H. TYPHOON HOPE 20 SEP 0500Z-29 SEP 0500Z

1. STATISTICS

a. Number of Warnings Issued - 37

b. Number of Warnings with Typhoon Intensity - 27

c. Distance Traveled During Warning Period - 3,034 MI

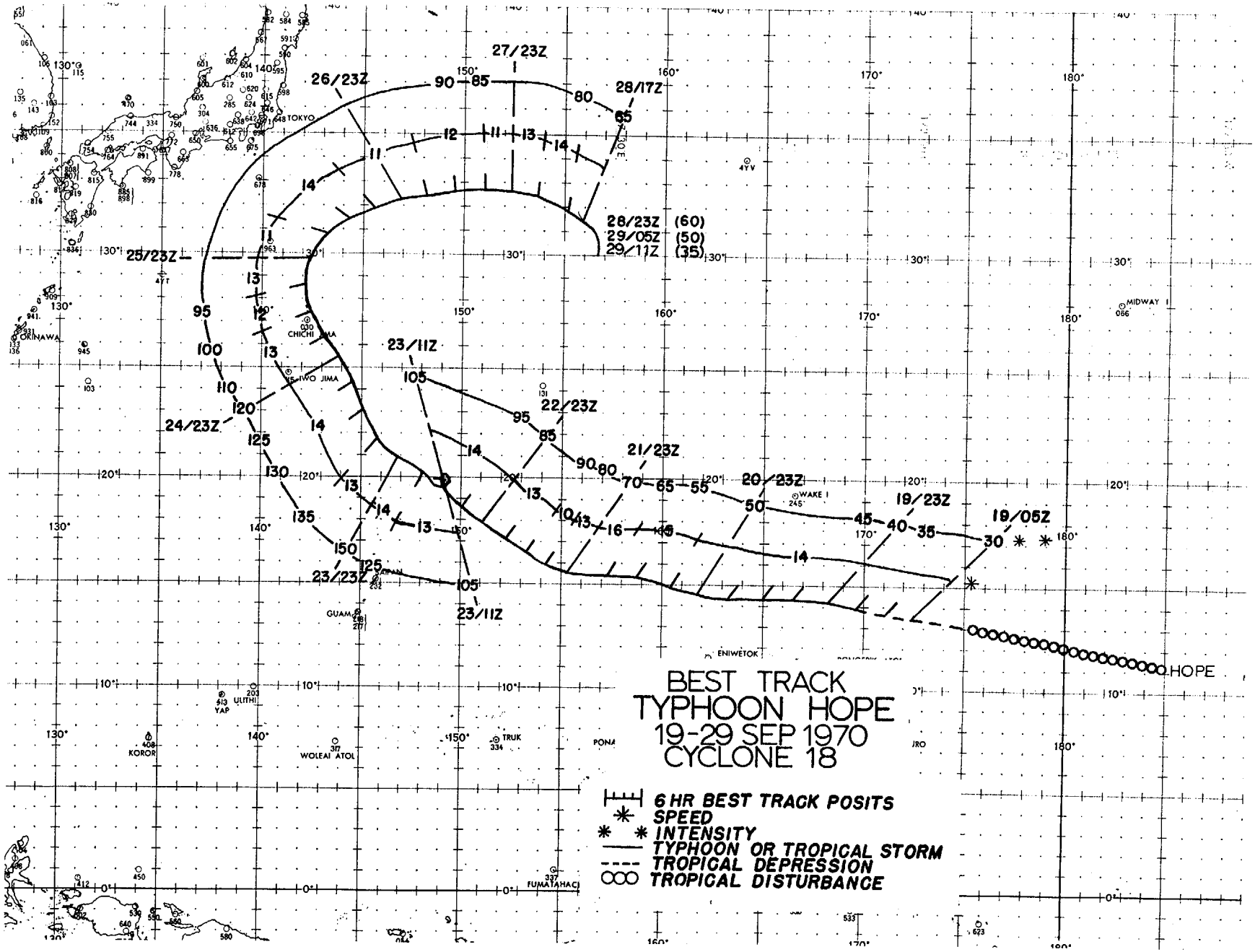
2. CHARACTERISTICS AS A TYPHOON

a. Minimum Observed SLP - 895 MBS at 23/2100Z

b. Minimum Observed 700 MB Height - 2219 M at 23/2100Z

c. Maximum Surface Wind - 150 KTS (From Best Track)

