

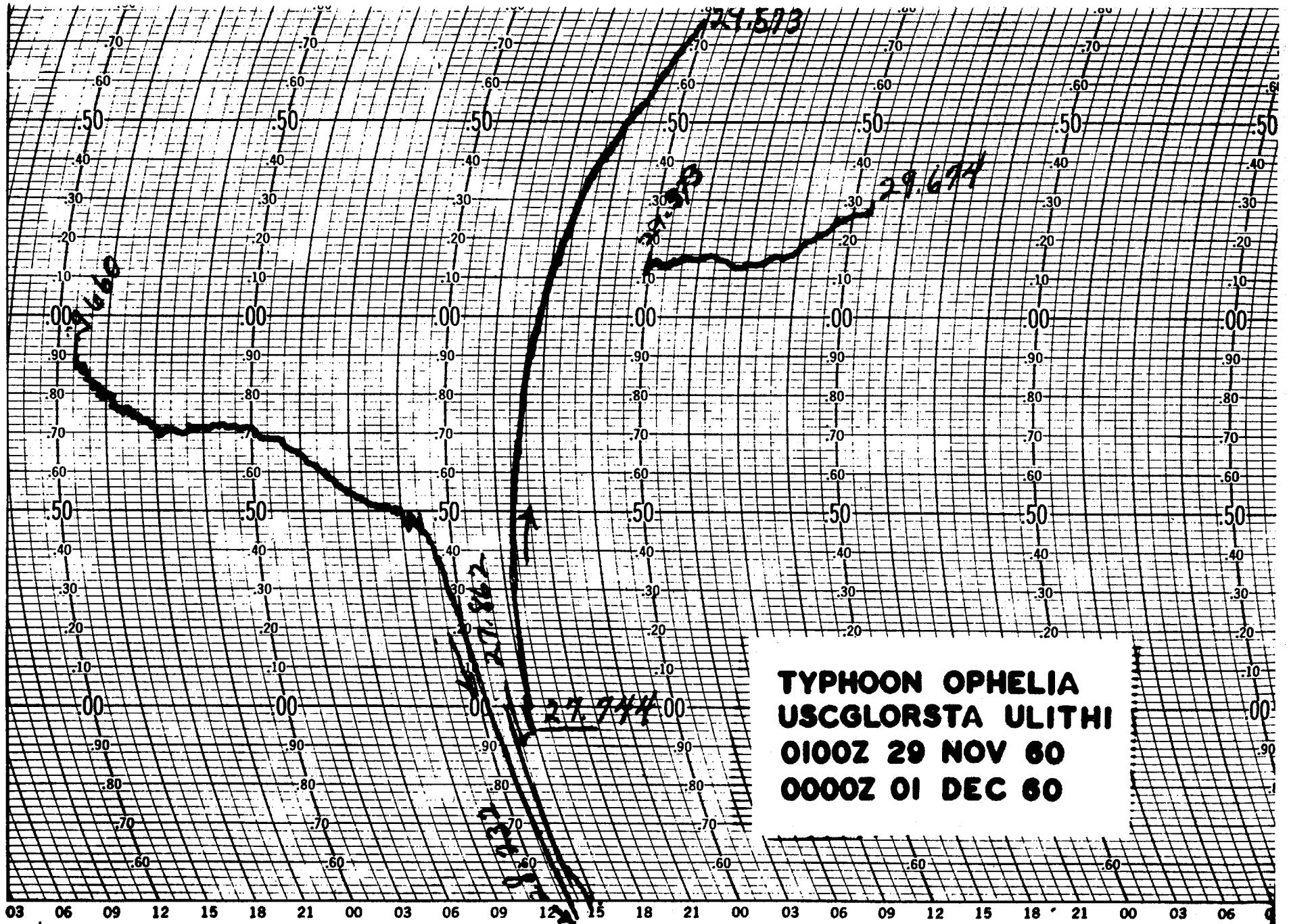
T. TYPHOON OPHELIA (211200Z NOVEMBER-060600Z DECEMBER 1960)

