CHAPTER IV — SUMMARY OF TROPICAL CYCLONES

1. GENERAL RESUME

The western North Pacific remained quiescent for the first six months of 1973 before the first tropical cyclone developed. Since World War II, only in 1952, when five months passed without a single tropical cyclone, has this area experienced such a late start of the tropical cyclone season (Table 4-1). According to statistics compiled by the Royal Observatory of Hong Kong, this dearth of tropical cyclone activity during the first six months of the year has not occurred since 1917. Interestingly, on the average, five tropical cyclones form during the first six months of the year of which three became typhoons.

The development of Tropical Storm Wilda on 1 July marked the beginning of the 1973 season. Within a span of 5 months, a total of only 21 named tropical cyclones developed, with 12 of these reaching typhoon intensity. Additionally, warnings were issued on two numbered tropical depressions. Typhoon frequency in 1973 was significantly lower than the yearly average of 19 since the establishment of the JTWC in 1959. Only 1969 and 1970 experienced a similar low frequency of typhoons during this period (Table 4-2).

In 1973, warnings were issued on only 77 calendar days, approximately one half of the 14-year average of 145 days. The JTWC remained in warning status 62 days less in 1973 than in 1972, an active tropical cyclone year.

Typhoon days for 1973 dipped to a record low of 42 compared to 121 in 1972 (Table 4-3). Based on the past 15 years, 1973 was 54 days below the average and 20 days below 1969 the next lowest. These facts indicate that there was not only a

TABLE 4-1. FREQUENCY OF TROPICAL STORMS (INCLUDING TYPHOONS) BY MONTHS AND YEARS

	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
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
Totals	13	7	13	20	31	45	115	147	131	111	76	33	742
Average	.45	.24	.45	.69	1.07	1.55	3.97	5.07	4.52	3.83	2.62	1.14	25.59

TABLE 4-2. FREQUENCY OF TROPICAL STORMS REACHING TYPHOON INTENSITY BY MONTHS AND YEARS

	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
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
Totals	8	2	6	17	24	31	75	103	93	84	52	22	517
Avg	.28	.07	.21	.59	.83	1.07	2.59	3.55	3.21	2.90	1.79	.76	17.83

short period of typhoon activity (July to October) but also the short duration of typhoons notably in August and September. The number of warnings issued totaled only 390 which is 55% of the average over the past 15 years. 1971 and 1972 could be considered "normal" years compared to 1973 since they were only slightly above the average with total number of warnings of 747 and 739, respectively. 1973 was not without multiple storm occurrences with 27 days with two or more cyclones and 9 days with three or more cyclones occurring simultaneously (Table 4-4).

There were only three super typhoons during 1973, Billie, Nora, and Patsy, which is half of the climatological mean of six based on the past 15 years. This is not surprising since most of the tropical cyclones developed outside of the favorable areas for super typhoon occurrence delineated by Holliday (1970).

The 1973 season was marked by another peculiarity. There was a pronounced absence of tropical cyclone activity in the area south of 20°N and east of 135°E which is normally a favorable area for tropical cyclone development. Except for brief periods during the summer months, the eastward extension of the monsoon trough over the western North Pacific Ocean was noticeably missing. It was not until the latter half of the season that the monsoon trough became firmly established in the area to the south of Guam when 3 successive typhoons were spawned during the first half of October.

The Tropical Upper Tropospheric Trough (TUTT) was well established by mid-May. It initiated the development of Tropical Storm Clara in July and Tropical Storm Hope and Tropical Depression No. 11 in August. Although the TUTT was in evidence throughout the typhoon season, the near-equatorial ridge which normally forms to the south of the TUTT was absent except for brief periods. Consequently, upper level westerlies prevailed over the Caroline and Marshall Islands, an area which would normally be under deep tropospheric easterlies during the primary tropical cyclone season. The resulting strong vertical wind shear over the eastern Trust Territory was unfavorable for tropical cyclone development.

TABLE 4-3. TYPHOON DAYS 1959-1973

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL PER YEAR
1959	---	---	---	8	---	---	3	18	19	18*	10	18	94
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	30*	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
TOTAL	9	5	10	50	55	77	202	284	271	282	129	67	1441
MEAN	.6	.3	.7	4.0	3.7	5.1	13.5	18.9	18.1	18.8	8.6	4.5	96.1

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

TABLE 4-4. SUMMARY OF JTWC WARNINGS 1969-1973

	1960-1973 (AVG)	1970	1971	1972	1973
TOTAL NUMBER OF WARNINGS	707	533	747	739	390
CALENDAR DAYS OF WARNING	146	127	163	139	77
NUMBER OF WARNING DAYS WITH TWO OR MORE CYCLONES	52	29	54	46	27
NUMBER OF WARNINGS DAYS WITH THREE OR MORE CYCLONES	12	0	6	13	9

Based on available casualty reports, typhoons Nora and Ruth and tropical storms Sarah and Vera accounted for the majority of the tropical cyclone related casualties. Taiwan, South Vietnam, and the Republic of the Philippines bore the brunt of the storm damages and casualties. The Republic of the Philippines was again, as in 1972, particularly hard hit by the passage of Nora, Ruth, and Vera. The main Japanese islands, interestingly, did not experience coastal crossing of a typhoon during 1973 which is a first according to available records since 1945.

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; Japan Meteorological Agency; National Weather Service of the Republic of the Philippines; the Environmental Data Service, National Oceanic and Atmospheric Administration and Casualty Returns, Liverpool Underwriters Association.

TABLE 4-5. LIST OF ESTIMATED CASUALTIES FOR THE 1973 SEASON

TYPE	NAME	DEATHS	MISSING
T	DOT	1	--
T	IRIS	2	3
T	NORA	22	48
T	RUTH	27	23
TS	SARAH	50	--
TS	VERA	75	58
	total	177	132

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

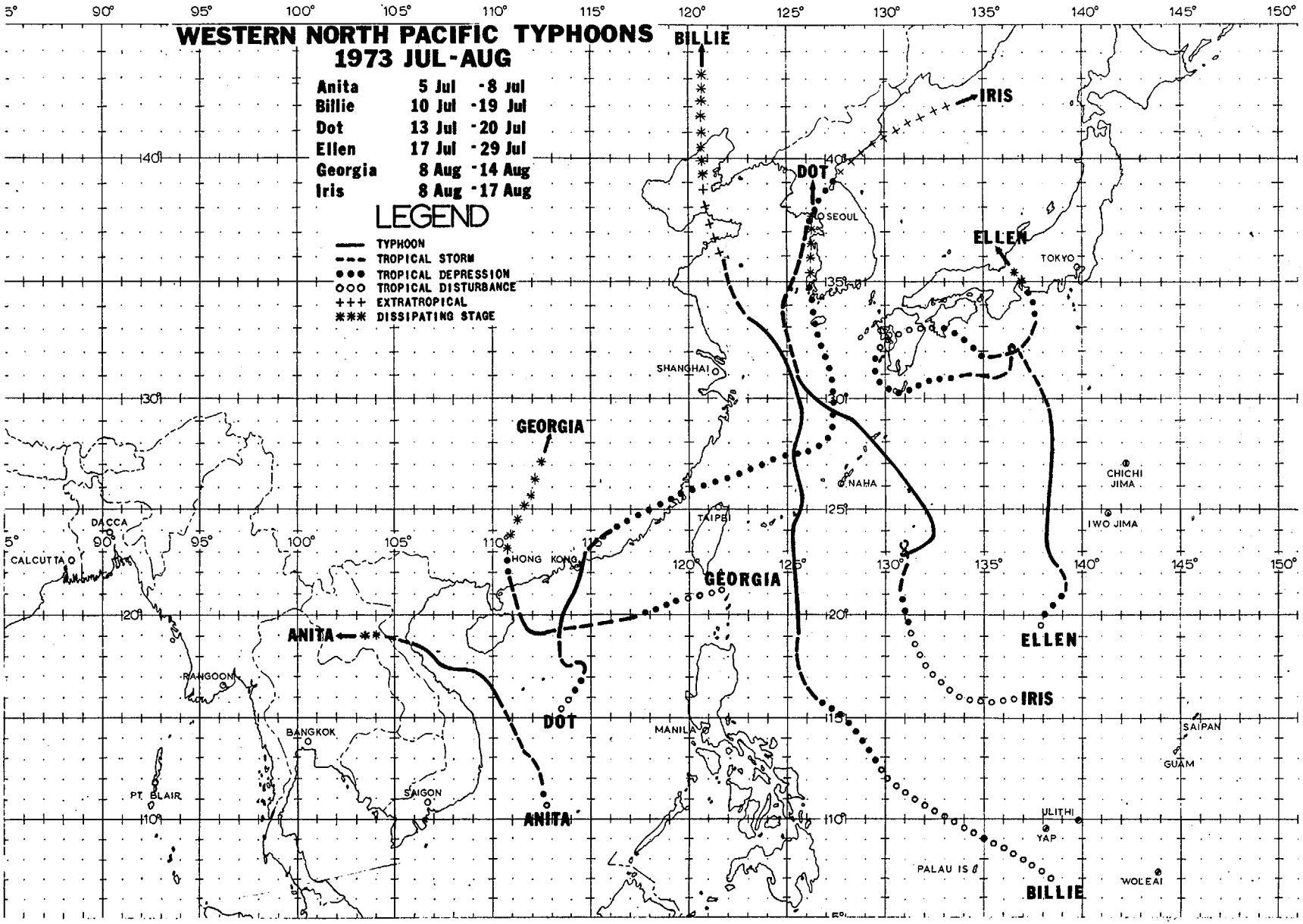
TABLE 4-6. 1973 TROPICAL CYCLONES

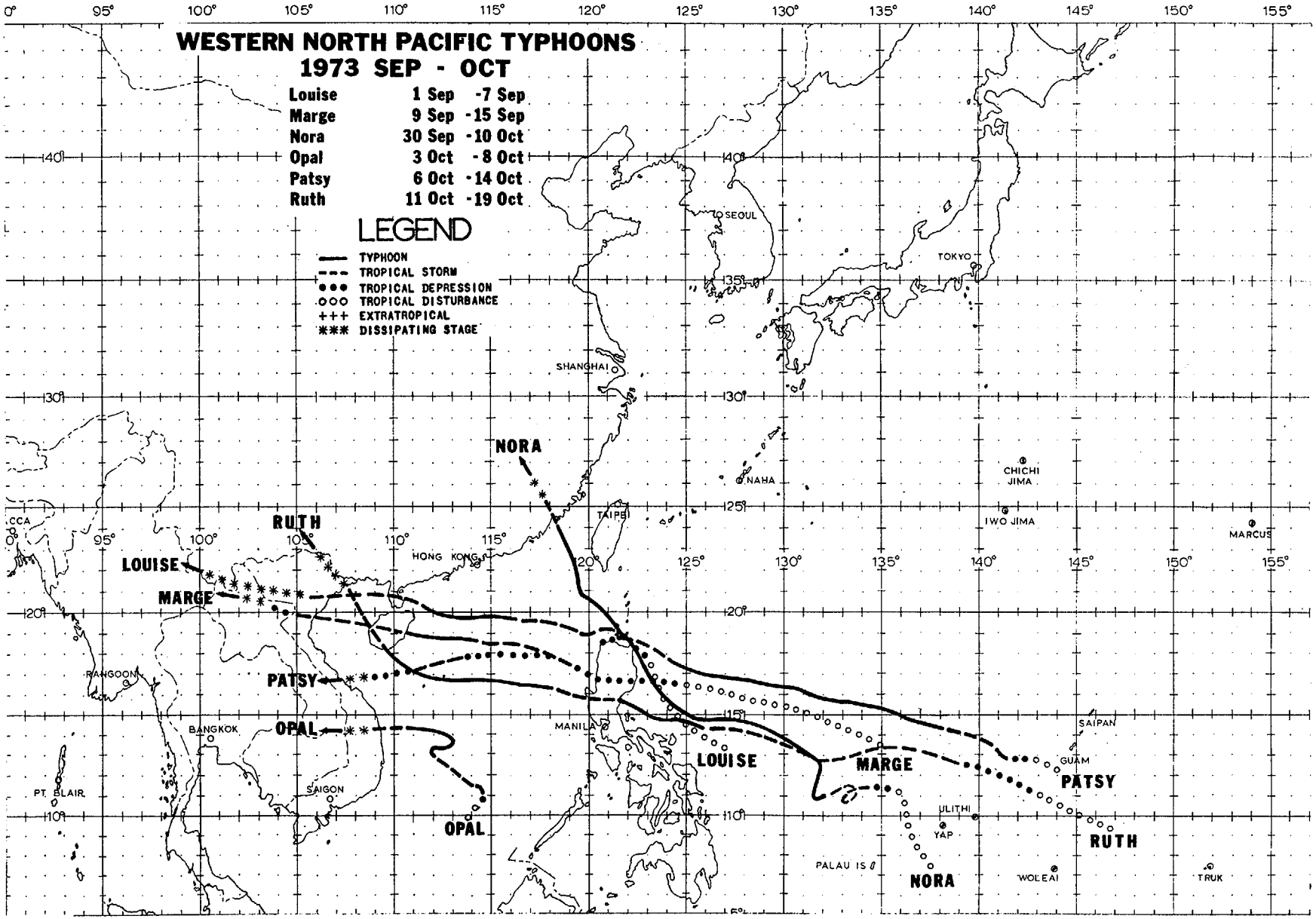
CYCLONE	TYPE	NAME	(PRD OF WRNG)	CALENDAR DAYS OF WARNING	MAX SFC WIND†	MIN OBS SLP	WARNINGS ISSUED TOTAL	WARNINGS ISSUED NO. AS TYPHOONS	WARNINGS ISSUED DISTANCE TRAVELED
01	TS	WILDA	01 JUL-03 JUL	3	60	982	9	--	384
02	TY	ANITA	05 JUL-08 JUL	4	70	980	13	6	720
03	TS	CLARA	12 JUL-14 JUL	3	50	998	7	--	324
04	TY	BILLIE	13 JUL-19 JUL	7	130	916	27	18	1560
05	TY	DOT	*	6	85	978	19	4	1020
06	TY	ELLEN	*	10	105	941	29	8	1092
07	TS	FRAN	29 JUL-30 JUL	2	40	1002	6	--	330
08	TY	GEORGIA	09 AUG-12 AUG	4	70	976	15	9	504
09	TS	HOPE	09 AUG-12 AUG	4	45	996	15	--	756
10	TY	IRIS	10 AUG-17 AUG	8	85	972	30	16	1218
11	TD	TD-11	13 AUG-14 AUG	2	30	1005	6	--	270
12	TS	JOAN	18 AUG-20 AUG	3	45	990	10	--	648
13	TS	KATE	24 AUG-26 AUG	2	60	983	8	--	294
14	TD	TD-14	01 SEP-02 SEP	2	30	NA	4	--	90
15	TY	LOUISE	03 SEP-07 SEP	5	75	974	18	6	816
16	TY	MARGE	12 SEP-14 SEP	3	80	964	12	4	792
17	TY	NORA	02 OCT-10 OCT	9	160	877	34	25	1584
18	TY	OPAL	04 OCT-08 OCT	5	75	968	16	9	540
19	TY	PATSY	*	10	140	893	34	14	1920
20	TY	RUTH	11 OCT-19 OCT	9	90	957	33	23	2112
21	TS	SARAH	10 NOV-10 NOV	1	55	984	4	--	180
22	TS	THELMA	*	4	55	991	13	--	660
23	TS	VERA	19 NOV-26 NOV	8	50	990	28	--	1134
		1973 TOTALS		77**			390	142	

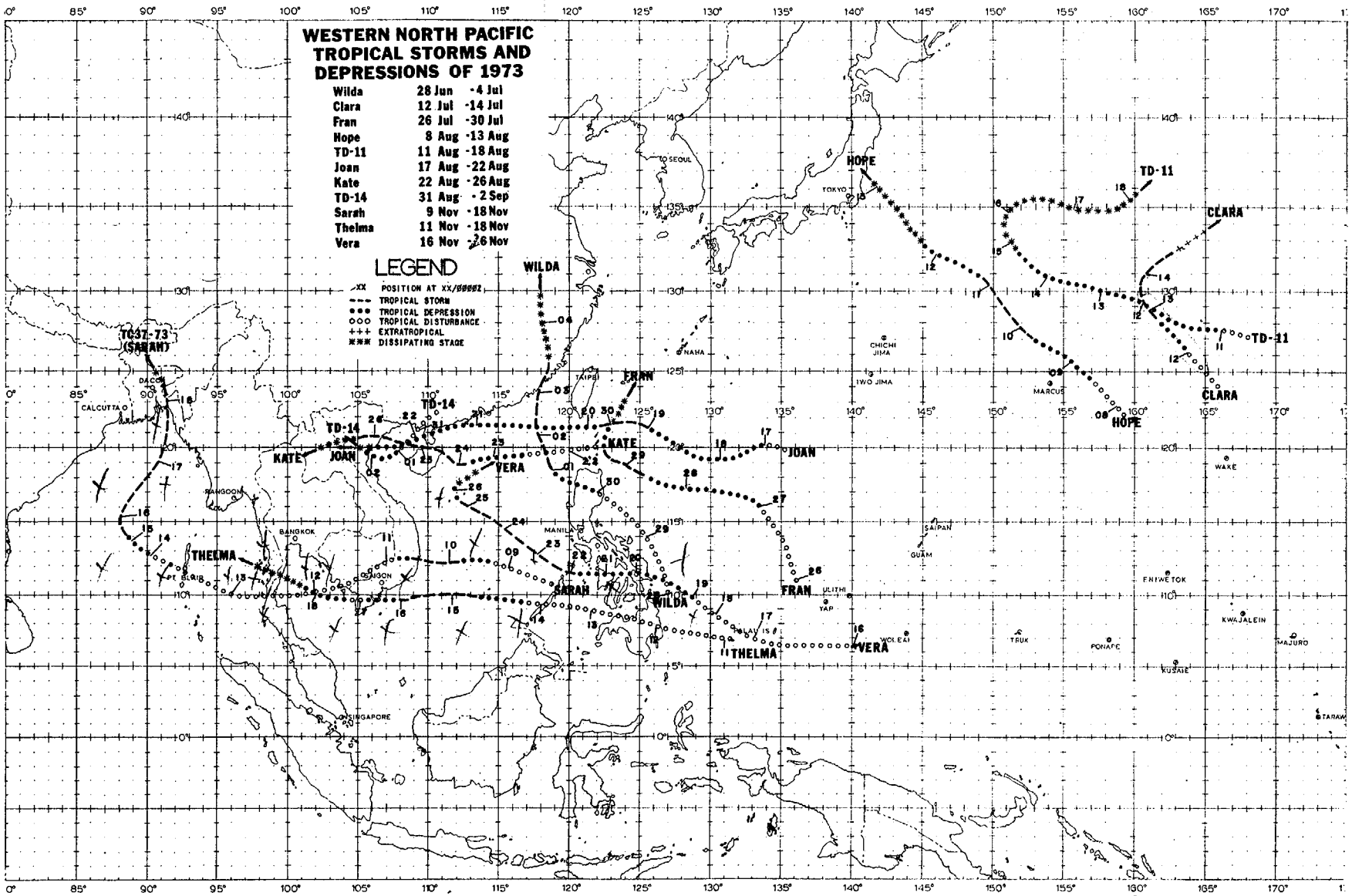
*Dot 14/06Z - 17/06Z and 19/00Z - 20/06Z JUL
Ellen 17/18Z - 21/06Z and 23/06Z - 25/06Z and 28/00Z - 29/06Z JUL
Patsy 06/06Z - 12/12Z and 13/12Z - 15/06Z OCT
Thelma 15/00Z - 17/06Z and 18/06Z - 18/18Z NOV

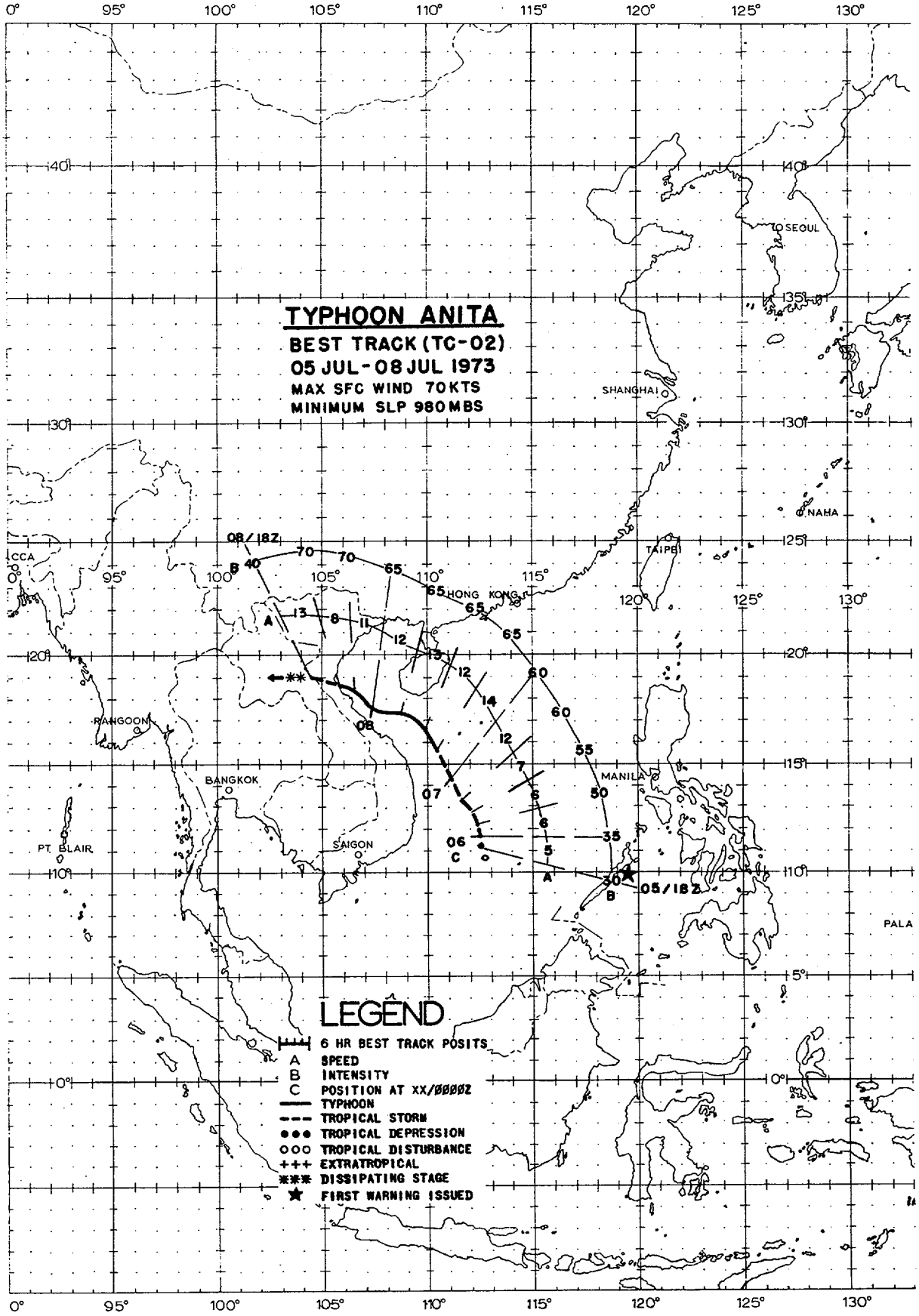
**Overlapping days included only once in sum
† Over water estimate (one-minute averaging period)

DATA TAKEN FROM BEST TRACK


WESTERN NORTH PACIFIC TYPHOONS
1973 JUL-AUG
Anita 5 Jul - 8 Jul
Billie 10 Jul - 19 Jul
Dot 13 Jul - 20 Jul
Ellen 17 Jul - 29 Jul
Georgia 8 Aug - 14 Aug
Iris 8 Aug - 17 Aug
LEGEND
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
BILLIE
IRIS
DOT
ELLEN
GEORGIA
ANITA
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
HONG KONG
CHICHI JIMA
IWO JIMA
DACCA
CALCUTTA
RANGOON
BANGKOK
SAIGON
PT. BLAIR
MANILA
SAIPAN
GUAM
ULITHI
YAP
PALAU IS
WOLEAI


WESTERN NORTH PACIFIC TYPHOONS
1973 SEP - OCT
Louise 1 Sep -7 Sep
Marge 9 Sep -15 Sep
Nora 30 Sep -10 Oct
Opal 3 Oct -8 Oct
Patsy 6 Oct -14 Oct
Ruth 11 Oct -19 Oct
LEGEND
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
HONG KONG
CHICHI JIMA
IWO JIMA
MARCUS
RANGOON
BANGKOK
SAIGON
MANILA
PT. BLAIR
SAIPAN
GUAM
ULITHI
YAP
PALAU IS
WOLEAI
TRUK
NORA
RUTH
LOUISE
MARGE
PATSY
OPAL


WESTERN NORTH PACIFIC
TROPICAL STORMS AND
DEPRESSIONS OF 1973
Wilda 28 Jun -4 Jul
Clara 12 Jul -14 Jul
Fran 26 Jul -30 Jul
Hope 8 Aug -13 Aug
TD-11 11 Aug -18 Aug
Joan 17 Aug -22 Aug
Kate 22 Aug -26 Aug
TD-14 31 Aug - 2 Sep
Sarah 9 Nov -18 Nov
Thelma 11 Nov -18 Nov
Vera 16 Nov -26 Nov
LEGEND
XX POSITION AT XX/00002
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
TC37-73 (SARAH)
WILDA
FRAN
HOPE
TD-11
CLARA
TD-14
KATE
JOAN
VERA
THELMA
SEOUL
TOKYO
NAHA
TAIPEI
CHICHI JIMA
IWO JIMA
MARCUS
WAKE
CALCUTTA
DACCA
RANGOON
BANGKOK
SAIGON
MANILA
SAIPAN
GUAM
ENIWETOK
ULITHI
YAP
WOLEAI
TRUK
PONAPE
KUSAIE
KWAJALEIN
MAJURO
TARAWA
SINGAPORE


TYPHOON ANITA
BEST TRACK (TC-02)
05 JUL-08 JUL 1973
MAX SFC WIND 70KTS
MINIMUM SLP 980MBS
SEOUL
SHANGHAI
NAHA
TAIPEI
HONG KONG
RANGOON
BANGKOK
SAIGON
MANILA
PT BLAIR
PALA
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/ØØØØZ
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED

ANITA

Anita, the season's first typhoon developed in the monsoon trough late on 5 July under conditions quite similar to those discussed by Ramage (1971). Several days prior to the initial development of Anita, the low level southwesterly flow throughout Indochina, the Malaysian Peninsula, and southern India increased from an average of 10 to 20 knots to speeds of 25 to 35 knots. The satellite mosaic on 4 July revealed that a band of cloudiness extending from the Arabian Sea to the South China Sea had increased markedly in response to the intensifying southwesterly flow (Figure 4-1).

Of particular interest during Anita's initial development were the strong winds (25 to 30 knots) extending more than 400nm from her center to the south with lighter winds (10 to 15 knots) near the large and diffuse center. These strong winds were primarily associated with the increased monsoon flow and not the storm itself, since Anita had not intensified sufficiently to produce the necessary pressure gradient to support such winds. Anita continued to exhibit this unusual wind structure as she intensified to typhoon strength (Figure 4-2). The USNS Washoe County reported winds in excess of 35 knots and mountainous seas over 150nm to the south of Anita (06/0900 GMT). Early on the 7th, a reconnaissance aircraft reported Anita's sea level pressure had dropped to 983mb with flight level and surface winds of 50 to 80 knots within a band 30 to 60nm from the storm center, while winds within a 30nm radius of her center were 30 knots or less.

The storm initially drifted northnorthwest in response to a weakness in the subtropical ridge to the north caused by the remains of Tropical Storm Wilda. However, by 1200 GMT, 7 July, significant height rises at 500mb indicated the ridge was reforming over southern China. As a result, Anita assumed a more westerly track.

The USS OGDEN (LPD-5) reported eye passage and greater than 60 knot winds (08/0000 GMT) near 17.5N 107.4E as her barometer registered 981mb. The barograph aboard the USS TRIPOLI (LPH-10) recorded eye passage (08/0100 GMT) as the ship steamed near 17.6N 107.2E (Figure 4-3).

A reconnaissance aircraft observed a minimum sea level pressure of 980mb and a well defined closed wall cloud indicating continued intensification as the storm neared the North Vietnamese coast(08/1010 GMT). Anita reached peak intensity of 70 knots prior to going ashore near Vinh, North Vietnam and quickly dissipated over land (Figure 4-4).

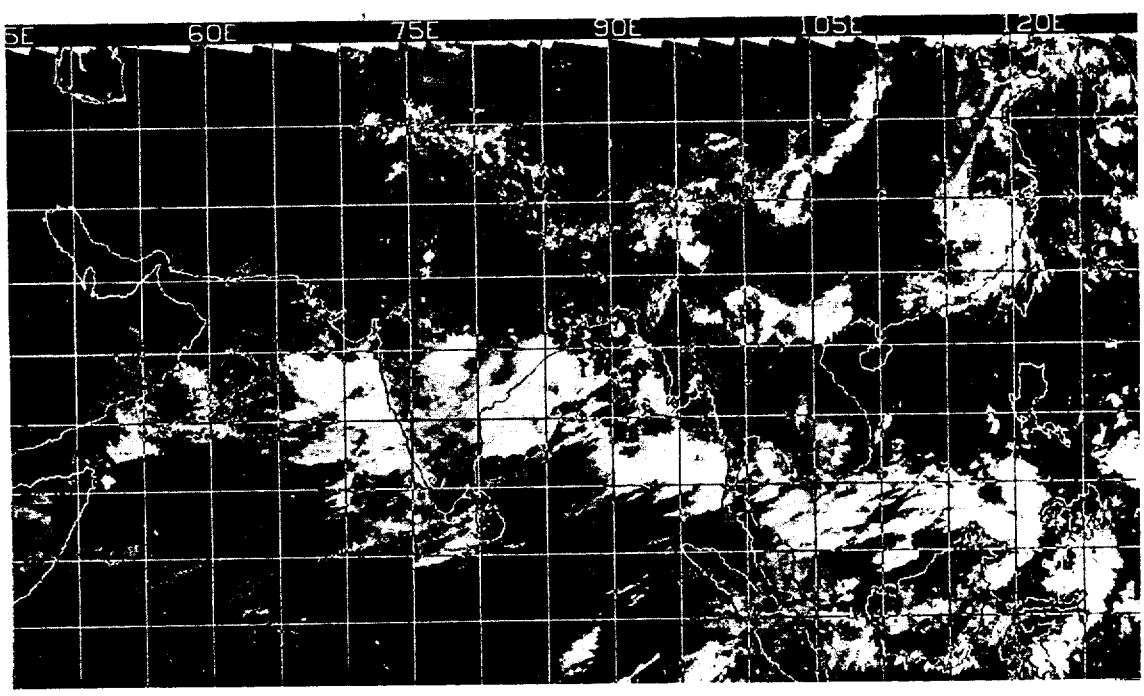


FIGURE 4-1. *NOAA-2 satellite mosaic for 3 July 1973 showing cloud band associated with the southwest monsoon extending from the Arabian Sea to the South China Sea. Remnants of Wilda (A).*

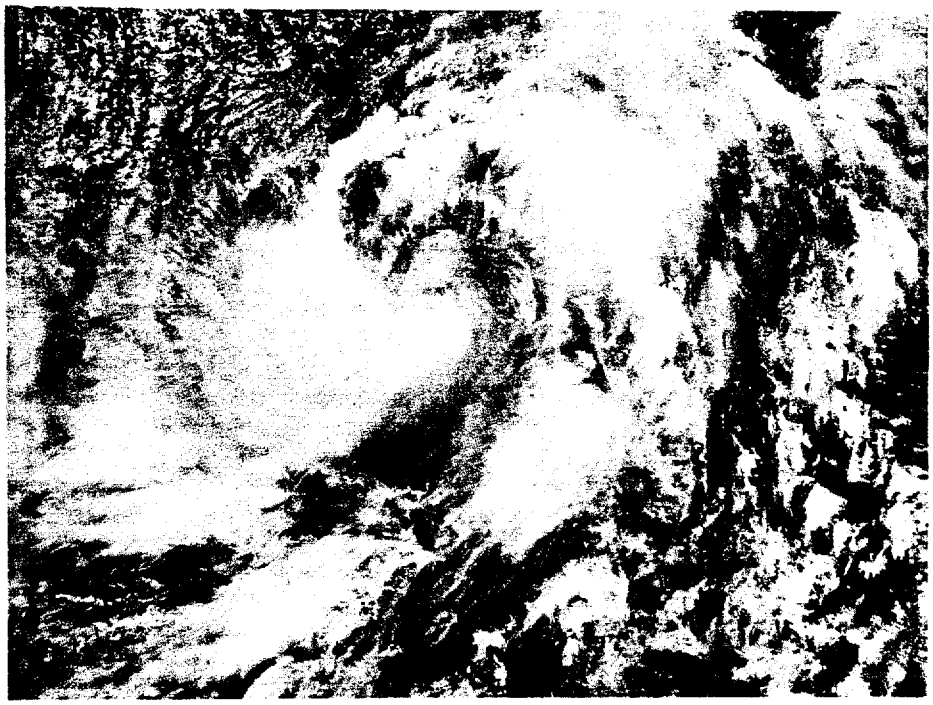


FIGURE 4-2. *Tropical Storm Anita near typhoon intensity 110 nm off the coast of the Republic of Vietnam, 7 July 1973, 0444 GMT. (DMSP imagery)*

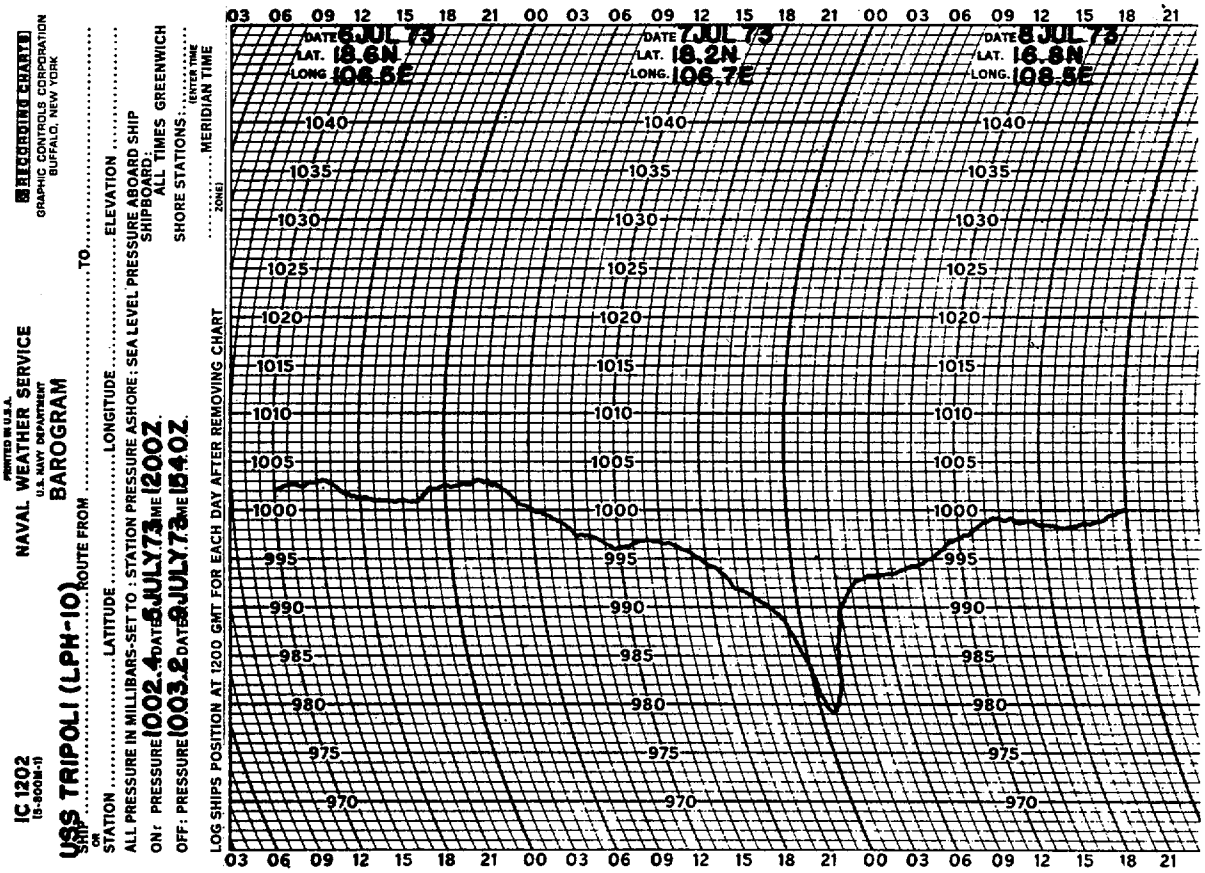


FIGURE 4-3. *Reproduction of Barograph trace from the USS Tripoli (LPH-10) as she passed through the eye of Typhoon Anita.*

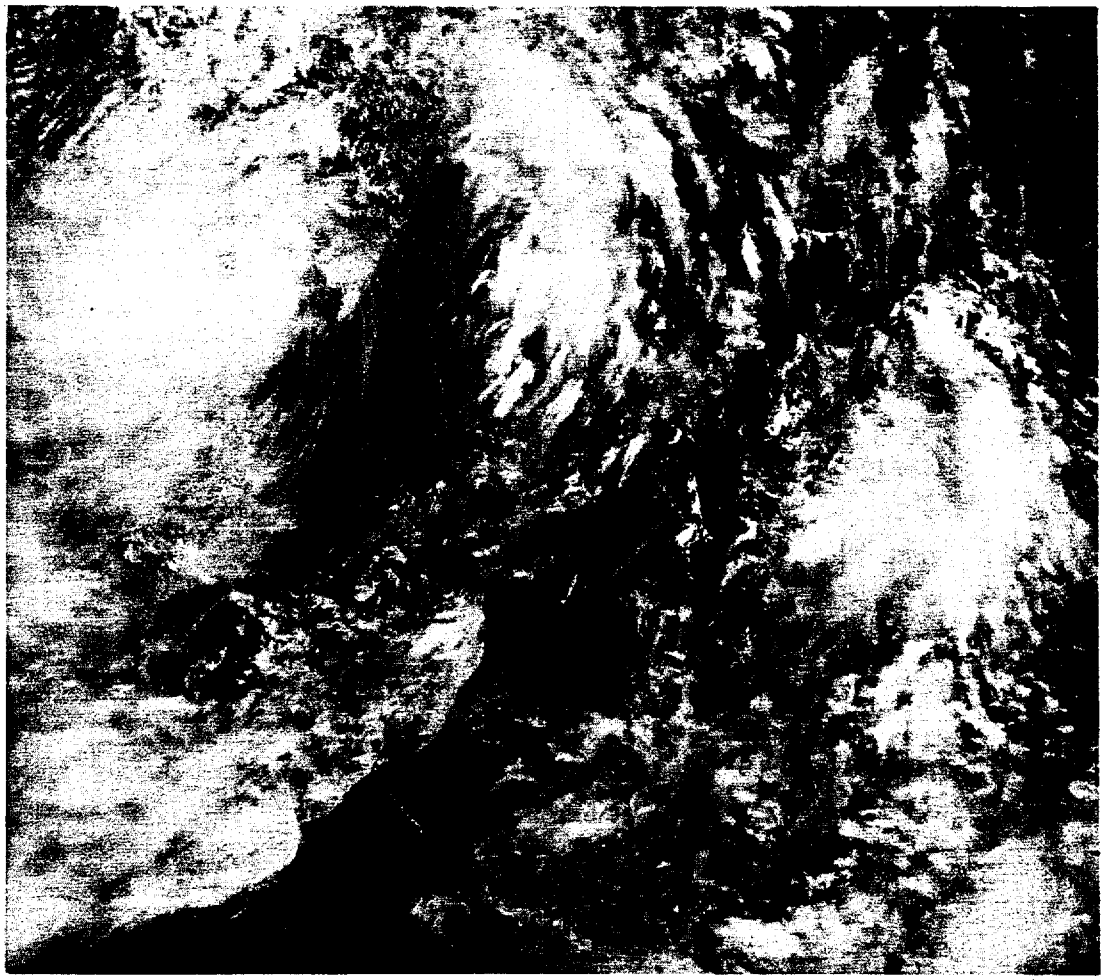
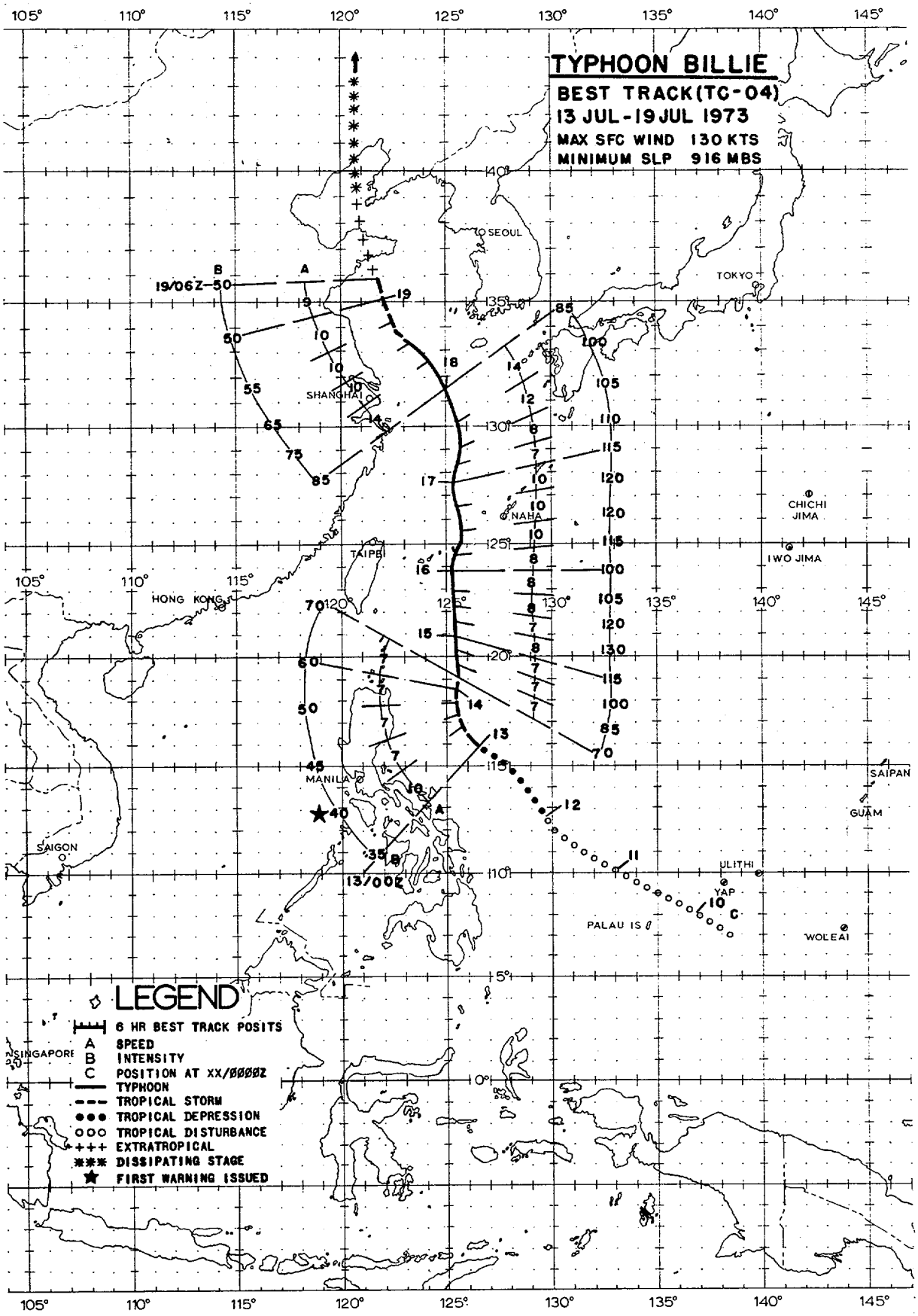


FIGURE 4-4. *Typhoon Anita in the Gulf of Tonkin near peak intensity, 8 July 1973, 0432 GMT. (DMSP imagery)*


TYPHOON BILLIE
BEST TRACK(TC-04)
13 JUL-19 JUL 1973
MAX SFC WIND 130 KTS
MINIMUM SLP 916 MBS
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
HONG KONG
MANILA
SAIGON
SINGAPORE
CHICHI JIMA
IWO JIMA
SAIPAN
GUAM
ULITHI
YAP
PALAU IS
WOLEAI
19/06Z
13/00Z
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/ØØØØZ
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED

Billie, the season's first super typhoon, became a tropical depression in the western Philippine Sea some 250nm east of Luzon on 12 July. Her early history can be traced to the Yap-Palau area on 10 July as a weak circulation in the monsoon trough.

