B. TYPHOON OLGA 28 JUN 2300Z-05 JUL 2300Z

1. STATISTICS

a. Number of Warnings Issued - 29

b. Number of Warnings with Typhoon Intensity - 22

c. Distance Traveled During Warning Period - 2,382 MI

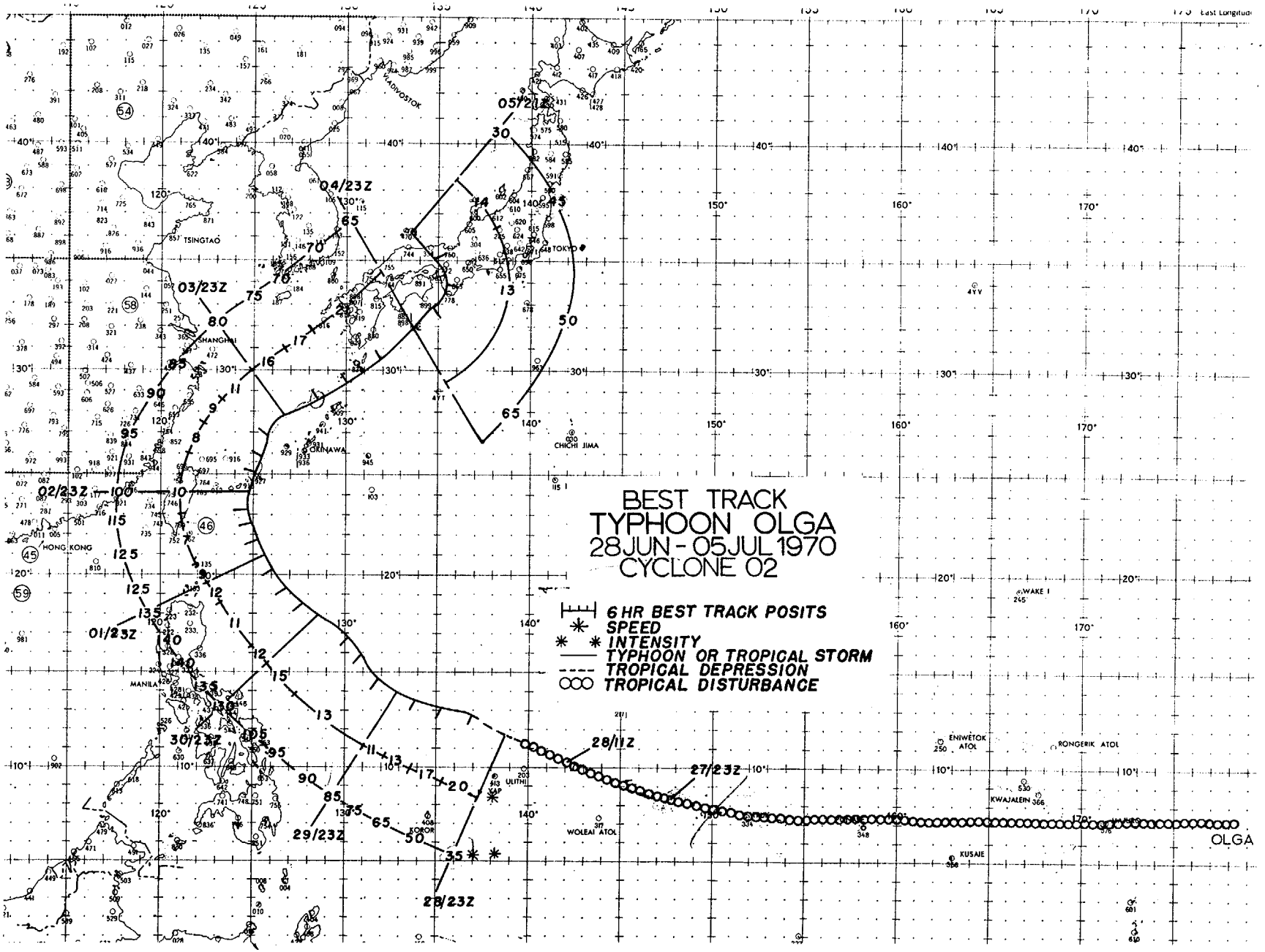
2. CHARACTERISTICS AS A TYPHOON

a. Minimum Observed SLP - 904 MBS at 01/2118Z

b. Minimum Observed 700 MB Height - 2268 M at 01/2100Z

c. Maximum Surface Wind - 140 KTS (From Best Track)