d. Maximum Radius of Surface Circulation - 180 MI


BEST TRACK
TYPHOON HOPE
19-29 SEP 1970
CYCLONE 18
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
25/23Z
26/23Z
27/23Z
28/17Z
28/23Z (60)
29/05Z (50)
29/11Z (35)
24/23Z
23/23Z
23/11Z
22/23Z
21/23Z
20/23Z
19/23Z
19/05Z
HOPE
TOKYO
OKINAWA
CHICHI JIMA
IWO JIMA
MIDWAY I
WAKE I
GUAM
YAP
ULITHI
KOROR
WOLEAI ATOL
TRUK
ENIWETOK
FUMATAHACI

3. TYPHOON HOPE NARRATIVE

Hope spent her seven day period of typhoon intensity describing a parabolic track around the September mean position of the subtropical high pressure system in the West Pacific.

Digitized ITOS-1 mosaics indicate that the initial disturbance can be tracked back to the Central Pacific south of Johnston Island as early as the 14th. Successive mosaics showed the system to move westward about 5 degrees of longitude per day with an apparent slowdown on crossing the International Date Line. On the 19th a reconnaissance aircraft was dispatched from Wake Island to the suspect area and located a weak circulation north of the Marshall Islands with a 1007 mb central pressure.

The tropical cyclone progressed on a west northwest course north of the Caroline Islands at 14 to 15 knots for the next two days. Upon reaching typhoon intensity early on the 22nd, Hope changed to a northwestward course as the ridge line weakened in the vicinity of 145-150°E. The storm moved on this heading for two days and continued to deepen reaching super typhoon force during the night of the 23rd to 24th. (See Figure 5-15.)

The 200 mb pattern at this time resembled that described by Miller (1957) as favorable for maximum intensity for hurricanes. An upper tropospheric trough extending from Southern Japan and west of Iwo Jima was stationed to the northwest of the typhoon. This combined with Hope's already large upper level anticyclone, provided considerable evacuation of mass outflow to the westerlies.

Aerial reconnaissance at daybreak on the 24th logged a central pressure of 895 mb, the lowest to occur in the Northern Hemisphere during 1970. When compared with the dropsonde reading 24 hours earlier of 979 mb, this represented a phenomenal drop of some 84 mb[2]. A 14.5°C rise in temperature was noted on penetration at the 700 mb level with 27°C recorded inside the eight mile diameter eye. Maximum winds at this time were estimated to be 150 knots.

The typhoon dropped below super status the following morning as it neared the Volcano Island group on a slightly more northward course. The center passed 30 miles east of Chi Chi Jima the evening of the 25th with the island reporting

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[4]A drop of 87 mb in 24 hours was observed in IDA-1958, as the typhoon reached a record low central pressure of 877 mb (see Jordan, 1959).