Billie initially tracked westward, gradually shifting to the northwest in response to a long wave, mid-tropospheric trough over eastern China. Reaching tropical storm force late on the 13th, Billie assumed a northerly course at a speed of 7 kts.

The long wave trough remained stationary, influencing Billie to maintain a meridional track at about 8 kts. Her center never deviated more than 30nm either side of 125.5E for 4 days, covering a distance of 720nm. This steadiness in direction for such an extended period of time sets Billie apart from any other northward moving typhoon during the period 1947-1972.

Rapid deepening occurred once typhoon force was attained early on the 14th as Billie's central pressure fell 50mb in 24 hours. At 15/0330 GMT, aircraft reconnaissance indicated that the central pressure had dropped to 916mb within a tightly organized eye 8nm in diameter (Figure 4-5).

Billie's central pressure rose to 954mb during the next 18 hours as she approached the Ryukyus. Commencing an unusual second deepening as she crossed through the island chain, Billie's central pressure dropped to 917mb in the East China Sea (16/1154 GMT).

Billie passed just east of Miyako Jima, where maximum sustained winds of 65 kts with gusts to 104 kts were recorded (16/0700 GMT). The lowest pressure reading at the Japanese Meteorological Agency Station was 947.5mb (16/0650 GMT).

The island of Okinawa experienced gale force winds as Billie transited northward through the East China Sea. Naha registered maximum sustained winds of 35 kts with gusts to 58 kts (16/1700 GMT) while White Beach Naval Port Facility recorded 45 kts sustained with gusts to 55 kts (16/1900 GMT). Kadena AFB reported lesser winds of 28 kts (16/1640 GMT) with gusts of 43 kts (16/1354 GMT). Based on land radar, Billie's eye passed 105nm west of Okinawa at 16/1800 GMT.

On the 17th, a short wave deepened the northern portion of the long wave trough situated in the Lake Baikal region of Siberia, causing increased ridging over Manchuria and the Sea of Japan. This ridging prevented Billie from recurving. On the 18th, Billie shifted to a northwest course 120nm southsouthwest of Cheju-do Island. Satellite imagery indicated drier air off the Asian Mainland was entering Billie's circulation at this time. She weakened significantly during the 18th, dropping to tropical storm strength late that day while tracking into the Yellow Sea.

Approaching the Gulf of Chihli on the 19th, Billie acquired extratropical characteristics and accelerated to a forward speed greater than 20 kts. Billie finally moved inland near Chin-Chow China and dissipated on the 20th.

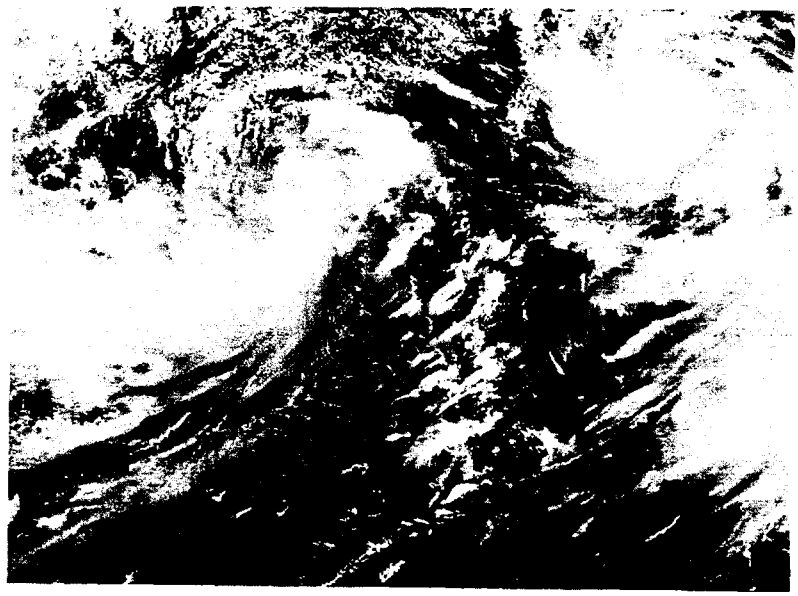
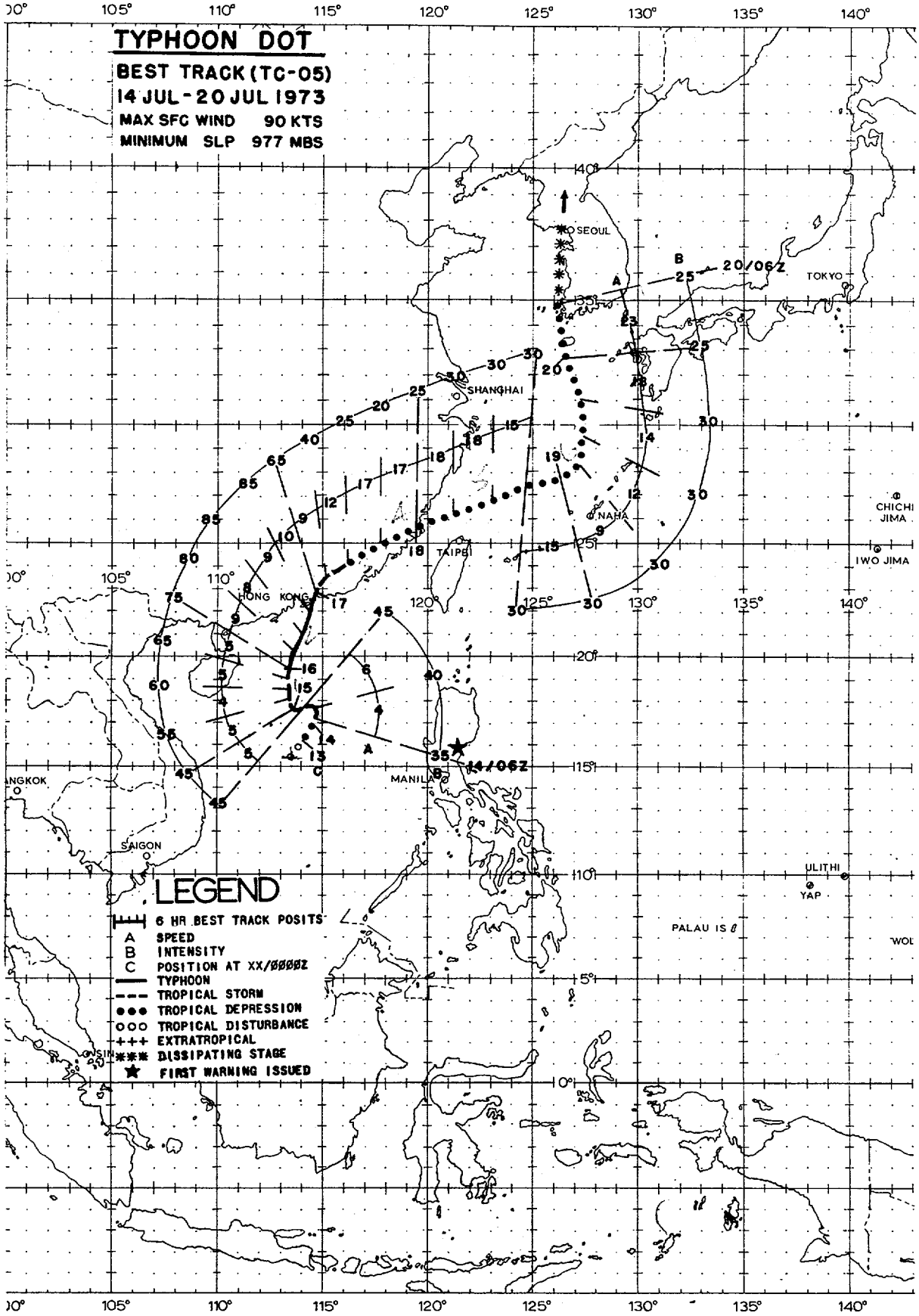


FIGURE 4-5. *Typhoon Billie (right) 7 hours prior to an unusual second deepening 190 nm east of Taiwan. Typhoon Dot (left) in the South China Sea, 16 July 1973, 0416 GMT. (DMSP imagery)*


TYPHOON DOT
BEST TRACK (TC-05)
14 JUL - 20 JUL 1973
MAX SFC WIND 90 KTS
MINIMUM SLP 977 MBS
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
HONG KONG
MANILA
SAIGON
CHICHI JIMA
IWO JIMA
ULITHI
YAP
PALAU IS
20/06Z
14/06Z
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/ØØØØZ
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED

The South China Sea spawned its second typhoon of the 1973 season on 13 July with the genesis of Dot. Her development was quite similar to Anita's. A surge in the low level southwesterlies preceded her formation in the monsoonal trough.

Dot formed a few days after Billie. While Billie intensified rapidly in the Philippine Sea to dominate the synoptic situation in the vicinity of both tropical cyclones, Dot drifted slowly northward remaining poorly organized (Figure 4-6). Billie's strong mass divergence aloft effectively blocked Dot's outflow to the subtropical westerlies leaving a good outflow channel only in the southwest semicircle. This may have been a critical factor in explaining Dot's slow rate of intensification during the first three days of her existence.

Late on the 15th, Dot began to increase her rate of intensification. The United Kingdom ship HYRIA, located 60 nautical miles southeast of Dot's center, observed 55 knots of wind and a pressure of 989.3mb (15/0600 GMT). She reached typhoon strength late that evening as she accelerated to a speed of 9 knots towards Hong Kong. During this period, the separation between Dot and Billie began to increase and Billie had reached peak intensity and was starting to weaken. This apparently allowed Dot to intensify at a faster rate.

Besides intensity interaction between Dot and Billie, both storms also experienced the Fujiwhara interaction (Figure 4-7). By subtracting the steering flow from the resultant movement of both storms the interaction is quite pronounced (Brand, 1968). Throughout the period of the interaction Billie remained the stronger of the

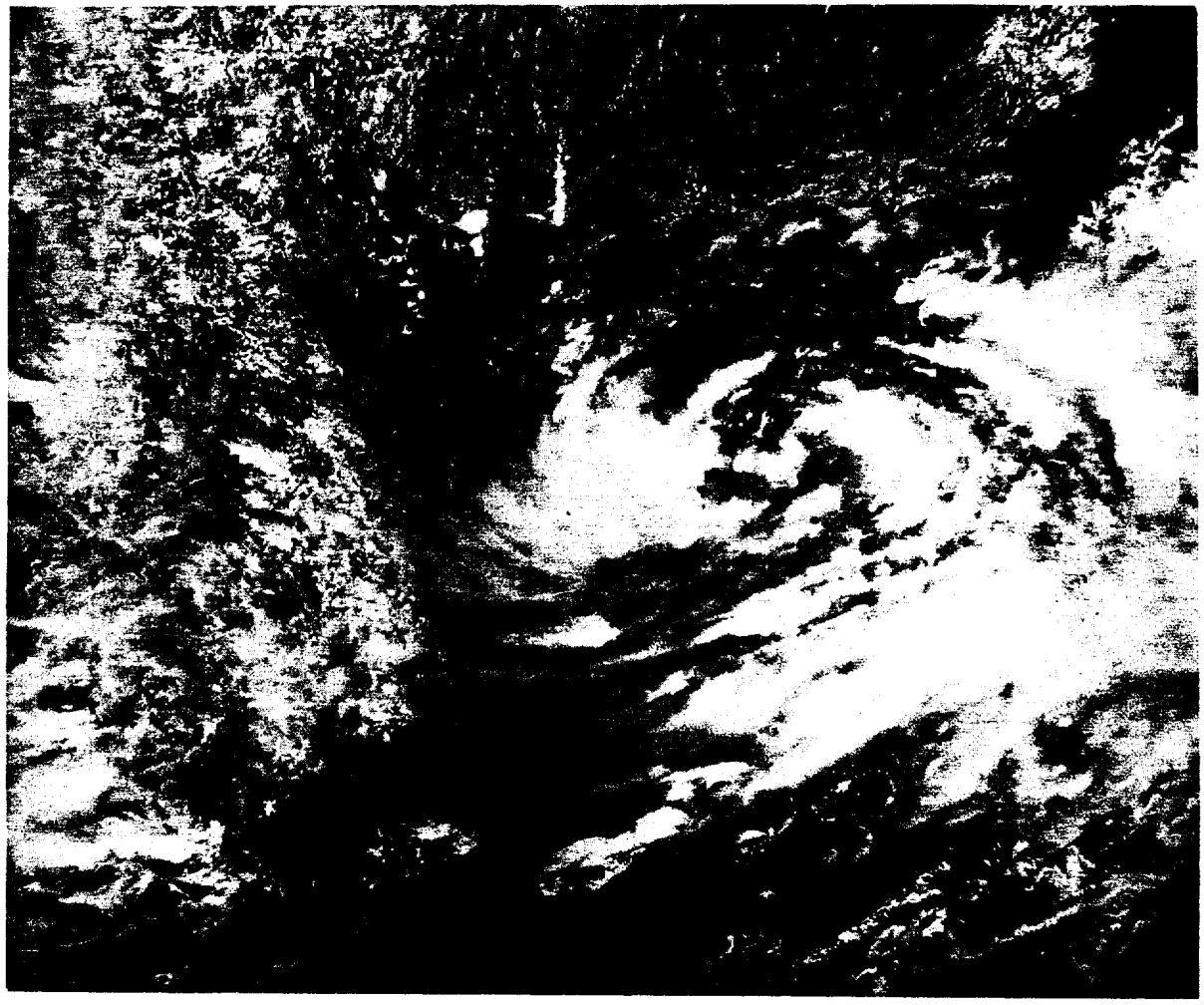


FIGURE 4-6. *Dot as a tropical depression in the South China Sea, 14 July 1973, 0446 GMT. (DMSP imagery)*

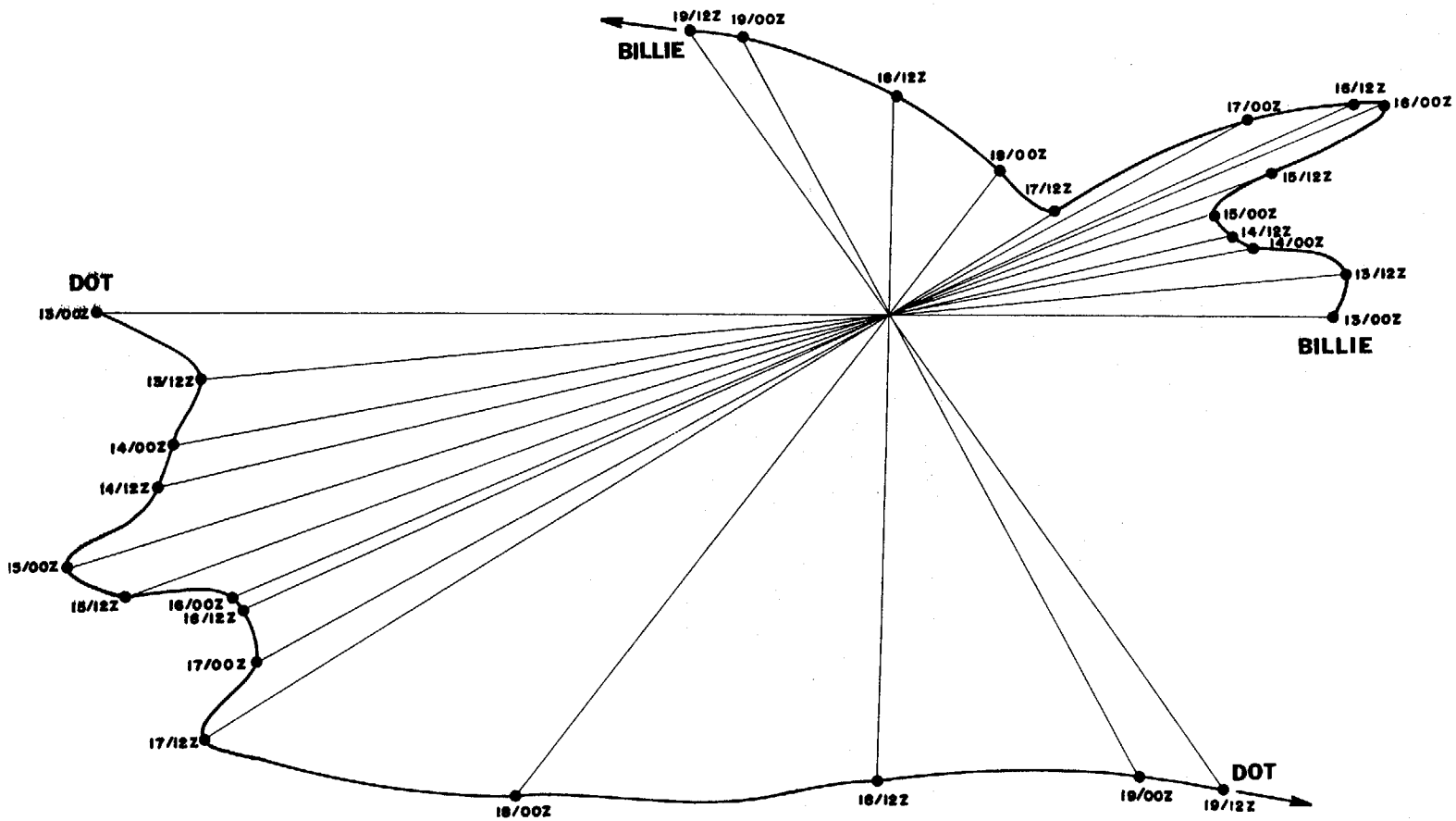


FIGURE 4-7. *Depicts Fujiwhara interaction between Typhoon Dot and Typhoon Billie over a period of approximately 6 1/2 days.*

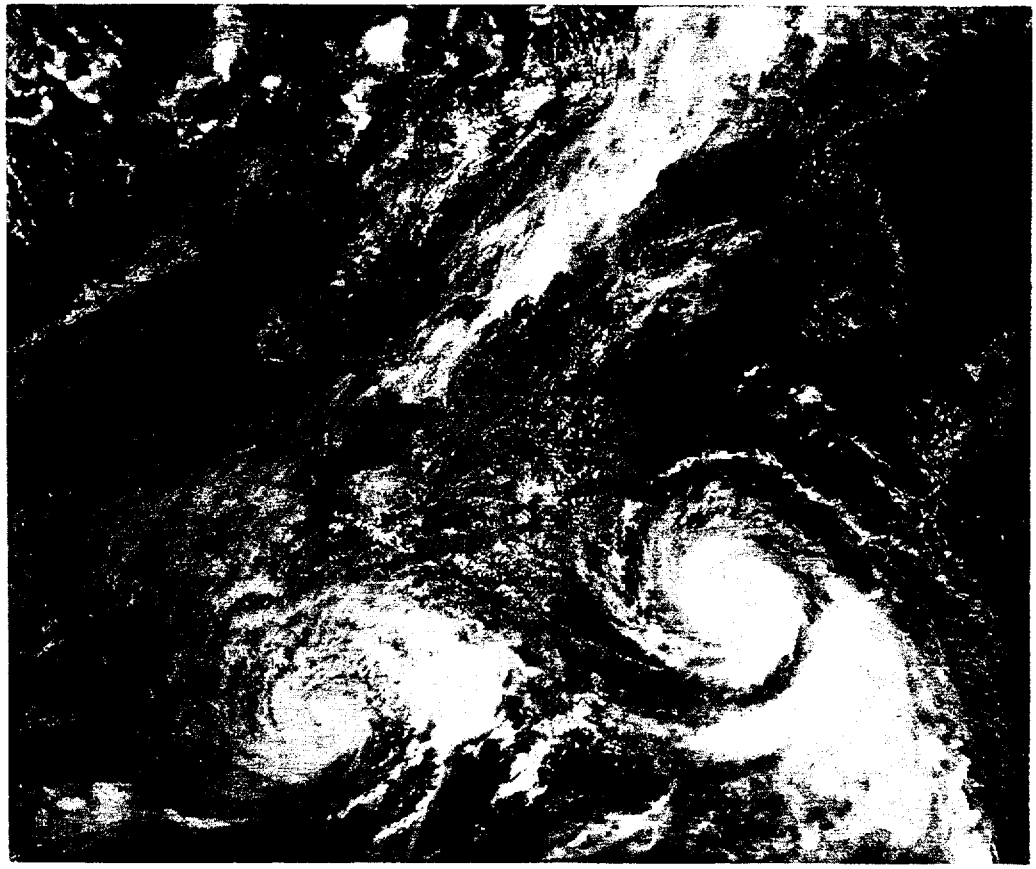


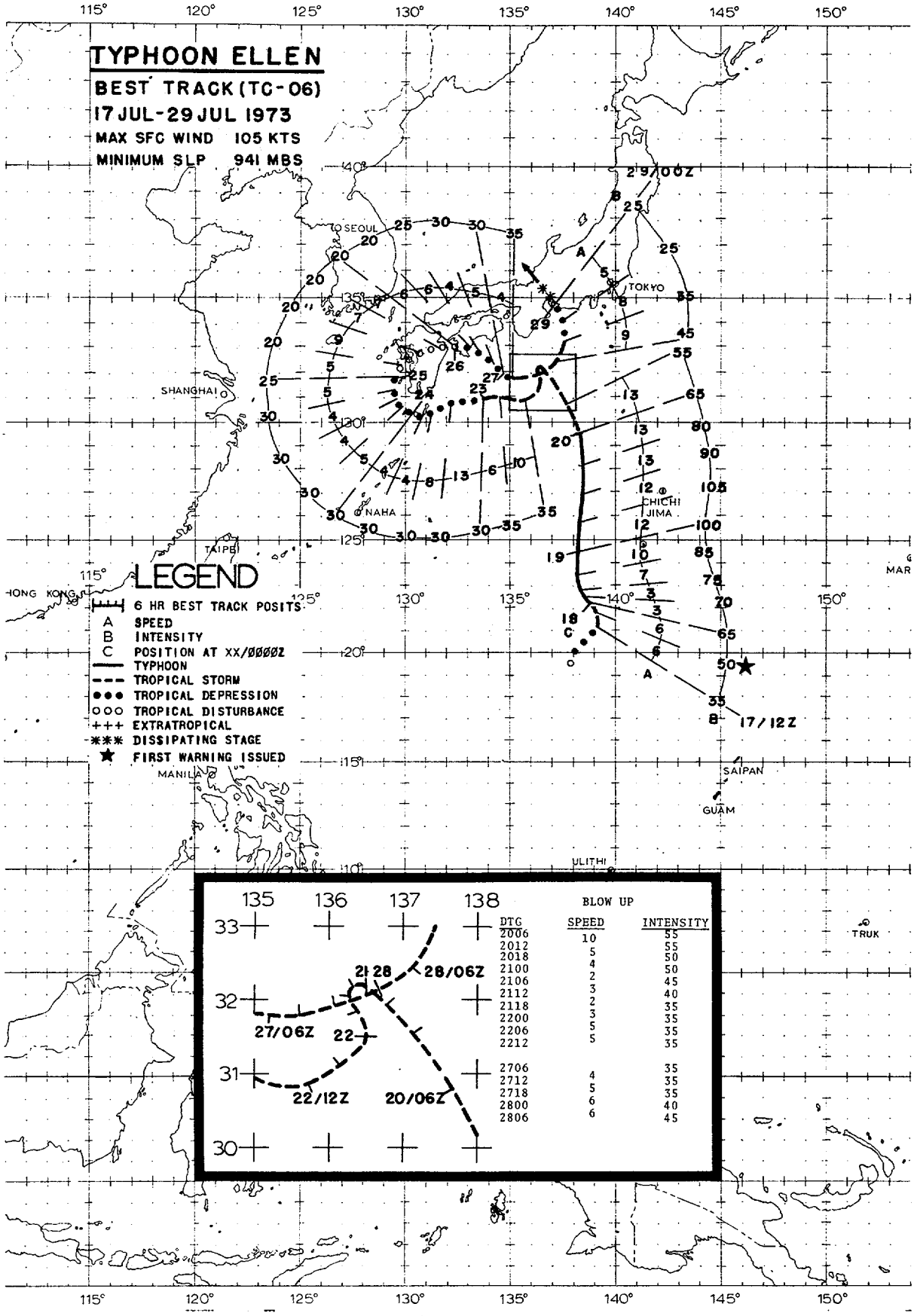
FIGURE 4-8. *Dot (left) overland 70 nm northeast of Hong Kong and Typhoon Billie (right) in the East China Sea, 17 July 1973, 0402 GMT. (DMSP imagery)*

two. As a result, Dot's resultant movement was affected much more significantly. Both storms rotated 124 degrees around the common center of rotation.

Dot reached her peak intensity of 85 knots on the 16th, about 80nm south of Hong Kong. She passed within 12 miles of the Royal Observatory in Hong Kong which experienced maximum sustained winds of 32 knots with a peak gust of 76 knots. Tate's Cairn in the Colony reported the strongest sustained winds of 57 knots with peak gusts of 97 knots.

Dot weakened considerably upon making landfall on the northeastern side of Mirs Bay (Figure 4-8). She tracked toward the eastnortheast over eastern Kwangtung during the night of the 17th as a low pressure area and entered the East China Sea near Foochow as a tropical depression on the morning of the 18th. As Dot approached within 120nm northnorthwest of Okinawa, she took an abrupt change of course due north in response to a building ridge to the east and accelerated rapidly, following in the wake of Billie. Dot dissipated over the Yellow Sea on the 20th.

Damage reports from Hong Kong indicated many low-lying areas in the New Territories were flooded. Hong Kong experienced heavy losses to garden crops, fruit trees, livestock, and farm houses. A landslide killed one person and injured 38 others. Two freighters were beached and six others dragged anchor.



DTG	SPEED	INTENSITY
2006	10	55
2012	5	55
2018	4	50
2100	2	50
2106	3	45
2112	2	40
2118	3	35
2200	5	35
2206	5	35
2212		35
2706	4	35
2712	5	35
2718	6	40
2800	6	45
2806		

The first indication of what was to become Ellen appeared in the surface data on 15 July as an increased troughing in the extensive convergence zone southeast of Typhoon Billie. By 17 July, high resolution DMSP satellite imagery confirmed the existence of a closed circulation in the trough near 20°N 138°E (Figure 4-9).

Ellen evolved unusually far north in the trailing convergence area of Typhoon Billie. Furthermore, in the early stages of development, the upper tropospheric outflow was most obviously influenced by the TUTT. Post-analysis of 200mb synoptic charts and satellite data indicates that the formation was assisted by a small, but pronounced, ridging induced on the east side of a westward moving cell in the upper tropospheric trough.

Ellen intensified rapidly, reaching typhoon strength by the 18th. Iwo Jima (Japanese Maritime Self Defense Force) reported southeasterlies with maximum gust of 44 knots as she passed to the west within 165nm (19/0200 GMT). Ellen achieved peak intensity as a reconnaissance aircraft observed maximum winds of 105 knots and a central pressure of 941mb (19/0420 GMT).

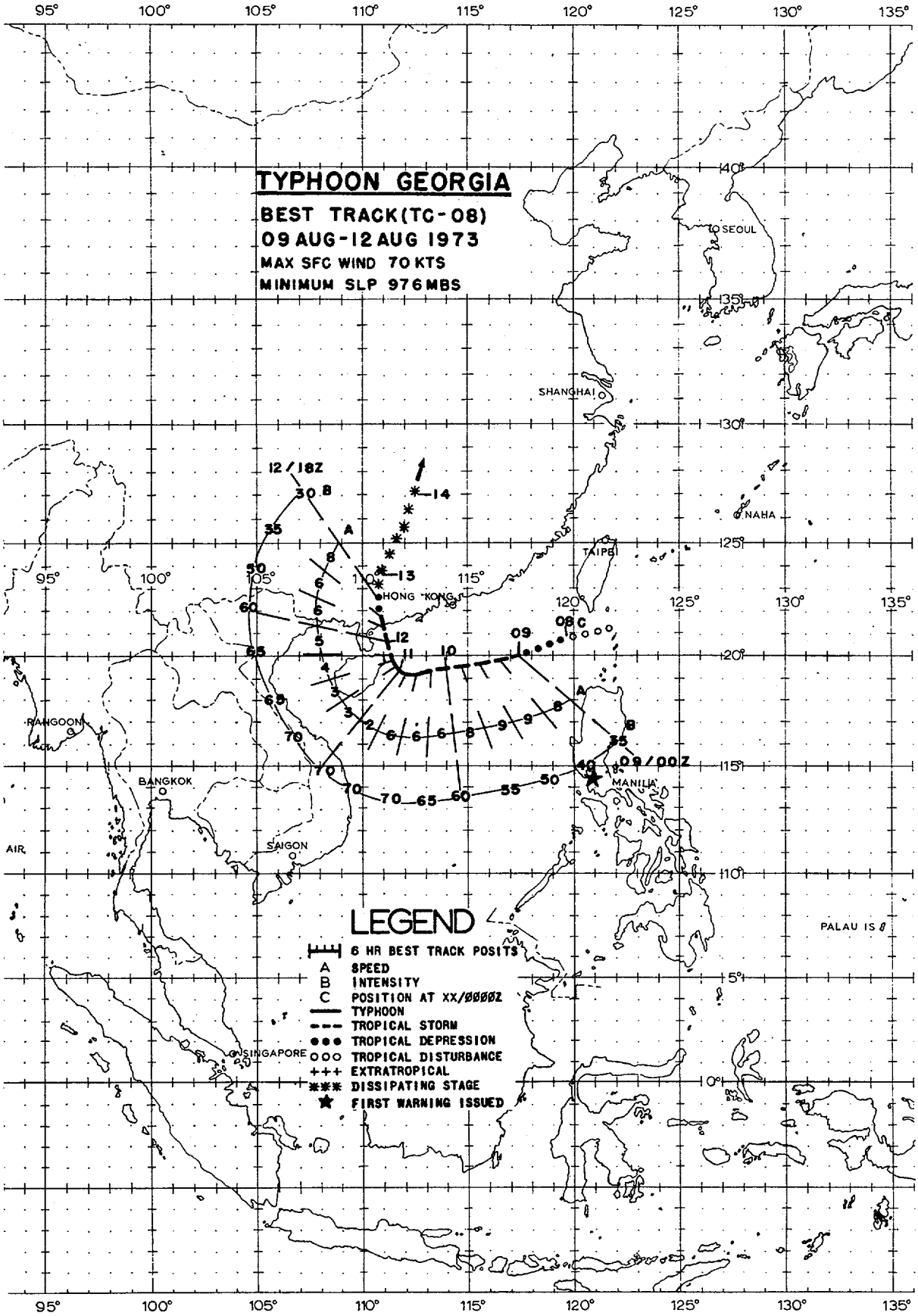
During the early portion of her life, Ellen tracked almost due north as Billie had done. She moved to the north beneath upper tropospheric northerly flow (35-40 knots). By late on the 19th, the strong vertical shearing environment caused her to deteriorate rapidly over open water (Figure 4-10). By the 20th, the upper level anticyclone over Ellen had sheared off exposing her low level circulation. Convective activity at this time was confined to convergence areas well south and southeast of the center.

As a weak low-level circulation, the remains of Ellen drifted westward under the influence of the troughing left by Billie and Dot and a quasi-stationary anticyclone over the Sea of Japan. Satellite imagery on 23 July indicated a rejuvenation of convection over the circulation which then persisted through 28 July with varying degrees of intensity. Reconnaissance aircraft on 24 July confirmed the presence of a warm core, closed circulation. As a result of the weak steering flow, Ellen's movement was erratic during the period from the 21st to the 28th.

On the 28th, she reintensified once more 90nm from the south coast of Honshu. The Japanese weather ship OJIKA and two other ships reported winds of 30 to 35 knots around Ellen (28/0000Z). She reached a peak of 45 knots as a shortwave trough over the Sea of Japan caused her to move on a northward course over south central Japan dissipating over land on the 29th.

FIGURE 4-9. *Formative stages of Ellen centered 300 nm southwest of Iwo Jima, 17 July 1973, 0221 GMT. (DMSP imagery)*

FIGURE 4-10. *Typhoon Ellen (right) at peak intensity. Dot (left) as a tropical depression, 19 July 1973, 0333 GMT. (DMSP imagery)*


TYPHOON GEORGIA
BEST TRACK(TC-08)
09 AUG-12 AUG 1973
MAX SFC WIND 70 KTS
MINIMUM SLP 976 MBS
SEOUL
SHANGHAI
NAHA
TAIPEI
HONG KONG
RANGOON
BANGKOK
SAIGON
MANILA
SINGAPORE
PALAU IS
12/18Z
09/00Z
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/ØØØØZ
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED

During early August, the tropical upper tropospheric trough (TUTT) remained to the north of and in close proximity to the monsoon trough in the South China Sea. As a result, Georgia's formation and subsequent development cannot be easily attributed to the monsoon trough or the TUTT independently, but more as an interaction between the two. Sadler (1973) suggests that westward moving cells in the TUTT provide an upper level westerly outflow channel which enhances development of disturbances in the monsoon trough. This type of influence was apparent during the development of Georgia.

Georgia reached minimum tropical storm intensity on 9 August as she transited on a westsouthwest course across the South China Sea at a moderate speed. She passed within 170nm of Hong Kong late on the 9th. Maximum sustained winds experienced at Hong Kong were 41 knots with a peak gust of 73 knots. Georgia reached typhoon intensity on 10 August (Figure 4-11).

Maintaining her westerly track at 8 knots until early on the 11th, Georgia then turned north in response to a weakness in the high cell over eastern China. She made landfall north of Hainan Island on 12 August and dissipated over China. Georgia was the third tropical cyclone originating in the South China Sea to reach typhoon intensity in 1973.

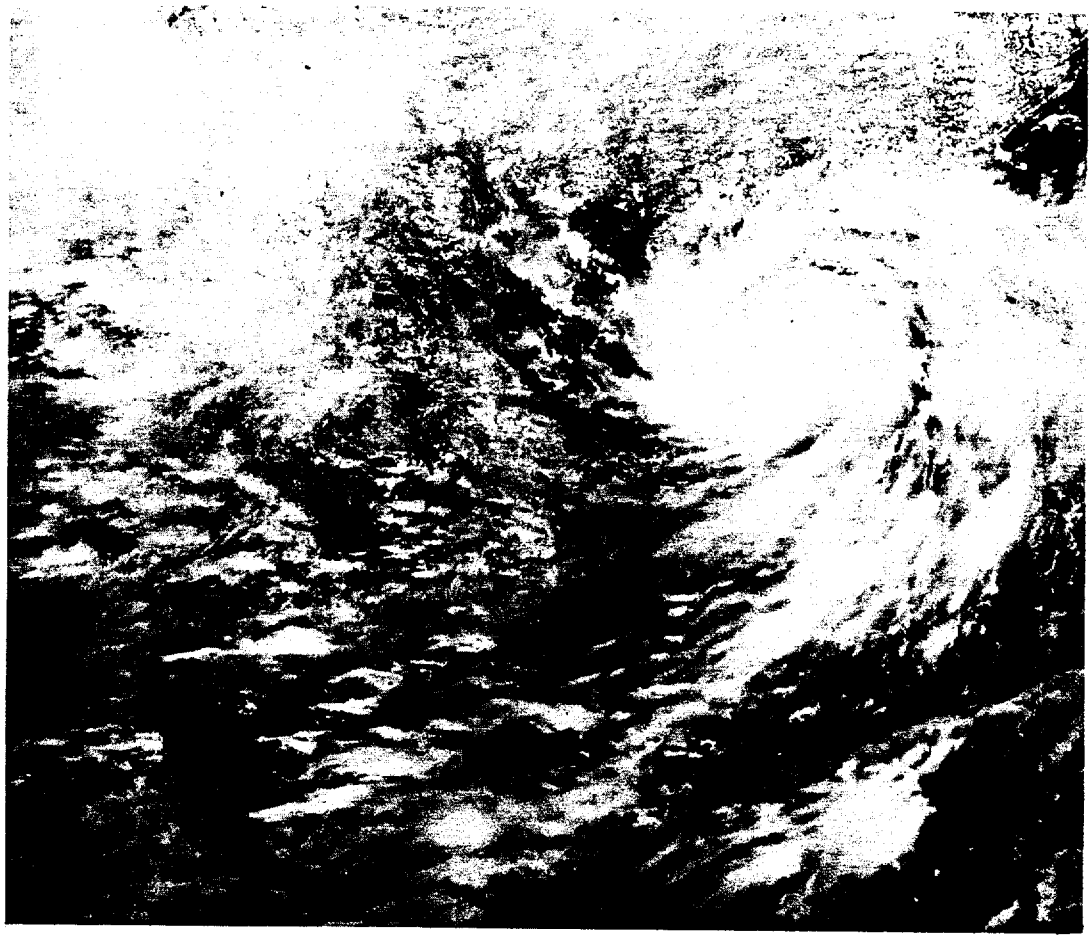
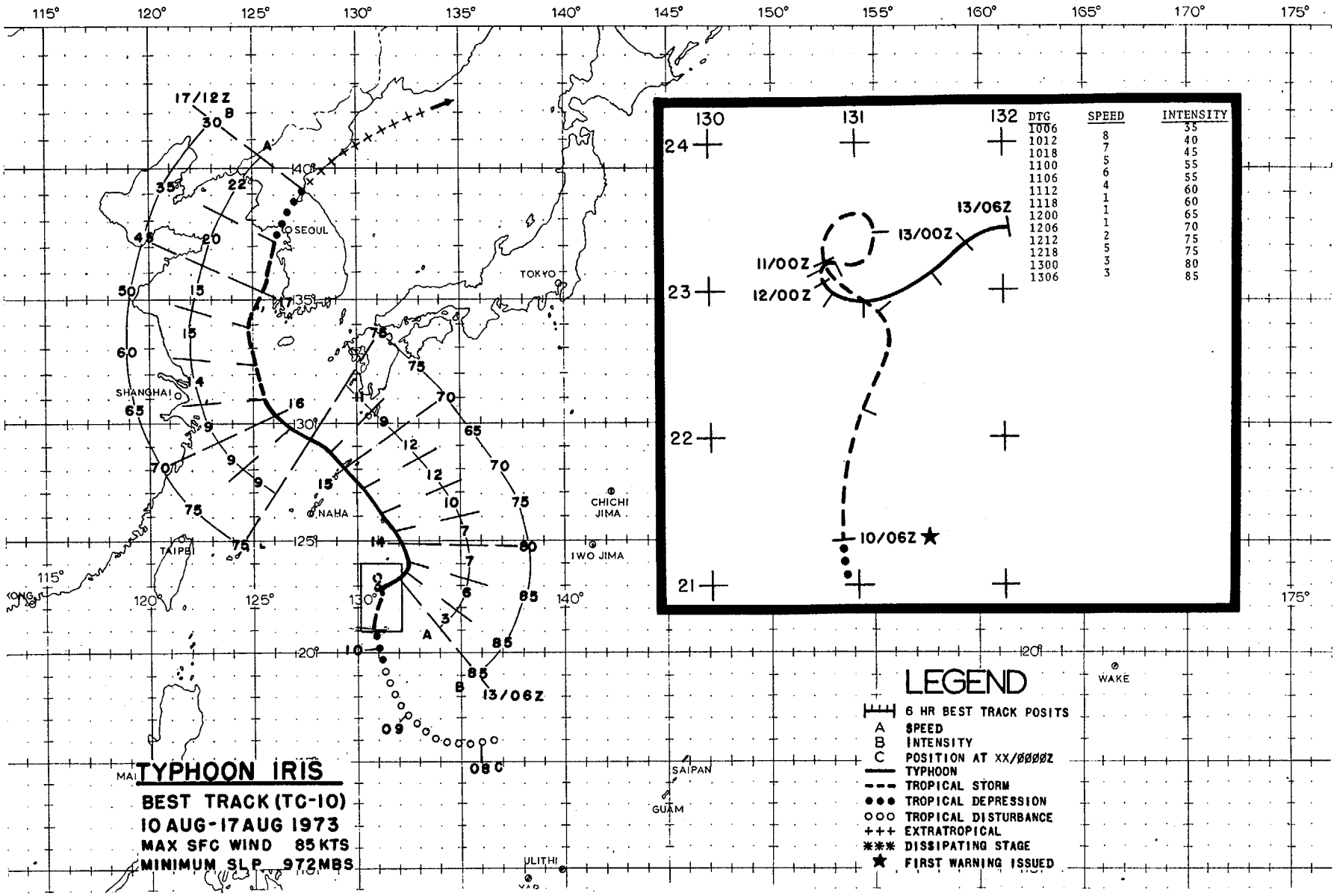


FIGURE 4-11. *Typhoon Georgia in the South China Sea 140 nm east of Hainan Island, 10 August 1973, 0500 GMT. (DMSP imagery)*



DTG	SPEED	INTENSITY
1006		35
1012	8	40
1018	7	45
1100	5	55
1106	6	55
1112	4	60
1118	1	60
1200	1	65
1206	1	70
1212	2	75
1218	5	75
1300	3	80
1306	3	85

On the 8th of August, the monsoon trough extended 1500 nautical miles southeast from the Luzon Strait to a position just west of Truk with a weak surface cyclonic circulation imbedded in the trough 420 nautical miles north of Yap. Only 24 hours previously, its eastward extent had been restricted to the northern part of the South China Sea.

During the next two days, the disturbance drifted northwestward with little development. By the 10th, the disturbance had intensified to Tropical Storm Iris. She continued to move northward at 8 knots.

On the morning of the 11th, the complex upper air and weak steering flow patterns resulting from the presence of the subtropical ridge to the north and the near equatorial ridge to the south of Iris forced her to remain essentially quasi-stationary for the next 48 hours. However, she continued to intensify during this period and by early on the 12th, developed typhoon strength winds.