d. Maximum Radius of Surface Circulation - 360 MI


BEST TRACK
TYPHOON OLGA
28JUN - 05JUL 1970
CYCLONE 02
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
OLGA
VLADIVOSTOK
TSINGTAO
SHANGHAI
TOKYO
OKINAWA
CHICHI JIMA
HONG KONG
MANILA
WAKE I
ENIWETOK ATOL
RONGERIK ATOL
KWAJALEIN
KUSAIE
WOLEAI ATOL
KOROR
ULITHI
05/21Z
04/23Z
03/23Z
02/23Z
01/23Z
30/23Z
29/23Z
28/23Z
28/11Z
27/23Z

3. TYPHOON OLGA NARRATIVE

After a four month lull of tropical cyclone activity, the subtropical ridge began to build in mid-June producing a broad flow of easterlies in the tropics south of 25°N and increasing tropical wave frequency.

The pre-Olga system was first noted by a wave passage at Majuro in the Marshall Island group on the 24th. Signs of a developing disturbance were detected as satellite pictures from ESSA-8 and ITOS-1 on the 26th showed considerable convective activity and evidence of banding as the wave reached the Truk-Ponape vicinity in the Central Carolines.

A tight pressure gradient existed south of the ridge line causing strong easterlies and a westward movement of the pre-Olga system in excess of 20 knots. This rate of forward speed apparently inhibited the establishment of a circulation at the surface until the system was southwest of Guam early on the 29th. Reconnaissance detected a closed center at first light just north of Ulithi Island with maximum winds of 35-40 knots (Figure 5-4).

The newly-developed storm assumed a northwest course upon entrance into the Philippine Sea as weakening occurred along the subtropical ridge line in the vicinity of the Ryukyu Islands. On this track, Olga was in a favorable region for further intensification as she approached difluent flow aloft associated with a 200 mb anticyclone south of the Ryukyu chain. The forward speed of the storm decreased to 13 knots and Olga reached typhoon strength by evening on the 29th and within 36 hours became the season's first super typhoon.

Deepening had occurred at a rapid rate during this period culminating in a 904 mb central pressure on July 1st when Olga was 300 miles due east of the northeastern tip of Luzon. This reduction of pressure represented an explosive deepening of 62 mb in 24 hours. Winds generated under the wall cloud region, surrounding a tight 6 mile diameter eye, were estimated near 140 knots at this point (Figure 5-5). The building of heights and establishment of a high cell in the vicinity of Iwo Jima created a relative weakness in the ridge line near the 125th meridian while Olga was reaching her maximum intensity. The storm reacted to this opened avenue by gradually shifting course northward on the 1st.

A short wave in the westerlies was nearing the Asian coast as the typhoon passed between Taiwan and Okinawa the following day. In response to the approach of the short wave, the typhoon took a sharp turn to the northeast while passing 100 miles abeam of Okinawa, and began to accelerate in forward

speed reaching 21 knots south of Kyushu some 12 hours later. A developing low in the short wave system moving into the Sea of Japan brought its influence on the scene by slowing and deflecting the storm's course to the northwest. The weakening Olga arrived ashore on Honshu's Kii Peninsula south of Osaka on the 5th with winds of tropical storm force.

Highest winds reported during the typhoon's transit through and west of the Ryukyu's occurred at Kume Shima which recorded 90 knots gusting to 110 knots during the early morning hours of the 4th some 50 miles east of the center.

Olga had weakened in strength considerably just before reaching the Ryukyu's early on the 3rd as dry air began to enter the system. The vertical extent of convective activity associated with the storm was markedly shallow during the period it traversed the East China Sea as reconnaissance aircraft were topping the typhoon's cloudiness at 10,000 feet.