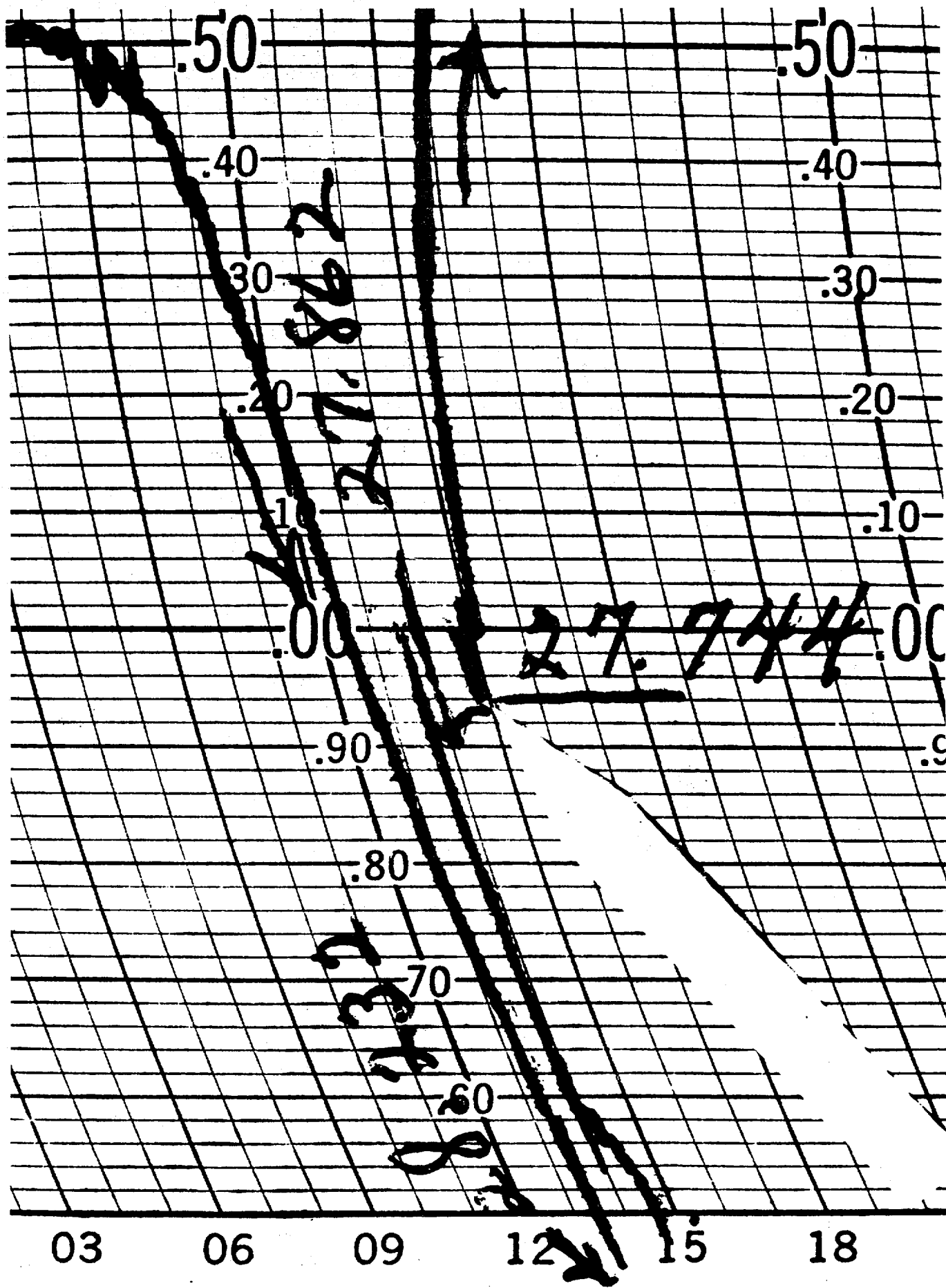
A shift of the surface wind at Kwajalein and the development of a small low just S of that station presaged Typhoon OPHELIA. The depression intensified as it moved W to a point 165 mi SW of Eniwetok, the position of the first warning at 211200Z on T.D. 24. As is often the case, quirks of nature confuse the situation. Shortly after the first warning was issued the system began to weaken and it appeared that the low would lose its identity. Warnings were discontinued at 240600Z, by which time the depression had reversed direction twice and was moving W in the vicinity of Ponape. Although warnings were not being issued, this circulation was carefully surveyed as it moved W, passed Truk, then turned NW and intensified again. At 270000Z, when the depression was 290 mi SE of Guam, the issuance of warnings was resumed. The depression increased to tropical storm intensity at 271800Z and to typhoon intensity at 290000Z. The speed of movement increased from 2 kts at 270000Z to 17 kts at 290600Z, at which time it was 240 mi S of Guam. The track followed a semi-sinusoidal pattern, creating a difficult forecast problem. Typhoon OPHELIA passed directly over Ulithi Atoll at 300300Z. The pressure was reported to be a minimum of 939.4 mb, and the winds were on the order of 125 kts. A facsimile of the barograph trace is shown here, and a photograph of damage is reproduced in another section. Ulithi Atoll was the only island or land mass over which the eye passed while warnings were being issued. Typhoon OPHELIA moved WNW to a point about 500 mi E of Catanduanes Island, Philippines at 011200Z, and then began to turn N. The change in direction was completed within 12 hours. The typhoon continued on this N track for about 2 days and traveled approximately 400 mi before completing the final turn of recurvature. OPHELIA moved NE and accelerated rapidly as it was influenced by very strong SW winds above the 500 mb level. On 5 December Typhoon OPHELIA moved about 1,275 mi at an average speed of 53 kts. The typhoon turned to the ENE at 051200Z, about 500 mi E of Tokyo. OPHELIA was classified as extratropical at 060600Z near 41N 169E, and the last warning was issued at this time.