Early on the 13th, Iris began to move toward the northeast under the influence of the near equatorial ridge reaching her maximum intensity of 85 knots that afternoon (Figure 4-12).

As Hope dissipated to the east, the subtropical ridge returned to its climatological position and the near equatorial ridge weakened. This forced Iris to alter her course to the northwest on the 14th in response to the change in the steering flow. The Japanese meteorological station at Minami Daito Jima measured a minimum pressure of 974.7mb during the passage of Iris (14/0707 GMT). Approximately 11 1/2 hours (1830 GMT) after passage of the surface center, the station reported peak gusts of 63 knots out of the southwest. She gradually weakened to minimum typhoon intensity prior to crossing the island of Amami O-Shima. Two fishing vessels were reported lost in the vicinity of the island during her passage.

After crossing the island she reintensified briefly to 75 knots. By the 16th, Iris weakened to tropical storm force and took a more northerly course (Figure 4-13).

On the morning of the 17th, Iris began recurving. Kunsan Air Base in the Republic of Korea experienced maximum sustained winds of 46 knots with a peak gust of 64 knots as Iris passed within 25nm (17/0646 GMT). She made landfall near Kaesong, Korea about 17/0800 GMT with maximum winds of 35 knots. Iris continued across Korea, entering the Sea of Japan near Wonsan where the maximum winds were still 30 knots. She became extrotropical over the Sea of Japan as she merged with a front moving off Manchuria.

Initial reports from Korea indicated two persons were killed, three missing and hundreds were left homeless. A barge carrying six persons sank in the sea off Kijang - Myon, Yangsangun; 3 were rescued.

FIGURE 4-12. *Typhoon Iris (left) near peak intensity 285 nm southeast of Okinawa. Remnants of Hope (right) just off the coast of Honshu, 13 August 1973, 0234 GMT. (DMSP imagery)*

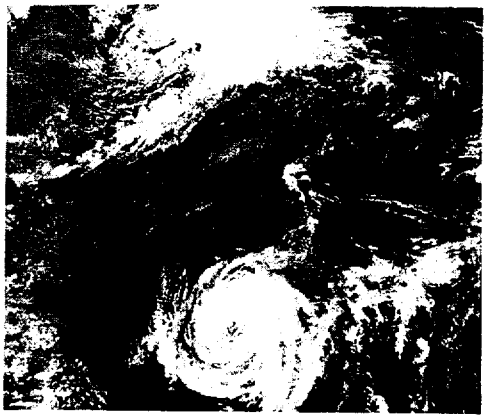
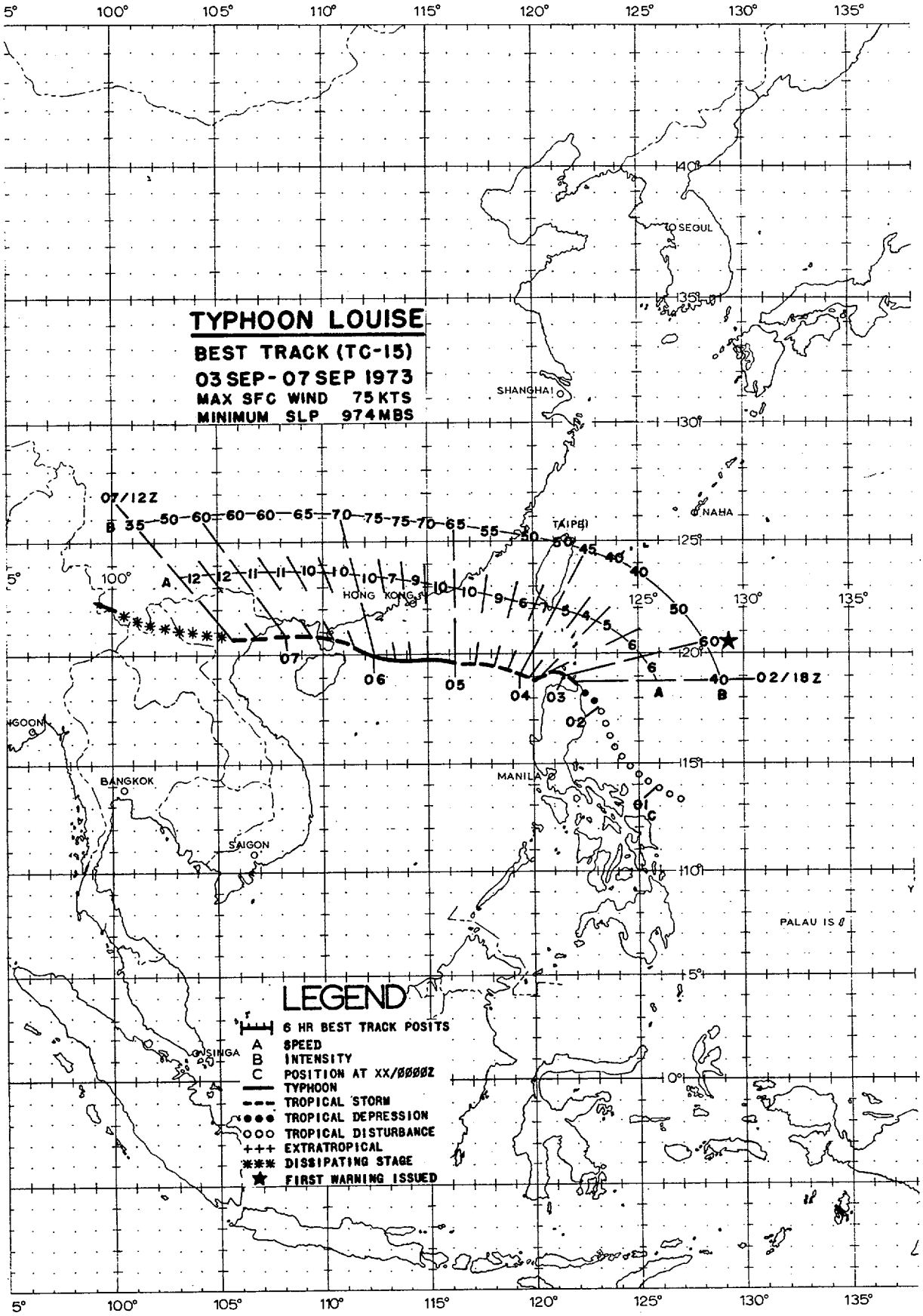


FIGURE 4-13. *Typhoon Iris 165 nm south of Cheju Do, 16 August 1973, 0332 GMT. (DMSP imagery)*


TYPHOON LOUISE
BEST TRACK (TC-15)
03 SEP - 07 SEP 1973
MAX SFC WIND 75 KTS
MINIMUM SLP 974 MBS
07/12Z
02/18Z
SHANGHAI
TAIPEI
NAHA
HONG KONG
BANGKOK
SAIGON
MANILA
PALAU IS
SEOUL
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/ØØØØZ
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED

Louise began as a low level circulation in the monsoon trough first noted on 30 August in the Philippine Sea to the east of Catanduanes Island. An organized cloud pattern became apparent the next day but the surface circulation remained weak. The weak surface low drifted towards the northwest for the next 72 hours.

By 3 September, an aircraft investigative mission reported a narrow band of 65 to 75 knot surface winds north of the low center although the minimum sea level pressure was only 998mb (03/0350 GMT). A 60 knot wind report from the United Kingdom ship SHEAF TYNE 30nm to the north of Louise confirmed the aircraft observation. Satellite imagery at approximately the same time showed Louise to be poorly organized. The near-typhoon force winds appear to have been a transitory phenomenon induced by the channeling effect of the Luzon Strait. By the evening of the 3rd, a reconnaissance aircraft reported maximum winds of only 40 knots as Louise entered the South China Sea.

On the 4th, Louise had become a better organized tropical storm well on her way to becoming a typhoon (Figure 4-14). The mid-tropospheric ridge to the north of Louise kept her on a westerly course at 10 kts across the South China Sea.

She passed 150nm to the south of Hong Kong late on the 5th just as she reached peak intensity of 75 kts. Throughout her life, Louise remained a relatively small typhoon. Louise crossed the Luichow Peninsula during the night of the 6th. Eighteen hours later she made landfall and dissipated rapidly over North Vietnam.

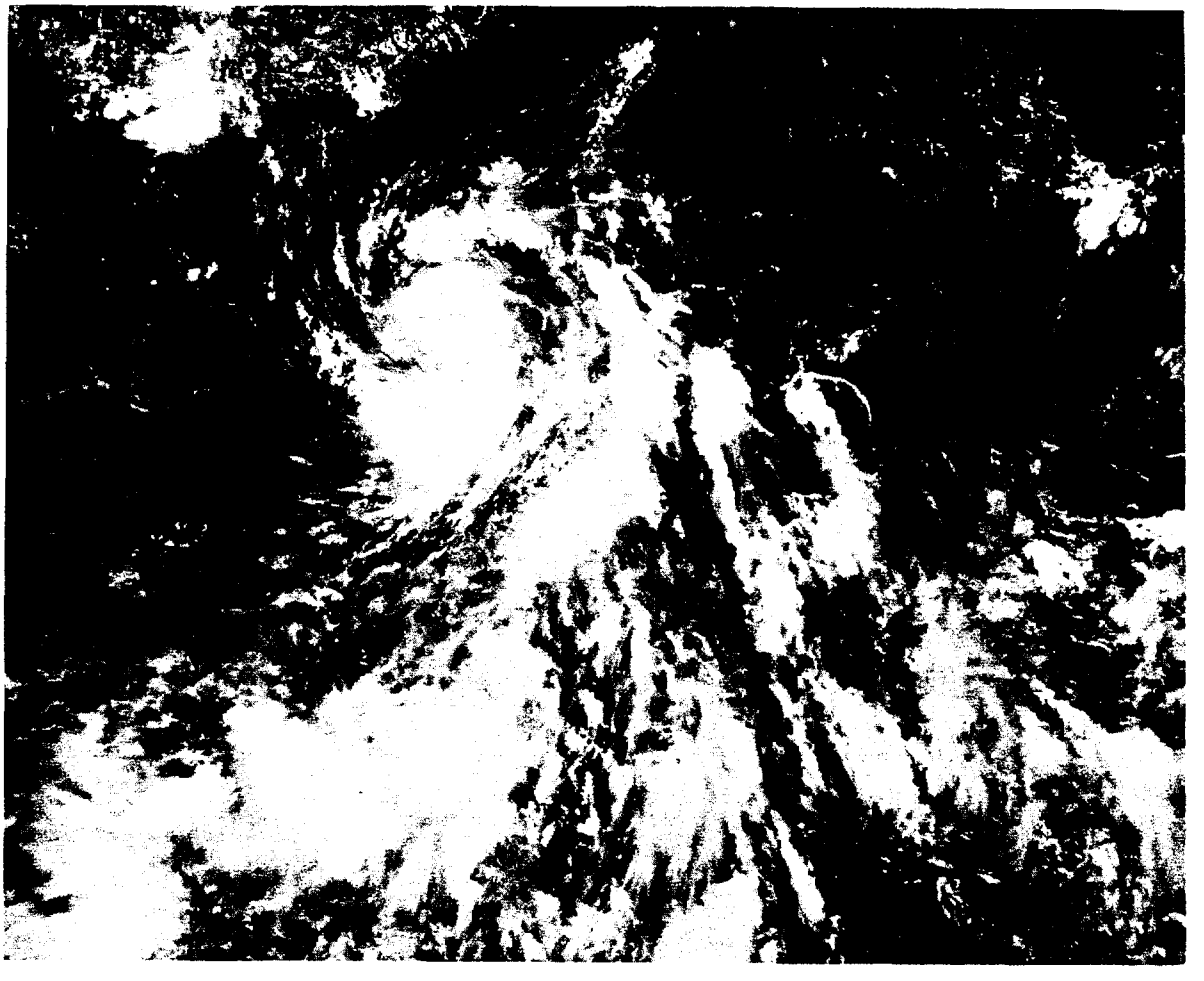
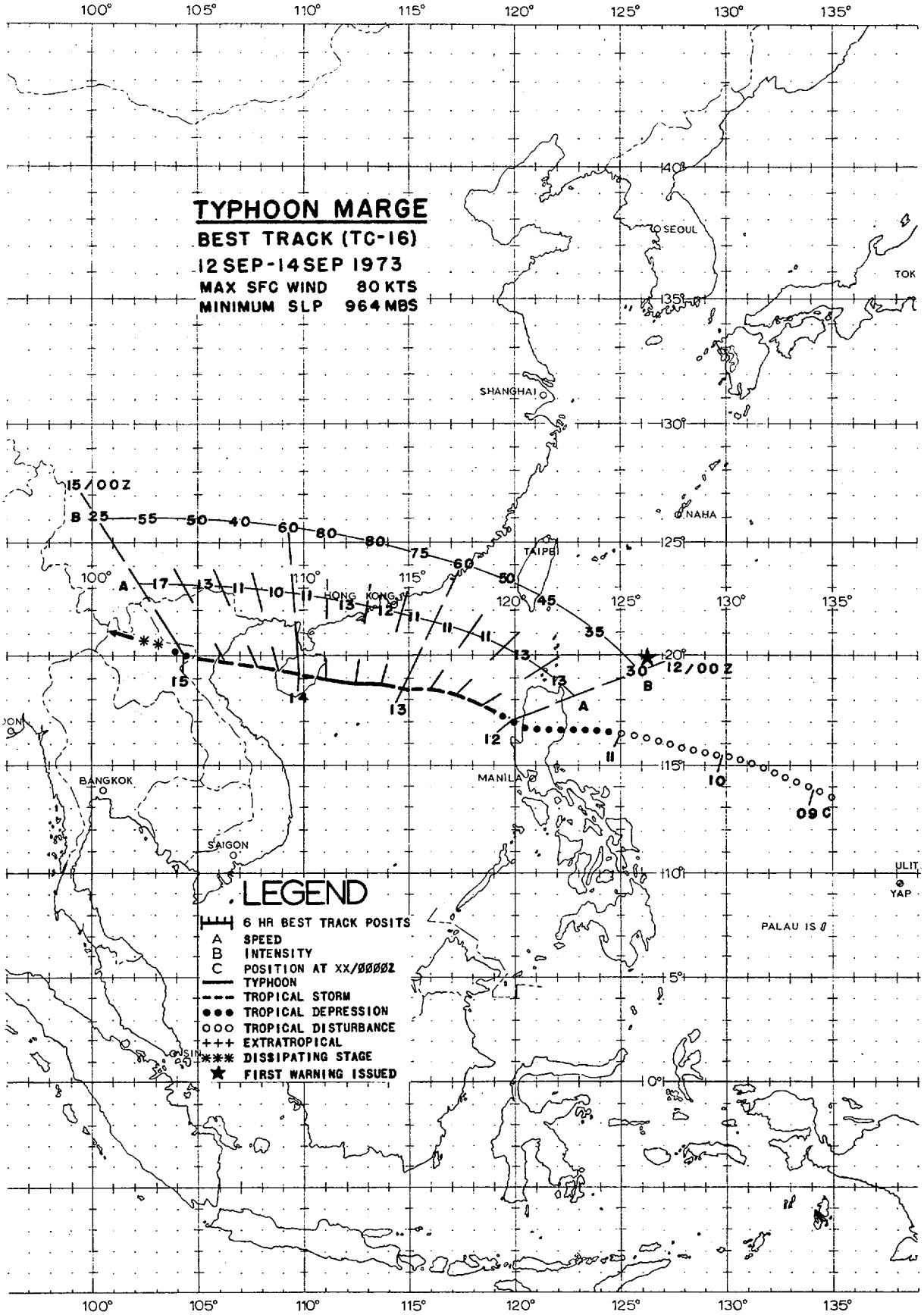


FIGURE 4-14. *Tropical Storm Louise 105 nm northwest of Luzon, 4 September 1973, 0401 GMT. (DMSP imagery)*


TYPHOON MARGE
BEST TRACK (TC-16)
12 SEP-14 SEP 1973
MAX SFC WIND 80 KTS
MINIMUM SLP 964 MBS
SEOUL
TOK
SHANGHAI
NAHA
TAIPEI
HONG KONG
BANGKOK
SAIGON
MANILA
ULIT
YAP
PALAU IS
15/00Z
12/00Z
09C
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/ØØØØZ
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED

Marge entered the South China Sea on 12 September as a tropical depression, after crossing northern Luzon (Figure 4-15). She quickly developed to tropical storm strength 125 nm northwest of Cape Bolinao. The early stages of Marge can be traced to a weak circulation in the monsoon trough appearing on the synoptic surface analysis 750 miles eastsoutheast of Luzon (08/0000 GMT). This system tracked westward during the next four days as it accelerated to a speed of 11 to 12 knots before making landfall on northern Luzon.

A narrow, mid-tropospheric, subtropical ridge was positioned over southern China as Marge emerged into the South China Sea. Little change in intensity or orientation of the ridge occurred during the next few days, dictating a westerly course which eventually caused Marge to strike North Vietnam 2 1/2 days later.

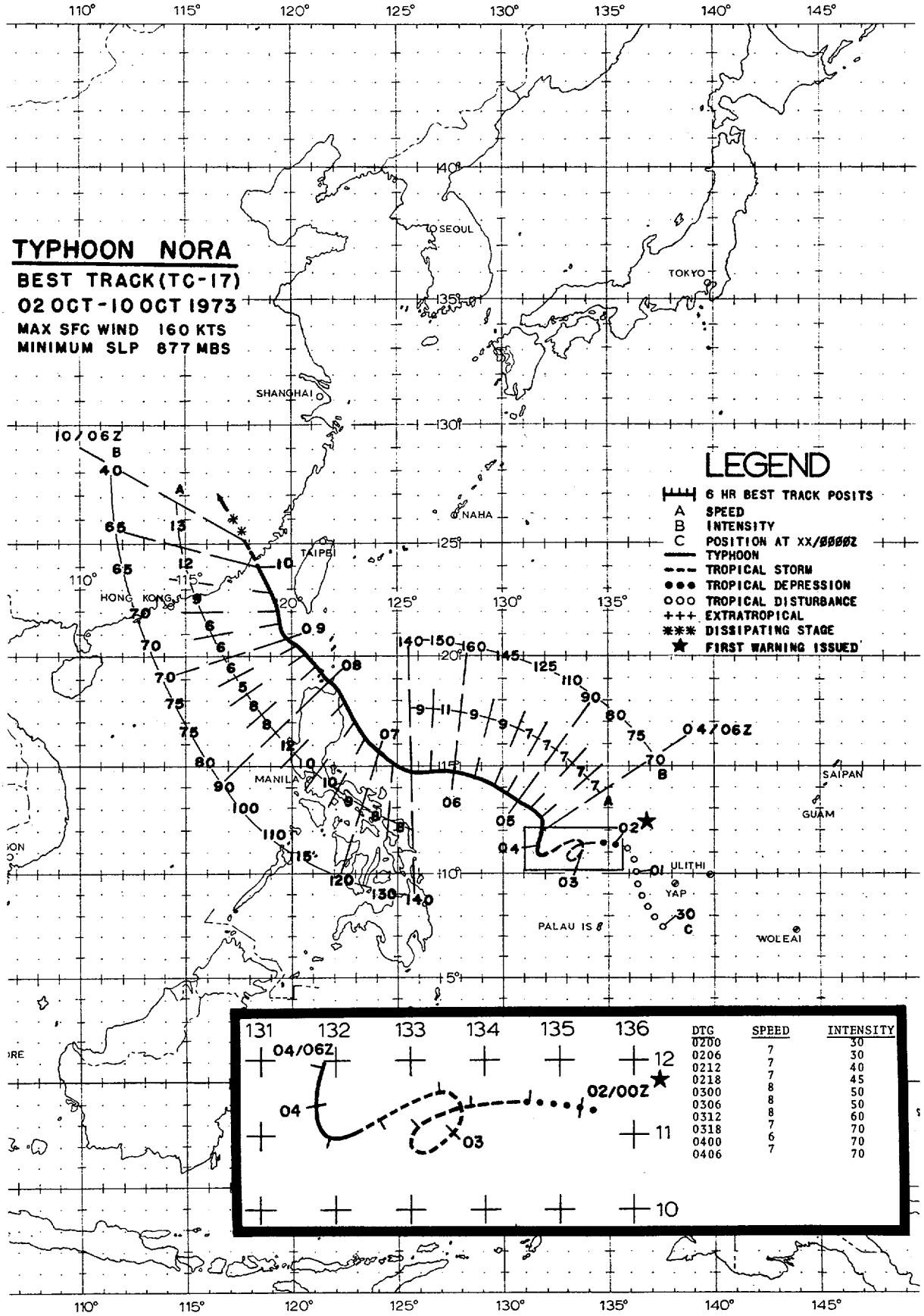
Maintaining a forward speed of 11 knots, Marge intensified steadily after entering the open waters of the South China Sea, reaching typhoon force as she passed 200 nm south of Hong Kong on the morning of the 13th (Figure 4-16). The minimum measured central pressure by aircraft reconnaissance, prior to the typhoon crossing the no-fly line, was 964 mb early in the evening of 13 September.

Striking central Hainan Island early on the morning of the 14th with sustained winds estimated near 80 knots, Marge emerged into the Gulf of Tonkin with tropical storm force some 12 hours later. Eventual landfall was made 60 nm north of Vinh, North Vietnam during the early morning hours of the 15th. Subsequently, Marge dissipated rapidly inland over the highlands of Laos.

One interesting feature of Marge during her transit of the South China Sea was her small size. Similar to Louise, as a typhoon, her circulation did not appear to exceed 150 miles in diameter as evidenced by ship and aircraft reconnaissance data. Typhoon strength winds were probably confined to the wall cloud region.

FIGURE 4-15. *Marge as a tropical depression 20 nm west of Luzon, 11 September 1973, 2342 GMT. (DMSP imagery)*

FIGURE 4-16. *Tropical Storm Marge near typhoon strength 225 nm south of Hong Kong, 13 September 1973, 0106 GMT. (DMSP imagery)*



DTG	SPEED	INTENSITY
0200		30
0206	7	30
0212	7	40
0218	7	45
0300	8	50
0306	8	50
0312	8	60
0318	7	70
0400	6	70
0406	7	70

A weak surface low formed in the monsoon trough, 120 miles south of Yap, on 30 September, and drifted northwest for the next two days. By the evening of 2 October, the tropical disturbance had intensified to Tropical Storm Nora. Reconnaissance aircraft reported maximum flight level winds of 45 kts and a minimum sea level pressure of 987 mb.

Nora continued a gradual intensification until early on the afternoon of the 5th when her winds exceeded 100 kts. During the next 20 hours, as she moved westward at 9 kts toward the Republic of the Philippines, Nora's central pressure plummeted 66mb to 877mb with maximum surface winds of 160 kts (Figure 4-17). Her central pressure ranked among the lowest on record (Jordon, 1961).

On the evening of the 6th, the high resolution DMSP infrared imagery revealed the typical anticyclonic outflow pattern in the cirrus. The infrared data was then "threshholded" to display only the colder portion of the infrared spectrum sensed by the radiometer (Figure 4-18). It revealed what appeared to be a tightly wound band spiraling out from the eye wall. Nora was a super typhoon at this time with estimated maximum winds of 140 kts.

When Nora was 225 miles east of Manila on the morning of the 6th, she took a more northwesterly track in response to an

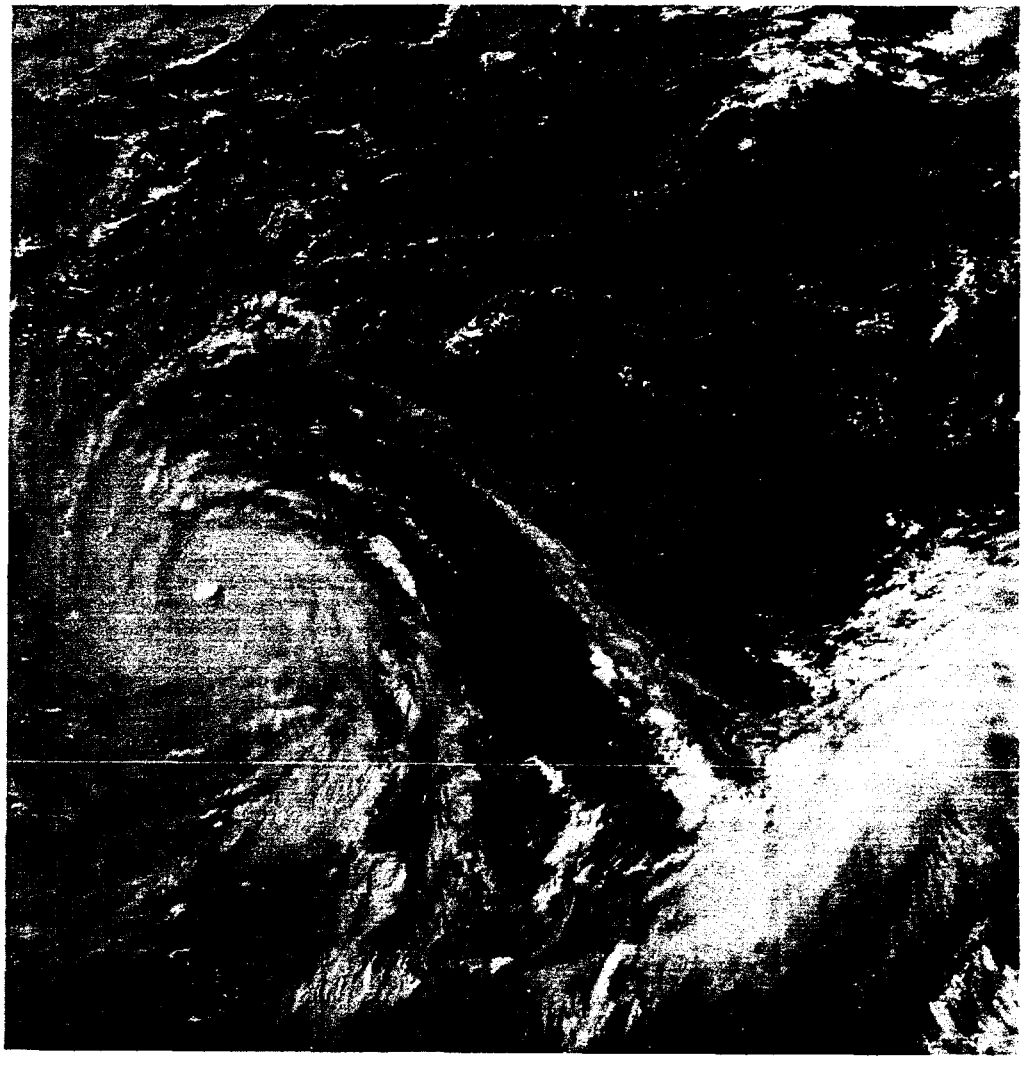


FIGURE 4-17. *Super Typhoon Nora (left) at peak intensity 200 nm eastnortheast of Catanduanes Island. Formative stages of Patsy (right) with low level circulation center exposed, 5 October 1973, 2312 GMT. (DMSP imagery)*

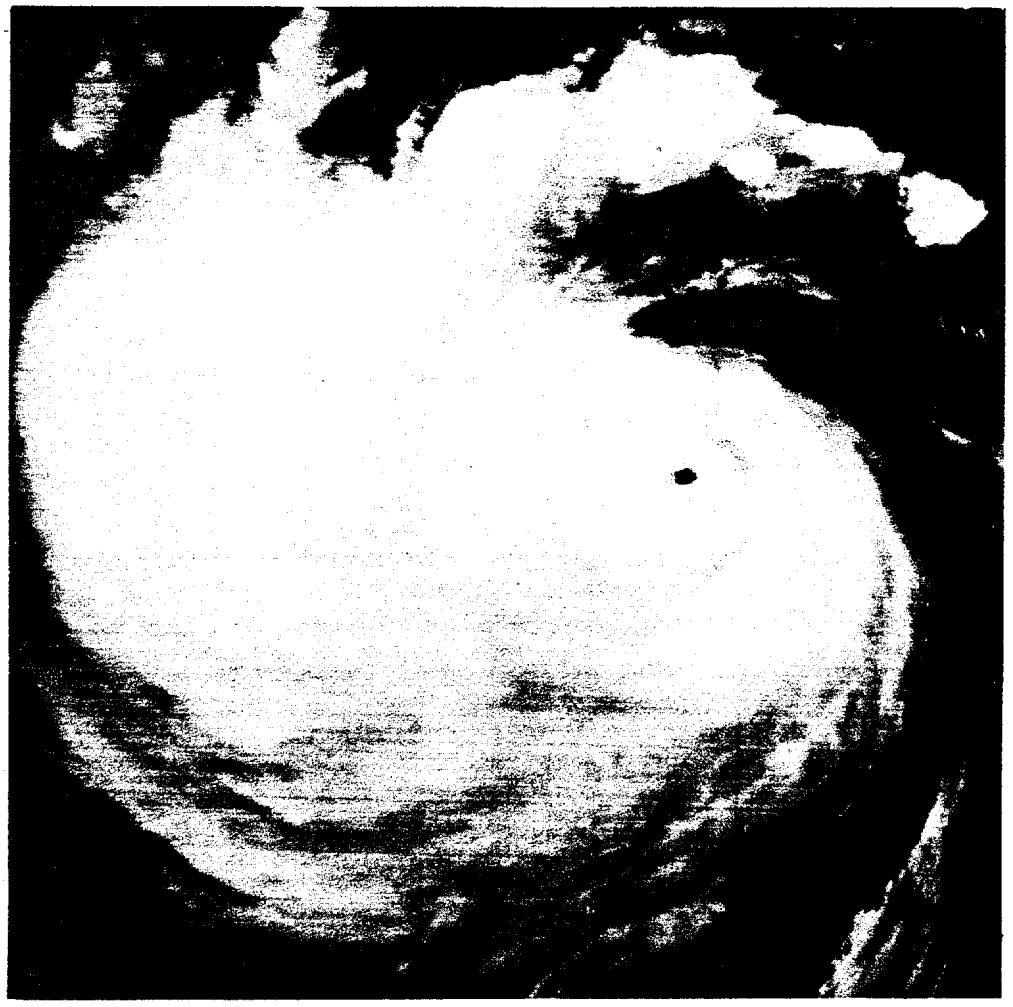


FIGURE 4-18. *Thresholded infrared imagery of Nora displaying only the colder portion of the infrared spectrum sensed by the radiometer, 6 October 1973, 1153 GMT. (DMSP imagery)*

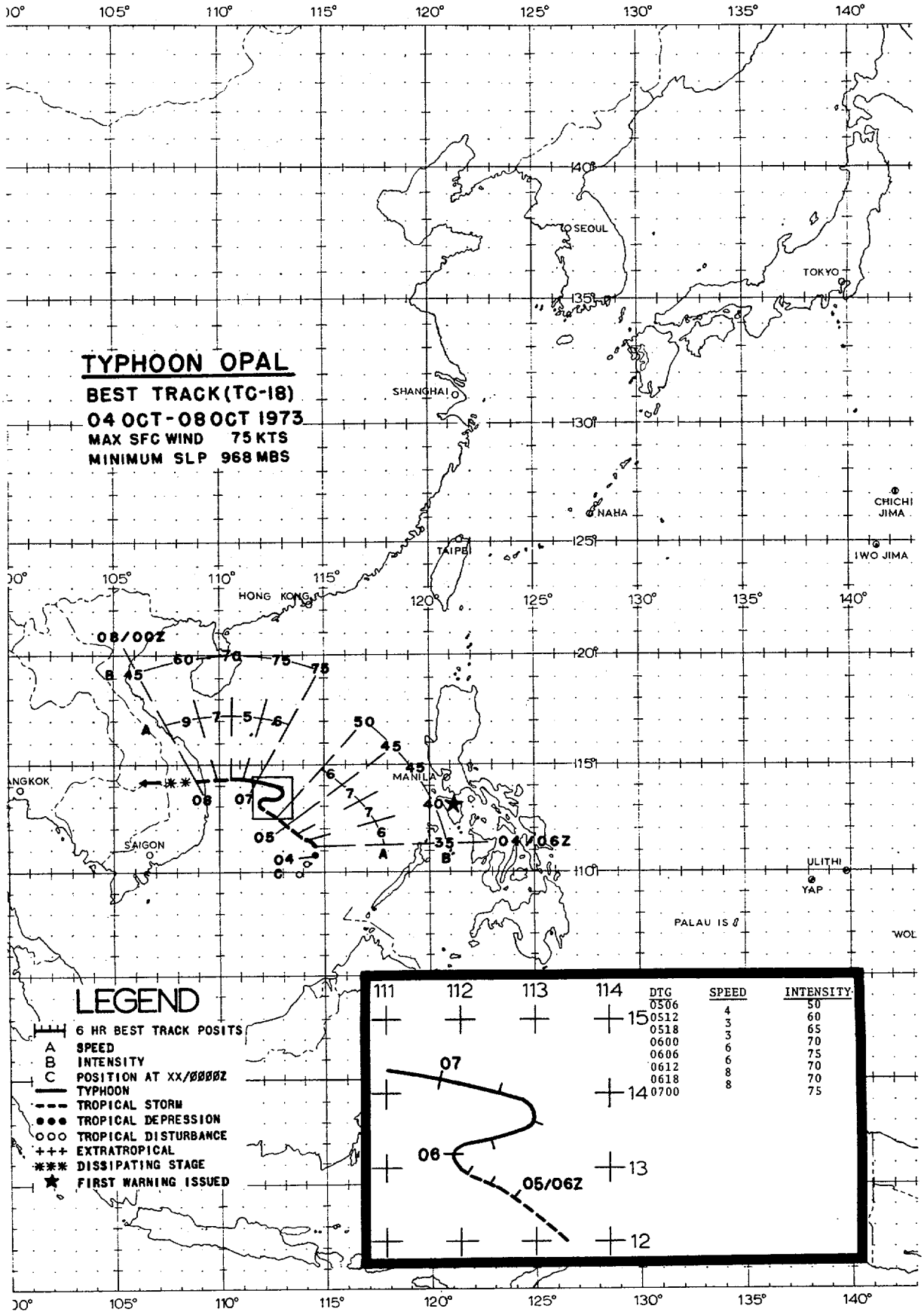
approaching shortwave trough over China. Nora skirted the northeast tip of Luzon with maximum sustained winds of 100 kts and weakening.

As she transited the Luzon Strait on the 8th a dramatic rescue operation was occurring in the Taiwan Strait. In thirty foot seas and 50 kt winds, the Missile Frigate USS WORDEN rescued seven fishermen aboard the Taiwanese fishing vessel JAI TAI NR3 from the approaching typhoon. One Taiwanese crewman was lost at sea. The fishing vessel had been floundering in heavy seas with the forward section split lengthwise (Figure 4-19).

Nora passed within 60nm of Kaohsiung, Taiwan as she accelerated to a speed of 12 kts toward the northwest. She made landfall near Amoy in southern China on the morning of the 10th and degenerated into a low pressure area.

Luzon in the Republic of the Philippines suffered considerable damage. It was reported that 6 persons were killed and over a hundred thousand people were left homeless. Estimates of over $2 million in damage to crops, public and private property were reported. A Philippine freighter ASIAN MARINER was reported sunk by Typhoon Nora in the Taiwan Straits. All 38 crew members were rescued. The Greek freighter BALTIC KLIF was also capsized and sunk by Nora some 80nm southwest of the Pescadores. Three of the crew were drowned with several missing and presumed lost. Taiwan also suffered extensive damage from Nora. Twelve persons were reported dead and 28 unaccounted for. Nearly 8,000 people were left homeless with Nora destroying over a thousand houses and damaging hundreds of others.

FIGURE 4-19. *Fishing trawler JAI TAI NR.3 floundering in high winds and heavy seas generated by Typhoon Nora. -- U.S. Navy photo*



DTG	SPEED	INTENSITY
0506		50
0512	4	60
0518	3	65
0600	3	70
0606	6	75
0612	6	70
0618	8	70
0700	8	75

Opal formed in an active monsoon trough in the South China Sea. The first evidence of a weak surface low appeared in the trough on the 1st of October. However, it wasn't until late on the 3rd that significant cloudiness associated with the incipient storm became apparent.

Early on 4 October, Opal reached minimal tropical storm intensity about 75 nm northwest of Nanshan Island. She moved to the northwest at 6 to 7 knots in response to the high pressure cell over eastern China. By the 5th, she had developed typhoon strength winds (Figure 4-20).

On the morning of the 6th, Opal abruptly changed her course and moved northeastward. She remained on this course for the next 12 hours before resuming a westnorthwesterly heading. A reasonable explanation for the temporary eastward movement may rest in a Fujiwhara interaction with typhoon Nora. Nora was positioned in the Philippine Sea about 750 nautical miles from Opal and reached maximum intensity almost coincidently with the eastward shift in Opal. Also, Nora turned to a more northerly track at this time. Brand (1968) reports a maximum distance for interaction of about 750 nautical miles. He demonstrates that the angularchange rate of a line connecting the storms at this distance should be very small, only 3 degrees per 12 hours. The actual change was somewhat smaller, indicating the weakness of the interaction. The short period of the interaction may be due to the terrain effects of the intervening Republic of the Philippines, among other factors, as Brand suggests that the binary rotation is due to the circulation of the inflow layer which occupies only the lowest few thousand feet.

Maximum winds of 70 to 75 knots were observed during the 6th and early on the 7th as Opal resumed her westnorthwest movement. Opal moved ashore north of Qui Nhon, Republic of Vietnam late on 7 October and rapidly dissipated.

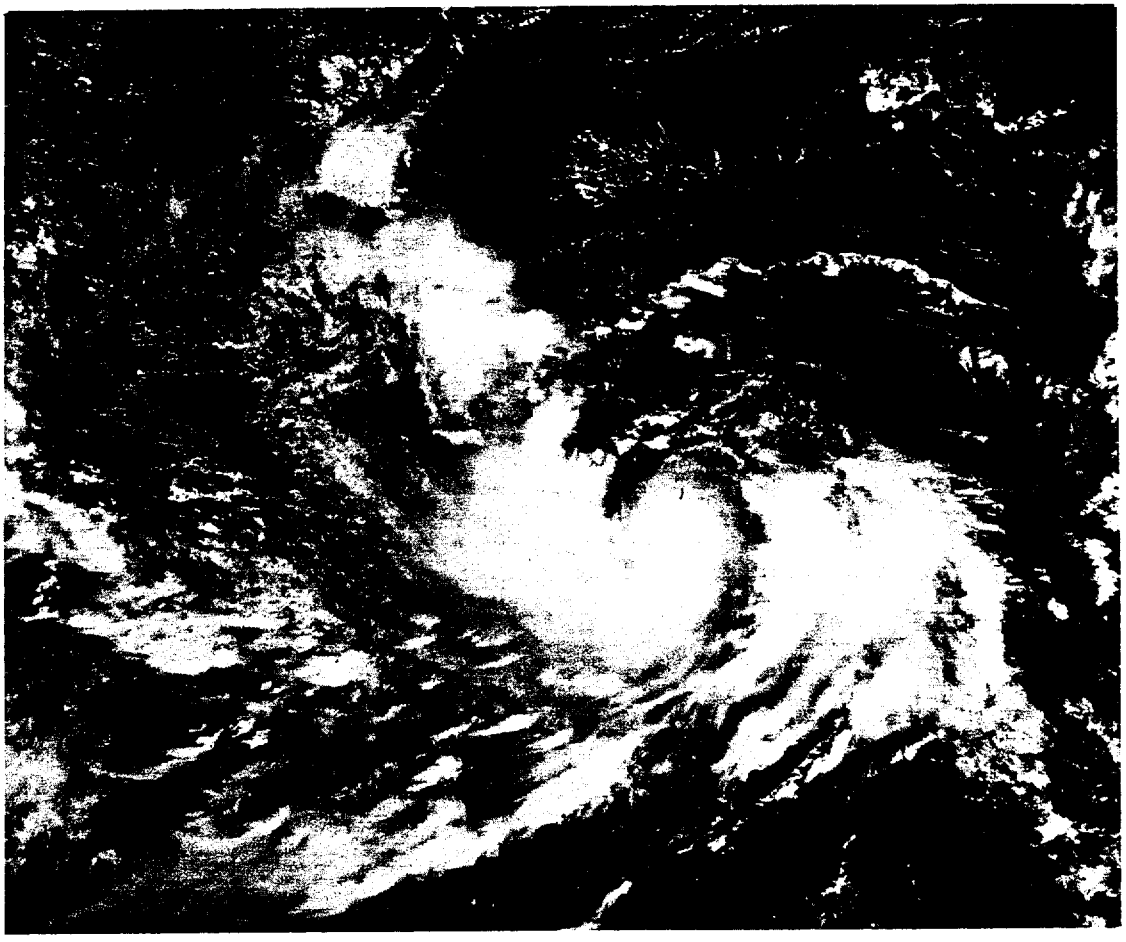
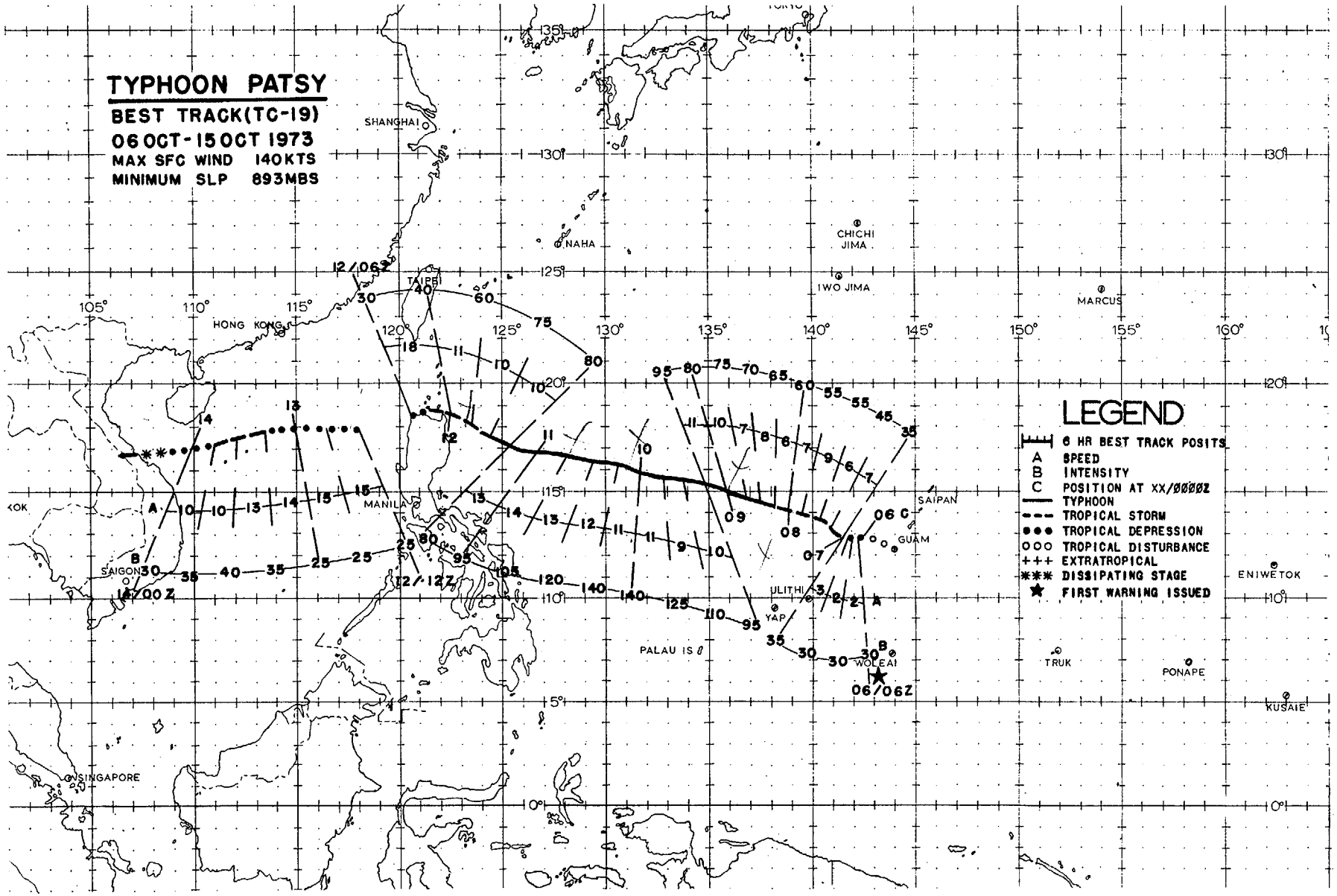


FIGURE 4-20. *Tropical Storm Opal in the South China Sea 225 nm southeast of Qui Nhon, 5 October 1973, 0458 GMT. (DMSP imagery)*


TYPHOON PATSY
BEST TRACK(TC-19)
06 OCT-15 OCT 1973
MAX SFC WIND 140KTS
MINIMUM SLP 893MBS
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/ØØØØZ
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
SHANGHAI
NAHA
CHICHI JIMA
IWO JIMA
MARCUS
TAIPEI
HONG KONG
MANILA
SAIGON
SAIPAN
GUAM
ULITHI
YAP
PALAU IS
WOLEAI
TRUK
PONAPE
ENIWETOK
KUSAIE
SINGAPORE
12/06Z
12/12Z
14/00Z
06/06Z
06 C
105°
110°
115°
120°
125°
130°
135°
140°
145°
150°
155°
160°
135°
130°
125°
120°
115°
110°
5°
0°

A weak disturbance formed in the monsoon trough 300nm south of Guam on the 3rd of October. The weak vortex drifted westward in the wake of Nora. Until the 6th, it underwent only minor development due to the strong vertical shear caused by Nora's vigorous upper tropospheric outflow. Reconnaissance aircraft, investigating the disturbance on that day, reported maximum surface winds of 35 kts, heralding the arrival of Tropical Storm Patsy.