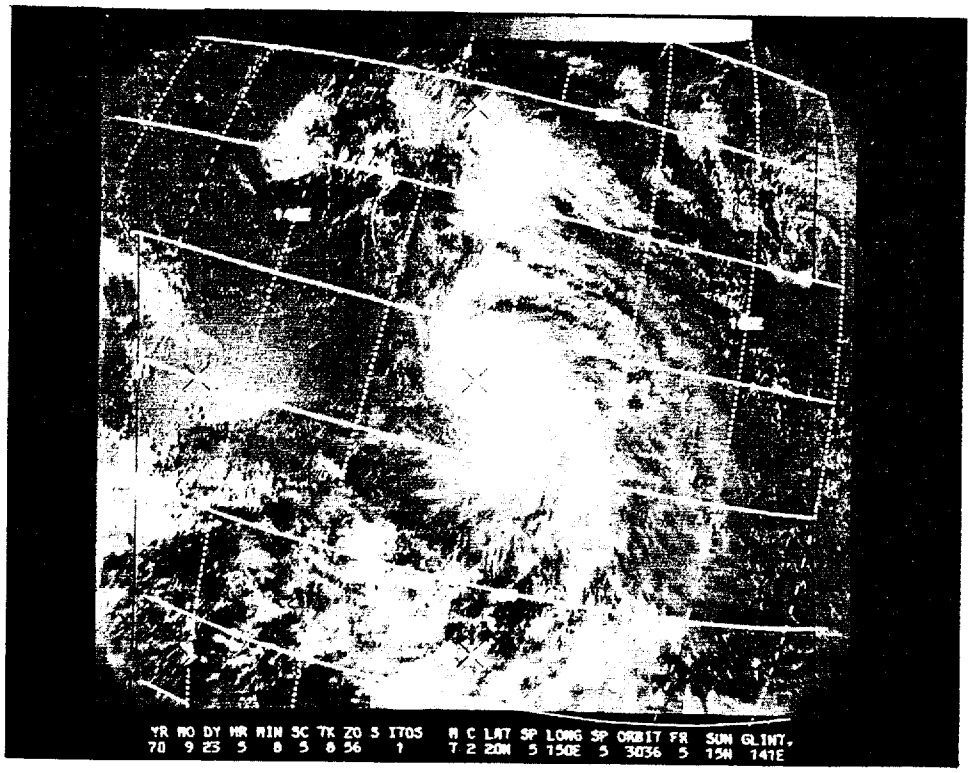

FIGURE 5-15 ITOS-1 VIEW OF SUPER TYPHOON HOPE ON THE AFTERNOON OF 23 SEPTEMBER DURING PERIOD OF MAXIMUM DEEPENING.

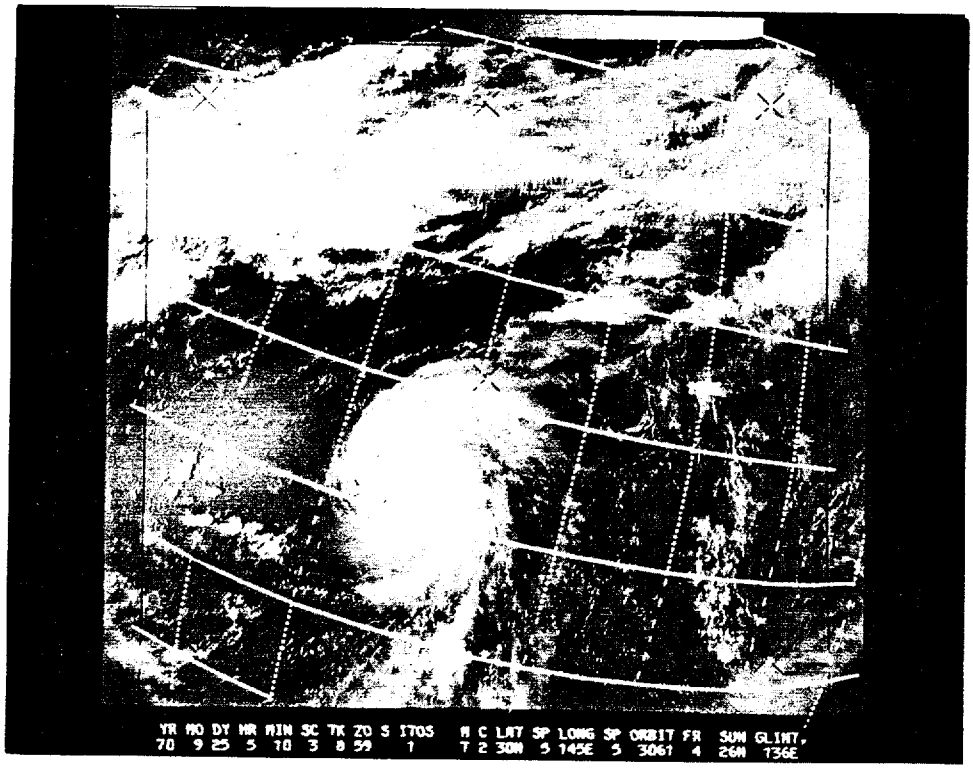

FIGURE 5-16 TYPHOON HOPE AS SEEN BY ITOS-1 ON 25 AUGUST A SHORT DISTANCE FROM CHI CHI JIMA ISLAND.

45 knot sustained and wind gusts to 89 knots with a barometer reading of 972.5 mb (Figure 5-16).

