

C. HURRICANE DOT (01-08 August 1959)

I. Introduction: This report was prepared by FWC, Pearl Harbor and edited by FWC/JTWC, Guam.

At 0000Z on 24 July the SS PACIFICUS at 19.5N - 127.5W, 1000 miles west of Lower California, reported 35 knot surface winds. Based on this report a tropical warning was issued at 240000Z with the remark that the accuracy of the position was poor. At 240600Z the same ship reported 55 knot winds, and the position given on the 0600Z warning was 18.4N - 120.6W. The movement of the unnamed storm was forecast to be west northwest at 12 knots. From 240600Z until 270000Z, there were no further ship reports. Subsequent warning positions were therefore based upon extrapolation. The storm was "killed" with the 270000Z warning. However, if the storm actually moved west southwest at 6 knots, it would have been positioned, by 2100Z on 1 August, at 15.7N - 141.2W, the point where Tropical Storm DOT was "discovered." This was possibly the case. There was no data available between 240600Z July and 012100Z August in the area of the unnamed storm, so it is impossible to determine whether the original storm dissipated or simply was rediscovered as DOT.

II. Method of Detection:

At 011800Z an unidentified ship reported 60 knot surface winds at 15.7N.- 141.2W. This was fixed as the first warning position (011800Z) of Tropical Storm DOT.

III. Best Track Analysis:

Between the first reconnaissance at 030000Z and the final

eye fix by reconnaissance at 071858Z, there were a total of 16 aircraft reconnaissance fixes on DOT, and many land-based radar fixes. The warnings issued by Fleet Weather Central, Pearl Harbor during DOT are summarized on page 56. The aircraft fixes were considered to be the most accurate. Due to strong attenuation by heavy precipitation, the land-based radar fixes were considered less reliable. As a result of excellent electronic navigation aids in the vicinity of the Hawaiian Islands, most reconnaissance fixes were considered to have been accurate to within 10 miles.

IV. Analysis of Development:

At 020000Z the following message was received from the SS SONOMA:

"0200Z RECORDED LOW PRESS OF 963PT4 AT 012300Z 15PT7N 141PT8W X WIND BACKING FROM NE AT 011800Z TO NW AT 012300Z X WIND SHIFT AND BARO INDICATES VESSEL PASSED THRU SRI PART OF STORM CNTR AT 012300Z"

The maximum surface wind recorded at this time was 90 knots. From 011800Z until 020600Z DOT's position was based upon the reports of this one ship. From 020600Z until the first aircraft fix at 030000Z, positions were based upon extrapolation only. From 030000Z until degeneration into an open wave at 080600Z, DOT's center was fixed continuously by aircraft reconnaissance. The minimum sea level pressure during the period of aircraft reconnaissance fixes was recorded, by dropsonde, as 952 millibar at 030000Z. Using the following equation, developed for determining the maximum winds of a tropical cyclone, the maximum surface wind was computed as 130 knots.

$$\text{Wind max} = \left(20 - \frac{\phi}{5} \right) \sqrt{1010 - P_c}$$

(Where ϕ is latitude in degrees, and P_c is central pressure in mb.)

The central pressure rose steadily, as determined from dropsonde observations and from the minimum 700 mb height using the below equation (see TABLE 1):

$$P_c = \frac{H700\text{mb}}{28} + 638$$

(Where P_c is central pressure in mb, and H700mb is 700 mb height in feet.)

TABLE 1. CENTRAL PRESSURE HURRICANE DOT

<u>DATE</u>	<u>TIME Z</u>	<u>CENTRAL PRESSURE</u>	<u>LAT N</u>	<u>LONG W</u>	<u>MAX OBSERVED SFC WIND</u>
3 AUG	0000Z	# 952	15.3	145.8	Not observed
3 AUG	1612Z	# 957	15.8	148.1	100 kt
4 AUG	0412Z	# 961	16.2	150.1	100 kt
4 AUG	2104Z	# 966	16.9	154.4	140 kt
5 AUG	1150Z	* 992	17.3	156.0	Not observed
5 AUG	1633Z	# 970	17.6	156.6	Not observed
5 AUG	2222Z	# 968	18.1	157.4	95 kt
6 AUG	1643Z	* 976	20.3	158.9	Not observed
7 AUG	1934Z	* 999	22.8	161.2	45 kt

Indicates dropsonde observation

* Indicates computed from min 700 mb height

V. Storm Movement:

The indicated 700-500 mb flow during the entire period between the discovery and dissipation of DCT was ESE becoming WSW north of Lihue. The indicated 200 mb flow for the same period was also constant from the ESE, curving gradually northward in the vicinity of the Island of Hawaii. The best track analysis indicates that the fully developed storm was steered by the flow near the 300 mb level. As the

storm weakened after passing Hawaii, the best steering flow appears to have been near the 500 mb level. This indicates the possibility of a direct, or nearly direct, relationship between storm intensity and height of steering level.