For the next two days she followed a westnorthwest course at 6-8 kts under the influence of the steering flow of the mid-tropospheric ridge to the north. Patsy was characteristically a small storm throughout her life. By the 8th she had developed typhoon force winds as she began to accelerate to a speed of 10-12 kts.

A reconnaissance aircraft reported that Patsy had rapidly intensified into a super typhoon with estimated maximum surface winds of 150 kts and a central pressure of 893mb (10/0020 GMT). Her central pressure had dropped 57mb in a span of 22 hours (Figure 4-21).

Patsy continued unerringly toward the northern tip of Luzon as she began to weaken late on the 10th. Interestingly, on the evening of the 11th, DMSP satellite imagery revealed that Patsy's low level circulation had separated from the upper level portion of the cyclone (Figure 4-22). The low level portion took a more northwesterly course and weakened to a tropical disturbance as it crossed the southern Luzon Strait. Meanwhile, a radar site in the Republic of the Philippines continued to follow the upper level cloudiness as it tracked due west towards Luzon. A similar situation occured with Susan in 1972.

The upper level circulation drifted over Luzon and out into the South China Sea. It apparently became superimposed over a low level vortex that had been situated in the South China Sea for several days. This system developed to tropical storm intensity as it passed to the north of the Paracel Islands. It weakened to a tropical depression just prior to making landfall in the Republic of Vietnam.

Patsy was the 3rd and final super typhoon of the year. She was only the 2nd storm to form in the western Caroline Islands area in the 1973 season.

FIGURE 4-21. *Super Typhoon Patsy (right) at peak intensity. Typhoon Nora (left) in the Taiwan Strait, 9 October 1973, 2341 GMT. (DMSP imagery)*

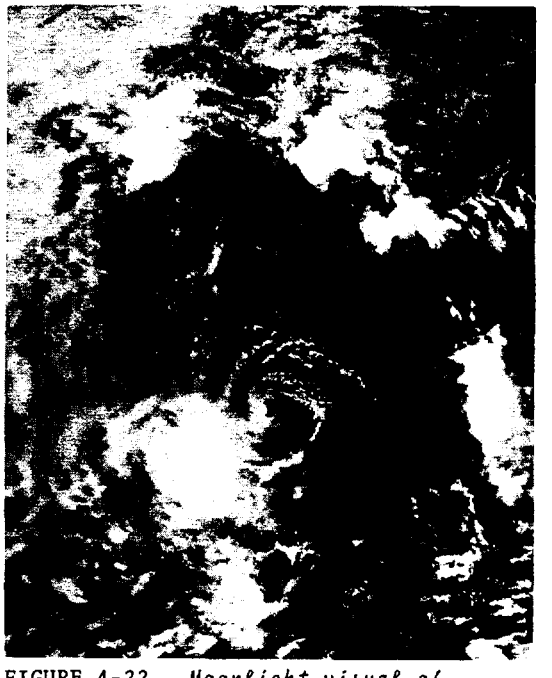
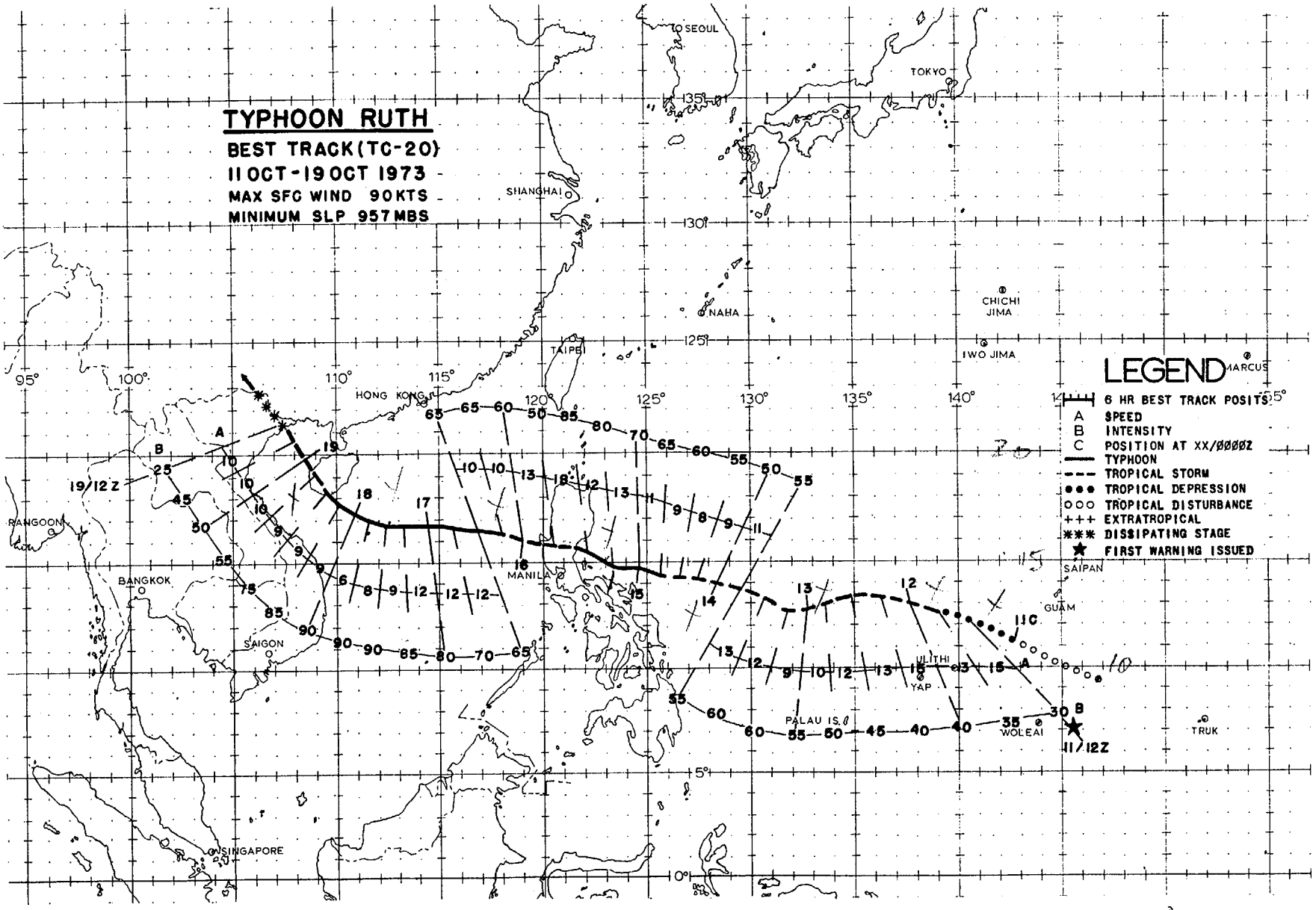


FIGURE 4-22. *Moonlight visual of Tropical Storm Patsy. Spiral cumulus pattern depicts the low level circulation with the cirrus canopy displaced to the southwest, 11 October 1973, 1613 GMT. (DMSP imagery)*


TYPHOON RUTH
BEST TRACK (TC-20)
11 OCT - 19 OCT 1973
MAX SFC WIND 90 KTS
MINIMUM SLP 957 MBS
LEGEND
6 HR BEST TRACK POSITS
A SPEED
B INTENSITY
C POSITION AT XX/ØØØØZ
TYPHOON
TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
HONG KONG
MANILA
CHICHI JIMA
IWO JIMA
MARCUS
SAIPAN
GUAM
ULITHI
YAP
PALAU IS.
WOLEAI
TRUK
RANGOON
BANGKOK
SAIGON
SINGAPORE
19/12Z
11/12Z
95°
100°
110°
115°
120°
125°
130°
135°
140°
145°
135°
130°
125°
15°
0°

The formative stage of Ruth appeared early on 10 October as a weak circulation in the monsoon trough in the western Caroline Islands. By the 11th, an area of enhanced convective activity associated with the cyclonic circulation became evident from satellite imagery. Ship reports on the afternoon of the 11th located Tropical Storm Ruth about 250nm westsouthwest of Guam with maximum winds of 35 kts.

Ruth followed 3 days behind Patsy. She tracked approximately 120nm to the south of but parallel to Patsy's track across the Philippine Sea. It is interesting to note that although Patsy intensified rapidly to super typhoon strength, Ruth developed slowly and reached typhoon intensity three days after she became a tropical storm. (Figure 4-23). The satellite data for this period showed little or no convective activity on the north side of Ruth. The strong upper tropospheric northeast flow from the subtropical ridge may have contributed to suppressing the outflow from Ruth on the north side and thereby inhibiting her development.

She continued her westerly movement with slow intensification until landfall on Luzon on the 15th, with maximum sustained wind speeds of 85 kts. Rapid weakening then occurred as the low level inflow was disrupted by terrain effects. Her maximum sustained wind had decreased to 50 kts by the time she reached central Luzon.

Ruth passed 42 miles north of Clark AB late on the night of the 15th where maximum sustained winds of 30 kts and peak gusts of 43 kts were recorded. Only minor damage was reported at Clark AB. Baler recorded maximum peak gust of 95 kts from the north (15/1355 GMT) while Casiguran 50 nm further north on the coast experienced a gust to 98 kts three hours later (15/1700 GMT).

On the 16th Ruth entered the South China Sea and tracked westward toward the Paracel Islands, still under the steering influence of the subtropical ridge (Figure 4-24). A Japanese ship IDEMITSU MARU reported 50 kts of wind and a surface pressure of 995mb as she passed 90nm northwest of Ruth (16/0000 GMT). She reintensified on her sojourn across the South China Sea reaching a maximum intensity of 90 kts on the afternoon of the 17th just east of the Paracels. Shortly after attaining her maximum intensity, Ruth turned to a northwesterly course in response to a weakness in the subtropical ridge. She then crossed Hainan Island and entered the Tonkin Gulf with maximum sustained winds of 50 kts. Ruth continued to weaken rapidly as upper tropospheric support waned, and dissipated completely as she moved inland along the North Vietnam coast on the afternoon of the 19th.

Damage reports indicate that while Ruth was crossing Luzon, 27 people were killed, 30 people were injured and 23 people were missing. Property damage amounted to more than five million dollars (U.S.) with thousands of homes destroyed.

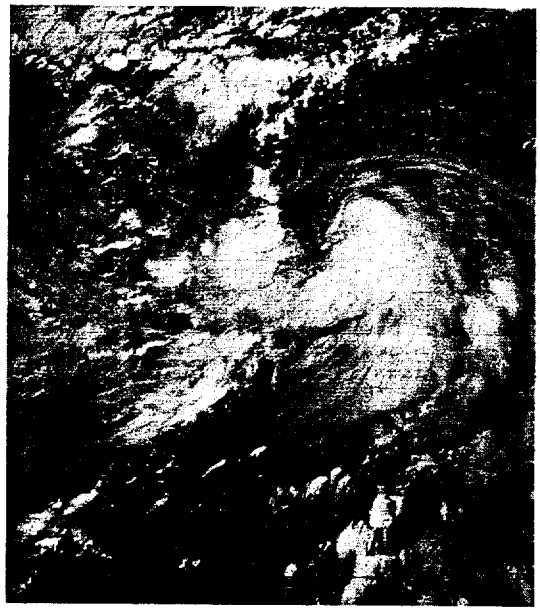


FIGURE 4-23. *Tropical Storm Ruth in the Philippine Sea 225 nm east of Catanduanes Island, 14 October 1973, 0009 GMT. (DMSP imagery)*

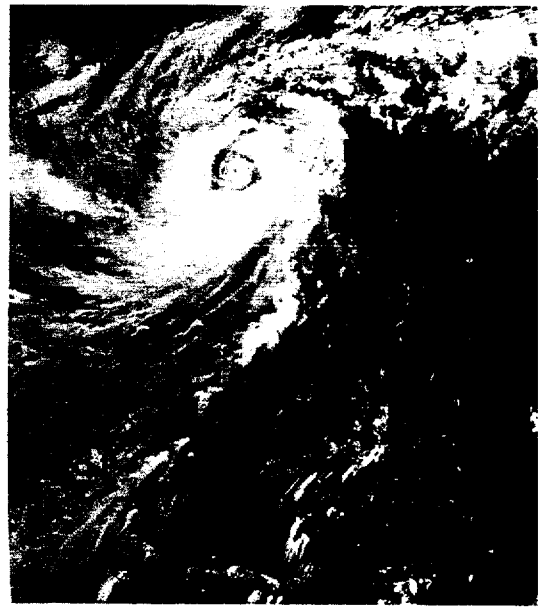


FIGURE 4-24. *Tropical Storm Ruth reintensifying after crossing Luzon, 16 October 1973, 0359 GMT. (DMSP imagery)*

3. TROPICAL CYCLONE CENTER FIX DATA

a. DISCUSSION OF DATA:

Fix data from all sources are included for each tropical cyclone. The first four columns of the print-out list the same information regardless of platform.

FIX NO.- Fixes are numbered sequentially.
TIME - GMT time in day, hour, and minutes of fix.
POSIT - Position of the storm in degrees and tenths.
FIX CAT- Fix platform used (SAT - satellite, P - 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 platform.

(1) SATELLITE - These data were derived from bulletins received from FLEWEAFAC and NESS Suitland, Maryland (NOAA-2), the APT site at U-Tapao, Thailand (ESSA-8), or DMSP (formerly DAPP) data from various sites (Chapter II). Intensity estimates (when available) are listed using the NESS classification system (NOAA Technical Memorandum NESS 45). If the source were DMSP (DAPP) data, the PCN (Position Code Number) appears followed by the name DMSP. If the platform were NOAA-2 or ESSA-8, that name will appear after the intensity information along with the site name and location confidence number (NOAA-2 only), (NHOP, 1973). NOAA-2 fixes without a site name will be assumed to be FLEWEAFAC Suitland fixes.

(2) RADAR - The latitude and longitude of land-based radars are given in the POSIT OF RADAR column. The position of mobile radar platforms are included if available. Plain language remarks appear after AC&W radar reports regarding tropical cyclone characteristics, size, and accuracy of fix (CINCPACINST 3140.1L, 1973). All other land radar reports contain a 5-digit code group identical to the WMO radar code for reporting tropical cyclone characteristics as regards to size, development, and accuracy of location of the center or the eye. A list of land-based radars providing data in the fix print-out is given in Table 4-7.

(3) CPA - If a station experiences center passage, maximum surface wind observed and minimum sea level pressure recorded are listed.

(4) SCF - If synoptic data is dense and consistent enough to provide accurate fix information, the derived storm position is listed. Maximum surface wind and minimum sea level pressure values are included, if possible.

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

The categories containing information from reconnaissance aircraft fixes 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 WND

Wind speed (kt) at flight level is measured by the AN/APN-82 doppler radar system aboard the WC-130 aircraft. The 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 maximum observed may be significantly lower than the true maximum wind in the circulation (i.e., 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. Also, the doppler radar mount on the WC-130 restricts wind measurements to drift angles $\leq 27°$ if wind is normal to heading of aircraft.

(d) MAX OBS SFC WND

The maximum surface wind (kt) observed from flight level is entered in this column. The observation is an estimate based on the state of the sea (refer to 9WRWGM 105-1, Vol II, pp 2-27-28). The sampling limitation noted in paragraph (c) also exists for this category. In addition, availability of these data is dependent on the absence of undercast conditions. The position relative to the vortex center of items (c) and (d) need not 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 at the flight level wind center. 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 700mb surface in the vortex center is recorded in decameters.

(g) FLT LVL T_i/T_o

This denotes maximum temperature measured in the center (T_i) and ambient temperature outside the center (T_o). Ambient temperature is measured just prior to entering the wall cloud. Both temperature observations are in degrees celsius and are made at a flight level of constant pressure surface (700, 500-mb).

Reconnaissance aircraft seldom penetrate on the same azimuth from one fix to another. Thus, the position of T_o normally varies from the center, both in bearing and range. The distance is directly 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 (see definition in Appendix). The orientation of the major axis is for elliptical cases. Abbreviations for the eye form are:

CIRC - Circular
ELIP - Elliptical
CONC - Concentric

REFERENCES:

Brand, S., "Interaction of Binary Tropical Cyclones of the Western North Pacific Ocean," NAVWEARSCHFAC Tech. Paper No. 26-68, September 1968.

CINCPACINST 3140.1L, "Tropical Cyclone Operations Manual," June 1973.

FLEWEACEN/JTWC, Annual Typhoon Report, Guam, Marianas Islands, 1970.

Ramage, C.S., Monsoon Meteorology, Academic Press, New York and London, 1971, pp. 189-190.

Sadler, J.C., "The Role of the Upper Tropospheric Trough (TUTT) in Early Season Development," ENVPREDRSCHFAC Tech. Paper, 1973 (in press).

U.S. Dept. of Commerce, NOAA, Federal Coordinator for Meteorological Services and Supporting Research, "National Hurricane Operations Plan," May 1973.

TABLE 4-7. LAND RADAR SITES

Location	Station No.	ICAO	Station Name
10.3N 124.0E	98646	RPMT	Mactan
	98440		
14.4N 120.6E	98425		Manila
16.4N 120.6E	98328		Baguio
17.4N 104.7E	48357	VTUW	Nakhon Phanom West (USAF)
26.1N 127.8E	47937		Itokau
26.4N 127.8E		RODN	Kadena AB (USAF)
26.2N 127.7E		ROAHJ	Naha AB (JASDF)
24.3N 124.2E	47918		Ishigakijima
28.4N 129.5E	47909		Naze
33.3N 134.2E	47899		Murotomisaki
30.6N 131.0E	47869		Tanegashima/Naka
33.6N 130.5E		RJFFJ	Itazuke Airport (JASDF)
33.4N 130.4E	47806		Fukuoka/Sefurisan
35.9N 126.6E	47141	RKJK	Kunsan AB (USAF)
37.5N 127.0E	47116		Kwanaksan Myn
34.6N 135.7E	47773		Osaka/Takayasuyama
24.3N 120.6E	46770	RCMQ	CCK AB/Taiwan
22.6N 120.3E	46744		Kaohsiung
23.0N 120.2E		RCNN	Tainan (AC&W)
22.6N 120.4E		RCKH	Kaohsiung Int'l Airport (AC&W)
23.5N 119.6E		RCQC	Makung (AC&W)
24.0N 121.6E	46699		Hwalien
22.3N 114.2E	45005		Hong Kong Obsr.
18.1N 120.5E			Paredes (AC&W)
16.6N 120.3E			Wallace AS (AC&W)
14.4N 122.6E			Paranal AS (AC&W)

b. FIX DATA PRINTOUT:

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                                   TROPICAL STORM  WILDA
                              FIX POSITIONS FOR CYCLONE NO.  1
                                   01 JUL TO 03 JUL
                                     MAX OBS          MAX OBS      OBS   MIN   FLT                                  POSIT
FIX                                                                                                                   OF          MSK
NO.  TIME      POSIT      FIX  ACCRY  FIX  FLT LVL WIND     SFC WIND     MIN  700MB  CVL  EYE   DIEN-  EYE  DIA   RADAR       NMBR
                          CAT NAV-MET LVL  DIR VEL BRG RNG  VEL BRG RNG  SLP   HGT  T1/TU FORM  ATION
 1  280124Z  11.0N 124.5E  SAT   (T1.5/1.5 /    /24HRS)    NOAA 2 (NESS) (CONF 02)
 2  280124Z  11.0N 124.5E  SAT   (T1.5/1.5 /D0.5/23HRS)    NOAA 2        (CONF 01)
 3  290029Z  15.0N 125.0E  SAT   (T1.5/1.5 /S   /23HRS)    NOAA 2        (CONF 02)
 4  290319Z  15.2N 124.9E  SAT   (T1.5/1.5 /    /  HRS)    PCN 3  DMSP
 5  290319Z  16.4N 124.2E  SAT   (T1.5/1.5 /D   /  HRS)    PCN 3  DMSP
 6  291809Z  15.3N 122.4E  SAT                              PCN 3  DMSP
 7  291809Z  15.8N 123.7E  SAT                              PCN 5  DMSP
 8  291809Z  15.5N 123.5E  SAT                              PCN 5  DMSP
 9  300117Z  17.5N 121.8E  SAT   (T2.0/2.0 /D0.5/25HRS)    NOAA 2 (NESS) (CONF 01)
10  300118Z  17.5N 121.5E  SAT   (T2.0/2.0 /D0.5/25HRS)    NOAA 2        (CONF 02)
11  300440Z  17.5N 121.5E  SAT   (T2.0/1.5 /    /  HRS)    PCN 3  DMSP
12  300447Z  17.8N 122.2E  SAT   (T1.0/1.5 /W0.5/25HRS)    PCN 5  DMSP
13  300447Z  17.5N 121.2E  SAT   (T2.0/2.0 /S   /  HRS)    PCN 5  DMSP
14  301548Z  17.8N 119.6E  SAT                              PCN 5  DMSP
15  301548Z  16.5N 120.4E  SAT                              PCN 8  DMSP
16  010153Z  18.0N 119.7E  P   5  25   -   -   -   -   -   35 100 100   -   -   25 25   -   -  -   -                    2
17  010213Z  18.0N 117.5E  SAT   (T2.5/2.5 /D0.5/25HRS)    NOAA 2        (CONF 02)
18  010432Z  18.8N 118.3E  SAT   (T2.0/2.0 /S   /25HRS)    PCN 3  DMSP
19  010432Z  18.9N 118.9E  SAT   (T1.5/1.5 /D0.5/24HRS)    PCN 3  DMSP
20  010708Z  19.2N 118.4E  P   1   4   -   300  30 240 40   40  30  35   927  305  -   -   -   -  -   -                    3
21  011303Z  20.0N 118.3E  P   2   2   -   130  55  30 100  -   -   -    991  300  -   -   CIRC -  -   0                    3
22  011718Z  20.3N 118.2E  SAT                              PCN 5  DMSP
23  011718Z  20.5N 118.0E  SAT                              PCN 5  DMSP
24  012133Z  20.3N 117.9E  P   5   2  700                  -   33 240 20   982  295  10  10   -   -  -   -                    4
25  020132Z  21.2N 117.4E  SAT   (T3.5/3.5 /D1.0/23HRS)    NOAA 2        (CONF 01)
26  020620Z  20.7N 117.7E  SAT   (T4.0/4.0 /D    /24HRS)    ESSA 8 (VIBU)
27  020300Z  21.2N 117.8E  P   5   5  700  220  55  90  25   50  90  45   985  295  13  10   -   -  -   -                    4
28  020917Z  21.1N 117.1E  SAT   (T3.5/3.5 /D1.5/24HRS)    PCN 3  DMSP
29  020917Z  21.2N 117.2E  SAT   (T3.0/2.0 /    /  HRS)    PCN 3  DMSP
30  020917Z  21.0N 117.6E  SAT   (T3.0/3.0 /D2.5/24HRS)    PCN 1  DMSP
31  020917Z  21.5N 117.3E  SAT   (T3.0/3.0 /D1.5/49HRS)    PCN 3  DMSP
32  020800Z  21.7N 117.9E  LRDR    - 30912                                                   -   -  -   -   22.3N 114.2E   -
33  020900Z  21.8N 117.9E  AC H                                                              -   -  -   -   20.9N 117.0E   5
34  020922Z  21.8N 117.8E  AC H    -                                                         -   -  -   -   21.4N 115.7E   5
35  021200Z  22.0N 117.7E  LRDR    - 3////                                                                   22.3N 114.2E   -
36  021500Z  22.3N 117.8E  LRDR    - 3////                                                   -   -  -   -   22.3N 114.2E   -
37  021500Z  22.5N 117.6E  AC H    -                                                                         21.9N 116.5E   5
38  021701Z  22.5N 117.7E  SAT                              PCN 1  DMSP
39  021701Z  22.4N 117.8E  SAT                              PCN 1  DMSP
40  021701Z  21.7N 117.5E  SAT                              PCN 2  DMSP
41  021701Z  22.5N 117.9E  SAT                              PCN 1  DMSP
42  021900Z  22.7N 117.8E  LRDR    - 30///                                                                   22.3N 114.2E   -
43  022100Z  23.1N 118.0E  LRDR    - 30 4/                                                                   22.3N 114.2E   -
44  030020Z  23.0N 117.9E  LRDR    - 3094/                                                                   22.3N 114.2E   -
45  030110Z  23.1N 117.1E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, FAIR FIX                               24.3N 120.6E   -
46  030140Z  23.9N 118.0E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, FAIR FIX                               24.3N 120.6E   -
47  030200Z  23.9N 117.5E  SAT   (T4.0/4.0 /D0.5/25HRS)    NOAA 2        (CONF 01)
48  030300Z  24.3N 119.3E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, FAIR FIX                               24.3N 120.6E   -
49  030310Z  24.5N 117.8E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, FAIR FIX                               24.3N 120.6E   -
50  030340Z  24.3N 118.3E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, FAIR FIX                               24.3N 120.6E   -
51  030400Z  24.3N 118.0E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, FAIR FIX                               24.3N 120.6E   -
52  030403Z  24.2N 118.0E  SAT   (T3.5/4.0 /W    /  HRS)    PCN 1  DMSP
53  030403Z  24.1N 118.1E  SAT   (T5.0/5.0-/D2.0/24HRS)    PCN 1  DMSP
54  030410Z  24.3N 118.0E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, FAIR FIX                               24.3N 120.6E
55  030440Z  24.5N 118.0E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, FAIR FIX                               24.3N 120.6E
56  030510Z  24.5N 117.8E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, FAIR FIX                               24.3N 120.6E
57  030540Z  24.8N 118.4E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, FAIR FIX                               24.3N 120.6E
58  030610Z  24.8N 118.3E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, FAIR FIX                               24.3N 120.6E
59  030940Z  24.7N 118.4E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, FAIR FIX                               24.3N 120.6E
60  030710Z  24.7N 118.3E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, FAIR FIX                               24.3N 120.6E
61  030740Z  24.8N 118.4E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, FAIR FIX                               24.3N 120.6E
62  030800Z  25.0N 118.2E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, FAIR FIX                               24.3N 120.6E
63  030810Z  25.0N 118.2E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, FAIR FIX                               24.3N 120.6E
64  030840Z  25.1N 118.2E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, FAIR FIX                               24.3N 120.6E
65  030940Z  25.0N 118.2E  LRDR    - POSSIBLE CENTER, 10 DEG OVERLAY, POOR FIX
66  031040Z  25.2N 118.8E  SAT                              PCN 5  DMSP
67  031047Z  24.4N 119.4E  SAT                              PCN 3  DMSP
68  010600Z  18.9N 118.8E  SCF                                     30
69  020600Z  21.8N 117.5E  SCF                                     30
70  030000Z  23.8N 118.5E  SCF                                     30
71  031200Z  25.6N 118.5E  SCF                                     30
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TYPHOON ANITA

FIX POSITIONS FOR CYCLONE NO. 2
05 JUL TO 08 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T1/TU	EYE FORM	DIEN-ATION	EYE DIA	POSIT OF RADAR	MSA NMBR
1	050207Z	10.5N 111.0E	SAT	(T1.5/1.5 /D0.5/25HRS)						NOAA 2			(CCNF 03)							
2	050613Z	12.0N 111.0E	SAT	(T1.5/1.5 /D0.5/24HRS)						NOAA 2 (NESS)										
3	050516Z	9.2N 113.0E	SAT	(T1.0/1.0 /S /24HRS)						PCN 5 UMSP										
4	060103Z	11.5N 112.5E	SAT	(T2.0/2.0 /D0.5/23HRS)						NOAA 2 (NESS)			(CCNF 03)							
5	060107Z	11.5N 112.5E	SAT	(T2.0/2.0 /D0.5/23HRS)						NOAA 2			(CCNF 03)							
6	060203Z	12.3N 112.0E	P	4 15	700	200	40	120		20	55	140	30	996	305	12	-	-	- - -			1
7	060500Z	12.3N 111.2E	SAT	(T2.5/2.5 /D / HRS)						PCN 3 UMSP										
8	060501Z	11.8N 111.2E	SAT	(T2.5/2.5+/D1.5/24HRS)						PCN 3 UMSP										
9	060915Z	12.5N 112.3E	P	3 10	700	170	50	70		80	50	70	75	991	300	13	-	-	- - -			
10	061715Z	13.3N 111.0E	P	5 15	700	180	60	40		20	-	-	-	992	299	14	12	-	- - -			2
11	061740Z	13.2N 111.7E	SAT							PCN 4 UMSP												3
12	062130Z	14.0N 111.4E	P	5 10	700	180	60	50		30	-	-	-	983	295	14	13	-	- - -			
13	070159Z	15.3N 110.2E	SAT	(T3.0/3.0 /D1.0/23HRS)						NOAA 2 (NESS)			(CCNF 02)									3
14	070201Z	15.3N 110.2E	SAT	(T3.0/3.0 /D1.0/25HRS)						NOAA 2			(CCNF 01)							
15	070245Z	15.0N 110.4E	SAT	(T4.0/4.0 /D / 24HRS)						ESSA 8 (VTBU)										
16	070350Z	15.4N 110.3E	P	10 20	700	230	50	140		40	80	130	30	984	295	12	-	-	- - -			
17	070444Z	14.5N 110.0E	SAT	(T2.5/2.5 /S /24HRS)						PCN 5 UMSP												4
18	070550Z	15.5N 110.2E	SAT	(T3.5/3.5 /S / HRS)						PCN 3 UMSP										
19	070845Z	16.1N 110.2E	P	5 5	700	160	45	60		40	80	210	50	983	293	13	-	-	- - -			4
20	071730Z	17.4N 108.7E	SAT							PCN 4 UMSP										
21	071730Z	17.3N 108.8E	SAT							PCN 3 UMSP										
22	072230Z	17.8N 107.7E	SNOW	-													-	- - -		
23	080255Z	18.7N 106.0E	SAT	(T4.0/4.0 /D1.0/25HRS)						NOAA 2			(CCNF 01)							-
24	080337Z	19.0N 107.2E	SAT	(T4.0/4.0 -/S /25HRS)						ESSA 8 (VTBU)										
25	080425Z	18.2N 106.5E	SAT	(T3.5/3.5 -/D1.0/25HRS)						PCN 1 UMSP										
26	080432Z	18.1N 106.5E	SAT	(T3.5/3.5 -/D1.0/25HRS)						PCN 1 UMSP										
27	081010Z	18.5N 106.2E	P	1 5	700	120	60	30		30	60	-	-	980	292	14	-	CIRC	.30			
28	081642Z	18.8N 105.8E	LROR	- POSSIBLE EYE, 15 DEG OVERLAY, GOOD FIX																17.4N 104.7E		7
29	081935Z	18.8N 105.5E	LROR	- POSSIBLE EYE, 15 DEG OVERLAY, GOOD FIX																		
30	081935Z	18.8N 105.2E	LROR	- SPIRAL OVERLAY EYE, GOOD FIX																17.4N 104.7E		
31	081935Z	18.9N 105.0E	LROR	- CIRC EYE, GOOD FIX, 70 PCT, DIAMETER 20																17.4N 104.7E		
32	081935Z	19.0N 104.7E	LROR	- CIRC EYE, GOOD FIX, 50 PCT, DIAMETER 15																17.4N 104.7E		
33	081710Z	19.0N 104.1E	SAT							PCN 3 UMSP										17.4N 104.7E		
34	081740Z	19.0N 104.5E	LROR	- CIRC EYE, FAIR FIX, EYE FILLING, DIAMETER 10																17.4N 104.7E		
35	081810Z	19.1N 104.2E	LROR	- CIRC EYE, GOOD FIX, DIAMETER 10																		
36	081935Z	19.1N 104.1E	LROR	- CIRC EYE, GOOD FIX, DIAMETER 10																17.4N 104.7E		
37	081910Z	19.1N 103.9E	LROR	- CIRC EYE, FAIR FIX, DIAMETER 10																17.4N 104.7E		
38	082010Z	18.9N 103.7E	LROR	- NO WELL DEFINED EYE, POOR FIX																17.4N 104.7E		
39	080100Z	17.6N 107.2E	CPA	EYE PASSAGE USS OGDEN(LPD-5)						60			982									
40	080230Z	17.5N 107.5E	CPA							47			986									

TROPICAL STORM CLARA

FIX POSITIONS FOR CYCLONE NO. 3
12 JUL TO 14 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T1/TU	EYE FORM	DIEN-ATION	EYE DIA	POSIT OF RADAR	MSA NMBR
1	120156Z	27.0N 165.7E	SAT	(T 0/2.0 / / HRS)						PCN 6 UMSP										
2	120156Z	26.5N 163.7E	SAT	(T2.0/2.0 / / HRS)						PCN 3 UMSP										
3	120456Z	25.8N 164.1E	SAT	(T1.5/1.5 / / HRS)						PCN 5 UMSP										
4	121439Z	27.5N 162.3E	SAT							PCN 4 UMSP										
5	121439Z	26.9N 162.1E	SAT							PCN 4 UMSP										
6	122139Z	29.2N 161.0E	SAT	(T2.5/2.5 /D1.5/24HRS)						NOAA 2 (NESS)										
7	122151Z	29.2N 161.0E	SAT	(T3.0/3.0 /D1.5/24HRS)						NOAA 2			(CCNF 02)							
8	130137Z	29.1N 160.9E	SAT	(T2.0/2.0 /D / HRS)						PCN 6 UMSP										
9	130137Z	29.5N 160.5E	SAT	(T4.0/4.0 /D2.0/24HRS)						PCN 4 UMSP										
10	130137Z	28.8N 160.2E	SAT	(T3.0/3.0 /D / HRS)						PCN 3 UMSP										
11	130455Z	29.0N 160.4E	P	5 10	-	350	40	270		35	45	280	25	998	-	25	22	-	- - -			1
12	131417Z	29.9N 160.2E	SAT							PCN 4 UMSP										
13	131421Z	30.0N 160.4E	SAT							PCN 4 UMSP										
14	132439Z	31.3N 160.9E	SAT	(T2.5/3.0 /W0.5/25HRS)						NOAA 2			(CCNF 01)							
15	132525Z	31.3N 159.8E	P	15 15	700	-	-	-		-	35	240	35	1001	308	13	-	-	- - -			1
16	140122Z	31.2N 160.9E	SAT	(T2.0/3.0 /W1.0/24HRS)						PCN 4 UMSP										
17	140122Z	31.0N 162.0E	SAT	(T2.5/3.0 -/W0.5/24HRS)						PCN 6 UMSP										
18	140122Z	31.3N 161.7E	SAT	(T2.5/3.5 /W2.0/24HRS)						PCN 3 UMSP										
19	141406Z	32.0N 163.1E	SAT							PCN 5 UMSP										

TYPHOON BILLIE

FIX POSITIONS FOR CYCLONE NO. 4

13 JUL 10 19 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCKY NAV-MET	FIX LVL	FLT LVL WIND DIR VEL	BRG RNG	MAX OBS	SFC WIND VEL	BRG RNG	MAX OBS	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TU	EYE FORM	DIEN-STION	EYE DIA	POSIT OF RADAR	MSA NMBR
1	1203332	13.7N 129.7E	SAI	(T1.5/1.5 /	/	HRS)		PCN 5	DMSP										
2	1216172	15.2N 126.8E	SAI					PCN 4	DMSP										
3	1216172	15.0N 126.8E	SAI					PCN 6	DMSP										
4	1216172	15.8N 127.7E	SAI					PCN 5	DMSP										
5	1301462	17.0N 124.5E	SAI	(T2.0/2.0 /01.0/25HRS)				NOAA 2			(CONF 02)								
6	1303172	16.2N 125.5E	SAI	(T3.5/3.5 /01.0/11HRS)				PCN 3	DMSP										
7	1303172	16.4N 125.4E	SAI	(T3.0/3.0 /0	/	HRS)		PCN 1	DMSP										
8	1303172	16.2N 125.5E	SAI	(T2.5/2.5 /0	/	HRS)		PCN 3	DMSP										
9	1303172	16.4N 125.7E	SAI	(T3.5/3.5 /	/	HRS)		PCN 3	DMSP										
10	1304002	16.7N 125.7E	P	5 4	-	320	45 250	25	35 250	40	- -			- -	ELIP	F-W	20X15		1
11	1310002	17.2N 125.5E	P	3 2	700	10	45 240	15	40 240	10	991	300	14	11	CIRC		20		1
12	1310102	17.3N 125.3E	P	5 5	700	70	45 10	20	- -		-								
13	1310032	17.4N 125.4E	SAI					PCN 3	DMSP			986	298	17	12	CIRC		16	2
14	1310032	17.2N 125.7E	SAI					PCN 3	DMSP										
15	1310032	17.5N 125.5E	SAI					PCN 3	DMSP										
16	1310032	17.3N 125.4E	SAI					PCN 3	DMSP										
17	1322302	18.4N 125.3E	P	5 2	700	250	50 120	10	65 140	8	986	294	15	11	CIRC		10		3
18	1400442	19.0N 125.0E	SAI	(T3.5/3.5 /01.5/23HRS)				NOAA 2			(CONF 01)								
19	1400442	19.0N 125.0E	SAI	(T3.5/3.5 /01.5/24HRS)				NOAA 2			(NESS) (CONF 02)								
20	1403042	18.9N 125.2E	SAI	(T4.0/4.0 /01.0/24HRS)				PCN 3	DMSP										
21	1403042	18.7N 125.0E	SAI	(T3.5/3.5 /W		/24HRS)		PCN 5	DMSP										
22	1403042	18.7N 124.9E	SAI	(T4.0/4.0 /0		/	HRS)	PCN 3	DMSP										
23	1403202	18.8N 125.7E	P	5 5	700	250	65 120	10	60 120	10	976	291	16	10	CIRC		5		3
24	1410002	19.4N 125.0E	P	5 5	700	300	80 200	15	65 200	20	967	281	16	13	CIRC		10		4
25	1410012	20.1N 125.5E	P	5 5	700	100	80 10	20	- -	-	957	272	16	-	CIRC		15		4
26	1415462	20.0N 125.3E	SAI					PCN 3	DMSP										
27	1415462	20.1N 125.4E	SAI					PCN 3	DMSP										
28	1415462	19.9N 125.5E	SAI					PCN 1	DMSP										
29	1422002	20.8N 125.3E	P	5 1	700	-	- -	-	130 220	7	921	240	22	11	CIRC		10		4
30	1501392	21.3N 125.0E	SAI	(T5.0/5.0 /01.5/24HRS)				NOAA 2			(NESS) (CONF 02)								
31	1501392	21.5N 125.0E	SAI	(T5.0/5.0 /01.5/25HRS)				NOAA 2			(CONF 02)								
32	1502002	21.1N 125.1E	SAI	(T5.5/5.5+/02.0/24HRS)				PCN 1	DMSP										
33	1502002	21.1N 125.0E	SAI	(T6.0/6.0 /02.0/24HRS)				PCN 1	DMSP										
34	1503302	21.3N 125.3E	P	5 1	700	90	110 30	10	130 220	7	916	236	21	12	CIRC		8		5
35	1504322	21.5N 125.0E	SAI	(T5.0/5.0 /0			HRS)	PCN 3	DMSP										
36	1504362	21.3N 125.5E	SAI	(T7.0/7.0 /0	/	HRS)		PCN 1	DMSP										
37	1504322	21.6N 125.7E	SAI	(T5.0/5.0 /01.0/24HRS)				PCN 1	DMSP										
38	1500002	21.4N 125.4E	LHUR	- 27/13														24.3N 124.2E	
39	1500002	21.6N 125.4E	LHUR	- 27/13														24.3N 124.2E	
40	1500002	21.7N 125.4E	LHUR	- 27/13														24.3N 124.2E	
41	1500002	21.9N 125.4E	LHUR	- 27/13														24.3N 124.2E	
42	1500002	21.9N 125.3E	LHUR	- 20412														24.3N 124.2E	
43	1510002	22.0N 125.2E	LHUR	- 20412														24.3N 124.2E	
44	1512272	22.4N 125.2E	P	5 5	700	270	110 180	10	100 180	10	938	255	16	15	CIRC		7		6
45	1512002	22.3N 125.3E	LHUR	- 4/7/3														24.3N 124.2E	
46	1513002	22.3N 125.3E	LHUR	- 11273														24.3N 124.2E	
47	1513002	22.8N 125.4E	LHUR	- 25413														24.0N 121.6E	
48	1513002	22.7N 125.4E	LHUR	- 25413														24.0N 121.6E	
49	1514002	22.5N 125.2E	LHUR	- 10803														24.3N 124.2E	
50	1514002	22.8N 125.4E	LHUR	- 25414														24.0N 121.6E	
51	1519002	22.6N 125.3E	LHUR	- 10803														24.3N 124.2E	
52	1519202	22.8N 125.1E	P	10 5	700	260	90 180	15	- -	-	947	265	17	13	CIRC		8		6
53	1513342	23.0N 125.2E	SAI					PCN 3	DMSP										
54	1513342	22.8N 125.1E	SAI					PCN 3	DMSP										
55	1513342	23.3N 125.3E	SAI					PCN 3	DMSP										
56	1516002	22.8N 125.3E	LHUR	- 11672														24.3N 124.2E	
57	1517002	22.9N 125.2E	LHUR	- 25772														24.3N 124.2E	
58	1517152	22.7N 125.6E	SAI					PCN 3	DMSP										
59	1517132	23.3N 125.1E	SAI					PCN 3	DMSP										
60	1517152	22.5N 125.5E	SAI					PCN 3	DMSP										
61	1517002	23.2N 125.3E	LHUR	- 14913														24.0N 121.6E	
62	1516002	23.1N 125.2E	LHUR	- 25772														24.3N 124.2E	
63	1517002	23.3N 125.2E	LHUR	- 11872														24.3N 124.2E	
64	1520002	23.4N 125.2E	LHUR	- 11813														24.3N 124.2E	
65	1521002	23.5N 125.2E	LHUR	- 11722														24.3N 124.2E	
66	1521002	23.5N 125.2E	LHUR	- 14633														24.0N 121.6E	
67	1522002	23.6N 125.2E	LHUR	- 11922														24.3N 124.2E	
68	1522152	23.7N 125.3E	P	10 5	700	180	60 270	30	80 180	15	954	269	17	-	CIRC		20		7
69	1523002	23.7N 125.3E	LHUR	- 10582														24.3N 124.2E	
70	1600002	23.9N 125.2E	LHUR	- 10512														24.3N 124.2E	
71	1600372	24.0N 125.0E	SAI	(T6.0/6.0 /01.0/24HRS)				NOAA 2			(NESS) (CONF 01)								
72	1600402	24.2N 124.8E	SAI	(T6.0/6.0 /01.0/23HRS)				NOAA 2			(CONF 01)								
73	1602002	24.1N 125.4E	LHUR	- 10512														24.3N 124.2E	
74	1603002	24.2N 125.3E	LHUR	- 20603														26.1N 127.8E	
75	1603002	24.2N 125.4E	P	10 5	700	190	100 240	15	90 240	10	937	256	19	15	CIRC		20		7
76	1603002	24.2N 125.3E	LHUR	- 10412														24.3N 124.2E	
77	1604002	24.3N 125.4E	LHUR	- 11672														26.1N 127.8E	
78	1604002	24.3N 125.4E	LHUR	- 11413														24.3N 124.2E	
79	1604172	24.3N 125.6E	SAI	(T5.5/5.5 /0		/24HRS)		PCN 1	DMSP										
80	1604172	24.5N 125.5E	SAI	(T6.5/6.5 /02.0/25HRS)				PCN 1	DMSP										
81	1604172	24.3N 125.3E	SAI	(T5.5/5.5 /S	/	HRS)		PCN 1	DMSP										
82	1604172	24.4N 125.1E	SAI	(T5.5/5.5 /00.5/24HRS)				PCN 1	DMSP										
83	1605002	24.6N 125.5E	LHUR	- 11513														26.1N 127.8E	
84	1605002	24.6N 125.4E	LHUR	- 10412														24.3N 124.2E	
85	1606002	24.6N 125.5E	LHUR	- 10522														26.1N 127.8E	
86	1606002	24.7N 125.5E	LHUR	- 10412														24.3N 124.2E	
87	1607002	24.8N 125.5E	LHUR	- 10473														26.1N 127.8E	
88	1607002	24.8N 125.4E	LHUR	- 10312														24.3N 124.2E	
89	1608002	24.9N 125.5E	LHUR	- 10427														24.3N 124.2E	
90	1608002	24.8N 125.6E	LHUR	- 10413														26.1N 127.8E	
91	1609002	25.0N 125.6E	LHUR	- 10412														24.3N 124.2E	
92	1609002	25.0N 125.7E	LHUR	- 10412														26.1N 127.8E	
93	1610002	25.1N 125.6E	LHUR	- 11412														26.1N 127.8E	
94	1610002	25.2N 125.7E	LHUR	- 10413														24.3N 124.2E	
95	1611002	25.3N 125.7E	LHUR	- 10413														24.3N 124.2E	
96	1611002	25.3N 125.7E	LHUR	- 70652														26.1N 127.8E	
97	1611562	25.5N 125.7E	P	1 1	700	330	65 240	8	- -	-	917	238	25	14	CIRC		12		6
98	1612002	25.5N 125.7E	LHUR	- 10413														24.3N 124.2E	
99	1613002	25.5N 125.7E	LHUR	- 10413														26.1N 127.8E	
100	1613002	25.7N 125.8E	LHUR	- 70413														26.1N 127.8E	