Hope shortly thereafter began to recurve and shift to a northeastward heading on the 26th. Like Clara, the storm was too far south to be accelerated northeast by an approaching short wave in the westerlies. By the next day it was forced on an easterly track by the northerly component behind this trough. However, the steering eventually pushed Hope south of east on the 28th toward the Mid-Pacific 200 mb shear line. This effectively reduced Hope to less than typhoon intensity in a 12 hour period as outflow from the system was impeded. As the storm drifted further south and under the shear aloft, it weakened to depression status and began to describe an anti-cyclonic hook to the west as it slowly dissipated.

The marked demise of a developed typhoon remaining over warm waters is an unusual event in the West Pacific, however, a not too infrequent occurrence in the Atlantic. Similar cases are mentioned by Sugg and Pelisser (1968) in discussion of Hurricane Beulah in the Western Carribean in 1967 and Simpson, Sugg and Staff (1970) for Hurricane Holly in the Atlantic in 1969.

TYPHOON HOPE

EYE FIXES CYCLONE 18

FIX NO.	TIME	POSIT	UNIT-METHOD-ACCY	FLT LVL	FLT LVL WND	OBS SFC WND	OBS MIN SLP	MIN 700MB HGT	FLT LVL TT/TD	EYE FORM	ORIEN-TATION	EYE DIA	CHARACTER WALL CLOUD
1	190520Z	13.0N 172.[illegible]E	VW-[illegible]-05---		---	030	007	---	25/23	----			----------
2	200410Z	14.0N 166.[illegible]E	SLTLS	STG 3	DIA --	CAT -							----------
3	200625Z	14.2N 166.2E	VW-[illegible]-05---		---	050	997	---	24/25	----			----------
4	202314Z	14.7N 161.7E	54-[illegible]-05---	700MB	050	065	995	3057	14/11	----			NEG W/C
5	210314Z	13.4N 161.1E	54-[illegible]-05---	700MB	035	050	998	3060	13/11	----			NEG W/C
6	210510Z	14.2N 159.8E	SLTLS	STG C	DIA --	CAT -							----------
7	210925Z	15.2N 159.4E	VW-[illegible]-05---		040	030	---	---	--/--	CIRC	----	12	OPEN NE-W
8	211415Z	15.1N 158.0E	VW-[illegible]-10---		035	035	997	---	26/25	CIRC	----	24	OPEN NE-SW
9	212100Z	15.5N 156.0E	54-[illegible]-10---	700MB	050	095	998	3042	15/12	CIRC	----	20	CLSD NW-SE
10	220000Z	15.5N 155.2E	54-[illegible]-10---	700MB	040	095	000	3072	15/09	CIRC	----	10	CLSD NE-SE
11	220300Z	15.5N 154.6E	54-[illegible]-10---	700MB	055	100	987	3011	16/10	ELIP	N-S	18X--	CLSD NW-S
12	220412Z	15.8N 155.8E	SLTLS	STG C	DIA --	CAT -							----------
13	220530Z	15.8N 154.6E	54-[illegible]----	0040M	---	---	---	---	--/--	CIRC	----	15	----------
14	220958Z	16.4N 153.6E	VW-[illegible]-05---		---	---	---	---	--/--	CIRC	----	15	CLSD
15	221145Z	16.3N 153.3E	VW-[illegible]-05---	6500M	---	---	953	---	15/11	ELIP	NW-SE	25X--	OPEN N
16	221245Z	16.4N 153.3E	ACFT RUR		---	---	---	---	--/--	----			----------
17	221500Z	16.8N 152.7E	VW-[illegible]-05---	6940M	---	---	951	2804	16/09	ELIP	NW-SE	25X--	W/C WEST QUAD
18	222100Z	17.5N 151.6E	54-[illegible]-06---	700MB	095	070	976	2920	15/10	CIRC	----	19	WC N-S-WSW