Upon crossing Honshu and entering the Sea of Japan, Olga merged with a cold low. Heavy rains attended the system while crossing Japan and later as it drifted over South Korea. The excessive rains (up to 13 inches in Japan) caused landslides and extensive flooding in some areas which was responsible for at least 8 deaths in Japan and 29 deaths in South Korea. Damage was estimated near 10 million dollars in and around Tokyo.

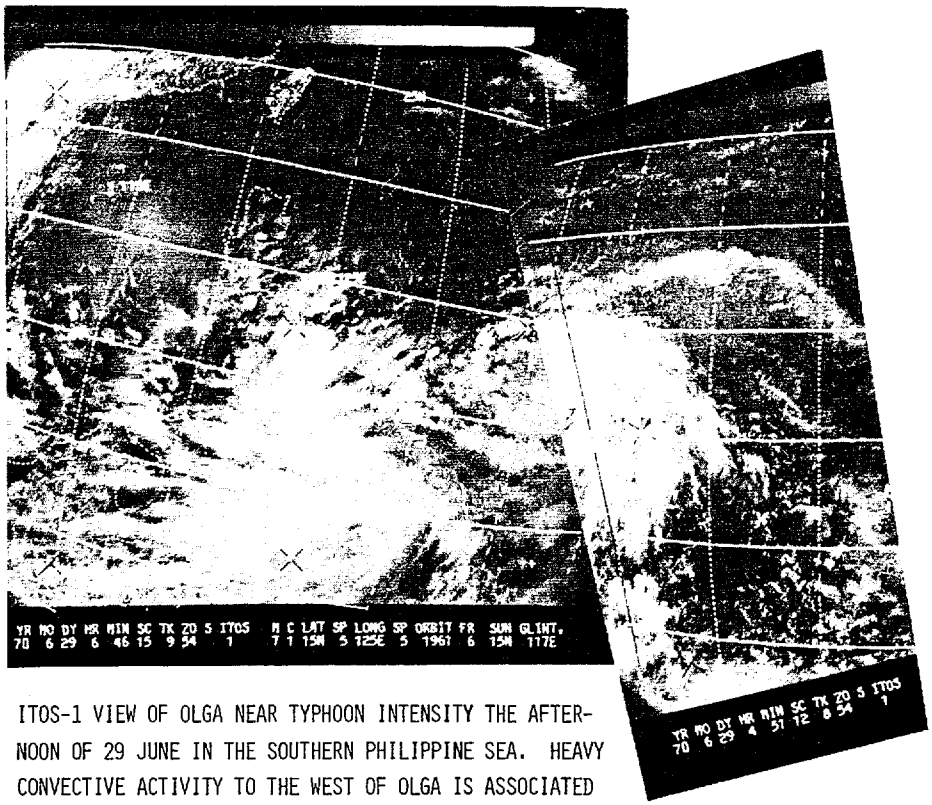


FIGURE 5-4 ITOS-1 VIEW OF OLGA NEAR TYPHOON INTENSITY THE AFTERNOON OF 29 JUNE IN THE SOUTHERN PHILIPPINE SEA. HEAVY CONVECTIVE ACTIVITY TO THE WEST OF OLGA IS ASSOCIATED WITH TROPICAL STORM PAMELA A SHORT DISTANCE EAST OF MINDANAO.