TYPHOON BILLIE
FIX POSITIONS FOR CYCLONE NO. 4
13 JUL TO 19 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCHY NAV-MET	FIX LVL	FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T1/TO	EYE FORM	RIEN-ATION	EYE DIA	POSIT OF RADAR	MSA NMBR
101	1613002	25.7N 125.7E	LHUR	- 10413															24.3N 124.3E	
102	1614002	25.9N 125.8E	LHUR	-												-	- -	-	26.1N 127.8E	
103	1614002	26.0N 125.7E	LHUR	- 10412															24.3N 124.2E	
104	1615002	26.2N 125.6E	LHUR	- 11413															26.1N 127.8E	
105	1615002	26.3N 125.5E	LHUR	- 21447															26.1N 127.8E	
106	1616002	26.4N 125.6E	P 3	1 700		220	119	120	15	-	-	-	929	249	23 11	CIRC		12		
107	1619002	26.3N 125.5E	LHUR	- 15443															24.3N 124.2E	C
108	1617002	26.5N 125.5E	LHUR	- 25/43															24.3N 124.2E	
109	1617012	26.6N 125.7E	SAI						PCN 1	DMSP										
110	1617012	26.4N 125.4E	SAI						PCN 1	DMSP										
111	1617012	26.6N 125.7E	SAI						PCN 1	DMSP										
112	1618002	26.7N 125.5E	LHUR	- 25/43															24.3N 124.2E	
113	1618002	26.6N 125.4E	LHUR	- 15633															26.1N 127.8E	
114	1619002	26.8N 125.2E	LHUR	- 25543															26.1N 127.8E	
115	1620002	27.0N 125.2E	LHUR	- 25523															26.1N 127.8E	
116	1621002	27.1N 125.1E	LHUR	- 25634															26.1N 127.8E	
117	1622002	27.2N 125.0E	LHUR	- 37534															26.1N 127.8E	
118	1622002	27.3N 125.2E	P 4	6 700		-	-	-	-	130	190	13	944	262	19 13	CIRC		10		1P
119	1623002	27.3N 125.1E	LHUR	- 37544															26.1N 127.8E	
120	1701312	28.0N 124.5E	SAI	(15.0/6.0 /W1.0/24HRS)					NOAA 2	(NESS)	(CONF 01)									
121	1701322	28.0N 124.5E	SAI	(15.5/6.0 /W0.5/23HRS)					NOAA 2		(CONF 01)									
122	1703002	28.0N 125.1E	P 2	(14.2/5.0 700 /W1.5/24HRS)					PCN 1	DMSP	100	-	951	266	10 14	CIRC		10		1P
123	1704022	28.0N 125.4E	SAI																	
124	1704022	27.8N 125.3E	SAI	(14.5/5.5 /W2.0/24HRS)					PCN 1	DMSP										
125	1704022	28.0N 125.0E	SAI	(16.0/6.0 /D0.5/24HRS)					PCN 1	DMSP										
126	1716102	28.9N 125.4E	P 5	1 700		290	79	180	15	-	-	-	953	267	10 14	CIRC	- -	15		11
127	1716152	29.9N 125.4E	P 15	5 700		290	100	180	30				960	275	10 12					1P
128	1716402	29.2N 125.7E	SAI						PCN 1	DMSP										
129	1716462	29.8N 125.6E	SAI						PCN 1	DMSP										
130	1716452	29.8N 125.7E	SAI						PCN 1	DMSP										
131	1721252	31.0N 125.3E	P 10	5 700		70	60	360	30	-	-	-	966	280	17 -	-	- -	-		1P
132	1800422	32.0N 124.5E	SAI	(14.0/3.0 /W1.0/24HRS)					NOAA 2	(NESS)	(CONF 01)									
133	1800312	32.2N 124.7E	SAI	(14.0/3.5 /W1.5/23HRS)					NOAA 2		(CONF 01)									
134	1803402	32.4N 124.2E	SAI	(14.0/3.0-/W2.0/24HRS)					PCN 3	DMSP										
135	1805402	32.5N 124.6E	SAI	(13.0/3.5 /W1.0/24HRS)					PCN 3	DMSP										
136	1803402	32.6N 124.5E	SAI	(12.5/3.5 /W2.0/24HRS)					PCN 3	DMSP										
137	1816312	34.0N 122.5E	SAI						PCN 3	DMSP										
138	1816322	34.0N 122.3E	SAI						PCN 3	DMSP										
139	1816322	34.0N 122.5E	SAI						PCN 3	DMSP										
140	1901232	35.2N 121.2E	SAI	(13.0/4.0 /D0.5/24HRS)					NOAA 2	(NESS)										
141	1901252	35.4N 121.6E	SAI	(13.0/4.0 /W1.0/24HRS)					NOAA 2		(CONF 02)									
142	1903332	35.5N 121.6E	SAI	(11.5/2.5 /W1.5/24HRS)					PCN 3	DMSP										
143	1903332	35.5N 122.1E	SAI	(12.5/3.0 /D0.5/25HRS)					PCN 3	DMSP										
144	1903332	35.6N 121.8E	SAI	(11.5/2.5 /W1.0/24HRS)					PCN 3	DMSP										
145	1912002	37.0N 121.4E	SCF							50			984							

TYPHOON DOT
FIX POSITIONS FOR CYCLONE NO. 5
14 JUL TO 20 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCHY NAV-MET	FIX LVL	FLT LVL WIND DIR	VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T1/TO	EYE FORM	RIEN-ATION	EYE DIA	POSIT OF RADAR	MSA NMBR
1	1305012	16.2N 114.7E	SAI	(11.5/1.5-/ / HRS)					PCN 5	DMSP										
2	1305012	16.2N 113.3E	SAI	(12.5/2.5 /D1.5/24HRS)					PCN 5	DMSP										
3	1400442	18.3N 115.5E	SAI	(12.0/2.0 /D1.0/24HRS)					NOAA 2	(NESS)	(CONF 02)									
4	1400452	17.4N 110.2E	SAI	(12.0/2.0 /D0.5/24HRS)					NOAA 2		(CONF 01)									
5	1400462	16.7N 112.5E	SAI	(11.5/1.5 /S /24HRS)					PCN 5	DMSP										
6	1400462	18.0N 115.0E	SAI	(11.5/1.5 /S / HRS)					PCN 5	DMSP										
7	1400462	17.3N 112.8E	SAI	(13.0/3.0 /D0.5/24HRS)					PCN 5	DMSP										
8	1412502	17.7N 114.5E	P 10	2 - 150		20	50		20	-	-	-	990	303	- -	-	- -	-		2
9	1415112	17.9N 114.3E	P	5 2 - 120		20	330		30	-	-	-	992	303	- -	-	- -	-		2
10	1417292	18.1N 114.2E	SAI						PCN 3	DMSP										
11	1417302	17.8N 113.3E	SAI						PCN 6	DMSP										
12	1417302	17.5N 114.0E	SAI						PCN 3	DMSP										
13	1422262	17.5N 113.8E	P	5 5 - 240		42	230		30	40	230	30	-	-	14 11	-	- -	-		2
14	1501352	18.0N 113.0E	SAI	(13.0/3.0 /D1.0/24HRS)					NOAA 2	(NESS)	(CONF 02)									
15	1501332	18.0N 114.0E	SAI	(13.5/3.5 /D1.5/25HRS)					NOAA 2		(CONF 01)									
16	1503052	17.9N 113.6E	P	2 5 - 240		50	190	120	120	50	190	120	-	-	17 14	-	- -	-		2
17	1504362	18.0N 113.9E	SAI	(13.0/3.0 /D1.5/24HRS)					PCN 3	DMSP										
18	1504362	17.7N 113.4E	SAI	(13.5/3.5 /D / HRS)					PCN 3	DMSP										
19	1504362	17.3N 113.4E	SAI	(14.0/4.0 /D1.0/24HRS)					PCN 5	DMSP										
20	1510502	16.4N 113.6E	P	10 10 - 210		50	90		30	65	90	30	-	-	15 -	-	- -	-		4
21	1515002	18.1N 113.5E	P	10 10 - 160		60	60		60	-	-	-	-	-	15 -	-	- -	-		4
22	1517152	18.7N 113.8E	SAI						PCN 3	DMSP										
23	1517152	17.3N 113.7E	SAI						PCN 5	DMSP										
24	1520502	18.9N 114.1E	LHUR	- 15///															22.3N 114.2E	
25	1523102	19.1N 113.3E	P	2 2 700		240	80	130	85	65	130	120	978	292	15 13	-	- -	-		C
26	1600302	20.0N 113.5E	SAI	(13.5/3.5 /D0.5/24HRS)					NOAA 2	(NESS)										
27	1600412	19.8N 113.8E	SAI	(14.0/4.0 /D0.5/25HRS)					NOAA 2				(CONF 02)							
28	1603202	19.9N 113.4E	P	5 5 - -					-	-	-	-	978	290	15 -	-	- -	-		C
29	1604172	20.4N 113.6E	SAI	(14.5/4.5 /D0.5/24HRS)					PCN 1	DMSP										
30	1604172	20.2N 113.7E	SAI	(15.0/5.0 /D / HRS)					PCN 1	DMSP										
31	1604172	20.3N 113.6E	SAI	(13.0/3.0 / / HRS)					PCN 1	DMSP										
32	1604172	20.3N 113.7E	SAI	(13.5/3.5 /D / HRS)					PCN 1	DMSP										
33	1605002	20.0N 113.9E	LHUR	-												-	- -	-	22.3N 114.2E	
34	1600002	20.4N 113.8E	LHUR	-												-	- -	-	22.3N 114.2E	
35	1607002	20.3N 113.7E	LHUR	-												-	- -	-	22.3N 114.2E	
36	1609002	20.6N 113.6E	LHUR	-												-	- -	-	22.3N 114.2E	
37	1610002	20.8N 113.9E	LHUR	-												-	- -	-	22.3N 114.2E	
38	1611002	20.7N 114.1E	LHUR	-												-	- -	-	22.3N 114.2E	
39	1612102	21.0N 114.2E	LHUR	-												-	- -	-	22.3N 114.2E	
40	1613002	21.1N 114.0E	LHUR	-												-	- -	-	22.3N 114.2E	
41	1614002	21.2N 114.1E	LHUR	-												-	- -	-	22.3N 114.2E	
42	1615002	21.4N 114.3E	LHUR	-												-	- -	-	22.3N 114.2E	
43	1616002	21.0N 114.1E	LHUR	-												-	- -	-	22.3N 114.2E	
44	1617002	21.0N 114.2E	LHUR	-												-	- -	-	22.3N 114.2E	
45	1617002	21.0N 114.0E	SAI						PCN 2	DMSP										
46	1617012	21.4N 114.0E	SAI						PCN 3	DMSP										
47	1617012	21.9N 114.2E	SAI						PCN 1	DMSP										
48	1617012	21.7N 114.1E	SAI						PCN 1	DMSP										
49	1618002	21.7N 114.2E	LHUR	-												-	- -	-	22.3N 114.2E	
50	1619002	22.0N 114.3E	LHUR	-															22.3N 114.2E	

TYPHOON DOT
FIX POSITIONS FOR CYCLONE NO. 5
14 JUL TO 20 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	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	RIEN-ATION	EYE DIA	POSIT OF RADAR	MSN NMBR
51	1620002	22.2N 114.4E	EHDR	-							-	- -	-	22.3N 114.2E	
52	1621002	22.3N 114.4E	EHDR	-							-	- -	-	22.3N 114.2E	
53	1623002	22.6N 114.5E	EHDR	-							-	- -	-	22.3N 114.2E	
54	1700002	22.7N 114.6E	EHDR	-							-	- -	-	22.3N 114.2E	
55	1701002	22.7N 114.8E	EHDR	-							-	- -	-	22.3N 114.2E	
56	1702002	23.0N 114.8E	EHDR	-							-	- -	-	22.3N 114.2E	
57	1703002	23.3N 115.0E	EHDR	-							-	- -	-	22.3N 114.2E	
58	1704062	23.2N 115.4E	SAT	(T3.0/3.5 /W0.5/24HRS)			PCN 3 DMSP								
59	1704022	23.4N 114.9E	SAT	(T2.5/3.5-/W2.0/24HRS)			PCN 3 DMSP								
60	1706062	22.9N 115.1E	SAT	(T4.0/4.0 /S /24HRS)			PCN 3 DMSP								
61	1716462	25.0N 116.9E	SAT				PCN 5 DMSP								
62	1716462	25.0N 116.7E	SAT				PCN 5 DMSP								
63	1810322	27.9N 125.7E	SAT				PCN 5 DMSP								
64	1810332	27.2N 125.0E	SAT				PCN 5 DMSP								
65	1901292	28.0N 126.0E	SAT	(T2.0/2.0 /D0.5/24HRS)			NOAA 2 (NESS)								
66	1901302	28.0N 125.8E	SAT	(T2.0/2.0 /D0.5/24HRS)			NOAA 2		(CCNF 02)						
67	1903332	28.2N 127.1E	SAT	(T2.0/2.0 /D /24HRS)			PCN 5 DMSP								
68	1903332	28.5N 126.4E	SAT	(T2.0/2.0 /D1.0/24HRS)			PCN 5 DMSP								
69	1903332	28.4N 127.8E	SAT	(T2.0/2.0 /D /24HRS)			PCN 3 DMSP								
70	1903332	28.7N 126.0E	SAT	(T1.5/1.5 /D /24HRS)			PCN 5 DMSP								
71	1904002	28.0N 126.8E	EHDR	- 20 DEG SPIRAL OVERLAY EYE. FAIR FIX										26.4N 127.8E	
72	1905102	27.8N 126.9E	EHDR	- FAIR FIX										26.4N 127.8E	
73	1905402	28.3N 127.3E	EHDR	- 20 DEG SPIRAL OVERLAY EYE, POOR FIX										26.4N 127.8E	
74	1906102	28.9N 127.3E	EHDR	- 20 DEG SPIRAL OVERLAY EYE										26.4N 127.8E	
75	1915402	30.7N 127.1E	P 20 10	700 150 30 50	15	- - -		994	303	14 -	-	- -	-		7
76	1916172	31.4N 127.0E	SAT				PCN 5 DMSP								
77	1916172	30.6N 126.3E	SAT				PCN 3 DMSP								
78	1916172	31.0N 127.1E	SAT				PCN 5 DMSP								
79	1920002	31.3N 127.1E	EHDR	- 30/1										33.4N 130.4E	
80	1921002	31.5N 127.2E	EHDR	- 35/12										33.4N 130.4E	
81	1922002	32.1N 127.0E	EHDR	- 35/11										33.4N 130.4E	
82	1923002	32.4N 127.0E	EHDR	- 35/11										33.4N 130.4E	
83	2000242	33.2N 126.2E	SAT	(T2.0/2.0 /W /24HRS)			NOAA 2 (NESS)								
84	2000262	33.8N 126.3E	SAT	(T2.0/2.0 /S /23HRS)			NOAA 2		(CCNF 01)						
85	2003192	33.8N 126.3E	SAT	(T1.5/2.0 /W /24HRS)			PCN 3 DMSP								
86	2016042	37.4N 126.3E	SAT				PCN 3 DMSP								
87	1623002	22.2N 114.3E	CPA	WAGLAND ISLAND			57 MAX GUST 87KT								
88	1712002	22.8N 116.4E	SCF				30								
89	1800002	25.8N 118.8E	SCF				35								

TYPHOON ELLEN
FIX POSITIONS FOR CYCLONE NO. 6
17 JUL TO 29 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	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	RIEN-ATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	1623302	20.5N 138.0E	SAT	(T2.0/2.0 /D1.0/23HRS)			NOAA 2 (NESS)		(CCNF 01)						
2	1623402	20.0N 138.0E	SAT	(T2.0/2.0 /D1.0/23HRS)			NOAA 2		(CCNF 01)						
3	1702212	20.5N 138.3E	SAT	(T1.5/1.5 /D0.5/24HRS)			PCN 3 DMSP								
4	1702212	20.3N 138.3E	SAT	(T2.5/2.5 / / HRS)			PCN 3 DMSP								
5	1713042	21.0N 139.9E	SAT				PCN 3 DMSP								
6	1713042	21.0N 139.3E	SAT				PCN 3 DMSP								
7	1726102	22.2N 139.0E	P 5 3	700 280 70 180			20 55 180 10	978	290	16 9	CIRC		10		1
8	1800332	22.2N 138.2E	SAT	(T3.5/3.5 /D1.5/24HRS)			NOAA 2 (NESS)								
9	1800342	22.4N 138.6E	SAT	(T3.5/3.2 /D1.5/25HRS)			NOAA 2		(CCNF 01)						
10	1800362	22.4N 138.6E	SAT	(T3.5/3.5 /D2.5/24HRS)			PCN 1 DMSP								
11	1802002	22.4N 138.8E	SAT	(T4.0/4.0 /D / HRS)			PCN 1 DMSP								
12	1802002	22.5N 138.8E	SAT	(T4.5/4.5 /D2.0/23HRS)			PCN 3 DMSP								
13	1803132	22.4N 138.3E	P 5 4	700 260 70 180			18 65 180 10	978	288	15 9	CIRC		20		1
14	1803402	22.5N 138.4E	SAT	(T4.5/4.5 / / HRS)			PCN 1 DMSP								
15	1803482	22.5N 138.2E	SAT	(T3.5/3.5 /D2.5/24HRS)			PCN 1 DMSP								
16	1809352	22.7N 138.4E	P 5 5	700 - 65 310			10 50 310 30	969	284	15 11	CIRC		20		2
17	1814502	23.0N 137.9E	SAT				PCN 2 DMSP								
18	1814502	23.0N 138.1E	SAT				PCN 2 DMSP								
19	1814502	22.9N 138.0E	SAT				PCN 2 DMSP								
20	1816322	23.1N 138.4E	SAT				PCN 1 DMSP								
21	1818362	23.1N 137.8E	SAT				PCN 1 DMSP								
22	1816322	23.1N 138.0E	SAT				PCN 1 DMSP								
23	1822002	24.0N 138.2E	P 5 3	700 150 100 170			10 110 50 8	944	262	2. 12	CIRC		17		1
24	1823322	24.0N 138.0E	SAT	(T4.0/4.0 /D0.5/24HRS)			NOAA 2 (NESS)								
25	1823332	24.0N 138.0E	SAT	(T5.5/5.5 /D2.0/23HRS)			NOAA 2		(CCNF 01)		-	- -	-		-
26	1900402	24.7N 138.2E	AC R												
27	1901512	25.1N 138.1E	SAT	(T3.5/3.5 /D2.5/24HRS)			PCN 1 DMSP								
28	1901512	24.8N 138.0E	SAT	(T5.5/5.5 /D1.0/24HRS)			PCN 1 DMSP								
29	1903332	25.3N 138.2E	SAT	(T5.0/5.0 /D1.5/24HRS)			PCN 1 DMSP								
30	1903332	25.2N 138.0E	SAT	(T4.5/4.5 /D1.0/24HRS)			PCN 1 DMSP								
31	1903332	25.2N 138.5E	SAT	(T5.0/5.0 /D1.0/25HRS)			PCN 1 DMSP								
32	1903332	25.3N 138.3E	SAT	(T5.5/5.5 /D1.0/24HRS)			PCN 1 DMSP								
33	1905202	25.8N 138.2E	P 5 1	700 270 100 200			5 100 300 -8	941	257	23 14	CIRC		12		4
34	1915302	26.5N 138.4E	P 10 5	700 280 80 230			25 - -	952	269	2. 13	ELIP	L-NE	20X15		4
35	1916172	27.0N 138.5E	SAT				PCN 3 DMSP								
36	1916172	27.0N 138.3E	SAT				PCN 1 DMSP								
37	1916172	27.7N 138.5E	SAT				PCN 3 DMSP								
38	1916292	28.0N 138.4E	P - 5	700 30 45 300			30 - - -	962	277	2 -	-	- -	-		6
39	1921052	28.8N 138.3E	P 3 10	700 120 55 20			30 50 350 15	973	286	2 16	-	- -	-		6
40	2000252	29.9N 138.0E	SAT	(T2.5/3.5 /W1.5/24HRS)			NOAA 2 (NESS)								
41	2000272	29.9N 138.0E	SAT	(T3.0/4.0 /W2.5/25HRS)			NOAA 2		(CCNF 01)						
42	2003192	30.2N 137.9E	SAT	(T3.5/4.5 /W1.0/24HRS)			PCN 3 DMSP								
43	2003192	30.2N 138.1E	SAT	(T3.5/4.5 /W1.5/24HRS)			PCN 3 DMSP								
44	2003192	30.2N 137.6E	SAT	(T3.0/4.0-/W1.5/24HRS)			PCN 3 DMSP								
45	2004172	30.4N 137.9E	P 4 5	- 250 45 160			50 40 180 70	981	294	16 6	-	- -	-		7
46	2009002	31.1N 137.6E	P 5 5	- 110 45 360			25 30 300 35	985	297	18 10	-	- -	-		7
47	2016062	32.1N 136.7E	SAT				PCN 3 DMSP								
48	2016002	32.1N 136.6E	SAT				PCN 3 DMSP								
49	2019202	32.9N 136.3E	P 3 5	700 210 45 100			45 - - -	990	300	15 11	-	- -	-		8
50	2021002	32.3N 136.5E	P 5 5	700 200 40 100			40 20 110 60	989	300	14 12	-	- -	-		8

TYPHOON ELLEN
FIX POSITIONS FOR CYCLONE NO. 6
17 JUL TO 29 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 TI/TO	EYE FORM	ORIENTATION	EYE DIA	POSIT OF RADAR	MSG NMBR
51	210121Z	32.0N 135.0E	SAT	(T2.0/3.0 /W1.0/25HRS)			NOAA 2	(CONF 02)							
52	210304Z	32.1N 136.2E	SAT	(T2.0/3.0 /W1.5/24HRS)			PCN 3 DMSP								
53	210304Z	31.9N 136.2E	SAT	(T2.0/3.0-/W1.0/24HRS)			PCN 3 DMSP								
54	210315Z	32.0N 136.5E	P	5 5	-	40 20 310 33	15 340 50	994	304	15 -	-	- -	-		e
55	211548Z	31.9N 136.6E	SAT				PCN 3 DMSP								
56	212324Z	32.2N 135.0E	SAT	(T1.5/2.5 /W1.0/24HRS)			NOAA 2 (NESS)								
57	220022Z	31.2N 136.0E	SAT	(T2.5/2.5 /D0.5/23HRS)			NOAA 2	(CONF 01)							
58	220249Z	31.4N 136.4E	SAT	(T2.0/2.0 /0 /24HRS)			PCN 3 DMSP								
59	220249Z	31.5N 136.3E	SAT	(T2.0/2.0 /W /24HRS)			PCN 3 DMSP								
60	221533Z	30.8N 135.7E	SAT				PCN 3 DMSP								
61	221533Z	30.8N 135.5E	SAT				PCN 3 DMSP								
62	230036Z	31.1N 133.9E	P	5 5	-	320 35 220 20	30 220 30	997	308	12 -	-	- -	-		10
63	230110Z	31.1N 131.8E	SAT	(T3.0/3.0 /D1.0/24HRS)			NOAA 2 (NESS)	(CONF 01)							
64	230118Z	31.2N 131.5E	SAT	(T3.0/3.0 /D0.5/25HRS)			NOAA 2	(CONF 01)							
65	230235Z	30.7N 132.6E	SAT	(T3.0/3.0 /D1.0/24HRS)			PCN 5 DMSP								
66	230235Z	30.7N 132.5E	SAT	(T3.5/3.5 /D1.5/24HRS)			PCN 3 DMSP								
67	230235Z	31.0N 132.3E	SAT	(T3.0/3.0 /D1.0/24HRS)			PCN 5 DMSP								
68	230300Z	30.8N 132.9E	LRDR	- 25411										30.6N 131.0E	
69	230300Z	30.8N 132.5E	LRDR	- 357/1										33.4N 130.4E	
70	230400Z	30.9N 132.4E	LRDR	- 35//1										33.4N 130.4E	
71	230500Z	30.9N 132.4E	LRDR	- 35//1										33.4N 130.4E	
72	230600Z	30.8N 132.3E	LRDR	- 303//										30.6N 131.0E	
73	230600Z	30.9N 132.2E	LRDR	- 357/1										33.4N 130.4E	
74	230700Z	30.8N 132.1E	LRDR	- 303//										30.6N 131.0E	
75	230700Z	30.9N 132.0E	LRDR	- 35//1										33.4N 130.4E	
76	230800Z	30.9N 131.8E	LRDR	- 35//1										33.4N 130.4E	
77	230800Z	30.8N 131.8E	LRDR	- 303/1										30.6N 131.0E	
78	230900Z	30.7N 131.6E	LRDR	- 303//										30.6N 131.0E	
79	230900Z	30.5N 131.7E	LRDR	- 35//										33.4N 130.4E	
80	231000Z	30.7N 131.8E	LRDR	- 35//0										33.4N 130.4E	
81	231200Z	30.4N 131.2E	LRDR	- 25890										33.4N 130.4E	
82	231300Z	30.1N 130.8E	LRDR	- 35//1										33.4N 130.4E	
83	231500Z	30.1N 131.4E	LRDR	- 10101										30.6N 131.0E	
84	231500Z	29.8N 130.8E	LRDR	- 35//0										33.4N 130.4E	
85	231519Z	30.1N 130.9E	SAT				PCN 5 DMSP								
86	231519Z	29.9N 130.9E	SAT				PCN 5 DMSP								
87	231519Z	30.0N 131.5E	SAT				PCN 5 DMSP								
88	231600Z	30.1N 131.2E	LRDR	- 10172										30.6N 131.0E	
89	231700Z	30.1N 131.0E	LRDR	- 10232										30.6N 131.0E	
90	231700Z	30.1N 131.0E	LRDR	- 203/1										28.4N 129.5E	
91	231701Z	29.9N 131.2E	SAT				PCN 5 DMSP								
92	231701Z	29.9N 130.9E	SAT				PCN 5 DMSP								
93	231800Z	30.2N 130.9E	LRDR	- 10332										30.6N 131.0E	
94	231800Z	30.1N 130.9E	LRDR	- 20321										28.4N 129.5E	
95	231900Z	30.2N 130.8E	LRDR	- 30341										28.4N 129.5E	
96	231900Z	30.3N 130.8E	LRDR	- 10312										30.6N 131.0E	
97	232000Z	30.2N 130.7E	LRDR	- 10312										30.6N 131.0E	
98	232000Z	30.2N 130.7E	LRDR	- 20311										28.4N 129.5E	
99	232100Z	30.2N 130.6E	LRDR	- 30341										28.4N 129.5E	
100	232100Z	30.2N 130.7E	LRDR	- 10312										30.6N 131.0E	
101	232200Z	30.3N 130.6E	LRDR	- 10312										30.6N 131.0E	
102	232200Z	30.3N 130.6E	LRDR	- 30421										28.4N 129.5E	
103	232300Z	30.3N 130.6E	LRDR	- 30411										28.4N 129.5E	
104	232300Z	30.3N 130.4E	LRDR	- 20342										30.6N 131.0E	
105	240000Z	30.4N 130.2E	LRDR	- 25701										28.4N 129.5E	
106	240000Z	30.4N 130.3E	LRDR	- 20312										30.6N 131.0E	
107	240112Z	30.1N 129.1E	SAT	(T2.5/3.0 /W0.5/24HRS)			NOAA 2 (NESS)	(CONF 01)							
108	240016Z	30.1N 129.0E	SAT	(T2.0/3.0 /W1.0/24HRS)			NOAA 2	(CONF 01)							
109	240100Z	30.5N 130.1E	LRDR	- 65/01										28.4N 129.5E	
110	240100Z	30.5N 130.3E	LRDR	- 30342										30.6N 131.0E	
111	240200Z	30.5N 129.8E	LRDR	- 20312										30.6N 131.0E	
112	240200Z	30.5N 130.0E	LRDR	- 20871										28.4N 129.5E	
113	240220Z	29.7N 129.5E	SAT	(T3.0/3.0 /W /24HRS)			PCN 5 DMSP								
114	240220Z	30.1N 130.0E	SAT	(T2.0/3.0 /W1.0/24HRS)			PCN 5 DMSP								
115	240220Z	30.0N 129.9E	SAT	(T3.0/3.0 /W0.5/24HRS)			PCN 3 DMSP								
116	240300Z	30.5N 129.9E	LRDR	- 55712										33.4N 130.4E	
117	240300Z	30.5N 129.8E	LRDR	- 21901										28.4N 129.5E	
118	240310Z	30.5N 129.8E	P	2 5	-	250 30 190 30	35 250 28	1001	307	10 -	-	- -	-		12
119	240400Z	30.5N 129.8E	LRDR	- 20811										28.4N 129.5E	
120	240402Z	30.5N 129.8E	SAT	(T3.0/3.0 /W /24HRS)			PCN 5 DMSP								
121	240402Z	30.3N 129.8E	SAT	(T3.5/3.5 / / HRS)			PCN 3 DMSP								
122	240402Z	30.3N 129.9E	SAT	(T2.0/3.0 /W1.0/25HRS)			PCN 3 DMSP								
123	240700Z	30.6N 129.8E	LRDR	- 6///1										28.4N 129.6E	
124	240700Z	30.7N 129.7E	LRDR	- 55812										33.4N 130.4E	
125	240800Z	30.7N 129.7E	LRDR	- 5////										28.4N 129.6E	
126	240900Z	30.7N 129.6E	LRDR	- 55/1										28.4N 129.5E	
127	241000Z	30.7N 129.6E	LRDR	- 10501										33.4N 130.4E	
128	241022Z	30.8N 129.5E	P	3 5	700	270 15 210 40	35 330 10	998	307	13 9	-	- -	-		13
129	241100Z	30.8N 129.6E	LRDR	- 10501										33.4N 130.4E	
130	241100Z	30.7N 129.4E	LRDR	- 55/11										28.4N 129.5E	
131	241200Z	30.7N 129.5E	LRDR	- 55/11										28.4N 129.5E	
132	241200Z	30.9N 129.6E	LRDR	- 10581										33.4N 130.4E	
133	241300Z	30.9N 129.6E	LRDR	- 11801										33.4N 130.4E	
134	241300Z	30.8N 129.6E	LRDR	- 22911										28.4N 129.5E	
135	241400Z	30.9N 129.5E	LRDR	- 5//61										33.4N 130.4E	
136	241400Z	31.0N 129.6E	LRDR	- 65/41										28.4N 129.5E	
137	241500Z	31.1N 129.6E	LRDR	- 20302										33.4N 130.4E	
138	241500Z	31.2N 129.4E	P	3 5	700	250 25 190 20	- - -	1002	309	14 12	-	- -	-		13
139	241600Z	31.3N 129.5E	LRDR	- 20712										33.4N 130.4E	
140	241640Z	31.4N 129.6E	SAT				PCN 3 DMSP								
141	241640Z	31.0N 129.3E	SAT				PCN 3 DMSP								
142	241700Z	31.3N 129.5E	LRDR	- 21932										33.4N 130.4E	
143	242000Z	31.4N 129.5E	LRDR	- 21952										33.4N 130.4E	
144	242000Z	30.8N 129.4E	LRDR	- 55/10										28.4N 129.5E	
145	242100Z	31.5N 129.5E	LRDR	- 21603										33.4N 130.4E	
146	242200Z	31.6N 129.5E	LRDR	- 11612										33.4N 130.4E	
147	242220Z	31.8N 129.5E	P	- 10	800	210 35 120 35	15 120 20	-	437	2 -	CIRC		20		14
148	242300Z	31.7N 129.5E	LRDR	- 10612										33.4N 130.4E	
149	250000Z	31.8N 129.6E	LRDR	- 10612										33.4N 130.4E	
150	250100Z	31.9N 129.5E	LRDR	- 10412										33.4N 130.4E	

TYPHOON ELLEN
FIX POSITIONS FOR CYCLONE NO. 6

17 JUL TO 29 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	FLT LVL WIND DIR VEL	SFC WIND BRG RNG	MAX OBS VEL	MAX OBS BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T/TD	EYE FORM	RIEN-ATION	EYE DIA	POSIT OF RADAR	MSA NMBR
151	250110Z	32.2N 128.9E	SAI		(T2.0/2.5 /W0.5/24HRS)		NOAA 2	(NESS)		(CONF 01)							
152	250111Z	32.2N 129.0E	SAI		(T2.0/2.0 /S /26HRS)		NOAA 2			(CONF 01)							
153	250347Z	32.1N 129.0E	SAI		(T3.0/3.0 /W /24HRS)		PCN 3	DMSP									
154	250348Z	32.1N 129.0E	SAI		(T3.5/3.5 /S /24HRS)		PCN 3	DMSP									
155	250500Z	32.2N 129.0E	LRDR		- 10402											33.4N 136.4E	
156	250900Z	32.3N 129.9E	LRDR		- 10412											33.4N 136.4E	
157	250700Z	32.3N 130.1E	LRDR		- 10223											33.4N 136.4E	
158	250800Z	32.5N 130.2E	LRDR		- 20312											33.4N 136.4E	
159	250900Z	32.6N 130.3E	LRDR		- 11211											33.4N 136.4E	
160	251000Z	32.8N 130.4E	LRDR		- 45/71											33.4N 136.4E	
161	251100Z	32.8N 130.6E	LRDR		- 45/71											33.4N 136.4E	
162	251200Z	32.7N 130.8E	LRDR		- 45/71											33.4N 136.4E	
163	251300Z	32.8N 130.9E	LRDR		- 45/71											33.4N 136.4E	
164	251400Z	32.9N 131.0E	LRDR		- 45/70											33.4N 136.4E	
165	251500Z	32.9N 131.1E	LRDR		- 55/70											33.3N 134.2E	
166	251500Z	32.9N 131.1E	LRDR		- 45/70								-	- -	-	33.4N 136.4E	
167	251600Z	32.9N 131.4E	LRDR		-											33.3N 134.2E	
168	251600Z	32.9N 131.2E	LRDR		- 45/70											33.4N 136.4E	
169	251700Z	32.9N 131.4E	LRDR		- 55/70											33.3N 134.2E	
170	251800Z	33.0N 131.8E	LRDR		- 55/71											33.3N 134.2E	
171	251800Z	32.9N 131.5E	LRDR		- 52601											30.6N 131.0E	
172	251900Z	33.0N 131.8E	LRDR		- 35/17								-	- -	-	33.3N 134.2E	
173	260000Z	33.0N 132.3E	LRDR		-												
174	260010Z	32.4N 132.0E	SAI		(T2.5/2.5 /W0.5/23HRS)		NOAA 2	(NESS)									
175	260011Z	33.5N 132.5E	SAI		(T2.5/2.5 /W0.5/23HRS)		NOAA 2			(CONF 01)							
176	260100Z	33.0N 132.4E	LRDR		-								-	- -	-	33.3N 134.2E	
177	260200Z	33.0N 132.6E	LRDR		-								-	- -	-	33.3N 134.2E	
178	260300Z	33.0N 132.7E	LRDR		-								-	- -	-	33.3N 134.2E	
179	260400Z	32.9N 132.9E	LRDR		-								-	- -	-	33.3N 134.2E	
180	260500Z	33.0N 133.0E	LRDR		-								-	- -	-	33.3N 134.2E	
181	260550Z	33.0N 133.1E	LRDR		-								-	- -	-	33.3N 134.2E	
182	260600Z	32.9N 133.5E	LRDR		-								-	- -	-	33.3N 134.2E	
183	261040Z	32.6N 133.7E	LRDR		-								-	- -	-	33.3N 134.2E	
184	261400Z	32.5N 133.8E	LRDR		-								-	- -	-	33.3N 134.2E	
185	261450Z	32.6N 133.9E	LRDR		-								-	- -	-	33.3N 134.2E	
186	262100Z	32.1N 134.5E	LRDR		-								-	- -	-	33.3N 134.2E	
187	262300Z	32.0N 134.6E	LRDR		-								-	- -	-	33.3N 134.2E	
188	270000Z	31.9N 134.7E	LRDR		- 5////											33.3N 134.2E	
189	270100Z	31.9N 134.8E	LRDR		- 5////											33.3N 134.2E	
190	270102Z	32.6N 135.0E	SAI		(T2.5/2.5 /S /24HRS)		NOAA 2	(NESS)									
191	270100Z	32.6N 135.0E	SAI		(T2.0/2.5 /W0.5/23HRS)		NOAA 2			(CONF 01)							
192	270200Z	31.9N 134.8E	LRDR		- 5////											33.3N 134.2E	
193	270300Z	31.9N 134.8E	LRDR		- 5////											33.3N 134.2E	
194	280002Z	32.0N 136.0E	SAI		(T2.5/2.5 /S /24HRS)		NOAA 2	(NESS)									
195	280000Z	32.5N 136.0E	SAI		(T2.0/2.0 /S /23HRS)		NOAA 2			(CONF 01)							
196	280300Z	32.1N 136.9E	LRDR		- 20911											35.4N 136.7E	
197	280302Z	32.2N 136.0E	SAI		(T2.0/3.0 /W1.0/24HRS)		PCN 3	DMSP									
198	280300Z	32.4N 136.5E	SAI		(T1.5/1.5 / / HRS)		PCN 3	DMSP									
199	280500Z	32.3N 137.1E	LRDR		- 20911											35.4N 136.7E	
200	280600Z	32.5N 137.2E	LRDR		- 10801											35.4N 136.7E	
201	280700Z	32.6N 137.4E	LRDR		- 20711											35.4N 136.7E	
202	280800Z	32.7N 137.3E	LRDR		- 20811											35.4N 136.7E	
203	281100Z	33.1N 137.4E	LRDR		- 20961											35.4N 136.7E	
204	281400Z	33.3N 137.4E	LRDR		- 20552											35.4N 136.7E	
205	281500Z	33.5N 137.4E	LRDR		- 20542											35.4N 136.7E	
206	281700Z	33.6N 137.4E	LRDR		- 10372											35.4N 136.7E	
207	281500Z	33.7N 137.4E	LRDR		- 20772											35.4N 136.7E	
208	281340Z	33.6N 137.3E	SAI				PCN 3	DMSP									
209	281340Z	33.7N 137.2E	SAI				PCN 3	DMSP									
210	281900Z	34.3N 137.6E	LRDR		- 11372											34.6N 135.7E	
211	282100Z	34.4N 137.4E	LRDR		-								-	- -	-	34.6N 137.7E	
212	282300Z	34.5N 137.1E	LRDR		- 10272											35.2N 137.0E	
213	290100Z	32.7N 136.0E	SAI		(T2.0/2.0-/S /25HRS)		NOAA 2			(CONF 01)							
214	290200Z	34.8N 136.8E	LRDR		- 21452											35.2N 137.0E	
215	290249Z	35.4N 137.1E	SAI		(T1.5/2.0 /W0.5/24HRS)		PCN 3	DMSP									
216	290249Z	32.5N 136.0E	SAI		(T1.5/1.5 / / HRS)		PCN 3	DMSP									
217	290300Z	34.8N 136.7E	LRDR		- 25452											35.2N 137.0E	
218	280000Z	32.1N 136.5E	SCF					35									
219	280600Z	32.7N 137.3E	SCF					50									