19	230000Z	17.7N 151.1E	54-[illegible]-10---	700MB	100	080	974	2877	17/12	CIRC	----	15	CLSD
20	230300Z	18.2N 150.6E	54-[illegible]-12---	700MB	070	100	969	2859	17/09	----			CLSD, APRNT TWO WALLS
21	230508Z	18.9N 150.0E	SLTLS	STG X	DIA 0[illegible]	CAT 4							----------
22	230820Z	19.5N 149.2E	VW-[illegible]-04---	700MB	095	100	---	2643	20/09	----			CLSD, W/C & FB CONC
23	231200Z	20.1N 149.1E	VW-[illegible]-06---		---	---	---	---	--/--	----			CLSD 5NM THK
24	231425Z	19.7N 148.8E	VW-[illegible]-04---	700MB	110	---	---	2627	22/09	CIRC	----	08	CLSD ALQUADS, 5NM THK
25	232100Z	20.5N 147.5E	54-[illegible]-01---	700MB	110	100	895	2219	27/12	CIRC	----	08	CLSD ALQUADS, 3NM THK
26	240300Z	21.1N 146.5E	54-[illegible]-10---	700MB	140	110	906	2240	26/12	CIRC	----	04	W/C CLSD 5NM THK
27	240604Z	22.5N 146.5E	SLTLS	STG X	DIA 04	CAT 3							----------
28	241022Z	22.6N 145.6E	VW-[illegible]-15---		---	---	---	---	--/--	CIRC	----	07	CLSD
29	241427Z	23.6N 144.8E	VW-[illegible]-10---		---	---	---	---	--/--	CIRC	----	10	CLSD
30	242100Z	24.8N 144.2E	54-[illegible]-10---	700MB	105	120	936	2554	17/09	CIRC	----	12	5NM THK, OPEN S
31	250300Z	25.9N 143.3E	54-[illegible]-10---	700MB	100	120	944	2603	15/12	CIRC	----	15	OPEN S
32	250510Z	25.8N 143.0E	SLTLS	STG X	DIA 04	CAT 4							----------
33	250900Z	26.8N 142.7E	VW-[illegible]-02---	0460M	080	070	---	---	--/--	ELIP	NE-SW	30X20	W/C SW-NE 11NM THK
34	251205Z	27.2N 143.0E	VW-[illegible]-10---	0500M	---	---	---	---	--/--	CIRC	----	40	12NM THK, OPEN S
35	251510Z	28.0N 142.2E	VW-[illegible]-05---	700MB	11[illegible]	---	957	2707	21/11	CIRC	----	22	OPEN S
36	252100Z	29.2N 142.2E	54-[illegible]-05---	700MB	085	080	949	2740	17/13	CIRC	----	28	OPEN S
37	260300Z	30.2N 142.7E	54-[illegible]-05---	700MB	085	080	950	2722	17/12	CIRC	----	25	CLSD
38	260606Z	30.3N 144.0E	SLTLS	STG X	DIA 04	CAT 4							----------
39	260842Z	30.8N 143.4E	VW-[illegible]-05---	0310M	---	---	---	---	--/--	CIRC	----	21	OPEN SE
40	261200Z	31.4N 144.7E	VW-[illegible]-05---	4540M	---	---	---	---	--/--	CIRC	----	20	CLSD
41	261505Z	31.5N 145.1E	VW-[illegible]-05---	700MB	095	---	949	2585	18/12	CIRC	----	35	OPEN SOMEWHAT IRREG
42	262100Z	32.2N 146.5E	54-[illegible]-06---	700MB	095	100	955	2694	17/15	CIRC	----	50	CLSD
43	270000Z	32.4N 147.0E	54-[illegible]-06---	700MB	098	110	954	2704	17/15	CIRC	----	50	CLSD
44	270300Z	32.3N 147.5E	54-[illegible]-05---	700MB	085	115	958	2734	17/14	CIRC	----	50	OPEN NNE
45	270507Z	32.0N 148.0E	SLTLS	STG X	DIA 0[illegible]	CAT 3							----------
46	270900Z	32.5N 149.2E	VW-[illegible]-10---		085	050	---	---	--/--	CIRC	----	50	12NM THK, OPEN N QUAD
47	271224Z	33.1N 149.7E	VW-[illegible]-10---		105	085	966	---	26/19	ELIP	NE-SW	32X32	18NM THK, OPEN SW QUAD
48	271440Z	32.6N 150.7E	VW-[illegible]-20---		---	---	---	---	--/--	----			----------