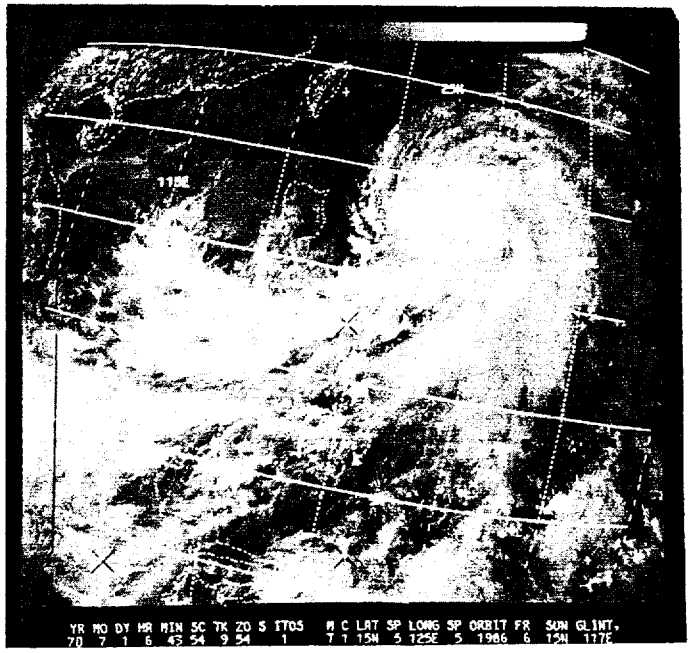


FIGURE 5-5 OLGA ON 1 JULY, OF SUPER TYPHOON INTENSITY LOCATED EAST OF NORTHERN LUZON AS SEEN BY CAMERA'S ABOARD ITOS-1.

TYPHOON OLGA

EYE FIXES CYCLONE 02

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	280550Z	10.0N 145.0E	SLTLS	STG B	DIA --	CAT -							----------
2	290225Z	12.5N 137.6E	54-P-07---	0420M	045	040	993	---	25/23	CIRC	----	18	W/C FORMG, OPEN SW
3	290646Z	13.0N 137.0E	SLTLS	STG X	DIA 02	CAT 2							----------
4	290646Z	13.0N 137.0E	SLTLS	STG X	DIA 02	CAT 2							----------
5	290945Z	13.0N 135.6E	VW-P-10---	0400M	---	050	---	---	--/27	CIRC	----	08	----------
6	291457Z	13.4N 134.3E	VW-P-10---	0200M	040	---	---	---	--/--	ELIP	NE-SW	16x13	W/C N QUAD, 18NM THK
7	292040Z	13.7N 133.3E	54-P-15---	700MB	060	100	966	2783	17/11	CIRC	----	12	10NM THK, OPEN NW QUAD
8	300200Z	14.3N 132.4E	54-P-15---	700MB	080	110	964	2768	21/11	CIRC	----	12	W/C E QUAD, 8NM THK
9	300548Z	14.5N 131.0E	SLTLS	STG X	DIA 03	CAT 2							----------
10	300929Z	15.5N 131.2E	VW-P-02---		---	---	---	---	24/21	----			CLSD
11	301211Z	16.0N 130.9E	VW-P-03---	700MB	070	045	978	2911	16/09	CIRC	----	12	10NM THK, OPEN NW
12	302100Z	17.5N 129.1E	54-P-03---	700MB	075	110	929	2481	18/10	CIRC	----	08	CLSD, 10NM THK
13	010000Z	17.9N 128.3E	54-P-03---	700MB	100	150	908	2301	24/11	CIRC	----	07	CLSD, 5NM THK
14	010218Z	18.2N 128.0E	54-P-03---	700MB	120	110	904	2268	24/12	CIRC	----	06	CLSD, 7NM THK
15	010644Z	19.0N 127.5E	SLTLS	STG X	DIA 04	CAT 4							CLSD
16	010909Z	19.0N 127.3E	VW-P-03---	0300M	---	---	---	---	--/--	CIRC	----	10	CLSD, 4NM THK
17	011502Z	20.2N 126.5E	VW-P-03---	0400M	---	---	---	---	--/--	CIRC	----	07	CLSD, 4NM THK
18	012000Z	20.4N 125.7E	54-P-02---	700MB	090	---	920	2320	18/10	CIRC	----	04	CLSD
19	020015Z	21.0N 125.6E	54-P-02---	700MB	090	130	915	2340	25/13	CIRC	----	06	CLSD
20	020300Z	21.4N 125.4E	54-P-02---	700MB	080	130	920	2380	19/15	CIRC	----	15	CLSD
21	020550Z	21.2N 124.9E	SLTLS	STG X	DIA 05	CAT 4							----------