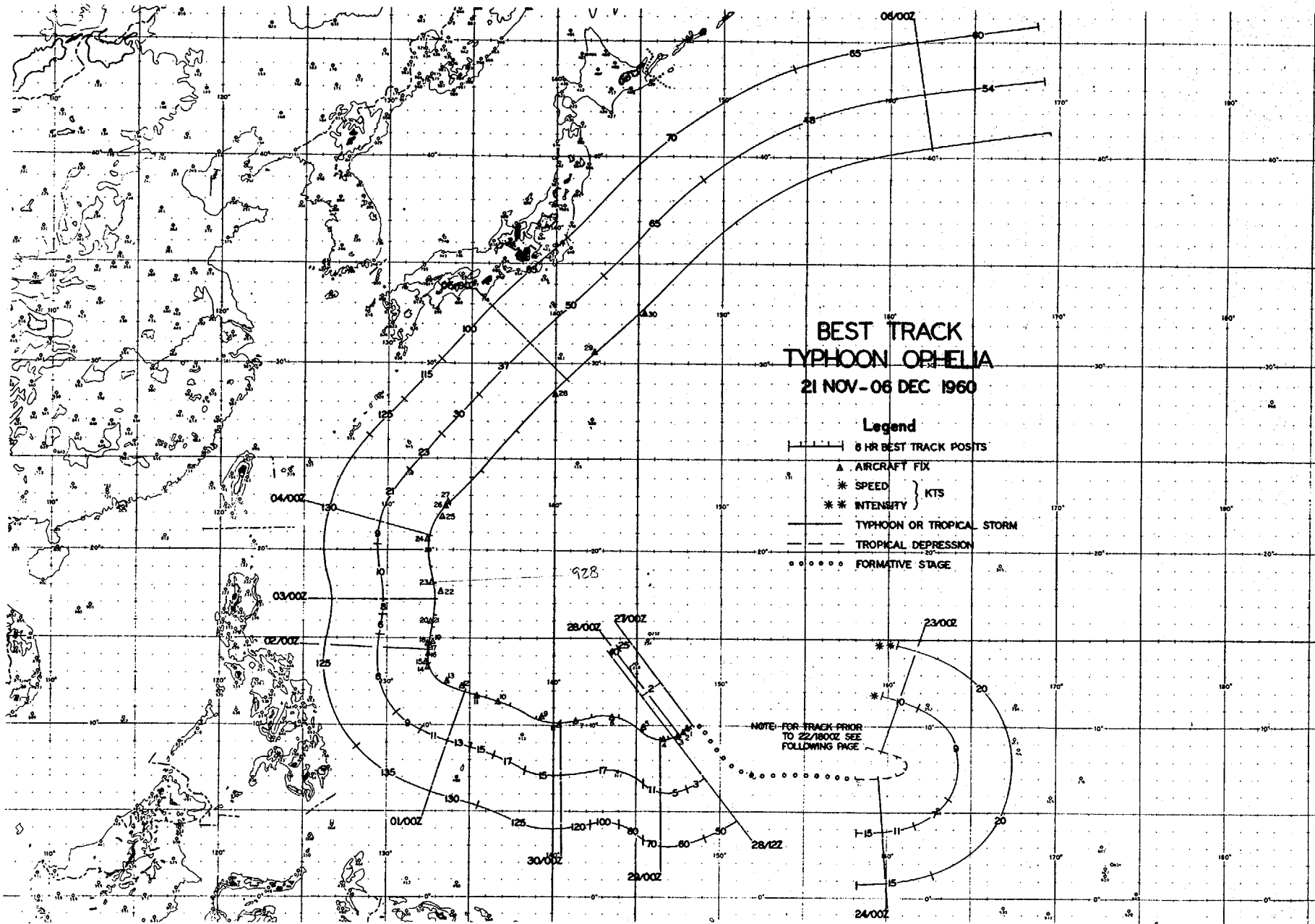
Typhoon OPHELIA traveled 5,000 mi at an average speed of 13 kts or 318 mi per day. The minimum speed was 2 kts on 22, 27 and 28 November, and the maximum speed was 65 kts on 5 December. Warnings were issued over a period of 15 days and 18 hours; however, no warnings were issued from 240600Z to 270000Z, which is included in this overall period of time.