TYPHOON HOPE

EYE FIXES CYCLONE 19

FIX NO.	TIME	POSIT	UNIT-METHOD -ACCY	FLT LVL	FLT LVL WND	OBS SFC WND	OBS MIN SLP	MIN 700MB HGT	FLT LVL FT/TO	EYE FORM	ORIEN-TATION	EYE DIA	CHARACTER WALL CLOUD
49	271530Z	32.5N 150.9E	VW--10---		085	---	---	---	--/--	CIRC	----	42	OPEN 12NM THK, OPEN S-W
50	272100Z	32.7N 151.7E	54--P-05---	700MB	087	100	968	2847	23/17	CIRC	----	40	POORLY DEF, OPEN S & W
51	280409Z	32.5N 153.5E	SLTLS	STG X	DIA 03		CAT 3						----------
52	280440Z	32.3N 153.5E	54--P-03---	700MB	095	120	968	2902	26/23	CIRC	----	40	W/C NE QUAD
53	280900Z	31.9N 154.8E	VW--P-15---		---	---	---	---	--/--	CIRC	----	70	OPEN S, DISORG
54	281935Z	32.1N 155.1E	VW--P-07---		---	060	977	---	25/21	CIRC	----	60	OPEN S W/C NE QUAD
55	281400Z	32.0N 155.6E	VW--P-30---		---	---	---	---	--/--	----			NEG W/C
56	290030Z	30.9N 156.6E	54--P-30---	700MB	---	060	997	3091	17/14	----			NEG W/C
57	290300Z	30.9N 156.6E	54--P-20---	450MB	---	060	996	---	24/--	----			NEG W/C
58	290505Z	30.3N 156.5E	SLTLS	STG -	DIA --		CAT -						----------