VI. Summarization:

South Point, Hawaii received heavy seas and gusty winds to 75 knots as DOT reached her closest point of approach to that island. The most significant effect of DOT on Oahu was the rainfall. The U.S. Weather Bureau, Honolulu recorded 2.66 inches, while normal rainfall for the entire month of August is only 0.80 inches. The greatest damage occurred on Kauai. The track analysis indicates that the storm center passed directly over Lihue, county seat of Kauai, and although that station reported gusts to 65 knots as the highest winds, unofficial reports of 90 knot winds were received from other parts of the island. The hurricane unroofed homes, uprooted trees and knocked down power and telephone lines as it raked the entire island of Kauai. Many roadways were blocked and huge waves pounded the shoreline. Torrential rains swelled rivers and streams to raise flood threats, and Kauai was subsequently proclaimed a disaster area.

WARNINGS ISSUED BY FWC, PEARL HARBOR

<u>WNG NO.</u>	<u>DTG OF WARNING</u>	<u>WARNING BASIS</u>	<u>LAT (N)</u>	<u>LONG (W)</u>	<u>MOVEMENT</u>		<u>MAX WIND (KTS)</u>	<u>POSIT</u>
					<u>DIR</u>	<u>SPD (KTS)</u>		
1	011800Z	Ship	15.7	141.2	W	9	60	Fair
2	020000Z	Ship	15.8	142.0	WNW	9	90	Fair
3	020600Z	Ship	15.7	142.9	W	10	90	Fair
4	021200Z	Extrap	15.6	144.0	WSW	10	85	Poor
5	021800Z	Extrap	16.0	144.5	W	7	75	Poor
6	030000Z	Recon	15.3	145.8	W	9	120	Good
7	030600Z	Extrap	15.3	146.3	W	7	120	Poor
8	031200Z	Extrap	15.3	147.0	W	7	115	Poor
9(WB)	031800Z	Recon	15.8	148.5	WNW	9	110	Fair
10	040000Z	Extrap	15.9	149.5	WNW	10	115	Fair
11	040600Z	Recon	16.2	150.5	WNW	10	120	Good
12	041200Z	Extrap	16.5	151.5	WNW	10	115	Fair
13	041800Z	Recon	16.7	152.5	WNW	10	120	Good
14	050000Z	Recon	17.0	154.0	WNW	12	115	Good
15	050600Z	Recon	17.5	155.3	WNW	13	115	Fair
16	051200Z	Recon	17.5	156.0	WNW	12	115	Fair
17	051800Z	Recon	17.7	156.8	WNW	11	90	Fair
18	060000Z	Recon	18.2	157.7	WNW	11	1st 12 hrs	
					NW	11	100	Good
19	060600Z	Recon	18.9	158.3	NW	10	100	Good
20	061200Z	Recon	19.6	158.8	N	8	90	Good
21	061800Z	Radar	20.4	158.9	N	4	1st 12 hrs	
					N	10	65	Fair
22	070000Z	Radar	21.2	159.2	NNE	10	1st 12 hrs	
					NE	10	65	Good
23	070600Z	Land Sta	22.1	159.2	NNE	13	90	Fair
24	071200Z	Analysis	22.8	160.0	NNW	13	1st 12 hrs	
					NNE	13	70	Poor
25	071800Z	Recon	22.8	161.1	WNW	9	45	Fair
26	080000Z	Extrap	23.0	162.1	WNW	10	45	Poor
27	080600Z	Recon	23.0	161.0	STNY	—	40	Poor

BEST TRACK ANALYSIS
HURRICANE DOT
02-07 AUG 1959

Legend
△ INDICATES RECON FIX

07/1858Z △ 07/0850Z

07/0220Z △
06/2110Z △

05/1843Z △

06/0514Z △

05/222Z △

05/1633Z △

05/0340Z △

05/1150Z △

04/1708Z △

04/2104Z △

04/0412Z △

03/2104Z △

03/161Z △

02/2356Z △

57