22	020600Z	21.9N 125.2E	LND RDR		---	---	---	---	--/--	----			----------
23	020700Z	22.0N 125.1E	LND RDR		---	---	---	---	--/--	----			----------
24	020800Z	22.1N 125.0E	LND RDR		---	---	---	---	--/--	----			----------
25	020855Z	22.5N 125.1E	VW-P-25---	0080M	002	---	---	---	--/--	CIRC	----	09	CLSD
26	020900Z	22.1N 125.0E	LND RDR		---	---	---	---	--/--	----			----------
27	020900Z	22.2N 125.0E	LND RDR		---	---	---	---	--/--	----			----------
28	021000Z	22.2N 125.0E	LND RDR		---	---	---	---	--/--	----			----------
29	021100Z	22.4N 125.0E	LND RDR		---	---	---	---	--/--	----			----------
30	021200Z	22.3N 125.0E	LND RDR		---	---	---	---	--/--	----			----------
31	021300Z	22.5N 125.0E	LND RDR		---	---	---	---	--/--	----			----------
32	021400Z	22.8N 125.0E	LND RDR		---	---	---	---	--/--	----			----------
33	021500Z	23.0N 125.0E	LND RDR		---	---	---	---	--/--	----			----------
34	021515Z	22.9N 124.7E	VW-P-05---		070	080	---	---	--/--	CIRC	----	08	14NM THK, OPEN W
35	021600Z	23.0N 125.0E	LND RDR		---	---	---	---	--/--	----			----------
36	021710Z	23.2N 125.0E	LND RDR		---	---	---	---	--/--	----			----------
37	021800Z	23.3N 124.8E	LND RDR		---	---	---	---	--/--	----			----------
38	021900Z	23.6N 124.9E	LND RDR		---	---	---	---	--/--	----			----------
39	022000Z	23.6N 124.9E	LND RDR		---	---	---	---	--/--	----			----------
40	022045Z	23.6N 124.9E	54-P-08---	700MB	075	075	950	2640	18/12	----			W/C E QUAD
41	022100Z	23.9N 125.1E	LND RDR		---	---	---	---	--/--	----			----------
42	030100Z	24.5N 124.9E	LND RDR		---	---	---	---	--/--	----			----------
43	030230Z	24.8N 125.0E	54-P-02---	700MB	070	125	960	2728	17/14	----			W/C SE QUAD
44	030300Z	24.8N 125.0E	LND RDR		---	---	---	---	--/--	----			----------
45	030646Z	24.0N 125.1E	SLTLS	STG X	DIA 0	CAT 3							----------
46	030700Z	25.2N 125.3E	LND RDR		---	---	---	---	--/--	----			----------
47	030830Z	25.8N 125.7E	LND RDR		---	---	---	---	--/--	----			----------
48	030900Z	25.3N 125.5E	VW-P-03---	700MB	---	---	---	---	--/--	CIRC	----	11	----------