TYPHOON HOPE

TROPICAL CYCLONE 18 -- 9/19/1700Z TO 9/29/0500Z
POSITION AND FORECAST VERIFICATION DATA

WARN NO.	DTG	WARNING POSIT LAT	WARNING POSIT LONG	BEST TRACK LAT	BEST TRACK LONG	24 HR FCST LAT	24 HR FCST LONG	24 HR ERROR DEG DIST	48 HR FCST LAT	48 HR FCST LONG	48 HR ERROR DEG DIST	72 HR FCST LAT	72 HR FCST LONG	72 HR ERROR DEG DIST
01	20/0500Z	14.1N	166.6E	14.2N	166.5E	15.5N	161.4E	057-0060	17.1N	157.2E	066-0180	-----	------	--------
02	20/1100Z	14.4N	165.3E	14.2N	164.9E	15.8N	160.2E	062-0084	17.6N	156.1E	066-0168	19.0N	152.2E	104-0186
03	20/1700Z	14.7N	164.0E	14.2N	163.3E	16.2N	159.1E	063-0114	18.1N	154.9E	068-0156	-----	------	--------
04	20/2300Z	14.7N	161.7E	14.3N	161.8E	15.5N	155.3E	----0000	16.7N	149.7E	233-0096	18.1N	144.5E	220-0204
05	21/0500Z	14.1N	160.6E	14.9N	160.4E	14.1N	154.5E	173-0102	15.1N	148.8E	197-0228	-----	------	--------
06	21/1100Z	15.2N	159.0E	15.1N	158.8E	16.0N	153.5E	153-0024	17.3N	148.7E	185-0150	19.5N	144.8E	187-0216
07	21/1700Z	15.2N	157.3E	15.3N	157.3E	16.2N	151.8E	204-0054	17.8N	147.2E	202-0144	-----	------	--------
08	21/2300Z	15.5N	155.4E	15.5N	155.3E	16.5N	148.9E	241-0144	18.4N	143.4E	234-0240	20.5N	138.8E	226-0402
09	22/0500Z	15.6N	154.1E	15.8N	154.2E	16.8N	147.8E	227-0174	18.9N	142.3E	230-0264	-----	------	--------
10	22/1100Z	16.3N	153.4E	16.4N	153.3E	18.2N	149.2E	172-0096	19.8N	144.9E	186-0198	21.9N	141.3E	191-0324
11	22/1700Z	17.1N	152.4E	17.1N	152.3E	18.7N	148.2E	180-0084	20.3N	143.9E	188-0234	-----	------	--------
12	22/2300Z	17.8N	151.2E	17.7N	151.1E	20.2N	146.9E	180-0036	22.5N	142.9E	200-0174	25.4N	139.8E	209-0288
13	23/0500Z	18.4N	150.2E	18.8N	150.0E	21.1N	146.1E	171-0042	23.7N	142.3E	196-0156	-----	------	--------
14	23/1100Z	19.8N	149.1E	19.8N	149.0E	25.2N	147.0E	036-0150	28.9N	144.4E	047-0138	33.5N	145.4E	023-0138
15	23/1700Z	20.1N	148.4E	20.1N	148.2E	23.7N	145.6E	116-0066	27.3N	143.8E	132-0114	-----	------	--------
16	23/2300Z	20.9N	147.1E	20.8N	146.9E	24.2N	143.0E	220-0084	28.0N	140.8E	220-0132	32.9N	143.4E	281-0174
17	24/0500Z	21.4N	146.1E	21.8N	146.0E	24.3N	142.3E	200-0126	27.7N	140.3E	220-0222	-----	------	--------
18	24/1100Z	22.4N	145.2E	23.1N	145.3E	26.5N	142.0E	201-0048	30.9N	142.1E	259-0114	36.3N	147.3E	334-0246
19	24/1700Z	24.0N	144.4E	24.2N	144.5E	29.6N	143.0E	035-0072	35.0N	146.8E	017-0204	-----	------	--------
20	24/2300Z	25.2N	144.0E	25.3N	144.0E	30.3N	143.2E	046-0048	36.9N	148.6E	017-0288	-----	------	--------
21	25/0500Z	26.4N	143.2E	26.3N	143.1E	31.9N	144.0E	029-0084	38.8N	150.3E	016-0402	-----	------	--------
22	25/1100Z	27.4N	142.5E	27.3N	142.4E	32.7N	144.4E	005-0084	42.0N	152.5E	014-0576	-----	------	--------
23	25/1700Z	28.4N	142.2E	28.6N	142.2E	33.7N	145.5E	360-0120	-----	------	--------	-----	------	--------
24	25/2300Z	29.6N	142.3E	29.7N	142.4E	35.4N	147.7E	011-0186	-----	------	--------	-----	------	--------
25	26/0500Z	30.7N	143.0E	30.6N	143.1E	36.2N	150.2E	024-0252	-----	------	--------	-----	------	--------
26	26/1100Z	31.2N	144.2E	31.3N	144.3E	37.3N	153.6E	036-0342	-----	------	--------	-----	------	--------
27	26/1700Z	31.8N	145.6E	31.7N	145.6E	-----	------	--------	-----	------	--------	-----	------	--------
28	26/2300Z	32.3N	146.8E	32.3N	146.9E	33.9N	152.2E	360-0084	33.7N	159.3E	040-0204	-----	------	--------
29	27/0500Z	32.3N	147.9E	32.3N	148.1E	32.3N	152.5E	270-0060	31.8N	158.6E	061-0120	-----	------	--------
30	27/1100Z	32.5N	149.6E	32.6N	149.5E	32.5N	155.5E	019-0036	32.8N	162.1E	--------	-----	------	--------
31	27/1700Z	32.5N	151.5E	32.6N	151.0E	32.5N	157.8E	058-0108	-----	------	--------	-----	------	--------
32	27/2300Z	32.6N	152.2E	32.5N	152.3E	32.6N	157.8E	033-0108	-----	------	--------	-----	------	--------
33	28/0500Z	32.4N	153.6E	32.3N	153.7E	32.3N	159.3E	057-0162	-----	------	--------	-----	------	--------
34	28/1100Z	32.1N	155.5E	31.9N	155.2E	32.0N	161.4E	--------	-----	------	--------	-----	------	--------
35	28/1700Z	32.0N	156.3E	31.5N	155.9E	32.1N	161.8E	--------	-----	------	--------	-----	------	--------
36	28/2300Z	31.2N	156.5E	31.0N	156.6E	-----	------	--------	-----	------	--------	-----	------	--------
37	29/0500Z	30.9N	156.5E	30.8N	156.5E	-----	------	--------	-----	------	--------	-----	------	--------

AVERAGE 24 HOUR ERROR - 0101 MI.
AVERAGE 48 HOUR ERROR - 0204 MI.
AVERAGE 72 HOUR ERROR - 0242 MI.