TROPICAL STORM FRAN
FIX POSITIONS FOR CYCLONE NO. 7
29 JUL TO 30 JUL

FIX NO.	TIME	POSIT	FIX CAT	ACCMY NAV-MET	FIX LVL	FLT LVL WIND DIR	FLT LVL WIND VEL	FLT LVL WIND BRG	FLT LVL 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 TI/TO	EYE FORM	RIEN-ATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	242322Z	12.0N 136.0E	SAT	(T1.5/1.5 /D0.5/24HRS)						NOAA 2 (NESS)			(CONF 02)							
2	250349Z	11.4N 136.0E	SAT	(T1.5/1.5 /D / HRS)						PCN 5 DMSP										
3	250348Z	11.2N 135.6E	SAT	(T2.0/2.0 /D1.0/24HRS)						PCN 5 DMSP										
4	260018Z	11.5N 130.5E	SAT	(T1.5/1.5 /D0.5/23HRS)						NOAA 2			(CONF 01)							
5	290333Z	11.3N 136.0E	SAT	(T1.5/1.5 /S / HRS)						PCN 5 DMSP										
6	270112Z	16.3N 132.3E	SAT	(T2.0/2.0 /D0.5/25HRS)						NOAA 2			(CONF 01)							
7	270318Z	16.7N 132.6E	SAT	(T2.0/2.0 / / HRS)						PCN 3 DMSP										
8	270318Z	16.7N 132.5E	SAT	(T1.5/1.5 /S /24HRS)						PCN 3 DMSP										
9	271006Z	17.6N 130.1E	SAT							PCN 5 DMSP										
10	280010Z	19.0N 127.5E	SAT	(T2.0/2.0 /S /24HRS)						NOAA 2 (NESS)			(CONF 02)							
11	280014Z	19.0N 127.5E	SAT	(T2.0/2.0 /S /23HRS)						NOAA 2			(CONF 02)							
12	280304Z	17.1N 127.5E	SAT	(T2.0/2.0 /S /24HRS)						PCN 3 DMSP										
13	280304Z	17.5N 127.3E	SAT	(T1.5/1.5 /S /24HRS)						PCN 5 DMSP										
14	281540Z	19.0N 124.7E	SAT							PCN 6 DMSP										
15	281540Z	18.1N 124.7E	SAT							PCN 5 DMSP										
16	282350Z	19.2N 123.5E	P	5 6 -	110	30	30	50	25	40	40	1004	312	14	13	-	- -	-		4
17	290100Z	19.7N 124.0E	SAT	(T2.5/2.5 /D0.5/25HRS)						NOAA 2			(CONF 01)							
18	290300Z	19.2N 123.7E	P	6 10 -	220	40	150	20	40	140	23	1002	311	12	-	-	- -	-		4
19	290431Z	19.4N 122.5E	SAT	(T3.0/3.0 /D / HRS)						PCN 5 DMSP										
20	291143Z	19.3N 122.8E	P	5 15 -	700	140	13	50	20	-	-	-	1004	312	11	-	-	-	-	5
21	291918Z	19.3N 122.3E	P	5 10 -	700	60	30	340	90	-	-	-	1005	313	11	-	-	-	-	5
22	291115Z	20.4N 120.6E	SAT							PCN 5 DMSP										
23	292221Z	19.7N 122.3E	P	- 10 -	700	210	25	150	15	15	220	10	1008	314	9	-	-	-	-	6
24	300000Z	22.0N 124.0E	SAT	(T1.5/1.5 /W1.0/23HRS)						NOAA 2			(CONF 01)							
25	300400Z	22.1N 121.6E	P	3 15 -	350	25	190	15	15	160	40	1008	316	11	-	-	- -	-		7
26	300410Z	19.5N 119.3E	SAT	(T1.0/2.0 /W2.0/24HRS)						PCN 5 DMSP										

TYPHOON GEORGIA
FIX POSITIONS FOR CYCLONE NO. 8
09 AUG TO 12 AUG

FIX NO.	TIME	POSIT	FIX CAT	ACCMY NAV-MET	FIX LVL	FLT LVL WIND DIR	FLT LVL WIND VEL	FLT LVL WIND BRG	FLT LVL 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 TI/TO	EYE FORM	RIEN-ATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	080040Z	20.0N 119.0E	SAT	(T2.0/2.0 /D1.0/24HRS)						NOAA 2 (NESS)			(CONF 01)							
2	080041Z	20.0N 119.0E	SAT	(T2.0/2.0 /D0.5/24HRS)						NOAA 2			(CONF 01)							
3	080310Z	21.9N 117.6E	SAT	(T1.5/1.5 /D / HRS)						ESSA 8 (VTBU)										
4	080342Z	20.8N 119.4E	SAT	(T1.5/1.5 /D0.5/24HRS)						PCN 5 DMSP										
5	081031Z	20.2N 117.7E	SAT							PCN 6 DMSP										
6	081031Z	20.5N 118.6E	SAT							PCN 5 DMSP										
7	090135Z	20.0N 117.0E	SAT	(T3.0/3.0 /D1.0/24HRS)						NOAA 2 (NESS)										
8	090143Z	20.0N 117.0E	SAT	(T3.0/3.0 /D1.0/25HRS)						NOAA 2			(CONF 01)							1
9	090210Z	19.8N 117.3E	P	10 5 -	50	35	340	35	30	340	35	992	302	12	-	-	- -	-		
10	090419Z	20.2N 116.8E	SAT	(T2.0/2.0 /D0.5/23HRS)						ESSA 8 (VTBU)									19.1N 117.1E	-
11	090500Z	19.8N 117.1E	SRDR	-												-	- -	-		
12	090332Z	19.9N 116.7E	SAT	(T2.5/2.5 /D1.0/24HRS)						PCN 3 DMSP										
13	090352Z	19.9N 117.0E	SAT	(T3.0/3.0 /D / HRS)						PCN 3 DMSP										
14	090332Z	20.0N 116.8E	SAT	(T2.5/2.5 /D /24HRS)						PCN 3 DMSP										
15	090352Z	19.7N 117.0E	SAT	(T2.0/2.0 /D1.0/24HRS)						PCN 3 DMSP										
16	090314Z	19.7N 116.6E	SAT	(T2.0/2.0 / / HRS)						PCN 3 DMSP										-
17	090600Z	19.9N 116.8E	SRDR	-												-	- -	-	22.3N 114.2E	-
18	090110Z	19.8N 116.5E	LRDR	- 25///															22.3N 114.2E	-
19	090900Z	19.8N 116.3E	LRDR	- 25///																2
20	090942Z	20.0N 116.3E	P	1 1 -	700	220	35	340	15	50	340	40	989	299	13	10	-	- -	-	
21	091200Z	19.7N 115.6E	LRDR	-													-	- -	-	
22	091500Z	19.8N 115.1E	LRDR	-													-	- -	-	22.3N 114.2E -
23	091510Z	19.8N 115.3E	P	1 1 -	700	230	45	150	10	-	-	-	980	294	15	10	CIRC		5	22.3N 114.2E -
24	091018Z	19.5N 115.1E	SAT							PCN 3 DMSP										2
25	091018Z	19.5N 115.3E	SAT							PCN 1 DMSP										
26	091018Z	19.2N 113.7E	SAT							PCN 4 DMSP										
27	091018Z	19.5N 114.7E	SAT							PCN 3 DMSP										
28	091018Z	19.4N 114.9E	SAT							PCN 5 DMSP										
29	091800Z	19.8N 114.7E	LRDR	-												-	- -	-	2.3N 114.2E	-
30	092100Z	19.4N 114.3E	LRDR	- 45///															2.3N 114.2E	-
31	092214Z	19.5N 114.5E	P	1 3 -	700	130	50	40	15	50	140	10	978	291	16	-	-	- -	-	
32	100000Z	19.5N 113.9E	LRDR	- 55///																3
33	100230Z	20.0N 113.5E	SAT	(T4.0/4.0 /D1.0/25HRS)						NOAA 2			(CONF 02)						22.3N 114.2E	-
34	100230Z	20.0N 113.5E	SAT	(T4.0/4.0 /D1.0/24HRS)						NOAA 2 (NESS)										
35	100304Z	19.0N 113.0E	SAT	(T4.0/4.0 /D2.0/24HRS)						ESSA 8 (VTBU)										
36	100350Z	19.5N 113.7E	P	5 2 -	160	55	30	20	65	180	10	978	290	17	-	CIRC		15		4
37	100500Z	19.5N 113.4E	SAT	(T4.0/4.0 /D2.0/24HRS)						PCN 3 DMSP										
38	100500Z	19.5N 113.1E	SAT	(T4.0/4.0+/D1.0/25HRS)						PCN 1 DMSP										
39	100600Z	19.5N 113.1E	LRDR	- 55///															22.3N 114.2E	
40	100850Z	19.5N 113.3E	P	- - -	170	40	-	-	-	-	-	976	288	17	-	-	- -	-		4
41	100850Z	19.3N 112.8E	LRDR	- 1061/															22.3N 114.2E	
42	101500Z	19.2N 112.7E	LRDR	- 1061/															22.3N 114.2E	
43	101500Z	19.1N 112.3E	LRDR	- 1061/															22.3N 114.2E	
44	101744Z	19.0N 112.2E	SAT							PCN 5 DMSP										
45	101744Z	19.0N 111.5E	SAT							PCN 1 DMSP										
46	101744Z	19.3N 112.5E	SAT							PCN 2 DMSP										
47	101600Z	19.1N 112.1E	LRDR	- 35///															22.3N 114.2E	
48	102100Z	19.1N 111.2E	LRDR	- 6////															22.3N 114.2E	
49	110000Z	19.1N 111.9E	LRDR	-												-	- -	-	22.3N 114.2E	
50	110131Z	19.0N 111.8E	SAT	(T4.0/4.0 /S /24HRS)						NOAA 2 (NESS)										
51	110132Z	19.0N 112.0E	SAT	(T4.5/4.5 /D0.5/23HRS)						NOAA 2			(CONF 01)							
52	110445Z	19.1N 111.6E	SAT	(T4.5/4.5 /D0.5/24HRS)						PCN 1 DMSP										
53	110445Z	19.3N 111.6E	SAT	(T4.5/4.5 /D0.5/24HRS)						PCN 1 DMSP										
54	110445Z	19.0N 111.7E	SAT	(T4.0/4.0 /S /24HRS)						PCN 1 DMSP										
55	111729Z	20.0N 111.7E	SAT							PCN 4 DMSP										
56	111729Z	20.1N 111.6E	SAT							PCN 1 DMSP										
57	111729Z	19.9N 111.3E	SAT							PCN 2 DMSP										
58	120000Z	20.3N 111.1E	LRDR	-												-	- -	-	22.3N 114.2E	
59	120029Z	20.4N 111.0E	SAT	(T5.0/5.0 /D0.5/23HRS)						NOAA 2			(CONF 02)							
60	120100Z	20.5N 111.1E	LRDR	-												-	- -	-	22.3N 114.2E	
61	120449Z	21.3N 111.8E	SAT	(T4.5/4.5 /D /23HRS)						ESSA 8 (VTBU)										
62	120400Z	21.0N 111.0E	LRDR	-												-	- -	-	22.3N 114.2E	
63	120430Z	20.9N 111.2E	SAT	(T4.5/4.5+/D0.5/24HRS)						PCN 1 DMSP										
64	120430Z	20.9N 111.1E	SAT	(T4.5/4.5 /S /24HRS)						PCN 1 DMSP										
65	120430Z	20.9N 111.1E	SAT	(T4.5/4.5 /S /24HRS)						PCN 1 DMSP										
66	121400Z	21.8N 110.8E	LRDR	-												-	- -	-	22.3N 114.2E	
67	121749Z	22.4N 110.7E	SAT							PCN 3 DMSP										
68	121749Z	22.4N 110.7E	SAT							PCN 5 DMSP										
69	121720Z	21.9N 110.6E	SAT							PCN 3 DMSP										
70	121800Z	22.0N 110.7E	SCF							25			990							

TROPICAL STORM HOPE
FIX POSITIONS FOR CYCLONE NO. 9
09 AUG TO 12 AUG

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVI	FLT LVL WIND DIR VEL BRG RNG	SFC WIND VEL BRG RNG	MAX OBS	OBS MIN SLP	MIN 700MB HGT	FLT LVL T/TD	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSW NMBR
1	0802052	23.0N 156.3E	SAT	(T1.0/1.0	/	/ HRS)	PCN 5 UMSP									
2	0802392	25.0N 156.0E	SAT	(T2.0/2.0	/D1.0/24HRS)		NOAA 2 (NESS)									
3	0903492	25.0N 156.0E	SAT	(T2.0/2.0	/D1.0/24HRS)		NOAA 2	(CCNF 03)								
4	0903512	25.9N 155.1E	SAT	(T2.0/2.0	/D1.0/24HRS)		PCN 3 UMSP									
5	0901512	25.8N 155.4E	SAT	(T2.0/2.0	/D	/24HRS)	PCN 3 UMSP									
6	0914352	27.0N 153.2E	SAT				PCN 4 UMSP									
7	0914332	26.8N 153.1E	SAT				PCN 6 UMSP									
8	0922242	27.3N 152.2E	P	20 5	700	180 35 90	10 45 180	20	996	305	13 -	-	- -	-		
9	0922382	27.5N 152.0E	SAT	(T3.0/3.0	/D1.0/24HRS)		NOAA 2 (NESS)		(CCNF 03)							
10	0922382	27.5N 152.0E	SAT	(T3.0/3.0	/D1.0/23HRS)		NOAA 2		(CCNF 03)							
11	1001382	28.6N 151.7E	SAT	(T3.0/3.0	/D1.0/24HRS)		PCN 3 UMSP									
12	1001382	27.7N 151.7E	SAT	(T3.5/3.5	/D	/11HRS)	PCN 3 UMSP									
13	1012272	28.9N 150.9E	P	15 10	-	300 40 180	50 - -	-	1006	310	- -	-	- -	-		2
14	1014202	29.4N 150.3E	SAT				PCN 3 UMSP									
15	1014202	29.4N 150.0E	SAT				PCN 4 UMSP									
16	1021302	30.0N 150.1E	P	5 5	700	150 35 50	25 20 180	15	1001	309	16 16	-	- -	-		3
17	1023362	30.0N 149.5E	SAT	(T3.0/3.0	/S	/24HRS)	NOAA 2 (NESS)		(CCNF 01)							
18	1023342	30.0N 150.0E	SAT	(T2.0/3.0	/W1.0/24HRS)		NOAA 2		(CCNF 01)							
19	1101212	30.3N 149.4E	SAT	(T3.5/3.5	/S	/24HRS)	PCN 4 UMSP									
20	1101212	30.5N 149.3E	SAT	(T4.0/4.0	-/D1.0/24HRS)		PCN 4 UMSP									
21	1107232	30.9N 148.5E	P	5 10	-	210 25 120	30 25 120	40	999	305	11 -	-	- -	-		4
22	1114052	31.9N 148.3E	SAT				PCN 4 UMSP									
23	1114092	32.0N 148.4E	SAT				PCN 4 UMSP									
24	1115472	32.1N 148.0E	SAT				PCN 3 UMSP									
25	1122432	31.5N 146.0E	SAT	(T2.0/2.0	/S	/23HRS)	NOAA 2		(CCNF 02)							
26	1202492	32.5N 145.6E	SAT	(T3.0/3.0	/S	/25HRS)	PCN 3 UMSP									
27	1206432	32.2N 145.3E	SAT	(T3.0/3.0	/S	/24HRS)	PCN 3 UMSP									
28	1206492	32.5N 145.0E	SAT	(T4.0/4.0	-/S	/24HRS)	PCN 5 UMSP									
29	1210202	32.4N 144.0E	P	5 10	-	200 25 140	30 - -	-	1008	313	- -	-	- -	-		5
30	1212002	32.8N 142.7E	LAND	-												
31	1215332	34.1N 144.0E	SAT				PCN 3 UMSP									
32	1215332	34.2N 143.8E	SAT				PCN 3 UMSP									
33	1213332	34.1N 143.6E	SAT				PCN 3 UMSP									

TYPHOON IRIS
FIX POSITIONS FOR CYCLONE NO. 10
10 AUG TO 17 AUG

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVI	FLT LVL WIND DIR VEL BRG RNG	SFC WIND VEL BRG RNG	MAX OBS	OBS MIN SLP	MIN 700MB HGT	FLT LVL T/TD	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSW NMBR
1	0823462	18.5N 132.0E	SAT	(T1.5/1.5	/D0.5/24HRS)		NOAA 2		(CCNF 01)							
2	0903362	17.3N 132.9E	SAT	(T1.5/1.5	/D	/ HRS)	PCN 3 UMSP									
3	0903362	17.4N 132.4E	SAT	(T1.5/1.5	/D0.5/24HRS)		PCN 3 UMSP									
4	0903362	17.2N 132.3E	SAT	(T2.0/2.0	/D	/24HRS)	PCN 3 UMSP									
5	0903362	17.5N 132.3E	SAT	(T2.0/2.0	/D1.0/24HRS)		PCN 3 UMSP									
6	0903362	17.2N 132.0E	SAT	(T2.0/2.0	/	/ HRS)	PCN 5 UMSP									
7	0910182	18.0N 131.7E	SAT				PCN 5 UMSP									
8	0910182	17.8N 132.1E	SAT				PCN 5 UMSP									
9	0910182	18.3N 131.8E	SAT				PCN 5 UMSP									
10	0910182	18.5N 131.6E	SAT				PCN 5 UMSP									
11	1000382	24.0N 130.0E	SAT	(T1.5/1.5	/S	/25HRS)	NOAA 2		(CCNF 03)							
12	1003182	22.4N 131.8E	SAT	(T2.5/2.5	/	/24HRS)	PCN 5 UMSP									
13	1003182	21.3N 131.9E	SAT	(T2.5/2.5	/D0.5/24HRS)		PCN 3 UMSP									
14	1003182	21.1N 131.1E	SAT	(T2.5/2.5	/D1.0/24HRS)		PCN 3 UMSP									
15	1003182	21.2N 131.0E	SAT	(T2.0/2.0	+/D0.5/24HRS)		PCN 3 UMSP									4
16	1011232	21.7N 130.9E	P	3 8	700	210 55 120	300 - -	-	1002	307	16 14	-	- -	-		4
17	1013592	22.8N 131.2E	P	5 10	700	240 50 150	120 - -	-	999	306	14 -	-	- -	-		
18	1016022	23.0N 131.5E	SAT				PCN 3 UMSP									
19	1016022	22.9N 131.2E	SAT				PCN 3 UMSP									
20	1016022	23.3N 132.0E	SAT				PCN 3 UMSP									
21	1022182	23.1N 130.8E	P	1 5	700	320 25 230	15 30 230	15	987	299	13 11	-	- -	-		5
22	1025352	24.0N 131.3E	SAT	(T3.0/3.0	/D1.5/23HRS)		NOAA 2		(CCNF 02)							
23	1103092	23.5N 131.1E	P	1 5	700	90 45 90	60 35 10	60	989	300	16 12	-	- -	-		5
24	1103032	23.5N 130.3E	SAT	(T4.0/4.0	+/D2.0/24HRS)		PCN 3 UMSP									
25	1103032	23.0N 130.9E	SAT	(T5.0/5.0	/D1.5/24HRS)		PCN 3 UMSP									
26	1103032	23.4N 130.3E	SAT	(T5.5/5.5	/D1.5/24HRS)		PCN 1 UMSP									
27	1103032	23.5N 130.1E	SAT	(T4.0/4.0	/D1.5/24HRS)		PCN 1 UMSP									6
28	1110092	23.1N 130.9E	P	2 15	700	310 40 200	40 30 200	40	984	295	14 -	-	- -	-		6
29	1115472	23.2N 130.8E	P	2 10	700	280 50 200	100 - -	-	982	294	16 -	-	- -	-		
30	1115472	22.8N 131.2E	SAT				PCN 3 UMSP									
31	1119472	23.1N 131.0E	SAT				PCN 3 UMSP									
32	1119472	22.8N 131.0E	SAT				PCN 3 UMSP									
33	1200312	23.0N 131.5E	SAT	(T5.0/5.0	/D1.0/23HRS)		NOAA 2		(CCNF 01)							
34	1202492	22.6N 131.4E	SAT	(T5.0/5.0	/D	/24HRS)	PCN 3 UMSP									
35	1202492	22.0N 130.9E	SAT	(T4.5/4.5	/D0.5/24HRS)		PCN 3 UMSP									
36	1202492	22.8N 131.1E	SAT	(T4.0/4.0	/D	/24HRS)	PCN 3 UMSP									
37	1208062	24.0N 130.9E	P	2 5	700	310 35 430	16 75 330	20	976	288	14 15	-	- -	-		8
38	1209562	23.0N 130.9E	P	2 5	700	20 85 300	60 70 330	60	973	285	14 15	-	- -	-		8
39	1213332	22.9N 131.1E	SAT				PCN 3 UMSP									
40	1213332	22.8N 131.4E	SAT				PCN 3 UMSP									
41	1213332	22.0N 131.4E	SAT				PCN 1 UMSP									9
42	1216402	23.1N 131.5E	P	5 3	700	210 65 130	103 - -	-	974	287	16 -	-	- -	-		9
43	1221142	23.4N 131.7E	P	5 2	700	240 60 160	10 - -	-	974	286	14 -	-	- -	-		
44	1223402	23.0N 130.0E	SAT	(T5.0/5.0	/D1.0/23HRS)		NOAA 2		(CCNF 02)							
45	1306332	23.0N 131.7E	SAT	(T6.0/6.0	/D1.0/24HRS)		PCN 1 UMSP									
46	1306342	22.8N 131.6E	SAT	(T5.0/5.0	/D0.5/24HRS)		PCN 1 UMSP									
47	1306432	23.1N 132.1E	SAT	(T5.0/5.0	+/D0.5/	HRS)	PCN 3 UMSP									10
48	1311432	23.5N 132.3E	P	2 15	700	360 60 260	60 - -	-	972	285	1[illegible] -	-	- -	-		
49	1313182	23.7N 131.9E	SAT				PCN 3 UMSP									
50	1315182	23.7N 132.7E	SAT				PCN 3 UMSP									

TYPHOON IRIS
FIX POSITIONS FOR CYCLONE NO. 10
10 AUG TO 17 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/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSW NMBR
51	1319182	23.6N 132.3E	SAT						PCN 3	DMSP										
52	1317002	24.0N 132.1E	P	10 10	-	330	6V	240	30	- -	-		974	287	14 -	-	- -	-		11
53	1321072	24.5N 132.3E	P	10 10	-	60	69	310	75	- -	-		974	286	14 -	-	- -	-		11
54	1400272	24.4N 132.0E	SAT	(T5.0/5.0 /S	/25MRS)				NOAA 2				(CONF 01)							
55	1402202	24.9N 132.1E	SAT	(T5.0/5.0 /S	/24MRS)				PCN 3	DMSP										
56	1402202	25.0N 132.3E	SAT	(T4.0/5.0 /W1.0/24MRS)					PCN 3	DMSP										
57	1402202	25.2N 132.0E	SAT	(T6.0/6.0 /W	/24MRS)				PCN 1	DMSP										
58	1402012	25.4N 131.8E	SAT	(T4.5/5.0 /W0.5/24MRS)					PCN 1	DMSP										
59	1404012	25.1N 132.1E	SAT	(T5.0/5.0 /S	/25MRS)				PCN 3	DMSP										
60	1402012	25.2N 131.6E	SAT	(T5.0/6.0 /W1.0/24MRS)					PCN 1	DMSP										
61	1404012	25.1N 132.2E	SAT	(T4.0/5.0 /W1.0/24MRS)					PCN 3	DMSP										
62	1405012	24.4N 132.0E	SAT	(T5.0/5.0 /S	/25MRS)				PCN 3	DMSP										
63	1409032	25.0N 131.5E	P	2 10	700	240	69	130	100	50 130	120		972	286	13 13	-	- -	-		12
64	1419302	27.0N 130.6E	P	5 10	700	140	6V	60	80	- -	-		979	291	14 14	-	- -	-		13
65	1416452	26.8N 131.1E	SAT						PCN 3	DMSP										
66	1419452	27.0N 130.6E	SAT						PCN 3	DMSP										
67	1416452	26.8N 130.9E	SAT						PCN 2	DMSP										
68	1419452	26.8N 130.9E	SAT						PCN 3	DMSP										
69	1416452	26.6N 130.3E	SAT						PCN 3	DMSP										
70	1419002	27.9N 131.3E	LRDR	- 54904															28.4N 129.5E	
71	1419002	28.2N 130.8E	LRDR	- 54914															28.4N 129.5E	
72	1420002	28.5N 130.0E	LRDR	- 04/43															28.4N 129.5E	
73	1422102	27.8N 129.7E	P	5 20	700	220	5V	130	135	60 130	135		980	291	13 12	-	- -	-		14
74	1501202	28.9N 129.8E	LRDR	- EYE, GOOD FIX															33.6N 130.5E	
75	1501202	28.5N 129.4E	SAT	(T4.0/5.0 /W1.0/25MRS)					NOAA 2				(CONF 01)							
76	1505002	28.6N 129.9E	LRDR	- 05/62															28.4N 129.5E	
77	1505002	27.9N 129.1E	LRDR	- 10 DEG OVERLAY															26.4N 127.8E	
78	1503472	28.6N 128.8E	SAT	(T3.5/4.5 /W0.5/24MRS)					PCN 1	DMSP										
79	1503472	28.2N 129.0E	SAT	(T4.0/5.0 /W	/ MRS)				PCN 3	DMSP										
80	1503472	28.2N 129.0E	SAT	(T5.0/5.0 /D	/24MRS)				PCN 1	DMSP										
81	1503472	28.4N 128.7E	SAT	(T3.5/4.5 /W1.5/24MRS)					PCN 3	DMSP										
82	1503472	28.3N 129.1E	SAT	(T4.0/4.5 /W0.5/24MRS)					PCN 3	DMSP										
83	1504002	28.4N 129.0E	LRDR	- 65/??															28.4N 129.5E	
84	1504152	28.3N 129.0E	P	1 15	700	230	3V	160	90	45 150	110		978	289	14 -	-	- -	-		15
85	1506002	29.3N 129.3E	LRDR	-												-	- -	-	33.6N 130.5E	
86	1507002	29.7N 129.3E	LRDR	-												-	- -	-	33.6N 130.5E	
87	1508002	28.9N 128.0E	LRDR	- ////?															28.4N 129.5E	
88	1509002	29.1N 128.9E	LRDR	- ////?															28.4N 129.5E	
89	1509552	28.9N 128.7E	P	10 15	-	220	3?	170	30	- -	-		977	291	13 -	-	- -	-		16
90	1510002	29.2N 128.2E	LRDR	- ////?															28.4N 129.5E	
91	1512002	29.5N 128.6E	LRDR	-												-	- -	-	33.6N 130.5E	
92	1513002	29.3N 128.0E	LRDR	- ////?															28.4N 129.5E	
93	1513002	29.9N 128.1E	LRDR	-												-	- -	-	33.6N 130.5E	
94	1513002	29.3N 127.9E	LRDR	- ////?															28.4N 129.5E	
95	1514002	30.1N 127.8E	LRDR	-												-	- -	-	33.6N 130.5E	
96	1513002	30.3N 127.3E	LRDR	-												-	- -	-	33.6N 130.5E	
97	1515522	29.4N 127.4E	P	1 30	700	330	4V	240	45	- -	-		975	288	13 -	-	- -	-		17
98	1516312	29.7N 127.0E	SAT						PCN 3	DMSP										
99	1516312	29.5N 126.8E	SAT						PCN 3	DMSP										
100	1521412	30.0N 126.6E	P	1 15	700	250	6?	140	60	35 140	85		972	286	13 14	-	- -	-		17
101	1600102	30.1N 126.5E	SAT	(T4.0/4.0 /S	/23MRS)				NOAA 2				(CONF 01)							
102	1603152	30.8N 125.4E	P	5 5	700	280	5V	180	90	4V 180	120		975	289	13 14	-	- -	-		18
103	1603322	31.1N 125.8E	SAT	(T2.5/2.5 /D	/ MRS)				PCN 5	DMSP										
104	1603322	31.1N 125.6E	SAT	(T3.0/4.0 /W1.0/24MRS)					PCN 3	DMSP										
105	1603322	31.1N 125.4E	SAT	(T3.5/3.5 /W0.5/24MRS)					PCN 3	DMSP										
106	1603322	30.9N 126.3E	SAT	(T5.0/5.0 /W	/24MRS)				PCN 3	DMSP										
107	1603322	30.8N 126.5E	SAT	(T4.0/4.0 /S	/24MRS)				PCN 3	DMSP										
108	1607132	31.3N 125.1E	P	5 5	700	140	6?	50	63	- -	-		976	287	13 -	CIRC		50		18
109	1610102	33.1N 125.9E	SAT						PCN 3	DMSP										
110	1610102	32.3N 125.1E	SAT						PCN 1	DMSP										
111	1610412	34.3N 124.8E	LRDR	- 20 DEG OVERLAY, FAIR FIX															35.9N 126.6E	
112	1614472	34.7N 124.6E	LRDR	- 20 DEG OVERLAY, FAIR FIX															35.9N 126.6E	
113	1622402	35.7N 124.5E	LRDR	- 20 DEG OVERLAY, FAIR FIX															35.9N 126.6E	
114	1701162	35.9N 125.1E	SAT	(T3.0/3.0 /W1.0/25MRS)					NOAA 2				(CONF 01)							
115	1702402	35.8N 126.0E	LRDR	- APPARENT EYE															35.9N 126.6E	
116	1703002	35.9N 126.1E	LRDR	- 21504															37.5N 127.0E	
117	1703192	36.3N 126.8E	SAT	(T1.0/1.0 /D	/24MRS)				PCN 3	DMSP										
118	1703192	36.1N 126.7E	SAT	(T3.5/4.5 /W1.5/24MRS)					PCN 3	DMSP										
119	1704002	36.1N 126.1E	LRDR	- 24544															37.5N 127.0E	
120	1710012	39.9N 130.1E	SAT						PCN 5	DMSP										

TROPICAL DEPRESSION 11
FIX POSITIONS FOR CYCLONE NO. 11
13 AUG TO 14 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/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSW NMBR
1	1024382	28.0N 167.0E	SAT	(T1.5/1.5 /D0.5/24MRS)					NOAA 2	(NESS)										
2	1101272	28.0N 167.3E	SAT	(T1.5/1.5 /D0.5/24MRS)					NOAA 2				(CONF 01)							
3	1101212	27.6N 165.8E	SAT	(T2.5/2.5 / / MRS)					PCN 6	DMSP										
4	1101612	27.5N 165.4E	SAT	(T1.5/1.5 / / MRS)					PCN 6	DMSP										
5	1101212	27.5N 165.5E	SAT	(T1.5/1.5 / / MRS)					PCN 6	DMSP										
6	1114032	28.0N 162.7E	SAT						PCN 6	DMSP										
7	1114032	28.0N 162.3E	SAT						PCN 6	DMSP										
8	1126362	29.6N 161.0E	SAT	(T2.0/2.0 /D0.5/24MRS)					NOAA 2	(NESS)			(CONF 01)							
9	1201072	29.1N 160.1E	SAT	(T2.0/2.0 /D0.5/24MRS)					PCN 3	DMSP										
10	1201072	29.2N 160.4E	SAT	(T2.5/2.5 /W0.5/24MRS)					PCN 4	DMSP										
11	1201072	29.4N 161.3E	SAT	(T2.5/2.5 /S	/24MRS)				PCN 4	DMSP										
12	1213512	29.8N 158.9E	SAT						PCN 3	DMSP										
13	1221302	29.9N 158.8E	SAT	(T2.0/2.0 /D1.0/24MRS)					NOAA 2				(CONF 02)							
14	1300362	29.8N 157.4E	SAT	(T4.0/4.5 /W0.5/24MRS)					PCN 4	DMSP										
15	1300522	30.1N 158.1E	SAT	(T3.0/3.0 /D1.0/24MRS)					PCN 3	DMSP										
16	1303302	30.3N 156.4E	P	5 5	-	70	3V	360	10	- -	-		1007	311	- 11	-	- -	-		1
17	1315102	30.4N 155.0E	SAT						PCN 3	DMSP										
18	1315182	30.5N 155.1E	SAT						PCN 3	DMSP										
19	1322052	30.6N 154.1E	P	5 8	-	190	2?	120	40	25 270	10		1005	312	12 -	-	- -	-		2
20	1322592	30.6N 153.6E	SAT	(T2.0/2.0 /S	/25MRS)				NOAA 2				(CONF 01)							
21	1402202	31.2N 153.3E	SAT	(T2.0/2.0 /W	/24MRS)				PCN 3	DMSP										
22	1402202	30.8N 153.3E	SAT	(T2.0/2.0 /S	/ MRS)				PCN 3	DMSP										
23	1402202	31.0N 153.2E	SAT	(T1.5/2.5 /W1.5/24MRS)					PCN 3	DMSP										
24	1413032	32.4N 151.9E	SAT						PCN 3	DMSP										
25	1423282	32.2N 151.0E	SAT	(T1.0/2.0 /W1.0/25MRS)					NOAA 2				(CONF 01)							
26	1629172	35.0N 155.5E	SAT	(T1.5/1.5 /D0.5/24MRS)					NOAA 2				(CONF 01)							

TROPICAL STORM JOAN
FIX POSITIONS FOR CYCLONE NO. 12
18 AUG TO 20 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	170417Z	20.1N 133.1E	SAT	(T1.5/1.5	/D1.0/24HRS)		NOAA 2	(CONF 02)							
2	170318Z	20.0N 134.3E	SAT	(T1.5/1.5	/D0.5/24HRS)		PCN 5 DMSP								
3	170318Z	19.9N 134.2E	SAT	(T1.5/1.5	/D	/24HRS)	PCN 5 DMSP								
4	171801Z	20.3N 132.9E	SAT				PCN 5 DMSP								
5	180019Z	21.0N 131.0E	SAT	(T1.5/1.5	/S	/24HRS)	NOAA 2 (NESS)	(CONF 02)							
6	180017Z	21.0N 131.0E	SAT	(T1.5/1.5	/S	/23HRS)	NOAA 2	(CONF 01)							
7	180303Z	19.3N 130.9E	SAT	(T2.0/2.0	/D0.5/24HRS)		PCN 3 DMSP								
8	180303Z	19.3N 131.0E	SAT	(T2.5/2.5	/D1.0/24HRS)		PCN 3 DMSP								
9	181947Z	18.5N 130.0E	SAT				PCN 5 DMSP								
10	181947Z	18.5N 129.9E	SAT				PCN 5 DMSP								
11	182247Z	18.4N 127.7E	P	3 10	700	270 14 200	30 15 200 35	1001	308	12 10	-	- -	-		3
12	190111Z	22.0N 124.2E	SAT	(T2.0/2.0	/D0.5/24HRS)		NOAA 2	(CONF 01)							
13	190408Z	21.9N 125.9E	SAT	(T2.0/2.0	/	/ HRS)	PCN 5 DMSP								
14	190430Z	21.7N 123.9E	SAT	(T2.0/2.0	/	/ HRS)	PCN 3 DMSP								
15	191714Z	21.8N 122.4E	SAT				PCN 5 DMSP								
16	191714Z	23.0N 123.7E	SAT				PCN 6 DMSP								
17	192116Z	20.8N 121.3E	P	10 15	-	120 34 50 157	- - -	990	302	- -	-	- -	-		6
18	200015Z	20.5N 121.0E	SAT	(T1.5/2.0	/W0.5/23HRS)		NOAA 2	(CONF 01)							
19	200014Z	20.5N 121.0E	SAT	(T1.5/2.0	/W0.5/24HRS)		NOAA 2 (NESS)								
20	200416Z	21.9N 119.0E	SAT	(T1.5/1.5	/	/ HRS)	PCN 5 DMSP								
21	200416Z	21.4N 120.6E	SAT	(T2.0/2.0	/	/ HRS)	PCN 5 DMSP								
22	200430Z	20.5N 118.8E	SAT	(T2.0/2.0	-/W0.5/35HRS)		PCN 5 DMSP								
23	201930Z	20.8N 122.5E	P	- -	-	- - -	- - - -	-	312	- -	-	- -	-		7
24	210130Z	21.4N 113.2E	LKDR	-							-	- -	-	22.3N 114.2E	
25	210430Z	21.4N 112.4E	LKDR	-							-	- -	-	22.3N 114.2E	
26	210600Z	21.5N 111.9E	LKDR	-							-	- -	-	22.3N 114.2E	

TROPICAL STORM KATE
FIX POSITIONS FOR CYCLONE NO. 13
24 AUG TO 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 TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	221400Z	19.9N 116.4E	LKDR	- 2070)										22.3N 114.2E	
2	221840Z	19.6N 115.0E	LKDR	- 207//							-	- -	-	22.3N 114.2E	
3	222030Z	19.4N 114.2E	LKDR	-										22.3N 114.2E	
4	230103Z	19.5N 114.9E	SAT	(T2.0/2.0	/D1.0/25HRS)		NOAA 2	(CONF 01)							
5	230514Z	19.2N 114.3E	SAT	(T1.5/1.5	/S	/13HRS)	PCN 5 DMSP				-	- -	-	22.3N 114.2E	
6	230340Z	19.4N 114.2E	LKDR	-										22.3N 114.2E	
7	231200Z	19.2N 113.1E	LKDR	- 65///											
8	240023Z	18.4N 112.2E	SAT	(T3.0/3.0	/D1.0/24HRS)		PCN 3 DMSP								
9	240054Z	18.8N 112.5E	SAT	(T3.0/3.0	/D1.0/24HRS)		NOAA 2	(CONF 01)							
10	240153Z	18.8N 112.5E	SAT	(T3.0/3.0	/D1.0/24HRS)		NOAA 2 (NESS)	(CONF 01)							
11	240459Z	18.9N 112.0E	SAT	(T3.0/3.0	/D	/24HRS)	PCN 3 DMSP								
12	240459Z	18.5N 111.9E	SAT	(T2.0/2.0	/D1.0/24HRS)		PCN 4 DMSP								
13	240459Z	18.4N 112.0E	SAT	(T3.5/3.5	/D2.0/24HRS)		PCN 3 DMSP								
14	241647Z	20.0N 107.3E	SAT				PCN 5 DMSP								
15	241505Z	19.1N 111.3E	SAT				PCN 4 DMSP								
16	241742Z	18.9N 109.9E	SAT				PCN 6 DMSP								
17	250005Z	19.8N 109.4E	SAT	(T3.5/3.5	/D2.0/	HRS)	PCN 3 DMSP								
18	250005Z	20.0N 109.0E	SAT	(T4.0/4.0	/	/ HRS)	PCN 3 DMSP								
19	250220Z	20.1N 108.0E	SAT	(T3.0/3.0	/D	/23HRS)	ESSA 8 (VTBU)								
20	250400Z	20.5N 109.0E	SAT	(T2.0/3.0	/W1.0/27HRS)		NOAA 2	(CONF 01)							
21	250445Z	20.2N 109.1E	SAT	(T4.0/4.0	/D2.0/24HRS)		PCN 2 DMSP								
22	250445Z	21.0N 109.0E	SAT	(T3.0/3.5	-/W0.5/24HRS)		PCN 3 DMSP								
23	251247Z	20.2N 107.4E	SAT				PCN 3 DMSP								
24	251247Z	20.5N 107.6E	SAT				PCN 1 DMSP								

TROPICAL DEPRESSION 14
FIX POSITIONS FOR CYCLONE NO. 14
01 SEP TO 02 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 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	300113Z	19.3N 114.1E	SAT	(T1.5/1.5	/D0.5/24HRS)		NOAA 2	(CONF 01)							
2	310229Z	20.5N 111.0E	SAT	(T1.5/1.5	/S	/24HRS)	NOAA 2 (NESS)	(CONF 02)							
3	310233Z	20.5N 111.5E	SAT	(T1.5/1.5	/S	/25HRS)	NOAA 2	(CONF 02)							
4	020103Z	19.7N 106.5E	SAT	(T1.5/1.5	/	/ HRS)	PCN 5 DMSP								
5	020430Z	19.6N 105.7E	SAT	(T1.2/2.0	/D1.0/24HRS)		PCN 3 DMSP								

