CENTER - Refers to the roughly circular central area of a well developed tropical cyclone usually characterized by comparatively light winds and fair weather. If more than half surrounded by wall cloud, the word "eye" is used, otherwise the area is referred to as a center.

MAXIMUM SUSTAINED WIND - Maximum surface wind speed, over water, in a cyclone averaged over a 1-minute period of time. Wind speed is subject to gusts which bring a sudden short duration (i.e., on the order of a few seconds) increase in speed. Peak gusts over water average 20 to 25 percent higher than the sustained 1-minute wind speed.

SIGNIFICANT TROPICAL CYCLONE - A tropical cyclone becomes "significant" with the issuance of the first numbered warning by the responsible warning agency.

SUSPICIOUS AREA - An area suspected of containing a developing or existing tropical cyclone.

TROPICAL CYCLONE - A synoptic scale nonfrontal cyclone developing over tropical or subtropical waters, having a definite organized circulation and warm core.

TROPICAL CYCLONE AIRCRAFT RECONNAISSANCE COORDINATOR - A CINCPACAF representative designated to levy tropical cyclone aircraft weather reconnaissance requirements on reconnaissance units within a designated area of the PACOM and to function as coordinator between CINCPACAF, aircraft weather reconnaissance units, and the appropriate typhoon/hurricane warning center.

TROPICAL DEPRESSION - A tropical cyclone in which the maximum sustained surface winds are 33 knots or less.

TROPICAL DISTURBANCE - A discrete system of apparently organized convection, generally 100 to 300 miles in diameter, originating in the tropics or sub-tropics, 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 on the wind field. As such, it is the basic generic designation which, in successive stages of intensification, may be subsequently classified as a tropical depression, tropical storm, or typhoon.

TROPICAL STORM - A tropical cyclone with maximum sustained surface winds in the range of 34 to 63 knots, inclusive.

TYPHOON/HURRICANE - A tropical cyclone in which maximum sustained surface winds are 64 knots or greater. West of 180 degrees longitude the name TYPHOON is used and east of 180 degrees longitude the name HURRICANE is used. All descriptive references to typhoons apply equally to hurricanes.

SUPER TYPHOON - A typhoon with maximum sustained surface winds greater than or equal to 130 knots.

WALL CLOUD - An organized band of cumuliform clouds immediately surrounding the central area of a tropical cyclone.

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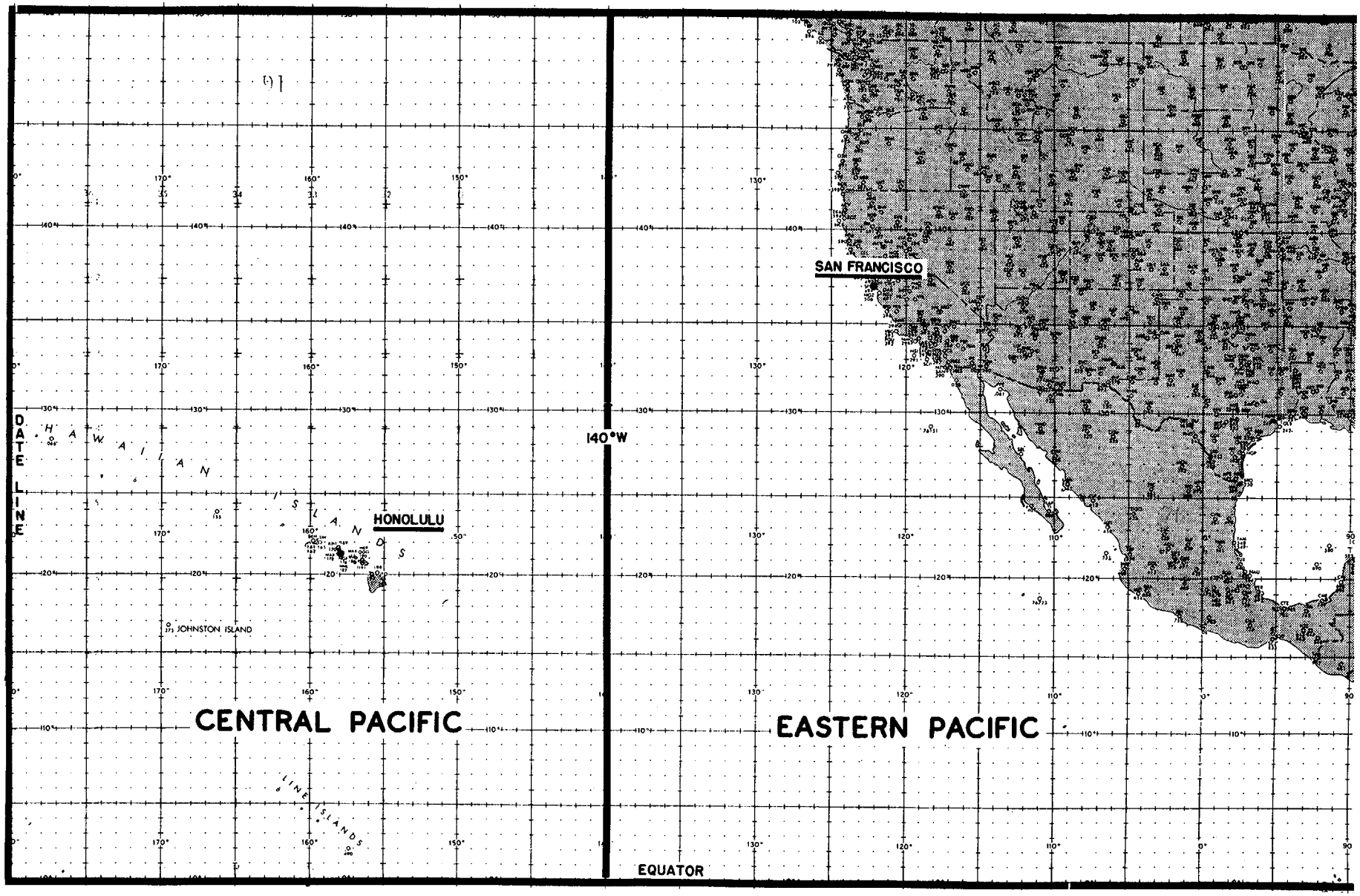
Annual publication summarizing the tropical cyclone season in the western North Pacific, Bay of Bengal, and the central North Pacific. A brief narrative is given on each typhoon in the western North Pacific including the best track. Pertinent reconnassance data used to construct the best tracks are provided. Forecast verification data and statistics for the JTWC are summarized. Research efforts at the JTWC is discussed briefly.



Areas of Responsibility - Central and Eastern Pacific Hurricane Centers

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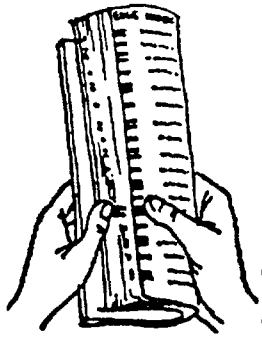

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