124 54

TYPHOON OLGA

EYE FIXES CYCLONE 02

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
49	031030Z	25.7N 125.6E	LND RDR		---	---	---	---	--/--	----			----------
50	031049Z	25.8N 125.5E	VW-[illegible]-03---	700MB	---	---	963	2777	22/13	CIRC	----	05	CLSD
51	031110Z	25.7N 125.2E	LND RDR		---	---	---	---	--/--	----			----------
52	031230Z	25.7N 125.7E	LND RDR		---	---	---	---	--/--	----			----------
53	031430Z	26.0N 125.9E	LND RDR		---	---	---	---	--/--	----			----------
54	031508Z	26.4N 125.7E	VW-[illegible]-02---	700MB	---	---	---	2835	25/14	CIRC	----	12	CLSD
55	031630Z	25.8N 126.6E	LND RDR		---	---	---	---	--/--	----			----------
56	032055Z	27.3N 126.0E	54-[illegible]-05---	700MB	065	065	948	3088	21/12	CIRC	----	20	WK W/C SE QUAD
57	040200Z	27.9N 127.8E	54-[illegible]-05---	700MB	060	050	955	2725	22/14	CIRC	----	--	APRNT WK W/C SE-W
58	040547Z	28.0N 128.0E	SLTLS	STG X	DIA 03	CAT 2							----------
59	040922Z	29.0N 129.5E	VW-[illegible]-05---	700MB	064	075	---	2826	21/14	----			OPEN N
60	041300Z	29.7N 130.9E	VW-[illegible]------		---	---	---	2896	--/--	----			----------
61	041430Z	29.9N 131.1E	VW-[illegible]-05---	700MB	080	---	967	2810	21/15	----			DIFF TO LOCATE EYE ON RDR
62	041800Z	30.9N 132.4E	LND RDR		---	---	---	---	--/--	----			----------
63	041900Z	30.9N 132.7E	LND RDR		---	---	---	---	--/--	----			----------
64	042000Z	31.3N 133.2E	LND RDR		---	---	---	---	--/--	----			----------
65	042100Z	31.4N 133.4E	LND RDR		---	---	---	---	--/--	----			----------
66	042104Z	31.6N 133.3E	54-[illegible]-05---	700MB	065	075	959	2740	17/14	ELIP	N-S	30X20	10NM THK, OPEN N
67	042200Z	31.6N 133.4E	LND RDR		---	---	---	---	--/--	----			----------
68	042300Z	31.7N 133.7E	LND RDR		---	---	---	---	--/--	----			----------
69	050235Z	32.3N 134.3E	54-[illegible]-05---		047	065	953	---	16/14	ELIP	N-S	45X30	6NM THK, OPEN NE
70	050449Z	32.0N 135.1E	SLTLS	STG X	DIA 03	CAT 3							----------
71	050750Z	33.3N 135.1E	VW-[illegible]-03---		---	---	---	---	--/--	----			----------
72	050800Z	33.2N 135.3E	LND RDR		---	---	---	---	--/--	----			----------
73	050900Z	33.2N 135.5E	LND RDR		---	---	---	---	--/--	----			----------
74	050906Z	33.4N 135.6E	VW-[illegible]-03---		---	---	---	---	--/--	CIRC	----	10	3NM THK, OPEN S&W QUAD
75	051200Z	34.2N 135.4E	LND RDR		---	---	---	---	--/--	----			----------
76	051300Z	34.3N 135.2E	LND RDR		---	---	---	---	--/--	----			----------
77	051400Z	34.4N 135.3E	LND RDR		---	---	---	---	--/--	----			----------
78	051600Z	34.8N 134.8E	LND RDR		---	---	---	---	--/--	----			----------
79	051700Z	35.0N 134.8E	LND RDR		---	---	---	---	--/--	----			----------
80	051800Z	35.6N 134.5E	LND RDR		---	---	---	---	--/--	----			----------
81	051900Z	35.9N 134.1E	LND RDR		---	---	---	---	--/--	----			----------
82	052000Z	35.9N 133.9E	LND RDR		---	---	---	---	--/--	----			----------
83	052100Z	36.1N 133.7E	LND RDR		---	---	---	---	--/--	----			----------

