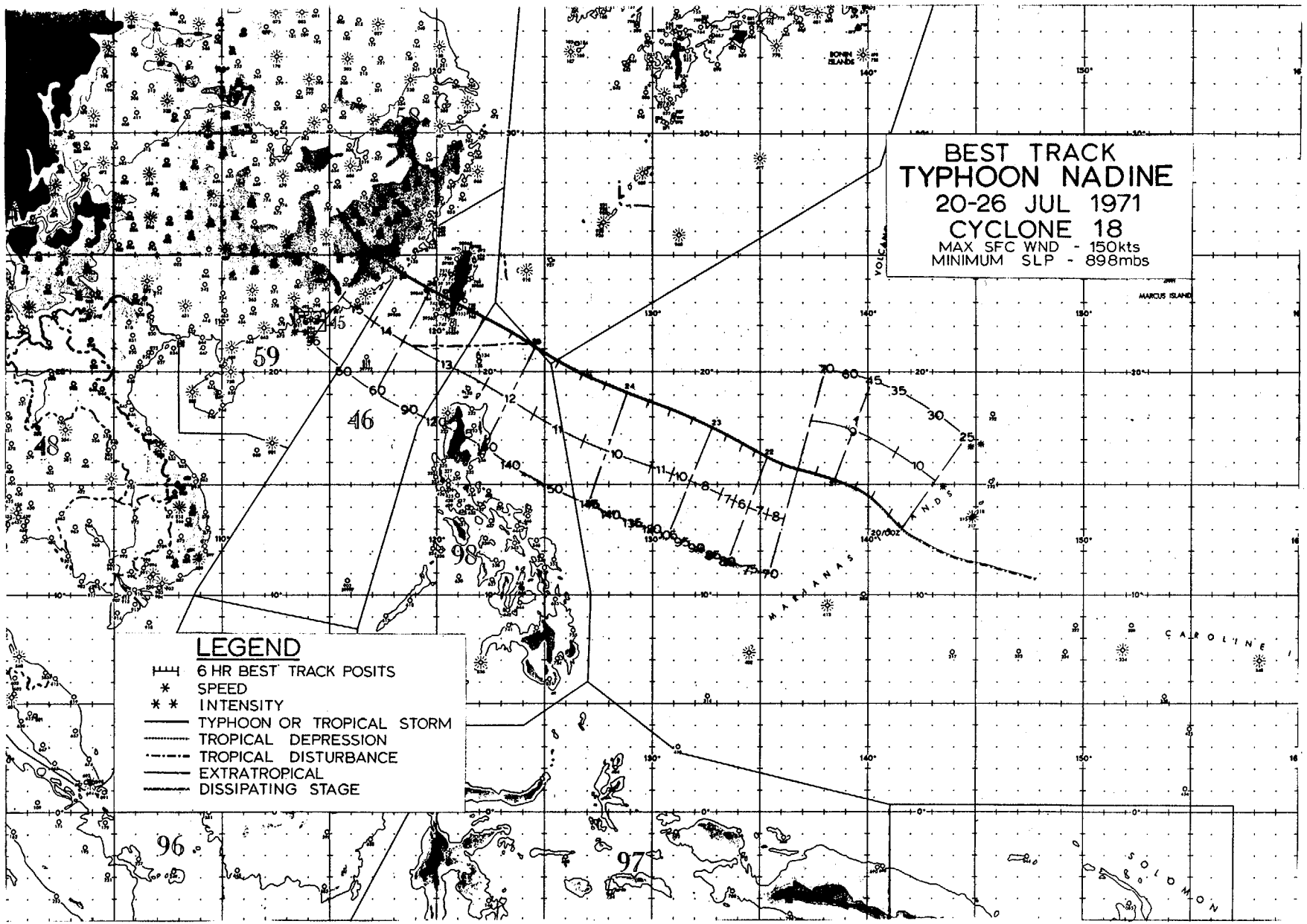
BEST TRACK
TYPHOON NADINE
20-26 JUL 1971
CYCLONE 18
MAX SFC WND - 150kts
MINIMUM SLP - 898mbs
LEGEND
6 HR BEST TRACK POSITS
SPEED
INTENSITY
TYPHOON OR TROPICAL STORM
TROPICAL DEPRESSION
TROPICAL DISTURBANCE
EXTRATROPICAL
DISSIPATING STAGE
BONIN ISLANDS
MARCUS ISLAND
VOLCANO
MARIANAS
CAROLINE
SOLOMON
59
46
48
98
96
97

As typhoon Lucy was reaching super typhoon strength in the Philippine Sea, another circulation destined to be Nadine, formed southeast of Guam on July 16th.

During her formative stages the pre-Nadine system dumped 6.05 inches of rain on Guam over a three-day period as she passed into the Philippine Sea causing [illegible] flooding on the island. Evidence that Nadine was on her way to intensification was provided by the AMERICAN CHARGER which reported northerly winds at 47 kt about 75 n mi due west of the center at 2200 GMT July 20th. Nadine took a track slightly northward of Lucy's as the ridge began to build across to the north dictating a west-northwest course of 8-10 kt.

Quickly reaching typhoon force (Figures 5-25 and 5-26), Nadine began to grow both in size and strength. The central pressure began to plummet rapidly and gale force winds began to spread. At her height the minimum pressure reported by reconnaissance aircraft was 898 mb some 300 n mi northeast of Luzon on the 24th. Maximum winds at this time of 150 kt were packed around Nadine's 20 n mi diameter eye. 100-kt winds spread some 100 n mi from the center while gale force winds encompassed the western Philippine Sea in excess of 300 n mi from the typhoon's eye.