Between 050600Z and 051200Z OPHELIA's average speed of movement was 65 kts, which is faster than any other typhoon of the Season.

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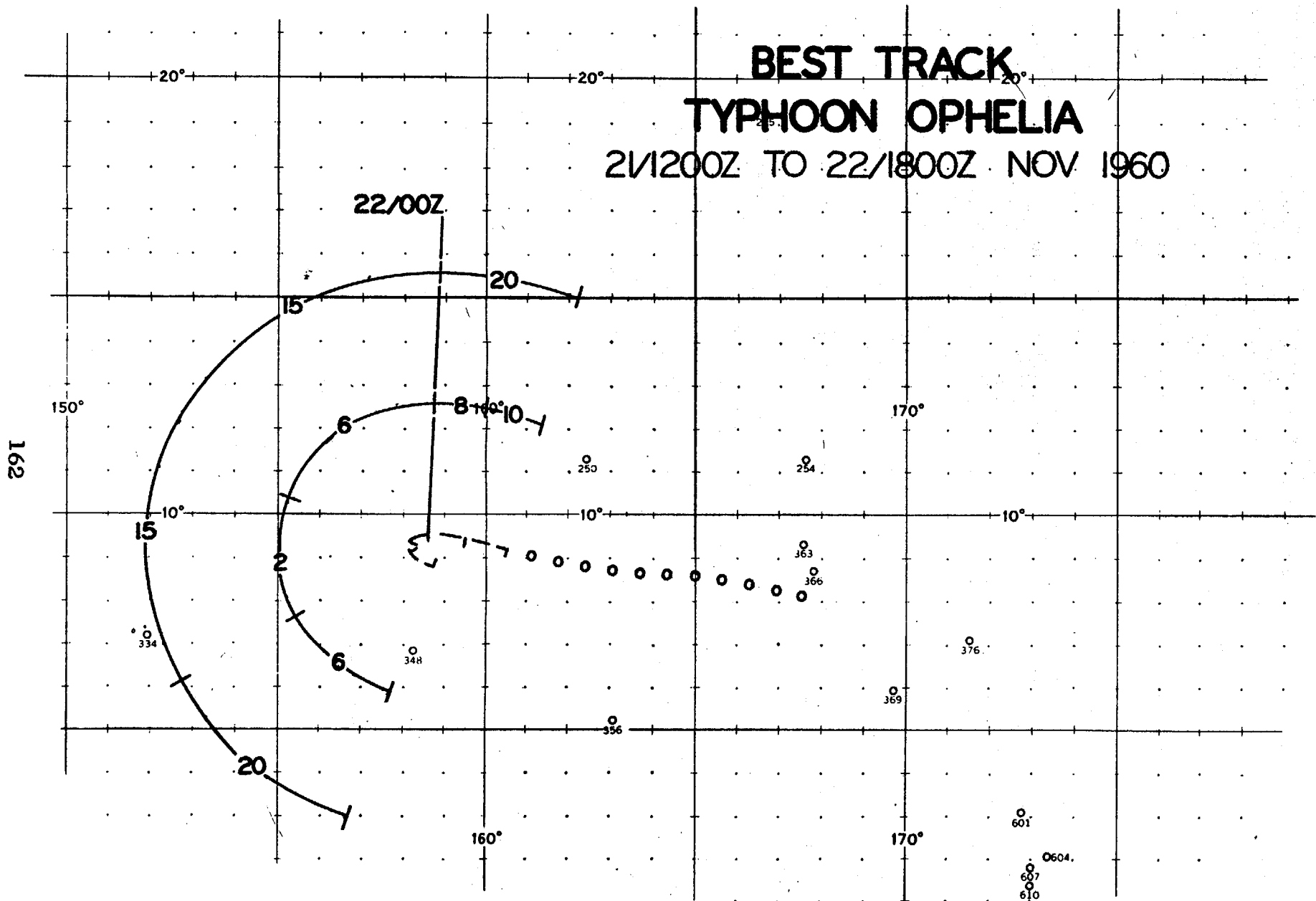