TYPHOON LOUISE
FIX POSITIONS FOR CYCLONE NO. 15
03 SEP TO 07 SEP

FIX NO.	TIME	POSIT	FIX CAT	ACCMY NAV-MET	FIX LVL	FLT LVL WIND DIR VEL	MAX OBS BRG RNG	MAX OBS SFC WIND VEL BRG RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T1/TD	EYE FORM	OBTEN-TATION	EYE DIA	POSIT OF RADAR	MSL NMBR
1	010100Z	13.8N 125.8E	SAT	(T1.5/1.5 /D1.0/24HRS)				NOAA 2	(CONF 01)							
2	010130Z	12.0N 124.0E	SAT	(T1.5/1.5 /D0.5/24HRS)				NOAA 2 (NESS)	(CONF 02)							
3	012321Z	17.0N 122.7E	SAT	(T1.0/1.0 / / HRS)				PCN 5 DMSP								
4	012321Z	17.9N 122.9E	SAT	(T1.0/1.0 / / HRS)				PCN 5 DMSP								
5	020033Z	18.0N 122.4E	SAT	(T2.0/2.0 /D0.5/24HRS)				NOAA 2	(CONF 01)							
6	020033Z	17.8N 122.5E	SAT	(T2.0/2.0 /D0.5/24HRS)				NOAA 2 (NESS)	(CONF 01)							
7	020430Z	17.8N 123.0E	SAT	(T2.0/2.0+/D1.0/24HRS)				PCN 3 DMSP								
8	021203Z	18.0N 122.9E	SAT					PCN 5 DMSP								
9	021203Z	18.0N 123.0E	SAT					PCN 3 DMSP								
10	021203Z	17.9N 122.7E	SAT					PCN 5 DMSP								
11	021730Z	18.7N 121.8E	SAT					PCN 5 DMSP								
12	030045Z	18.7N 120.3E	SAT	(T1.0/1.0 /S /24HRS)				PCN 5 DMSP								
13	030045Z	18.8N 121.0E	SAT	(T2.0/2.0+/D1.0/24HRS)				PCN 5 DMSP								
14	030055Z	19.4N 120.9E	P	1 3 700 30 45 290				15 75 290	15	998	309	18 9	-	- -	-	
15	030059Z	19.4N 120.8E	SAT	(T3.5/3.5 /D1.5/25HRS)				NOAA 2	(CONF 01)							
16	030130Z	19.3N 120.5E	SAT	(T2.0/2.0+/S /24HRS)				NOAA 2 (NESS)	(CONF 01)							
17	030350Z	19.4N 120.5E	P	2 2 700 100 45 360				15 70 10	15	998	310	16 10	CIRC		10	
18	030415Z	19.0N 121.0E	SAT	(T1.0/1.0 /S /24HRS)				PCN 5 DMSP								
19	030415Z	19.2N 120.9E	SAT	(T2.5/2.5 /D1.0/24HRS)				PCN 5 DMSP								
20	030415Z	19.3N 120.8E	SAT	(T3.0/3.0 /D1.0/24HRS)				PCN 5 DMSP								
21	030815Z	18.8N 120.6E	LHUR	- POSSIBLE EYE												
22	030845Z	19.0N 120.7E	LHUR	- POSSIBLE EYE,ELLIPTICAL, AXIS 48X22											18.1N 120.5E	
23	031500Z	18.8N 120.6E	LHUR	-									-	- -	-	
24	031520Z	18.8N 120.3E	SAT					PCN 5 DMSP							18.1N 120.5E	
25	031200Z	18.0N 120.0E	SAT					PCN 5 DMSP								
26	031610Z	19.0N 119.9E	P	5 10 700 130 40 50				20 - -	-	996	306	14 -	-	- -	-	
27	031950Z	18.8N 119.9E	SAT					PCN 5 DMSP								
28	032203Z	19.2N 119.3E	P	1 5 700 50 30 320				10 25 320	10	999	306	15 12	-	- -	-	
29	040020Z	18.4N 119.1E	SAT	(T3.0/3.0 /D1.0/24HRS)				PCN 1 DMSP								
30	040020Z	19.0N 120.2E	SAT	(T2.5/2.5+/D1.5/24HRS)				PCN 3 DMSP								
31	040030Z	18.7N 119.1E	SAT	(T2.5/2.5 /D0.5/24HRS)				NOAA 2 (NESS)	(CONF 01)							
32	040037Z	18.8N 119.2E	SAT	(T3.5/3.5 /S /24HRS)				NOAA 2	(CONF 01)							
33	040330Z	19.4N 118.9E	P	2 3 700 290 40 210				30 30 210	30	997	307	15 10	-	- -	-	
34	040401Z	19.2N 118.8E	SAT	(T3.0/3.0 /S /24HRS)				PCN 3 DMSP								
35	040401Z	19.3N 118.8E	SAT	(T3.5/3.5 /D1.0/24HRS)				PCN 3 DMSP								
36	040401Z	19.1N 118.8E	SAT	(T3.5/3.5 /D / HRS)				PCN 3 DMSP								
37	040501Z	19.0N 119.3E	SAT	(T3.5/3.5 /D / HRS)				PCN 3 DMSP								
38	040730Z	19.7N 118.4E	P	2 4 700 250 40 180				50 50 330	15	993	303	16 11	-	- -	-	
39	041300Z	19.3N 118.1E	SAT					PCN 5 DMSP								
40	041315Z	19.4N 117.8E	AC R	-									-	- -	-	
41	041000Z	19.8N 117.4E	P	5 3 700 240 45 150				25 - -	-	989	300	15 -	CIRC		15	
42	041044Z	19.5N 117.8E	SAT					PCN 5 DMSP								
43	041044Z	19.0N 117.8E	SAT					PCN 5 DMSP								
44	041044Z	19.2N 117.4E	SAT					PCN 5 DMSP								
45	042010Z	19.7N 116.8E	LHUR	- 1077/											22.3N 114.2E	
46	042100Z	20.2N 116.6E	P	5 3 700 230 35 170				10 55 -	-	986	298	14 10	CIRC		20	
47	042100Z	19.7N 116.6E	LHUR	-									-	- -	-	
48	042300Z	19.7N 116.4E	LHUR	-									-	- -	-	
49	042350Z	19.8N 116.2E	LHUR	- 2051											22.3N 114.2E	
50	050000Z	20.0N 116.3E	SAT	(T4.5/4.5 /D1.0/24HRS)				PCN 3 DMSP								
51	050008Z	19.9N 116.7E	SAT	(T4.5/4.5 /D1.0/20HRS)				PCN 3 DMSP								
52	050100Z	19.9N 115.9E	LHUR	-									-	- -	-	
53	050121Z	19.9N 115.8E	SAT	(T4.0/4.0 /D0.5/25HRS)				NOAA 2	(CONF 02)						22.3N 114.2E	
54	050123Z	20.0N 115.8E	SAT	(T3.5/3.5 /D1.0/24HRS)				NOAA 2 (NESS)	(CONF 02)							
55	050200Z	19.9N 115.7E	LHUR	-									-	- -	-	
56	050413Z	20.0N 115.4E	SAT	(T4.5/4.5 /D / HRS)				ESSA 8 (VTBU)							22.3N 114.2E	
57	050500Z	19.9N 115.5E	LHUR	- 1071/												
58	050400Z	19.8N 115.2E	SAT	(T4.5/4.5 /D1.0/ HRS)				PCN 1 DMSP							22.3N 114.2E	
59	050340Z	19.8N 115.2E	SAT	(T4.0/4.0 /D1.0/24HRS)				PCN 1 DMSP								
60	050400Z	19.9N 115.1E	SAT	(T4.5/4.5 /D1.0/20HRS)				PCN 1 DMSP								
61	050400Z	19.9N 115.3E	LHUR	- 1071/											22.3N 114.2E	
62	050700Z	19.9N 114.8E	LHUR	-									-	- -	- 22.3N 114.2E	
63	050600Z	19.9N 114.7E	LHUR	- 1081/											22.3N 114.2E	
64	050700Z	19.9N 114.9E	LHUR	- 1081/											22.3N 114.2E	
65	051000Z	19.9N 114.7E	P	2 3 700 200 65 110				20 50 360	10	974	287	15 10	CIRC		12	
66	051000Z	19.9N 114.5E	LHUR	-									-	- -	- 22.3N 114.2E	
67	051100Z	19.9N 114.4E	LHUR	-									-	- -	- 22.3N 114.2E	
68	051600Z	19.8N 114.1E	LHUR	-									-	- -	- 22.3N 114.2E	
69	051520Z	19.8N 114.0E	SAT					PCN 1 DMSP								
70	051520Z	19.8N 114.2E	SAT					PCN 3 DMSP								
71	051500Z	19.8N 113.7E	LHUR	-									-	- -	- 22.3N 114.2E	
72	051030Z	19.8N 113.6E	SAT					PCN 5 DMSP								
73	051030Z	19.8N 113.5E	SAT					PCN 3 DMSP								
74	051030Z	19.5N 112.9E	SAT					PCN 5 DMSP								
75	051800Z	19.9N 113.3E	LHUR	-									-	- -	- 22.3N 114.2E	
76	052100Z	20.0N 112.9E	LHUR	- 2////											22.3N 114.2E	
77	052200Z	20.1N 112.7E	LHUR	- 2////											22.3N 114.2E	
78	052300Z	20.2N 112.5E	LHUR	-									-	- -	- 22.3N 114.2E	
79	052350Z	19.9N 112.2E	SAT	(T4.5/4.5 /D1.0/20HRS)				PCN 3 DMSP								
80	052350Z	19.8N 112.3E	SAT	(T3.5/4.5 /W1.0/24HRS)				PCN 3 DMSP								
81	052350Z	20.0N 112.4E	SAT	(T4.0/4.0 / / HRS)				PCN 3 DMSP								
82	060000Z	20.2N 112.3E	LHUR	- 1091/											22.3N 114.2E	
83	060100Z	20.1N 112.1E	LHUR	-									-	- -	- 22.3N 114.2E	
84	060130Z	20.1N 112.0E	SAT	(T4.0/4.0 /D1.0/24HRS)				PCN 3 DMSP								
85	060200Z	20.2N 112.0E	LHUR	-									-	- -	- 22.3N 114.2E	
86	060200Z	20.0N 111.5E	SAT	(T4.0/4.0-/D0.5/24HRS)				NOAA 2 (NESS)	(CONF 01)							
87	060220Z	19.5N 111.2E	SAT	(T4.5/4.5-/D0.5/25HRS)				NOAA 2	(CONF 02)						22.3N 114.2E	
88	060500Z	20.2N 111.9E	LHUR	-									-	- -	-	
89	060500Z	19.8N 111.7E	SAT	(T4.0/4.5 /W0.5/25HRS)				ESSA 8 (VTBU)								
90	060730Z	20.2N 112.0E	SAT	(T4.5/4.5 /D0.5/24HRS)				PCN 3 DMSP								
91	061230Z	20.5N 110.4E	SAT					PCN 5 DMSP								
92	061430Z	21.0N 109.8E	SAT					PCN 1 DMSP								
93	061750Z	20.0N 109.4E	SAT					PCN 5 DMSP								
94	070130Z	21.0N 108.0E	SAT	(T3.5/4.5 /W1.0/24HRS)				NOAA 2	(CONF 01)							
95	070130Z	21.1N 107.8E	SAT	(T3.5/4.0 /W0.5/24HRS)				NOAA 2 (NESS)	(CONF 01)							
96	070430Z	20.8N 107.2E	SAT	(T3.0/3.0-/D0.5/24HRS)				PCN 5 DMSP								

TYPHOON MAMIE

FIX POSITIONS FOR CYCLONE NO. 16
12 SEP TO 14 SEP

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	FLT LVL WIND DIR	MAX OBS VEL	BRG	RNG	MAX OBS SFC WIND VEL	BRG	RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T1/T0	EYE FORM	DIEN-STION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	082255Z	13.8N 134.5E	SAT	(T1.0/1.0 /		/		MRS)		PCN 5	DMSP									
2	082255Z	14.0N 134.0E	SAT	(T1.0/1.0 /		/		MRS)		PCN 6	DMSP									
3	090240Z	13.8N 134.2E	SAT	(T1.0/1.0 /S		/	4	MRS)		PCN 5	DMSP									
4	092237Z	15.3N 130.0E	SAT	(T1.0/1.0 /		/		MRS)		PCN 5	DMSP									
5	110001Z	16.9N 125.0E	SAT	(T1.5/1.5 /D0.5/24				MRS)		PCN 5	DMSP									
6	110001Z	16.1N 125.8E	SAT	(T1.0/1.0 /		/		MRS)		PCN 5	DMSP									
7	110109Z	16.5N 124.5E	SAT	(T1.5/1.5 /D0.5/24				MRS)		NOAA 2				(CONF 01)						
8	110400Z	16.7N 123.6E	SAT	(T1.0/1.0 /		/		MRS)		PCN 5	DMSP									
9	110400Z	17.0N 124.3E	SAT	(T1.5/1.5 /D0.5/24				MRS)		PCN 5	DMSP									
10	111242Z	16.9N 122.3E	SAT							PCN 6	DMSP									
11	111242Z	16.9N 122.5E	SAT							PCN 6	DMSP									
12	111242Z	17.4N 122.5E	SAT							PCN 6	DMSP									
13	111242Z	16.8N 121.8E	SAT							PCN 6	DMSP									
14	111644Z	17.0N 121.9E	SAT							PCN 5	DMSP									
15	112342Z	17.0N 119.5E	SAT	(T2.0/2.0+/D0.5/24				MRS)		PCN 3	DMSP									
16	112342Z	16.5N 119.8E	SAT	(T2.5/2.5 /D1.5/24				MRS)		PCN 5	DMSP									
17	112342Z	16.9N 119.5E	SAT	(T2.0/2.0 /D0.5/24				MRS)		PCN 3	DMSP									
18	120008Z	16.8N 119.0E	SAT	(T1.5/1.5+/S			/24	MRS)		NOAA 2				(CONF 02)						
19	120312Z	17.9N 119.3E	SAT	(T2.0/2.0 /D		/		MRS)		ESSA 8 (VTBU)										
20	120328Z	17.3N 118.8E	P	5 5	-	120	34	40		10 35 240		18	1003	309	-	-	-	- -	-	1
21	120348Z	17.7N 118.9E	SAT	(T2.0/2.0+/D0.5/				MRS)		PCN 3	DMSP									
22	120348Z	17.6N 118.8E	SAT	(T2.5/2.5 /D1.5/24				MRS)		PCN 3	DMSP									
23	120348Z	17.6N 118.8E	SAT	(T2.5/2.5 /D1.0/24				MRS)		PCN 3	DMSP									
24	120440Z	17.8N 119.0E	CRDR	- POSSIBLE CENTER, 90 PCT, ELLIPTICAL, AXIS 125X85																
25	121030Z	18.3N 117.4E	P	10 8	700	50	45	30		15 -	-	-	998	305	11	10	-	- -	-	2
26	121224Z	18.1N 117.0E	SAT							PCN 4	DMSP									
27	121224Z	18.3N 116.9E	SAT							PCN 4	DMSP									
28	121224Z	18.2N 117.0E	SAT							PCN 6	DMSP									
29	121900Z	18.2N 117.0E	P	5 3	700	130	65	20		25 -	-	-	990	299	13	11	CIRC		15	2
30	121929Z	18.3N 116.2E	SAT							PCN 5	DMSP									
31	121929Z	18.3N 116.4E	SAT							PCN 6	DMSP									
32	121929Z	18.6N 116.4E	SAT							PCN 6	DMSP									
33	122210Z	18.4N 115.0E	P	30 5	700	150	60	90		25 -	-	-	987	297	13	-	CIRC		22	3
34	122330Z	18.5N 114.8E	CRDR	- 2051/ EYE OPEN TO SOUTH															22.3N 114.2E	
35	130000Z	18.6N 114.7E	CRDR	-													-	- -	-	22.3N 114.2E
36	130103Z	18.7N 114.7E	SAT	(T4.5/4.5 /D3.0/23				MRS)		NOAA 2				(CONF 01)						
37	130108Z	18.7N 114.6E	SAT	(T4.5/4.5 /D1.5/24				MRS)		NOAA 2 (NESS)				(CONF 01)						
38	130108Z	18.7N 114.7E	SAT	(T2.5/2.5 /D1.0/24				MRS)		PCN 1	DMSP									
39	130108Z	18.7N 114.6E	SAT	(T4.0/4.0+/D2.0/25				MRS)		PCN 1	DMSP									
40	130150Z	18.6N 114.4E	CRDR	- 2051/															22.3N 114.2E	
41	130300Z	18.6N 114.1E	CRDR	- 2051/															22.3N 114.2E	
42	130321Z	18.7N 114.3E	SAT	(T3.0/3.0 /D1.0/25				MRS)		ESSA 8 (VTBU)										
43	130513Z	18.8N 113.8E	SAT	(T4.5/4.5 /D2.0/24				MRS)		PCN 1	DMSP									
44	130513Z	18.8N 113.7E	SAT	(T4.0/4.0+/D2.0/				MRS)		PCN 1	DMSP									
45	130800Z	18.7N 113.5E	CRDR	-													-	- -	-	22.3N 114.2E
46	130900Z	18.9N 113.1E	P	5 3	700	170	60	90		10 100	90	20	964	281	2	12	CIRC		13	4
47	130900Z	18.9N 112.9E	CRDR	-													-	- -	-	22.3N 114.2E
48	131200Z	18.9N 112.3E	CRDR	-													-	- -	-	22.3N 114.2E
49	131347Z	18.8N 111.6E	SAT							PCN 2	DMSP									
50	131347Z	19.2N 112.4E	SAT							PCN 2	DMSP									
51	131510Z	18.9N 111.7E	CRDR	-													-	- -	-	22.3N 114.2E
52	131756Z	18.9N 111.8E	SAT							PCN 2	DMSP									
53	131756Z	19.2N 111.6E	SAT							PCN 2	DMSP									
54	140947Z	18.9N 109.3E	SAT	(T4.0/4.5 /W				/24	MRS)		PCN 3	DMSP								
55	140156Z	19.1N 109.1E	SAT	(T3.5/4.5 /W1.0/25				MRS)		NOAA 2				(CONF 01)						
56	140437Z	19.3N 108.5E	SAT	(T4.0/4.5 /W				/24	MRS)		PCN 3	DMSP								
57	140459Z	19.3N 108.5E	SAT	(T5.0/5.0 /S0.5/24				MRS)			PCN 3	DMSP								
58	141329Z	19.1N 107.6E	SAT							PCN 6	DMSP									
59	141742Z	19.2N 106.9E	SAT							PCN 6	DMSP									
60	150444Z	19.1N 102.4E	SAT	(T5.0/5.0 /		/		MRS)		PCN 5	DMSP									

TYPHOON NORA
FIX POSITIONS FOR CYCLONE NO. 17
02 OCT TO 10 OCT

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV	ACCRY 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	FLT LVL TO	EYE FORM	ORIEN-TATION	EYE DIA	POSIT OF RADAR	MSG NMBR
1	292329Z	7.0N 137.9E	SAT	(T1.5/1.5 /D0.5/23HRS)							NOAA 2			(CONF 01)								
2	292331Z	7.0N 137.0E	SAT	(T1.5/1.5 /D0.5/24HRS)							NOAA 2 (NESS)											
3	302301Z	10.0N 136.3E	SAT	(T1.0/1.0 /D /24HRS)							PCN 5 DMSP											
4	010233Z	10.0N 136.1E	SAT	(T1.0/1.0 /D / HRS)							PCN 5 DMSP											
5	011510Z	10.3N 136.3E	SAT								PCN 6 DMSP											
6	012243Z	11.0N 136.6E	SAT	(T2.5/2.5 /D1.5/24HRS)							PCN 5 DMSP											
7	012324Z	11.5N 136.5E	SAT	(T1.5/1.5 /D0.5/24HRS)							NOAA 2			(CONF 02)								
8	020130Z	11.4N 135.1E	P	5	12	-	70	30	310	80	40	30	60	-	-	16	11	-	-	-		1
9	020320Z	11.4N 134.9E	P	5	15	-	20	30	280	50	30	290	40	1001	-	25	24	-	-	-		2
10	020400Z	11.5N 134.9E	SAT	(T1.5/1.5 /D0.5/ HRS)							PCN 5 DMSP											
11	020400Z	11.5N 135.6E	SAT	(T2.5/2.5 /D1.5/ HRS)							PCN 3 DMSP											
12	021125Z	12.0N 133.7E	SAT								PCN 5 DMSP											
13	021135Z	11.5N 133.9E	P	5	5	700	130	45	90	15	-	-	-	987	298	15	9	-	- -	-		3
14	021501Z	12.3N 133.4E	SAT								PCN 5 DMSP											
15	021626Z	11.2N 133.3E	P	5	5	700	10	45	350	20	-	-	-	989	299	14	13	CIRC		15		3
16	022155Z	10.8N 133.1E	P	2	5	700	110	30	60	100	45	30	60	991	302	14	-	-	- -	-		4
17	022326Z	11.1N 133.5E	SAT	(T3.0/3.0 /D1.5/24HRS)							NOAA 2 (NESS)			(CONF 01)								
18	030006Z	11.5N 133.9E	SAT	(T3.5/3.5 /D1.0/24HRS)							PCN 5 DMSP											
19	030006Z	11.1N 134.4E	SAT	(T1.5/1.5 /D0.5/ HRS)							PCN 5 DMSP											
20	030019Z	11.4N 133.6E	SAT	(T3.0/3.0 /D1.5/24HRS)							NOAA 2			(CONF 01)								
21	030345Z	11.9N 133.8E	SAT	(T3.0/3.0+/D1.5/24HRS)							PCN 1 DMSP											
22	030345Z	11.6N 133.5E	SAT	(T3.5/3.5 /D1.0/ HRS)							PCN 3 DMSP											
23	031030Z	11.1N 133.2E	P	10	10	700	180	50	160	10	-	-	-	978	292	16	12	CIRC		20		5
24	031100Z	11.8N 132.5E	SAT								PCN 1 DMSP											
25	031550Z	11.1N 132.4E	P	5	5	700	160	45	70	25	-	-	-	978	293	15	-	-	- -	-		6
26	031628Z	11.5N 132.3E	SAT								PCN 5 DMSP											
27	031628Z	11.7N 132.8E	SAT								PCN 3 DMSP											
28	032200Z	11.1N 131.5E	P	5	5	700	330	70	250	20	80	360	30	976	293	16	14	CIRC		20		7
29	032319Z	11.9N 131.2E	SAT	(T4.5/4.5 /D1.5/23HRS)							NOAA 2			(CONF 01)								
30	032320Z	11.2N 131.7E	SAT	(T4.0/4.0 /D1.0/24HRS)							NOAA 2 (NESS)			(CONF 02)								
31	032348Z	11.9N 131.9E	SAT	(T3.0/3.0+/D1.5/24HRS)							PCN 3 DMSP											
32	032348Z	12.0N 131.2E	SAT	(T4.5/4.5 /D1.0/24HRS)							PCN 3 DMSP											
33	040056Z	11.3N 132.0E	P	-	-	-	-	-	-	-	90	-	-	978	290	-	-	-	- -	-		7
34	040331Z	11.9N 132.0E	SAT	(T4.5/4.5 /D1.5/24HRS)							PCN 1 DMSP											
35	040331Z	12.0N 131.8E	SAT	(T4.5/4.5 /D1.0/24HRS)							PCN 1 DMSP											
36	041020Z	12.3N 131.8E	P	5	3	700	240	55	160	30	-	-	-	969	284	17	14	CIRC		10		8
37	041230Z	12.9N 132.1E	SAT								PCN 1 DMSP											
38	041230Z	12.9N 132.3E	SAT								PCN 1 DMSP											
39	041500Z	12.7N 131.4E	P	5	2	700	210	65	180	40	-	-	-	964	279	17	14	ELIP	P-NW	30X1		8
40	041614Z	12.9N 131.6E	SAT								PCN 1 DMSP											
41	041614Z	12.4N 131.3E	SAT								PCN 5 DMSP											
42	042330Z	13.3N 130.7E	SAT	(T4.5/4.5 /S /24HRS)							PCN 1 DMSP											
43	042350Z	13.3N 130.7E	P	5	10	700	90	90	360	20	70	90	20	949	267	16	12	CIRC		20		9
44	050018Z	13.4N 130.9E	SAT	(T5.5/5.5 /D1.0/24HRS)							NOAA 2			(CONF 01)								
45	050019Z	13.7N 130.8E	SAT	(T5.5/5.5 /D1.5/24HRS)							NOAA 2 (NESS)			(CONF 01)								
46	050316Z	13.8N 130.2E	SAT	(T4.5/4.5 /S /24HRS)							PCN 1 DMSP											
47	050340Z	13.7N 130.2E	P	5	5	700	90	115	360	30	100	360	10	940	259	17	12	CIRC		20		9
48	050925Z	14.0N 129.9E	P	5	5	700	180	65	80	30	90	90	5	910	230	25	16	CIRC		12		10
49	051211Z	14.2N 129.5E	SAT								PCN 1 DMSP											
50	051520Z	14.4N 129.2E	P	5	5	700	60	110	30	15	-	-	-	893	209	26	14	CIRC		10		10
51	051559Z	14.6N 128.8E	SAT								PCN 1 DMSP											
52	052312Z	14.7N 127.4E	SAT	(T7.0/7.0 /D /24HRS)							PCN 2 DMSP											
53	052312Z	14.7N 127.4E	SAT	(T6.5/6.5 /D2.0/ HRS)							PCN 1 DMSP											
54	060020Z	14.8N 128.2E	P	5	5	700	110	150	20	40	140	20	15	877	201	30	16	CIRC		8		11
55	060107Z	14.9N 127.3E	SAT	(T6.5/6.5 /D1.0/25HRS)							NOAA 2			(CONF 01)								
56	060100Z	14.8N 127.4E	SAT	(T7.0/7.0-/D1.5/24HRS)							NOAA 2 (NESS)			(CONF 01)								
57	060301Z	14.7N 126.6E	SAT	(T7.0/7.0 /D /24HRS)							PCN 1 DMSP											
58	060301Z	14.7N 126.8E	SAT	(T6.5/6.5 /D2.0/24HRS)							PCN 1 DMSP											
59	060329Z	14.8N 127.7E	P	5	5	-	-	-	-	-	85	300	160	878	201	27	-	CIRC		8		11
60	061020Z	14.9N 125.9E	P	5	3	700	350	90	270	30	-	-	-	894	214	19	13	CIRC		12		12
61	061153Z	14.9N 125.4E	SAT								PCN 1 DMSP											
62	061230Z	14.8N 125.5E	LRDR	- APPARENT EYE, SOLID																	14.4N 122.6E	-
63	061400Z	14.9N 125.2E	LRDR	-														-	- -	-	15.0N 120.5E	-
64	061410Z	14.9N 125.4E	LRDR	-														-	- -	-	14.4N 122.6E	
65	061500Z	14.8N 125.1E	P	5	2	700	190	100	100	47	-	-	-	903	224	19	12	CIRC		12		12
66	061545Z	14.9N 125.2E	SAT								PCN 3 DMSP											
67	061700Z	15.0N 125.0E	LRDR	- WELL DEFINED EYE, D20														-	- -	-	15.0N 120.5E	-
68	061800Z	15.1N 124.8E	LRDR	-																	15.0N 120.5E	-
69	061900Z	15.2N 124.7E	LRDR	- EYE, D12																	15.0N 120.5E	-
70	062100Z	15.2N 124.5E	LRDR	- EYE, 100 PCT, DS																		
71	062200Z	15.3N 124.5E	LRDR	- EYE																	14.4N 122.6E	-
72	062500Z	15.5N 124.4E	LRDR	- EYE, CIRCULAR, D15																	14.4N 122.6E	-
73	070006Z	15.1N 124.5E	SAT	(T7.0/7.0 /D0.5/23HRS)							NOAA 2			(CONF 03)								
74	070007Z	16.0N 124.0E	SAT	(T6.0/7.0 /W1.0/24HRS)							NOAA 2 (NESS)			(CONF 02)								
75	070018Z	15.7N 124.2E	P	5	2	-	190	120	90	20	130	90	10	-	-	24	16	CIRC		10		13
76	070035Z	16.0N 124.6E	SAT	(T7.0/7.0 /D2.5/69HRS)							PCN 3 DMSP											
77	070040Z	15.7N 124.2E	LRDR	- EYE, 75 PCT, CIRCULAR OPEN N, D28																	14.4N 122.6E	-
78	070135Z	15.8N 124.0E	LRDR	- EYE, 75 PCT, CIRCULAR OPEN N, D30																	14.4N 122.6E	-
79	070233Z	15.6N 123.7E	P	5	3	-	280	115	190	25	130	240	6	-	-	21	15	CIRC		15		13
80	070250Z	15.9N 124.0E	LRDR	- EYE, 75 PCT, CIRCULAR OPEN N, D35																	14.4N 122.6E	-
81	070400Z	16.1N 123.8E	LRDR	- EYE, 75 PCT, CIRCULAR OPEN N																	14.4N 122.6E	-
82	070429Z	16.3N 123.9E	SAT	(T7.0/7.0 /D2.5/69HRS)							PCN 3 DMSP											
83	070600Z	16.5N 123.5E	LRDR	- POSSIBLE EYE, SOLID NO DEFINITE EYE																	14.4N 122.6E	-
84	070600Z	16.4N 123.4E	LRDR	- POSSIBLE EYE,																	14.4N 122.6E	-
85	071100Z	17.1N 123.1E	LRDR	-														-	- -	-	15.0N 120.5E	-
86	071100Z	17.1N 123.1E	LRDR	-														-	- -	-	16.4N 120.6E	-
87	071316Z	17.2N 123.0E	SAT								PCN 6 DMSP											
88	071320Z	17.4N 123.0E	P	8	5	-	20	110	300	15	-	-	-	923	244	18	-	CIRC		12		14
89	071400Z	17.4N 122.7E	LRDR	- POSSIBLE EYE																	15.0N 120.5E	-
90	071430Z	17.5N 122.8E	LRDR	- 6///?																		
91	071430Z	17.4N 122.9E	LRDR	-														-	- -	-	16.4N 120.6E	-
92	071510Z	17.7N 122.8E	P	8	5	-	-	-	-	-	-	-	-	923	244	17	16	CIRC		12		14
93	071700Z	17.6N 122.8E	LRDR	- POOR FIX																	18.2N 120.5E	-
94	071712Z	17.6N 122.8E	SAT								PCN 5 DMSP											
95	071800Z	17.8N 122.5E	LRDR	- EYE, CIRCULAR, D15																	18.2N 120.5E	-
96	072000Z	18.1N 122.2E	LRDR	- EYE, OVAL, D2[illegible]-30																		
97	072100Z	18.2N 122.2E	LRDR	- EYE, OVAL, D2[illegible]-30																	18.2N 120.5E	-
98	072200Z	18.3N 122.1E	LRDR	- EYE																	18.2N 120.5E	-
99	072202Z	18.8N 122.0E	P	2	5	-	100	65	20	130	100	310	25	-	-	24	-	CIRC		30		15
100	080017Z	18.7N 121.9E	SAT	(T4.5/5.5 /W2.0/48HRS)							PCN 3 DMSP											

TYPHOON NORA
FIX POSITIONS FOR CYCLONE NO. 17

02 OCT TO 10 OCT

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	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	DIEN-ATION	EYE DIA	POSIT OF RADAR	MSN NMBR
101	0800Z17	18.5N 122.0E	SAT	(T7.0/7.0 /D2.5/69HRS)			PCN 3 DMSP								
102	0800Z17	18.4N 121.7E	SAT	(T5.0/5.5 /W0.5/24HRS)			PCN 3 DMSP								
103	0800Z92	18.7N 121.9E	SAT	(T6.0/7.0 /W1.0/24HRS)			NOAA 2 (CONF 02)								
104	0801Z37	18.8N 121.8E	SAT	(T5.0/5.0 /S /24HRS)			NOAA 2 (NESS) (CONF 01)								
105	0803Z02	19.1N 121.3E	P	2 10 - 360 50 270			15 120 270 10	-	-	25 13	CIRC		20		15
106	0804Z47	18.8N 122.2E	SAT	(T5.0/5.0-/W2.0/24HRS)			PCN 1 DMSP								
107	0804Z42	18.7N 122.0E	SAT	(T4.5/5.5 /W0.5/ HRS)			PCN 3 DMSP								
108	0807Z07	19.9N 120.8E	P	5 5 - 100 70 360			70 70 360 30	973	287	17 14	-	- -	-		16
109	0810Z02	20.3N 120.4E	LMDR	- EYE										18.2N 120.5E	-
110	0812Z47	20.3N 120.5E	P	- - - 270 50 180			50 - - -	977	289	- -	-	- -	-		18
111	0812Z02	20.0N 120.8E	SAT				PCN 3 DMSP								
112	0812Z02	20.0N 121.0E	SAT				PCN 5 DMSP								
113	0813Z42	20.4N 120.8E	P	10 10 700 30 70 340			40 - - -	978	291	15 11	-	- -	-		16
114	0813Z37	20.0N 120.2E	P	3 2 - 190 40 100			10 - - -	976	294	17 -	-	- -	-		17
115	0816Z72	20.0N 120.1E	SAT				PCN 3 DMSP								
116	0821Z42	20.0N 119.9E	P	8 2 - 80 60 340			40 - - -	973	287	17 -	-	- -	-		17
117	0823Z92	20.9N 119.8E	SAT	(T5.0/6.0-/W2.0/24HRS)			PCN 4 DMSP								
118	0824Z37	21.0N 119.9E	SAT	(T5.0/5.0-/W2.0/24HRS)			PCN 5 DMSP								
119	0825Z92	20.9N 120.0E	SAT	(T4.5/4.5 /S /24HRS)			PCN 3 DMSP								
120	0901Z37	21.0N 119.9E	SAT	(T5.0/6.0 /W1.0/25HRS)			NOAA 2 (CONF 01)								
121	0901Z02	21.0N 119.8E	SAT	(T5.0/5.0 /S /24HRS)			NOAA 2 (NESS) (CONF 01)								
122	0903Z37	21.0N 119.4E	SAT	(T4.5/4.5 /S / HRS)			PCN 1 DMSP								
123	0903Z92	21.2N 119.2E	SAT	(T4.0/5.0 /W1.0/24HRS)			PCN 1 DMSP								
124	0905Z97	21.2N 119.3E	SAT	(T5.0/5.0 /D /13HRS)			PCN 3 DMSP							22.6N 120.3E	-
125	0904Z02	21.4N 119.6E	LMDR	- 55///										23.5N 119.6E	-
126	0906Z07	21.2N 119.6E	LMDR	-							-	- -	-	23.5N 119.6E	-
127	0905152	21.5N 119.5E	LMDR	-							-	- -	-	22.6N 120.3E	-
128	0908Z07	21.4N 119.5E	LMDR	- 55///											19
129	0906162	21.4N 119.6E	P	3 2 700 200 60 110			40 - - -	974	286	14 12	CIRC		30	23.0N 120.2E	-
130	0907307	21.6N 119.6E	LMDR	-							-	- -	-	22.6N 120.4E	-
131	0907352	21.6N 119.8E	LMDR	-							-	- -	-	23.5N 119.6E	-
132	0909307	21.6N 119.5E	LMDR	-							-	- -	-	22.6N 120.3E	-
133	0909002	21.6N 119.5E	LMDR	- 55///										23.5N 119.6E	-
134	0909307	21.8N 119.5E	LMDR	-							-	- -	-		19
135	0909342	21.8N 119.5E	P	3 1 700 190 70 80			30 50 150 30	976	283	16 13	CIRC		30		
136	0916407	22.1N 119.3E	SAT				PCN 3 DMSP								
137	0912402	22.2N 119.1E	SAT				PCN 3 DMSP								
138	0916407	22.2N 119.3E	SAT				PCN 3 DMSP							22.6N 120.3E	-
139	0915002	22.1N 119.2E	LMDR	- 45///										23.5N 119.6E	-
140	0914307	22.2N 119.4E	LMDR	-							-	- -	-	23.5N 119.6E	-
141	0914002	22.2N 119.2E	LMDR	-							-	- -	-	23.5N 119.6E	-
142	0919007	22.4N 119.1E	LMDR	-							-	- -	-	23.5N 119.6E	-
143	0919002	22.6N 119.1E	LMDR	-							-	- -	-	23.5N 119.6E	-
144	0919437	22.7N 119.3E	SAT				PCN 6 DMSP								
145	0918432	23.0N 119.3E	SAT				PCN 2 DMSP								
146	0919437	22.9N 119.4E	SAT				PCN 2 DMSP								
147	0917002	22.7N 119.0E	LMDR	-							-	- -	-	23.5N 119.6E	-
148	0918007	22.9N 119.1E	LMDR	-							-	- -	-	23.5N 119.6E	-
149	0917002	22.9N 119.0E	LMDR	-							-	- -	-	23.5N 119.6E	-
150	0921002	23.3N 118.9E	LMDR	-							-	- -	-	23.5N 119.6E	-
151	0922002	23.7N 118.6E	LMDR	-							-	- -	-	23.5N 119.6E	-
152	0923417	23.9N 118.4E	SAT	(T5.0/5.0 /D / HRS)			PCN 3 DMSP								
153	0923412	23.9N 118.6E	SAT	(T4.0/5.0 /W1.0/24HRS)			PCN 3 DMSP								
154	0923417	23.8N 118.7E	SAT	(T3.5/4.5 /W1.0/24HRS)			PCN 3 DMSP								
155	1003452	24.0N 118.0E	SAT	(T3.0/4.0 /W2.0/24HRS)			PCN 3 DMSP								
156	1003457	24.0N 118.0E	SAT	(T4.0/4.0 /S /24HRS)			PCN 3 DMSP								
157	1003452	24.0N 118.0E	SAT	(T3.5/4.5 /W1.0/ HRS)			PCN 3 DMSP								

TYPHOON OPAL
FIX POSITIONS FOR CYCLONE NO. 18

04 OCT TO 08 OCT

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	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	DIEN-ATION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	0401142	10.5N 114.2E	SAT	(T2.0/2.0 /D1.0/24HRS)			NOAA 2 (CONF 01)								
2	0401132	10.5N 114.0E	SAT	(T2.0/2.0 /D1.0/24HRS)			NOAA 2 (NESS) (CONF 01)								
3	0401302	11.5N 114.0E	SAT	(T1.0/1.0 /S / HRS)			PCN 5 DMSP								
4	0402Z77	11.3N 114.6E	P	10 10 700 330 30 210			20 40 170 33	1002	308	12 10	-	- -	-		1
5	0412502	11.7N 114.1E	SAT				PCN 5 DMSP								
6	0415057	11.4N 114.0E	P	10 10 700 280 50 180			30 - - -	1001	308	10 8	-	- -	-		1
7	0416142	11.0N 113.1E	SAT				PCN 5 DMSP								
8	0422Z37	12.1N 113.4E	P	5 5 700 170 45 90			50 45 70 35	991	301	12 10	CIRC		25		2
9	0500552	12.5N 112.7E	P	5 3 700 310 30 40			40 25 40 30	991	301	12 10	CIRC		25		2
10	0501172	11.5N 113.2E	SAT	(T3.0/3.0 /D2.0/24HRS)			PCN 5 DMSP								
11	0502072	12.9N 112.2E	SAT	(T3.0/3.0 /D1.0/24HRS)			NOAA 2 (NESS)								
12	0502072	12.0N 111.9E	SAT	(T3.0/3.0 /D1.0/25HRS)			NOAA 2 (CONF 01)								
13	0502452	12.6N 113.0E	SAT	(T3.0/3.0 /D / HRS)			ESSA 8 (V180)								
14	0503072	12.4N 112.6E	P	5 12 700 140 50 70			58 45 70 50	990	300	13 10	CIRC		27		2
15	0504562	12.7N 112.4E	SAT	(T3.0/3.0 /D2.0/24HRS)			PCN 5 DMSP								
16	0514072	12.8N 112.6E	P	5 5 700 100 50 10			20 50 90 60	986	296	12 12	-	- -	-		3
17	0513532	13.1N 111.8E	SAT				PCN 1 DMSP								
18	0515102	12.9N 112.2E	P	10 10 700 190 60 110			25 - - -	982	293	14 9	-	- -	-		3
19	0517412	12.9N 112.7E	SAT				PCN 5 DMSP								
20	0522452	13.1N 112.1E	P	5 3 700 40 65 330			30 50 340 7	968	283	17 15	CIRC		15		4
21	0600552	13.4N 111.7E	SAT	(T4.5/4.5 /D1.5/24HRS)			PCN 3 DMSP								
22	0601072	13.8N 111.8E	SAT	(T4.0/4.0 /D1.0/25HRS)			NOAA 2 (CONF 02)								
23	0601082	13.6N 111.5E	SAT	(T4.5/4.5-/D1.5/24HRS)			NOAA 2 (NESS)								
24	0802Z97	13.3N 112.9E	P	5 2 700 270 75 180			30 75 180 25	968	283	17 16	CIRC		20		4
25	0804432	13.4N 111.9E	SAT	(T4.5/4.5 /D1.5/24HRS)			PCN 1 DMSP								
26	0812Z97	13.7N 113.3E	P	10 5 - 180 50 90			90 - - -	-	-	16 -	CIRC		40		5
27	0813542	14.0N 112.4E	SAT				PCN 5 DMSP								
28	0813Z97	13.9N 112.9E	P	10 5 - 210 50 120			40 - - -	-	-	17 -	CIRC		40		5
29	0817202	14.0N 112.2E	SAT				PCN 5 DMSP								
30	0700Z37	14.4N 111.9E	SAT	(T5.5/5.5 /D1.0/24HRS)			PCN 5 DMSP								
31	0702022	14.3N 111.1E	SAT	(T4.5/4.5 /D0.5/24HRS)			NOAA 2 (CONF 02)								
32	0702552	14.7N 110.9E	SAT	(T4.5/4.5 /D / HRS)			ESSA 8 (V180)								
33	0704002	14.2N 111.1E	P	10 10 700 180 40 100			20 75 100 45	971	286	16 14	-	- -	-		6
34	0704272	14.1N 110.8E	SAT	(T5.5/5.5 /D1.0/24HRS)			PCN 3 DMSP								
35	0709002	14.4N 111.0E	P	10 10 700 - - -			- 85 120 10	971	286	17 12	-	- -	-		6
36	0713102	14.5N 110.5E	SAT				PCN 6 DMSP								
37	0717122	12.9N 109.3E	SAT				PCN 5 DMSP								
38	0718282	14.2N 110.0E	P	5 8 700 140 45 50			50 - - -	981	292	13 14	CIRC		25		8
39	0721052	14.3N 109.7E	P	5 6 700 150 35 80			20 - - -	985	293	16 14	CIRC		25		8