TYPHOON OLGA

TROPICAL CYCLONE 02 -- 6/28/2300Z TO 7/5/2300Z
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	28/2300Z	11.5N	139.3E	11.7N	139.1E	14.0N	132.6E	270-0012	-----	------	--------	-----	------	--------
02	29/0500Z	12.9N	136.9E	12.7N	137.0E	15.7N	129.2E	089-0156	18.3N	122.5E	268-0294	-----	------	
03	29/1100Z	13.1N	135.3E	13.1N	135.3E	15.0N	129.0E	249-0126	17.5N	123.7E	239-0204	20.3N	119.2E	247-0348
04	29/1700Z	13.7N	133.7E	13.5N	133.9E	15.7N	127.3E	248-0174	18.3N	122.0E	245-0252	-----	------	--------
05	29/2300Z	13.9N	132.9E	14.0N	132.9E	15.5N	127.6E	209-0150	17.8N	123.2E	217-0228	20.8N	119.2E	238-0372
06	30/0500Z	14.3N	131.9E	14.8N	131.8E	15.9N	127.2E	189-0156	17.8N	123.0E	208-0270	-----	------	--------
07	30/1100Z	15.8N	131.0E	15.8N	131.1E	18.7N	127.1E	161-0036	20.5N	122.9E	224-0174	22.7N	118.9E	242-0414
08	30/1700Z	16.9N	130.3E	16.8N	130.2E	19.1N	126.0E	180-0060	21.0N	121.9E	230-0210	-----	------	--------
09	30/2300Z	18.0N	128.8E	17.7N	128.9E	21.7N	125.1E	327-0054	25.9N	125.3E	007-0102	30.2N	133.0E	066-0342
10	01/0500Z	18.5N	127.5E	18.5N	127.7E	22.2N	124.5E	299-0048	26.9N	126.4E	280-0114	-----	------	--------
11	01/1100Z	19.2N	126.9E	19.3N	126.8E	22.8N	122.5E	360-0012	26.7N	126.3E	041-0054	30.7N	134.1E	069-0210
12	01/1700Z	20.6N	126.2E	20.1N	126.1E	24.8N	125.5E	019-0090	28.7N	129.6E	061-0216	-----	------	--------
13	01/2300Z	20.9N	125.7E	20.9N	125.7E	24.7N	125.2E	022-0030	28.4N	128.9E	070-0102	31.5N	137.1E	098-0156
14	02/0500Z	21.7N	125.3E	21.8N	125.3E	25.2N	125.5E	090-0012	29.7N	130.5E	052-0114	-----	------	--------
15	02/1100Z	22.7N	125.0E	22.6N	125.1E	26.3N	126.8E	064-0036	30.6N	132.2E	054-0120	35.2N	142.5E	077-0342
16	02/1700Z	23.1N	124.9E	23.3N	124.9E	26.3N	126.3E	161-0036	30.6N	132.2E	090-0006	-----	------	--------
17	02/2300Z	24.1N	125.0E	24.2N	125.0E	27.6N	127.7E	108-0036	31.5N	134.1E	165-0024	36.2N	143.8E	--------
18	03/0500Z	25.1N	125.1E	25.2N	125.3E	28.8N	128.0E	296-0036	32.4N	133.5E	252-0072	-----	------	--------
19	03/1100Z	25.9N	125.5E	26.0N	125.6E	29.8N	128.8E	287-0078	35.0N	134.4E	317-0084	-----	------	--------
20	03/1700Z	26.7N	126.0E	26.9N	126.0E	30.3N	129.1E	264-0150	35.5N	134.8E	326-0018	-----	------	--------
21	03/2300Z	27.6N	126.2E	27.8N	127.0E	31.0N	128.4E	260-0282	34.8N	132.2E	--------	-----	------	--------
22	04/0500Z	28.5N	128.7E	28.5N	128.7E	33.7N	135.0E	000-0054	39.3N	144.2E	--------	-----	------	--------
23	04/1100Z	29.5N	130.2E	29.4N	130.3E	34.4N	137.4E	071-0084	37.0N	150.0E	--------	-----	------	--------
24	04/1700Z	30.3N	131.8E	30.6N	132.1E	34.5N	139.6E	100-0222	35.6N	150.3E	--------	-----	------	--------
25	04/2300Z	31.9N	134.0E	31.9N	134.0E	35.5N	142.8E	--------	-----	------	--------	-----	------	--------
26	05/0500Z	32.7N	135.0E	32.8N	135.0E	35.7N	142.1E	--------	-----	------	--------	-----	------	--------
27	05/1100Z	33.9N	135.5E	33.9N	135.7E	-----	------	--------	-----	------	--------	-----	------	--------
28	05/1700Z	35.0N	135.4E	35.2N	135.1E	-----	------	--------	-----	------	--------	-----	------	--------
29	05/2300Z	36.5N	133.1E	-----	------	-----	------	--------	-----	------	--------	-----	------	--------

AVERAGE 24 HOUR ERROR - 0088 MI.
AVERAGE 48 HOUR ERROR - 0139 MI.
AVERAGE 72 HOUR ERROR - 0312 MI.