BEST TRACK TYPHOON OPHELIA

21/200Z TO 22/1800Z NOV 1960



RECONNAISSANCE AIRCRAFT FIXES - TYPHOON OPHELIA

FIX NO.	TIME	LAT.	LONG.	UNIT METHOD & ACCY	MIN SLP MBS	MAX SFC WND	MIN 700MB HGT	MAX 700MB WND	700MB TT/Td (°C)	EYE CHARACTERISTICS
1	270800Z	09.9N	148.0E	56-P-05	982	25	10070 ⁹⁹⁸	30	11/05	CIRC DIA 15 MI WALL CLDS ALL QUADS
2	272215Z	09.7N	147.9E	56-P-10	993	35	9940 ⁹⁹³	45	11/08	POORLY DEFINED
3	280805Z	09.3N	147.5E	56-P-05	995	40	9900 ⁹⁹²	50	10/10	DIFFUSE
4	282210Z	09.2N	146.7E	56-P-05	974	50	9520 ⁹⁷⁹	- -	15/12	ELLIP N-S 14X10 MI
5	290715Z	09.9N	145.3E	56-P-02	- -	50	9270 ⁹⁹⁰	72	16/12	ILL-DEFINED CIRC DIA 30MI
6	291325Z	10.4N	143.5E	VW1-R-03	- -	- -	- - -	- -	- - -	CIRC DIA 36 MI WELL DEFINED
7	292145Z	10.2N	141.2E	56-P-08	950	125	8710 ⁹⁵¹	115	18/10	CIRC DIA 35 MI
8	300200Z	10.0N	140.2E	56-P-05	946	125	8570 ⁹⁴⁵	105	18/--	ELLIP N-S 25 MI E-W 17 MI
9	300652Z	10.5N	139.2E	56-P-05	936	100	8430 ⁹⁴¹	112	17/--	CIRC DIA 40 MI
10	301500Z	11.2N	136.7E	VW1-R-05	- -	- -	- - -	- -	- - -	CIRC DIA 35 MI
11	302108Z	11.7N	135.2E	56-P-10	938	100	8370 ⁹³⁸	110	19/18	WALL CLDS WELL DEFINED
12	010155Z	12.2N	134.5E	56-P-10	934	175	8460 ⁹⁴²	110	28/17	DIA 15 MI
13	010700Z	12.6N	133.7E	56-P-10	942	140	8330 ⁹²⁷	- -	18/15	CIRC OPEN E
14	011449Z	13.2N	132.3E	VW1-R-10	- -	- -	- - -	- -	- - -	OPEN NE SEMICIRCLE
15	011608Z	13.7N	132.2E	VW1-R-20	- -	- -	- - -	- -	- - -	OPEN NE SEMICIRCLE
16	012315Z	14.1N	132.5E	56-P-05	945	110	8570 ⁹⁴⁵	80	18/15	- - - - -
17	020120Z	14.5N	132.4E	56-P-05	- -	110	8430 ⁹⁴¹	90	15/14	FILLED WITH 6/8 SC
18	020300Z	14.7N	132.4E	56-P-05	938	110	8430 ⁹⁴¹	90	18/16	CIRC DIA 30 MI

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RECONNAISSANCE AIRCRAFT FIXES - TYPHOON OPHELIA (CONT'D)

FIX NO.	TIME	LAT.	LONG.	UNIT METHOD & ACCY	MIN SLP MBS	MAX SFC WND	MIN 700MB HGT	MAX 700MB WND	700MB TT/Td (°C)	EYE CHARACTERISTICS
19	020800Z	14.8N	132.8E	56-P-10	936	80	8410 ⁹⁴⁰	80	17/17	CIRC DIA 25 MI OPEN NE
20	021356Z	16.0N	132.7E	VW1-R-10	- -	- -	- - -	- -	- - -	OPEN NE
21	021500Z	16.0N	132.7E	VW1-R-05	- -	- -	- - -	- -	- - -	CIRC DIA 25 MI
22	030300Z	17.7N	133.1E	56-P-10	929	90	8080 ⁹²⁸	100	17/14	CIRC DIA 25 MI
23	030625Z	18.1N	132.8E	56-P-03	928	90	7960 ⁹²⁴	100	17/14	CIRC DIA 25 MI WELL DEFINED
24	032230Z	20.6N	132.4E	56-P-07	930	130	8220 ⁹²⁴	150	17/14	ELLIP E-W 30 MI
25	040230Z	21.9N	133.2E	56-P-10	931	150	8260 ⁹³⁵	120	18/15	CIRC DIA 20 MI OPEN SW
26	040433Z	22.5N	133.6E	VW1-R-10	- -	- -	- - -	- -	- - -	CIRC DIA 16 MI
27	040700Z	22.7N	133.8E	56-P-05	944	110	8280 ⁹³⁵	115	20/17	CIRC DIA 25 MI
28	042236Z	28.4N	140.0E	56-P-03	963	85	9070 ⁹⁶³	60	16/12	OPEN NE-SE
29	050242Z	30.5N	142.2E	56-P-01	974	120	9270 ⁹⁷⁰	45	16/11	POORLY DEFINED
30	050630Z	32.5N	145.3E	56-P-05	980	115	9420 ⁹⁷⁵	115	17/06	POORLY DEFINED