TYPHOON PATSY
FIX POSITIONS FOR CYCLONE NO. 19
06 OCT TO 15 OCT

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	FLT LVL WIND (MAX OBS) DIR VEL BRG RNG	SFC WIND (MAX OBS) 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	050019Z	14.5N 143.0E	SAT	(T1.5/1.5 /D0.5/24HRS)			NOAA 2 (NESS)	(CONF 02)							
2	052312Z	13.0N 142.4E	SAT	(T1.5/1.5 / / HRS)			PCN 3 DMSP								
3	052315Z	13.5N 142.0E	SAT	(T2.0/2.0 /D0.5/24HRS)			NOAA 2 (NESS)								
4	060301Z	13.0N 142.1E	SAT	(T1.5/1.5 / / HRS)			PCN 3 DMSP								
5	061153Z	13.0N 142.6E	SAT				PCN 5 DMSP								
6	061542Z	13.0N 142.2E	SAT				PCN 5 DMSP								
7	062254Z	12.9N 141.3E	SAT	(T3.0/3.0 /D1.5/24HRS)			PCN 3 DMSP								
8	070007Z	13.5N 141.7E	SAT	(T2.5/2.5 /D1.5/24HRS)			NOAA 2	(CONF 02)							
9	070007Z	12.9N 141.2E	SAT	(T3.0/3.0 /D1.0/24HRS)			NOAA 2 (NESS)	(CONF 01)							
10	070647Z	12.8N 140.9E	SAT	(T3.0/3.0 /D / HRS)			PCN 4 DMSP								
11	070647Z	12.9N 140.9E	SAT	(T3.0/3.0 /D1.5/ HRS)			PCN 3 DMSP								
12	070310Z	13.0N 141.0E	P	2 8	-	150 50 50 40	50 40 30	-	-	20 -	CIRC		50		2
13	071000Z	13.7N 140.6E	P	10 2	-	40 60 50 35	- - -	-	-	- -	CIRC		2		2
14	071135Z	13.0N 140.0E	SAT				PCN 6 DMSP								
15	071135Z	13.8N 140.3E	SAT				PCN 4 DMSP								
16	071530Z	13.7N 139.9E	SAT				PCN 3 DMSP								
17	071530Z	14.1N 139.9E	SAT				PCN 3 DMSP								
18	072210Z	14.0N 139.0E	SAT	(T4.0/4.0 /D1.5/24HRS)			NOAA 2	(CONF 01)							
19	072235Z	14.0N 139.2E	SAT	(T4.5/4.5 /D1.5/20HRS)			PCN 2 DMSP								
20	072235Z	13.9N 139.2E	SAT	(T4.0/4.0 /D / HRS)			PCN 1 DMSP								
21	072235Z	14.0N 138.9E	SAT	(T4.0/4.0 /D1.0/24HRS)			PCN 1 DMSP								
22	072309Z	14.1N 139.0E	SAT	(T4.0/4.0 /D1.0/24HRS)			NOAA 2 (NESS)	(CONF 01)							
23	080232Z	13.8N 138.3E	SAT	(T4.5/4.5 /D1.5/24HRS)			PCN 4 DMSP								
24	080432Z	14.1N 138.3E	SAT	(T4.0/4.0 /D1.0/24HRS)			PCN 3 DMSP								
25	080440Z	14.2N 138.2E	P	2 5	700	150 70 40 50	80 40 20	974	289	16 11	CIRC		30		3
26	080910Z	14.3N 138.1E	P	5 10	700	180 50 100 40	- - -	976	290	16 13	CIRC		30		3
27	081117Z	14.6N 137.6E	SAT				PCN 5 DMSP								
28	081117Z	14.7N 137.0E	SAT				PCN 6 DMSP								
29	081515Z	14.8N 137.2E	SAT				PCN 1 DMSP								
30	081513Z	14.7N 137.2E	SAT				PCN 1 DMSP								
31	082115Z	14.9N 136.1E	P	5 5	700	130 60 330 15	75 290 10	958	272	16 10	CIRC		20		4
32	082217Z	15.0N 135.9E	SAT	(T4.0/4.0 /D1.0/ HRS)			PCN 3 DMSP								
33	082217Z	15.0N 135.8E	SAT	(T4.5/4.5 /D1.5/ HRS)			PCN 2 DMSP								
34	082359Z	15.2N 135.7E	SAT	(T5.0/5.0 /D / HRS)			PCN 1 DMSP								
35	082359Z	15.0N 135.8E	SAT	(T5.0/5.0 /D1.0/24HRS)			PCN 1 DMSP								
36	090002Z	15.0N 135.6E	SAT	(T5.0/5.0 /D1.0/26HRS)			NOAA 2	(CONF 01)							
37	090004Z	15.1N 135.7E	SAT	(T5.0/5.0 /D1.0/24HRS)			NOAA 2 (NESS)	(CONF 01)							
38	090218Z	15.1N 135.1E	SAT	(T5.0/5.0 /D1.0/ HRS)			PCN 1 DMSP								
39	090219Z	15.2N 135.5E	SAT	(T4.5/4.5 /D1.5/20HRS)			PCN 1 DMSP								
40	090300Z	15.0N 135.4E	P	5 3	700	350 75 270 10	100 270 5	950	265	15 12	CIRC		10		4
41	090359Z	15.3N 135.0E	SAT	(T5.0/5.0 /D / HRS)			PCN 1 DMSP								
42	090359Z	15.1N 135.1E	SAT	(T5.0/5.0 /D1.0/ HRS)			PCN 1 DMSP								
43	090700Z	15.3N 135.0E	AC R	-							-	- -	-		-
44	091059Z	15.6N 133.8E	SAT				PCN 1 DMSP								
45	091059Z	15.3N 133.1E	SAT				PCN 5 DMSP								
46	091218Z	15.5N 133.6E	P	7 2	-	360 90 270 15	70 80 4	-	-	16 11	CIRC		7		5
47	091240Z	15.4N 133.8E	SAT				PCN 1 DMSP								
48	091240Z	15.4N 133.8E	SAT				PCN 1 DMSP								
49	091501Z	15.5N 133.3E	SAT				PCN 1 DMSP								
50	091501Z	15.6N 133.4E	SAT				PCN 1 DMSP								
51	092341Z	16.0N 131.8E	SAT	(T6.0/6.0 /D1.0/24HRS)			PCN 1 DMSP								
52	092341Z	16.1N 131.6E	SAT	(T5.0/5.0 /D0.5/ HRS)			PCN 1 DMSP								
53	092341Z	16.0N 131.9E	SAT	(T6.0/6.0 /D1.0/24HRS)			PCN 1 DMSP								
54	100020Z	15.8N 131.6E	P	1 1	700	240 100 - -	150 - -	893	214	25 12	CIRC	- -	5		6
55	100300Z	16.0N 131.1E	P	10 -	-	- - - -	- - -	-	-	- -	-	- -	-		6
56	100345Z	16.0N 131.0E	SAT	(T6.0/6.0 /D1.0/ HRS)			PCN 1 DMSP								
57	100345Z	16.0N 130.9E	SAT	(T6.0/6.0 /D1.0/24HRS)			PCN 1 DMSP								
58	100345Z	16.0N 131.2E	SAT	(T6.5/6.5 /D1.5/24HRS)			PCN 1 DMSP								
59	100900Z	16.3N 130.0E	P	5 3	700	120 125 50 10	130 80 4	911	230	23 13	CIRC		8		7
60	101222Z	16.2N 129.3E	SAT				PCN 5 DMSP								
61	101222Z	16.5N 129.0E	SAT				PCN 6 DMSP								
62	101222Z	16.5N 129.4E	SAT				PCN 5 DMSP								
63	101628Z	16.5N 128.3E	SAT				PCN 5 DMSP								
64	101628Z	16.4N 128.4E	SAT				PCN 5 DMSP								
65	101628Z	16.9N 129.0E	SAT				PCN 5 DMSP								
66	102147Z	16.8N 127.1E	P	5 3	700	40 75 330 15	130 40 30	962	276	20 20	ELIP	E-W	15X10		8
67	102322Z	17.1N 126.6E	SAT	(T6.5/6.5 /D1.5/24HRS)			PCN 4 DMSP								
68	102322Z	16.8N 126.8E	SAT	(T5.5/6.0 /W0.5/24HRS)			PCN 3 DMSP								
69	102358Z	16.0N 126.0E	SAT	(T6.0/6.0 /D1.0/24HRS)			NOAA 2	(CONF 02)							
70	110330Z	17.1N 126.2E	SAT	(T4.5/5.5 /W2.0/24HRS)			PCN 4 DMSP								
71	110330Z	17.0N 126.2E	SAT	(T5.5/6.0 /W0.5/ HRS)			PCN 3 DMSP								
72	110430Z	17.1N 126.2E	SAT	(T7.0/7.0 /D1.0/27HRS)			PCN 3 DMSP								
73	110747Z	17.3N 124.9E	P	15 10	-	- - - -	140 270 10	-	286	10 -	CIRC		10		9
74	110830Z	17.2N 124.5E	LAND RADAR	- EYE. D10										14.4N 122.6E	
75	110900Z	17.3N 124.5E	LAND RADAR	- CENTER 15 DEG SPIRAL OVERLAY										14.4N 122.6E	
76	111030Z	17.2N 124.0E	LAND RADAR	- CENTER 15 DEG SPIRAL OVERLAY										14.4N 122.6E	
77	111130Z	17.1N 123.6E	LAND RADAR	- CENTER 15 DEG SPIRAL OVERLAY										14.4N 122.6E	
78	111604Z	17.2N 123.4E	SAT				PCN 5 DMSP								
79	111204Z	17.2N 123.2E	SAT				PCN 3 DMSP								
80	111230Z	17.2N 123.2E	LAND RADAR	-							-	-	-	14.4N 122.6E	
81	111300Z	17.2N 122.9E	LAND RADAR	-							-	-	-	14.4N 122.6E	
82	111330Z	17.2N 122.8E	LAND RADAR	- CENTER 15 DEG SPIRAL OVERLAY										14.4N 122.6E	
83	111613Z	18.2N 123.9E	SAT				PCN 3 DMSP								
84	111613Z	17.7N 124.2E	SAT				PCN 3 DMSP								
85	111613Z	17.8N 124.0E	SAT				PCN 3 DMSP								
86	112304Z	18.6N 122.8E	SAT	(T2.5/3.5 /W2.0/13HRS)			PCN 3 DMSP								
87	112304Z	18.5N 123.0E	SAT	(T4.5/4.5 /W2.0/ HRS)			PCN 3 DMSP								
88	120046Z	18.4N 122.4E	SAT	(T5.0/5.0 /W2.0/21HRS)			PCN 3 DMSP								
89	120053Z	19.0N 122.0E	SAT	(T3.0/4.0-/W3.0/24HRS)			NOAA 2	(CONF 01)							
90	120053Z	19.0N 122.0E	SAT	(T2.0/3.0 /W2.5/24HRS)			NOAA 2 (NESS)	(CONF 01)							
91	120310Z	19.0N 121.4E	SAT	(T4.5/4.5 /W2.0/ HRS)			PCN 5 DMSP								
92	120316Z	18.3N 121.2E	SAT	(T1.5/2.5 /W1.0/11HRS)			PCN 6 DMSP								
93	120457Z	19.0N 121.0E	SAT	(T5.0/5.0 /W2.0/ HRS)			PCN 5 DMSP								
94	130146Z	16.9N 111.6E	SAT	(T2.0/2.0 /D1.0/24HRS)			NOAA 2	(CONF 02)							
95	130149Z	17.5N 111.8E	SAT	(T3.0/3.0 /D1.0/24HRS)			NOAA 2 (NESS)	(CONF 02)							
96	130443Z	18.0N 112.6E	SAT	(T2.0/2.0 /D1.0/ HRS)			PCN 5 DMSP								
97	131309Z	17.4N 110.1E	SAT				PCN 5 DMSP								
98	131726Z	17.5N 107.0E	SAT				PCN 5 DMSP								
99	140009Z	17.0N 110.0E	SAT	(T1.0/2.0 /W / HRS)			PCN 3 DMSP								
100	140009Z	17.5N 106.7E	SAT	(T2.0/2.0 /D1.0/ HRS)			PCN 5 DMSP								
101	140242Z	16.4N 110.0E	SAT	(T1.5/1.5 / /24HRS)			NOAA 2								
102	140246Z	16.3N 109.9E	SAT	(T2.0/3.0 /W1.0/24HRS)			NOAA 2 (NESS)								
103	140302Z	15.8N 110.9E	SAT	(T2.0/2.0 / / HRS)			ESSA 8 (VTBU)								
104	140428Z	16.6N 110.0E	SAT	(T2.0/2.0 /S /24HRS)			PCN 3 DMSP								

TYPHOON RUTH
FIX POSITIONS FOR CYCLONE NO. 20
11 OCT TO 19 OCT

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	FLT LVL DIR	MAX OBS WIND VEL	MAX OBS WIND BRG	MAX OBS WIND RNG	SFC WIND VEL	SFC WIND BRG	SFC WIND RNG	OBS MIN SLP	MIN 700MB HGT	FLT LVL T1/T0	EYE FORM	DIEN-ATION	EYE DIA	POSIT OF RADAR	MSN NMPH
1	1023Z	10.2N 140.4E	SAT	(T1.5/1.5 /D0.5/24HRS)				PCN 5 DMSP												
2	1100Z	10.2N 139.7E	SAT	(T1.5/1.5 /D0.5/ HRS)				PCN 5 DMSP												
3	1112Z	12.0N 138.5E	SAT					PCN 5 DMSP												
4	1120Z	12.1N 140.5E	SAT					PCN 5 DMSP												
5	1142Z	12.5N 140.6E	AC R	-												-	- -	-		.
6	1143Z	12.2N 139.9E	SAT					PCN 5 DMSP												
7	1125Z	11.0N 137.2E	SAT	(T2.0/2.0 /D1.0/24HRS)				NOAA 2		(CONF 02)										
8	1130Z	12.0N 137.6E	SAT	(T2.5/2.5 /D1.5/24HRS)				NOAA 2 (NESS)		(CONF 02)										
9	1123Z	12.8N 137.4E	SAT	(T2.5/2.5 /D1.0/24HRS)				PCN 3 DMSP												
10	1130Z	12.8N 137.3E	SAT	(T3.0/3.0 /D0.5/11HRS)				PCN 3 DMSP												
11	1200Z	13.3N 137.7E	P	5 3 -	100	35	40	50	35	40	50	999	-	25	24	-	- -	-		2
12	1203Z	13.1N 137.4E	P	5 5 -	90	20	360	15	45	90	15	995	-	25	24	-	- -	-		2
13	1203Z	13.1N 137.1E	SAT	(T2.5/2.5 /D1.0/ HRS)				PCN 3 DMSP												
14	1211Z	13.2N 135.1E	SAT					PCN 5 DMSP												
15	1215Z	13.9N 134.7E	P	2 20 -	-	-	-	-	-	-	-	-	309	-	-	-	- -	-		3
16	1215Z	13.5N 134.7E	P	2 15 -	150	45	100	15	-	-	-	1001	309	16	14	-	- -	-		3
17	1215Z	13.7N 134.5E	P	2 15 -	110	40	30	25	-	-	-	996	305	16	-	-	- -	-		3
18	1215Z	13.4N 134.2E	SAT					PCN 3 DMSP												
19	1215Z	13.7N 134.0E	SAT					PCN 6 DMSP												
20	1224Z	12.7N 132.3E	SAT	(T3.0/3.0 /D0.5/24HRS)				PCN 3 DMSP												
21	1225Z	12.8N 132.5E	SAT	(T3.5/3.5 /D0.5/24HRS)				PCN 4 DMSP												
22	1223Z	12.5N 133.0E	SAT	(T3.5/3.5 /D1.5/25HRS)				NOAA 2		(CONF 01)										
23	1225Z	12.0N 132.8E	SAT	(T3.5/3.5 /D1.0/24HRS)				NOAA 2 (NESS)		(CONF 02)										
24	1303Z	12.7N 131.6E	SAT	(T3.0/3.0 /D0.5/ HRS)				PCN 3 DMSP												
25	1303Z	12.9N 131.7E	SAT	(T3.5/3.5 /D0.5/ HRS)				PCN 4 DMSP												
26	1304Z	12.7N 132.0E	P	10 2 700	110	55	360	15	80	360	17	975	290	17	14	CIRC		13		4
27	1307Z	12.9N 131.4E	P	10 5 700	100	50	30	30	80	30	25	982	292	15	13	CIRC		14		4
28	1311Z	13.1N 130.7E	SAT					PCN 3 DMSP												
29	1312Z	13.5N 130.5E	SAT					PCN 4 DMSP												
30	1319Z	13.4N 130.0E	SAT					PCN 3 DMSP												
31	1315Z	13.4N 130.4E	SAT					PCN 3 DMSP												
32	1316Z	13.5N 130.2E	P	5 10 -	40	30	330	30	-	-	-	-	-	17	-	CIRC		25		5
33	1321Z	13.9N 129.0E	P	5 5 -	120	50	50	60	-	-	-	-	-	16	-	CIRC		25		5
34	1400Z	13.9N 128.2E	SAT	(T3.5/3.5 /D2.5/ HRS)				PCN 5 DMSP												
35	1400Z	14.0N 128.5E	SAT	(T4.0/4.0 /D1.0/24HRS)				PCN 3 DMSP												
36	1404Z	14.0N 128.0E	SAT	(T3.0/3.5 /W0.5/25HRS)				NOAA 2		(CONF 01)										
37	1400Z	14.0N 128.2E	SAT	(T3.0/3.5 /W0.5/24HRS)				NOAA 2 (NESS)												
38	1402Z	14.0N 128.1E	SAT	(T4.0/4.0 /D1.0/ HRS)				PCN 5 DMSP												
39	1403Z	14.2N 127.8E	P	5 10 700	60	65	350	40	60	350	35	987	298	15	14	-	- -	-		6
40	1404Z	14.5N 127.8E	SAT	(T3.5/3.5 /D2.5/ HRS)				PCN 3 DMSP												
41	1407Z	14.2N 126.8E	P	5 10 700	30	65	260	50	65	40	70	983	294	19	-	CIRC		40		7
42	1412Z	14.5N 126.6E	SAT					PCN 5 DMSP												
43	1416Z	14.4N 126.7E	SAT					PCN 3 DMSP												
44	1418Z	14.2N 126.0E	P	5 10 700	110	65	20	50	-	-	-	982	294	20	-	CIRC		40		7
45	1413Z	14.3N 126.0E	SAT					PCN 4 DMSP												
46	1419Z	14.5N 126.3E	SAT					PCN 1 DMSP												
47	1421Z	14.4N 125.2E	LHUR	- EYE, 10 DEG SPIRAL OVERLAY, 100 PCT, ELLIPTICAL, AXIS 44X32															14.4N 122.6E	
48	1423Z	14.6N 124.8E	LHUR	- EYE, 90 PCT, CIRCULAR OPEN SW, D32															14.4N 122.6E	
49	1423Z	14.3N 124.4E	SAT	(T4.5/4.5 /D0.5/24HRS)				PCN 3 DMSP												
50	1423Z	14.6N 124.6E	SAT	(T4.0/4.0 /D0.5/24HRS)				PCN 3 DMSP												
51	1423Z	14.5N 124.2E	SAT	(T5.5/5.5 /D2.0/ HRS)				PCN 1 DMSP												.
52	1500Z	14.8N 124.7E	LHUR	- EYE, 75 PCT, CIRCULAR OPEN N, D60															14.4N 122.6E	
53	1501Z	14.8N 124.3E	LHUR	- EYE, 75 PCT, CIRCULAR OPEN N, D60															14.4N 122.6E	
54	1501Z	14.8N 124.4E	SAT	(T5.0/5.0+/D2.0/25HRS)				NOAA 2		(CONF 01)										
55	1501Z	14.8N 124.5E	SAT	(T5.0/5.0 /D1.5/24HRS)				NOAA 2 (NESS)												
56	1506Z	14.7N 124.1E	LHUR	- EYE, 70 PCT, CIRCULAR OPEN N, D65															14.4N 122.6E	
57	1505Z	14.8N 124.2E	P	10 10 700	350	70	250	15	75	90	60	972	286	16	12	CIRC		30		8
58	1503Z	14.8N 124.0E	LHUR	- EYE, 70 PCT, CIRCULAR OPEN N, D55															14.4N 122.6E	
59	1504Z	14.7N 123.6E	SAT	(T4.0/4.0 /D0.5/ HRS)				PCN 1 DMSP												
60	1504Z	14.7N 123.5E	SAT	(T4.5/4.5 /D0.5/ HRS)				PCN 1 DMSP											14.4N 120.6E	
61	1509Z	15.0N 122.7E	LHUR	- 67771																
62	1507Z	15.1N 122.9E	P	- 5 700	110	65	20	54	65	20	40	961	277	16	13	CIRC		25		9
63	1510Z	15.1N 122.7E	LHUR	- 61301															14.4N 120.6E	
64	1511Z	15.3N 122.5E	LHUR	- 32941															14.4N 120.6E	
65	1513Z	15.0N 122.3E	LHUR	- EYE															14.4N 122.6E	
66	1516Z	15.4N 122.1E	LHUR	- 20970															14.4N 120.6E	
67	1512Z	15.6N 122.1E	LHUR	- EYE															14.4N 122.6E	
68	1516Z	15.3N 122.2E	SAT					PCN 1 DMSP												
69	1512Z	15.6N 122.0E	SAT					PCN 1 DMSP												
70	1513Z	15.5N 122.0E	LHUR	- 20971												-	- -	-	14.4N 120.6E	
71	1514Z	15.7N 121.8E	LHUR	-															14.4N 120.6E	
72	1515Z	15.8N 121.6E	LHUR	- EYE, 100 PCT, CIRCULAR, D33															14.4N 122.6E	
73	1519Z	15.6N 121.4E	LHUR	- 22811															14.4N 120.6E	
74	1513Z	15.4N 120.8E	LHUR	- POSSIBLE EYE, 100 PCT, CIRCULAR, D20															18.2N 120.5E	
75	1519Z	15.7N 120.9E	LHUR	- 11611															14.4N 120.6E	
76	1518Z	15.4N 120.8E	P	3 15 -	80	85	360	35	-	-	-	-	-	2	1	CIRC		30		10
77	1513Z	15.5N 120.7E	LHUR	- POSSIBLE EYE, D24															18.2N 120.5E	
78	1519Z	15.7N 120.9E	SAT					PCN 1 DMSP												
79	1517Z	15.7N 120.7E	LHUR	- 10811															14.4N 120.6E	
80	1517Z	15.9N 120.5E	LHUR	- EYE, D20															18.2N 120.5E	
81	1519Z	15.8N 120.8E	LHUR	- 10822															14.4N 120.6E	
82	1513Z	16.1N 120.5E	LHUR	- EYE, D20															18.2N 120.5E	
83	1520Z	15.9N 119.9E	LHUR	- EYE, D14															14.4N 120.6E	
84	1521Z	15.4N 119.8E	P	3 5 500	40	50	310	50	-	-	-	989	569	1	-	CIRC		40		10
85	1521Z	15.6N 119.3E	LHUR	- CENTER, D30															18.2N 120.5E	
86	1523Z	16.1N 119.1E	SAT	(T4.5/4.5 /D0.5/ HRS)				PCN 3 DMSP												
87	1523Z	16.0N 119.1E	SAT	(T4.0/4.0 /S /24HRS)				PCN 3 DMSP												
88	1523Z	16.0N 119.0E	SAT	(T5.5/5.5 /D2.0/24HRS)				PCN 3 DMSP												
89	1526Z	16.1N 119.1E	SAT	(T5.5/5.5 /W0.5/24HRS)				NOAA 2		(CONF 01)										
90	1600Z	16.2N 119.0E	SAT	(T4.0/5.0 /W1.0/24HRS)				NOAA 2 (NESS)		(CONF 01)										
91	1603Z	16.3N 118.8E	LHUR	- EYE, ELLIPTICAL DIFFUSE, D32															18.2N 120.5E	
92	1603Z	16.2N 118.1E	SAT	(T4.0/4.0 /S / HRS)				PCN 3 DMSP												
93	1603Z	16.1N 118.2E	SAT	(T4.0/4.0 /S0.5/26HRS)				PCN 3 DMSP												
94	1604Z	16.1N 118.3E	P	8 10 500	170	80	90	80	70	60	20	985	571	-2	-4	CIRC		25		11
95	1604Z	16.0N 118.2E	LHUR	- EYE, 50 PCT, ELLIPTICAL OPEN W															18.2N 120.5E	
96	1603Z	16.2N 119.6E	LHUR	- EYE, 50 PCT, ELLIPTICAL, D35															18.2N 120.5E	
97	1607Z	16.5N 117.5E	P	7 10 700	30	50	320	25	60	330	55	978	290	13	11	CIRC		25		11
98	1610Z	16.5N 116.3E	P	5 5 700	110	65	10	24	-	-	-	975	287	13	11	CIRC		20		12
99	1616Z	16.5N 116.1E	SAT					PCN 3 DMSP												
100	1619Z	15.9N 116.6E	SAT					PCN 5 DMSP												

TYPHOON RUTH
FIX POSITIONS FOR CYCLONE NO. 20
11 OCT TO 19 OCT

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	FLT LVL	MAX OBS 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	MSA NMMR
101	102100Z	16.8N 115.2E	P	5 5	700		130	70	60	35	-	-	-	966	281	10 14	CIRC		21		19
102	170058Z	16.9N 114.3E	SAT				(T5.0/5.0	/D1.0/24HRS)			PCN 1 DMSP										
103	170138Z	16.9N 114.5E	SAT				(T5.0/5.0	/D0.5/25HRS)			NOAA 2			(CONF 01)							
104	170141Z	16.5N 114.5E	SAT				(T5.0/5.0	/D1.0/24HRS)			NOAA 2 (NESS)			(CONF 01)							
105	170344Z	16.5N 113.4E	SAT				(T4.5/4.5	/W1.0/28HRS)			PCN 3 DMSP										
106	170344Z	17.0N 113.8E	SAT				(T4.5/4.5	/D0.5/24HRS)			PCN 5 DMSP										
107	170344Z	16.8N 113.8E	SAT				(T5.0/5.0	/D1.0/ HRS)			PCN 5 DMSP										
108	170620Z	16.9N 113.5E	SAT				(T5.0/5.0	/D1.0/ HRS)			PCN 3 DMSP										
109	170955Z	16.8N 112.6E	P	5 10	700		150	90	70	80	40	70	100	957	273	10 14	CIRC		40		13
110	171003Z	16.8N 112.0E	P	5 8	700		130	100	40	30	-	-	-	960	274	10 11	CIRC		35		13
111	171028Z	16.9N 111.9E	SAT								PCN 5 DMSP										
112	171028Z	17.1N 112.0E	SAT								PCN 1 DMSP										
113	171028Z	17.0N 112.2E	SAT								PCN 3 DMSP										
114	172200Z	17.1N 111.1E	P	5 5	700		-	-	-	-	-	-	-	960	276	10 11	CIRC		33		14
115	180038Z	17.2N 110.8E	SAT				(T5.0/5.0	-/S	/24HRS)		PCN 1 DMSP										
116	180434Z	17.2N 110.7E	SAT				(T5.0/5.0	/D0.5/25HRS)			ESSA 8 (VTBU)										
117	180234Z	18.0N 110.3E	SAT				(T5.0/5.0	/S	/24HRS)		NOAA 2			(CONF 02)							
118	180716Z	17.7N 110.4E	SAT				(T5.0/5.0	-/S	/ HRS)		PCN 1 DMSP										
119	181755Z	18.1N 109.3E	SAT								PCN 5 DMSP										
120	190020Z	20.0N 107.9E	SAT				(T4.0/4.0	/W0.5/24HRS)			PCN 4 DMSP										
121	190133Z	20.8N 108.0E	SAT				(T4.0/5.0	/W1.0/23HRS)			NOAA 2			(CONF 02)							
122	190433Z	20.8N 108.0E	SAT				(T4.0/5.0	/W1.0/23HRS)			NON DMSP										
123	190533Z	19.4N 108.7E	SAT				(T4.0/4.0	/W1.0/25HRS)			NON DMSP										
124	190957Z	20.8N 108.0E	SAT				(T3.0/4.0	/W2.0/27HRS)			PCN 1 DMSP										

TROPICAL STORM SARAH
FIX POSITIONS FOR CYCLONE NO. 21
10 NOV TO 10 NOV

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	FLT LVL	MAX OBS 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	MSA NMMR
1	080049Z	10.8N 116.5E	SAT				(T2.0/2.0	/D0.5/24HRS)			NOAA 2 (NESS)			(CONF 02)							
2	090043Z	12.0N 115.4E	SAT				(T1.5/1.5	/D0.5/ HRS)			PCN 5 DMSP										
3	090144Z	11.0N 115.0E	SAT				(T2.0/2.0	/D1.0/24HRS)			NOAA 2			(CONF 01)							
4	090144Z	11.0N 115.0E	SAT				(T2.5/2.5	/D0.5/24HRS)			NOAA 2 (NESS)			(CONF 01)							
5	090456Z	12.7N 114.5E	SAT				(T1.5/1.5	/D0.5/ HRS)			PCN 3 DMSP										
6	091329Z	13.2N 113.2E	SAT								PCN 3 DMSP										
7	091739Z	13.5N 113.1E	SAT								PCN 3 DMSP										
8	100025Z	12.2N 111.4E	SAT				(T3.0/3.0	/D1.5/24HRS)			PCN 3 DMSP										
9	100041Z	12.8N 111.8E	SAT				(T3.0/3.0	/D1.0/24HRS)			NOAA 2			(CONF 02)							
10	100635Z	12.8N 110.3E	SAT				(T3.5/3.5	-/D1.0/24HRS)			NOAA 2 (NESS)										
11	100408Z	12.1N 110.8E	P	10 5	700		120	40	350	50	45	360	15	992	301	10 10	CIRC		25		1
12	100941Z	12.1N 111.0E	SAT				(T3.0/3.0	/D1.5/24HRS)			PCN 3 DMSP										
13	100935Z	12.2N 109.8E	P	- 5	500		180	25	90	18	50	240	10	984	572	-2 -6	CIRC		25		2
14	101307Z	12.4N 109.7E	SAT								PCN 2 DMSP										
15	101725Z	12.3N 109.1E	SAT								PCN 3 DMSP										
16	110148Z	12.2N 107.6E	SAT				(T3.0/3.0	/D	/24HRS)		PCN 5 DMSP										
17	140227Z	13.0N 89.5E	SAT				(T1.5/1.5	/D0.5/24HRS)			NOAA 2			(CONF 01)							
18	140258Z	12.5N 88.5E	SAT				(T2.0/2.0	/D1.0/24HRS)			NOAA 2 (NESS)										
19	140235Z	13.1N 89.7E	SAT				(T2.0/2.0	/D1.0/ HRS)			PCN 5 DMSP										
20	140529Z	13.2N 89.6E	SAT				(T2.0/2.0	/D1.0/ HRS)			PCN 5 DMSP										
21	141009Z	14.5N 89.5E	SAT				(T2.0/2.0	/ / HRS)			PCN 3 DMSP										
22	150217Z	14.1N 89.1E	SAT				(T2.0/2.0	/ / HRS)			PCN 3 DMSP										
23	150356Z	14.2N 88.1E	SAT				(T2.5/2.5	/D1.0/25HRS)			NOAA 2			(CONF 01)							
24	150523Z	14.0N 88.7E	SAT				(T2.5/2.5	/D0.5/24HRS)			NOAA 2 (NESS)										
25	150956Z	15.1N 88.6E	SAT				(T2.0/2.0	/ / HRS)			PCN 3 DMSP										
26	151459Z	14.6N 87.4E	SAT								PCN 5 DMSP										
27	160159Z	15.2N 87.8E	SAT				(T4.0/4.0	/ / HRS)			PCN 3 DMSP										
28	160224Z	15.3N 87.4E	SAT				(T3.5/3.5	/D1.0/24HRS)			NOAA 2 (NESS)										
29	160413Z	15.3N 88.5E	SAT				(T3.5/3.5	/D1.0/24HRS)			NOAA 2			(CONF 02)							
30	160637Z	15.8N 88.6E	SAT				(T4.0/4.0	/D2.0/24HRS)			PCN 1 DMSP										
31	160637Z	15.7N 88.7E	SAT				(T4.0/4.0	/ / HRS)			PCN 3 DMSP										
32	161441Z	17.4N 89.0E	SAT								PCN 3 DMSP										
33	161441Z	17.4N 89.0E	SAT								PCN 3 DMSP										
34	170141Z	19.3N 90.9E	SAT				(T4.0/4.0	/ / HRS)			PCN 3 DMSP										
35	170141Z	19.3N 91.3E	SAT				(T4.0/4.0	/ / HRS)			PCN 4 DMSP										
36	170315Z	20.0N 90.6E	SAT				(T4.0/4.0	/D0.5/23HRS)			NOAA 2										
37	170414Z	19.3N 90.9E	SAT				(T4.0/4.0	-/S	/24HRS)		PCN 3 DMSP										
38	170622Z	20.2N 91.4E	SAT				(T4.0/4.0	/ / HRS)			PCN 3 DMSP										

TROPICAL STORM THELMA
FIX POSITIONS FOR CYCLONE NO. 22
15 NOV TO 18 NOV

FIX NO.	TIME	POSIT	FIX CAT	ACCRY NAV-MET	FIX LVL	FLT LVL	MAX OBS 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	MSA NMMR
1	100042Z	9.1N 132.5E	SAT				(T1.5/1.5	/D0.5/24HRS)			NOAA 2			(CONF 01)							
2	100044Z	8.5N 132.8E	SAT				(T1.5/1.5	/D0.5/24HRS)			NOAA 2 (NESS)										
3	102342Z	8.0N 130.8E	SAT				(T1.5/1.5	/S	/23HRS)		NOAA 2			(CONF 02)							
4	120038Z	9.5N 125.5E	SAT				(T2.0/2.0	/D0.5/25HRS)			NOAA 2			(CONF 02)							
5	120040Z	9.8N 126.5E	SAT				(T2.0/2.0	/D0.5/24HRS)			NOAA 2 (NESS)										
6	130133Z	9.5N 121.0E	SAT				(T3.0/3.0	/D1.0/25HRS)			NOAA 2			(CONF 01)							
7	130134Z	9.5N 121.5E	SAT				(T3.0/3.0	/D1.0/25HRS)			NOAA 2 (NESS)										
8	140031Z	10.1N 117.4E	SAT				(T3.5/3.5	/D0.5/25HRS)			NOAA 2			(CONF 02)							
9	140034Z	10.2N 117.4E	SAT				(T3.0/3.0	/S	/23HRS)		NOAA 2 (NESS)			(CONF 02)							
10	140034Z	10.2N 116.1E	SAT				(T1.5/1.5	/S	/25HRS)		PCN 5 DMSP										
11	140524Z	10.5N 116.2E	SAT				(T1.5/1.5	/S	/25HRS)		PCN 5 DMSP										
12	141332Z	12.0N 113.6E	SAT								PCN 5 DMSP										
13	141020Z	12.0N 112.8E	SAT								PCN 5 DMSP										
14	150039Z	10.5N 109.9E	SAT				(T1.5/1.5	/S	/25HRS)		PCN 3 DMSP										
15	150036Z	10.3N 110.3E	SAT				(T3.0/3.0	/	/ HRS)		PCN 3 DMSP										
16	150127Z	10.3N 110.0E	SAT				(T3.5/3.5	/S	/25HRS)		NOAA 2			(CONF 01)							
17	150129Z	10.0N 110.0E	SAT				(T3.5/3.5	/D0.5/24HRS)			NOAA 2 (NESS)										
18	150306Z	9.8N 110.3E	P	5 15	-		150	55	60	20	70	310	20	993	304	17 15	-	- -	-		1
19	150310Z	10.0N 109.7E	SAT				(T3.0/3.0	/	/ HRS)		PCN 3 DMSP										
20	150310Z	10.4N 109.7E	SAT				(T3.0/3.0	/D1.5/24HRS)			PCN 3 DMSP										
21	150900Z	9.7N 109.3E	P	1 15	-		90	60	360	15	60	360	10	991	301	18 17	-	- -	-		1
22	151317Z	9.8N 105.6E	SAT								PCN 5 DMSP										
23	151317Z	9.7N 105.7E	SAT								PCN 5 DMSP										
24	151759Z	8.9N 104.9E	SAT								PCN 5 DMSP										
25	160017Z	9.5N 108.0E	SAT				(T3.0/3.0	/D1.5/24HRS)			PCN 3 DMSP										
26	160017Z	9.8N 108.5E	SAT				(T2.0/2.0	/ / HRS)			PCN 3 DMSP										
27	160223Z	9.7N 107.8E	SAT				(T2.5/3.5	/W1.0/24HRS)			NOAA 2 (NESS)										
28	160223Z	9.8N 107.8E	SAT				(T2.5/3.5	-/W1.0/25HRS)			NOAA 2			(CONF 01)							
29	160455Z	9.8N 107.5E	SAT				(T1.5/2.5	/W1.5/24HRS)			PCN 3 DMSP										
30	160455Z	9.8N 107.5E	SAT				(T2.0/2.0	/W	/24HRS)		PCN 3 DMSP										
31	161012Z	9.8N 106.8E	P	- 10	-		25	-		-	30	-	-	998	-	25 -	-	- -	-		2
32	161137Z	9.5N 104.8E	SAT								PCN 5 DMSP										
33	170124Z	9.0N 105.5E	SAT				(T1.5/2.5	/W1.0/23HRS)			NOAA 2			(CONF 02)							
34	170129Z	9.7N 103.9E	SAT				(T1.5/1.5	/W1.0/23HRS)			NOAA 2 (NESS)			(CONF 02)							
35	170441Z	9.0N 106.2E	SAT				(T1.0/1.5	/W0.5/24HRS)			PCN 5 DMSP										
36	180419Z	10.0N 100.0E	SAT				(T2.0/2.0	/D0.5/25HRS)			NOAA 2			(CONF 02)							
37	180420Z	10.0N 100.0E	SAT				(T1.5/1.5	/D	/25HRS)		NOAA 2 (NESS)										

TROPICAL STORM VERA
FIX POSITIONS FOR CYCLONE NO. 23
19 NOV TO 26 NOV

FIX NO.	TIME	POSIT	FIX CAT	ACCMY MAX-MET	FIX LVL	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	DIMEN-SION	EYE DIA	POSIT OF RADAR	MSN NMBR
1	162329Z	7.5N 141.9E	SAT	(T1.5/1.5		/D0.5/23MRS)			NOAA 2			(CONF 01)							
2	180023Z	7.3N 142.9E	SAT	(T1.5/1.5		/D0.5/24MRS)			NOAA 2	(NESS)		(CONF 02)							
3	180023Z	10.7N 136.2E	SAT	(T1.5/1.5		/S /23MRS)			NOAA 2			(CONF 01)							
4	180923Z	11.0N 138.5E	SAT	(T1.5/1.5		/S /24MRS)			NOAA 2	(NESS)									
5	190118Z	11.0N 128.0E	SAT	(T2.5/2.5		/D1.0/25MRS)			NOAA 2			(CONF 02)							
6	190411Z	10.8N 128.1E	SAT	(T1.5/1.5		/D0.5/24MRS)			PCN 5	DMSP									
7	190901Z	10.3N 127.3E	P	10 30	-	140	28	70	230 35	330	230	1002	-	24 11	-	- -	-		1
8	191609Z	11.4N 126.7E	SAT						PCN 5	DMSP									
9	191655Z	11.7N 126.3E	SAT						PCN 5	DMSP									
10	200027Z	13.0N 124.5E	SAT	(T3.0/3.0		/D1.0/24MRS)			NOAA 2	(NESS)									
11	200620Z	12.0N 124.2E	SAT	(T3.0/3.0		/D0.5/23MRS)			NOAA 2			(CONF 01)							
12	200940Z	12.0N 124.5E	SAT	(T2.5/2.5		/D2.5/ MRS)			PCN 5	DMSP									
13	200600Z	11.4N 123.5E	CRUR	- 3310/														10.3N 124.0E	
14	200640Z	11.4N 123.3E	CRUR	- 2111/														10.3N 124.0E	
15	200357Z	12.2N 123.4E	SAT	(T2.0/2.0		/D0.5/24MRS)			PCN 5	DMSP									
16	200357Z	12.1N 124.1E	SAT	(T2.5/2.5		/D2.5/ MRS)			PCN 5	DMSP									
17	201146Z	12.8N 123.0E	SAT						PCN 5	DMSP									
18	201940Z	12.5N 121.5E	SAT						PCN 5	DMSP									
19	201641Z	12.8N 121.7E	SAT						PCN 5	DMSP									
20	210028Z	11.9N 120.1E	SAT	(T3.0/3.0		/D0.5/24MRS)			PCN 5	DMSP									
21	210113Z	11.9N 120.8E	SAT	(T3.0/3.0		/S /25MRS)			NOAA 2			(CONF 01)							
22	210112Z	11.5N 121.0E	SAT	(T3.0/3.0		/S /24MRS)			NOAA 2	(NESS)		(CONF 01)							
23	210342Z	11.8N 121.8E	SAT	(T3.0/3.0		/D0.5/24MRS)			PCN 5	DMSP									
24	210942Z	11.7N 121.3E	SAT	(T2.0/2.0		/S /24MRS)			PCN 5	DMSP									
25	211509Z	11.1N 121.9E	SAT						PCN 5	DMSP									
26	211828Z	10.9N 119.8E	SAT						PCN 5	DMSP									
27	211828Z	11.8N 120.4E	SAT						PCN 5	DMSP									
28	220010Z	11.8N 119.6E	SAT	(T4.0/4.0		/D1.0/24MRS)			PCN 5	DMSP									
29	220011Z	11.3N 119.9E	SAT	(T2.0/2.0		/S /24MRS)			PCN 5	DMSP									
30	220600Z	11.0N 119.5E	SAT	(T2.0/3.0		/W1.0/24MRS)			NOAA 2			(CONF 02)							
31	220611Z	11.5N 119.3E	SAT	(T3.5/3.5		/D0.5/24MRS)			NOAA 2	(NESS)		(CONF 02)							
32	220907Z	12.3N 118.6E	SAT	(T4.0/4.0		/D1.0/24MRS)			PCN 5	DMSP									
33	220905Z	12.5N 119.7E	P	- 10		700	190	35 170	20	45	210	30 995	305	12 12	ELIP	N-S	60X40		4
34	221501Z	12.0N 118.4E	SAT						PCN 5	DMSP									
35	221611Z	13.2N 117.7E	SAT						PCN 5	DMSP									
36	221911Z	13.1N 118.9E	SAT						PCN 5	DMSP									
37	222220Z	13.1N 117.7E	P	- 25	-	130	30	40 145	30	130	20	995	304	10 -	-	- -	-		5
38	222351Z	13.0N 117.8E	SAT	(T3.0/4.0		/W1.0/24MRS)			PCN 3	DMSP									
39	222351Z	13.2N 116.4E	SAT	(T1.5/2.0		/W0.5/24MRS)			PCN 3	DMSP									
40	230100Z	13.5N 117.5E	SAT	(T3.0/3.5		/W0.5/24MRS)			NOAA 2	(NESS)									
41	230109Z	13.5N 117.5E	SAT	(T3.0/3.0		/D1.0/23MRS)			NOAA 2			(CONF 01)							
42	230451Z	12.9N 117.3E	SAT	(T3.0/3.0		/ / MRS)			PCN 3	DMSP									
43	230451Z	13.0N 117.5E	SAT	(T3.0/4.0		/W1.0/24MRS)			PCN 3	DMSP									
44	230930Z	13.3N 117.2E	P	2 8		700	-	- -	-	35	300	50 993	305	14 -	-	- -	-		6
45	231233Z	13.5N 117.4E	SAT						PCN 5	DMSP									
46	231633Z	13.9N 117.2E	SAT						PCN 5	DMSP									
47	231739Z	14.0N 114.8E	SAT						PCN 5	DMSP									
48	231739Z	13.9N 115.8E	SAT						PCN 5	DMSP									
49	232217Z	14.5N 115.7E	P	2 5	-	190	45	-	-	30	90	20 990	302	10 -	-	- -	-		7
50	240119Z	14.5N 115.5E	SAT	(T4.0/4.0		/D1.0/24MRS)			PCN 5	DMSP									
51	240119Z	14.7N 115.2E	SAT	(T4.0/4.0		+/D1.0/20MRS)			PCN 3	DMSP									
52	240110Z	15.2N 114.7E	SAT	(T3.5/3.5		/D0.5/23MRS)			NOAA 2			(CONF 01)							
53	240440Z	15.1N 114.7E	SAT	(T4.0/4.0		/D1.0/24MRS)			PCN 3	DMSP									
54	240440Z	15.0N 114.2E	SAT	(T4.0/4.0		+/D1.0/20MRS)			PCN 3	DMSP									
55	241147Z	15.6N 113.3E	P	10 10	-	220	45	130	25	-	-	- 996	305	10 -	-	- -	-		8
56	241617Z	15.8N 114.7E	SAT						PCN 5	DMSP									
57	241215Z	15.4N 114.3E	SAT						PCN 5	DMSP									
58	241500Z	16.0N 113.1E	SAT						PCN 5	DMSP									
59	241350Z	15.9N 113.3E	SAT						PCN 5	DMSP									
60	241740Z	16.3N 112.2E	SAT						PCN 5	DMSP									
61	241742Z	16.0N 113.1E	SAT						PCN 5	DMSP									
62	250027Z	16.3N 113.0E	P	3 5		700	240	45 -	-	40	170	20 996	307	14 11	-	- -	-		9
63	250056Z	16.4N 112.5E	SAT	(T2.5/3.5		/W1.5/24MRS)			PCN 3	DMSP									
64	250050Z	16.7N 112.2E	SAT	(T2.5/3.5		/W1.5/24MRS)			PCN 5	DMSP									
65	250103Z	16.0N 111.7E	SAT	(T3.0/3.5		/W0.5/25MRS)			NOAA 2			(CONF 02)							
66	250104Z	16.5N 111.8E	SAT	(T3.0/3.5		/W0.5/24MRS)			NOAA 2	(NESS)		(CONF 02)							
67	250426Z	17.1N 111.9E	SAT	(T2.5/3.5		/W1.5/24MRS)			PCN 5	DMSP									
68	250426Z	16.3N 112.1E	SAT	(T2.5/3.5		/W1.5/24MRS)			PCN 3	DMSP									
69	251338Z	17.4N 111.1E	SAT						PCN 5	DMSP									
70	251709Z	17.4N 110.9E	SAT						PCN 3	DMSP									
71	260036Z	17.2N 111.8E	SAT	(T1.5/2.5		/W1.0/24MRS)			PCN 3	DMSP									
72	260911Z	17.3N 111.9E	SAT	(T1.5/2.5		/W1.0/24MRS)			PCN 3	DMSP									
73	260911Z	17.4N 111.9E	SAT	(T1.5/1.5		/W0.5/48MRS)			PCN 3	DMSP									