TYPHOON OPHELIA 21 NOVEMBER-06 DECEMBER 1960
POSITION AND FORECAST VERIFICATION DATA

DTG	STORM POSITION		24 HR. ERROR		48 HR. ERROR	
	LAT.	LONG.	DEG.	DISTANCE	DEG.	DISTANCE
211200Z	09.2N	160.5E	-	-	-	-
211800Z	09.4N	159.5E	-	-	-	-
220000Z	09.5N	158.7E	-	-	-	-
220600Z	09.4N	158.1E	-	-	-	-
221200Z	09.2N	158.2E	-	-	-	-
221800Z	08.9N	158.7E	-	-	-	-
230000Z	08.6N	159.6E	-	-	-	-
230600Z	08.2N	160.6E	-	-	-	-
231200Z	07.5N	161.1E	-	-	-	-
231800Z	07.1N	160.6E	-	-	-	-
240000Z	07.0N	159.5E	-	-	-	-
240600Z	07.0N	157.9E	-	-	-	-
240600Z TO 270000Z NO WARNINGS ISSUED						
270000Z	10.0N	148.3E	-	-	-	-
270600Z	09.9N	148.2E	-	-	-	-
271200Z	09.8N	148.0E	-	-	-	-
271800Z	09.7N	147.8E	-	-	-	-
280000Z	09.5N	147.6E	317	-71	-	-
280600Z	09.4N	147.5E	312	-107	-	-
281200Z	09.3N	147.2E	316	-150	-	-
281800Z	09.2N	147.0E	323	-145	-	-
290000Z	09.1N	146.5E	010	-67	314	-191
290600Z	09.6N	145.4E	036	-65	315	-165
291200Z	10.4N	144.0E	115	-131	325	-119
291800Z	10.4N	142.2E	105	-226	031	-101
300000Z	10.1N	140.5E	099	-251	074	-245
300600Z	10.3N	139.0E	078	-157	077	-298
301200Z	11.1N	137.4E	331	-66	103	-440
301800Z	11.6N	136.0E	320	-75	105	-517
010000Z	12.0N	134.8E	234	-47	105	-450
010600Z	12.3N	133.6E	222	-116	096	-235
011200Z	12.8N	132.9E	200	-97	292	-188
011800Z	13.5N	132.4E	202	-103	284	-270
020000Z	14.3N	132.4E	254	-213	259	-268

TYPHOON OPHELIA 21 NOVEMBER-06 DECEMBER 1960
 POSITION AND FORECAST VERIFICATION DATA (CONT'D)

DTG	STORM POSITION		24 HR. ERROR	48 HR. ERROR
	LAT.	LONG.	DEG. DISTANCE	DEG. DISTANCE
020600Z	15.1N	132.5E	262-285	245-327
021200Z	15.7N	132.7E	263-287	246-326
021800Z	16.2N	132.9E	261-327	230-347
030000Z	17.1N	133.0E	016-67	254-540
030600Z	18.1N	132.9E	182-152	258-582
031200Z	19.0N	132.6E	174-128	257-535
031800Z	20.0N	132.5E	112-93	255-570
040000Z	20.9N	132.5E	091-129	075-356
040600Z	22.6N	133.7E	118-109	183-237
041200Z	24.3N	135.5E	146-71	198-324
041800Z	26.5N	137.8E	213-103	198-220
050000Z	29.1N	140.7E	249-366	198-173
050600Z	32.6N	145.0E	235-218	215-377
051200Z	37.0N	150.9E	- - - -	- - - -
051800Z	39.4N	156.2E	- - - -	- - - -
060000Z	40.3N	162.3E	- - - -	- - - -
060600Z	41.1N	169.3E	- - - -	- - - -
AVERAGE 24 HOUR ERROR			147 MI	
AVERAGE 48 HOUR ERROR			323 MI	