As Nadine approached Taiwan, gales were felt as far south as Manila which reported gusts to 33 kt. The Philippine Weather Bureau station on Basco in the Luzon Straits measured wind gusts of 127 kt (probably due to channeling in the straits) as Nadine's center passed 100 n mi to the northwest.

The poor weather and low ceilings over Luzon caused by Nadine may have contributed to the crash of a Pan American cargo aircraft. Bound from Guam to Manila, the jet crashed into a mountain side 17 miles northeast of Manila on July 25th with the loss of four crew members.

Nadine's eye landed on the southeastern coast of Taiwan between Hsinkong and Taitung in the early morning of July 26th. The typhoon brought torrential rain over southeastern Taiwan with 12.07 inches recorded at Hengehan during her passage. Lanyu recorded maximum winds of 95 kt and gusts to 99 kt. The toll in Taiwan due to the typhoon amounted to 28 killed with an additional 25 missing. Over 1,250

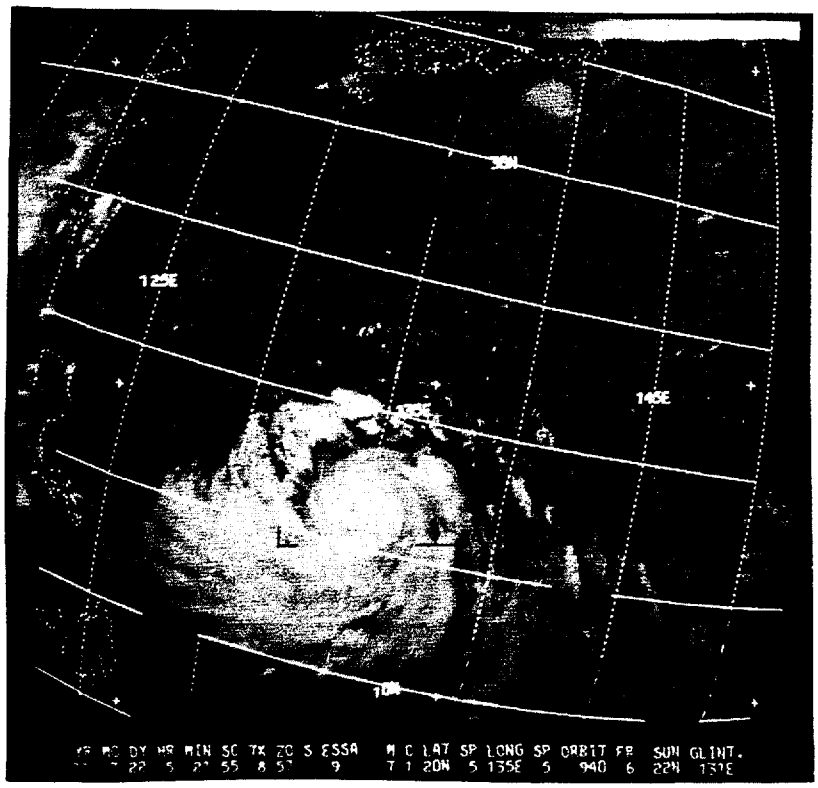

FIGURE 5-25. NADINE AS A RECENTLY DEVELOPED TYPHOON IN THE PHILIPPINE SEA ON 22 JULY.

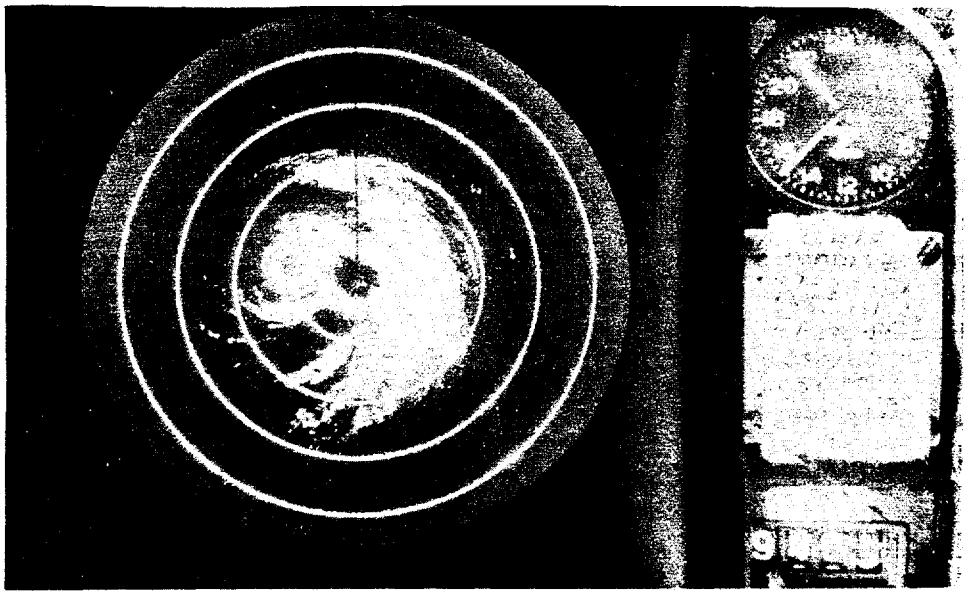

FIGURE 5-26. APS-20 RADARSCOPE PICTURE OF NADINE TAKEN FROM NAVY RECONNAISSANCE AIRCRAFT (VQ-1) AT 2137 GMT 23 JULY (RANGE MARKS ARE AT 50 N MI INTERVALS).

homes were totally destroyed and some 2,180 dwellings were badly damaged. In addition, the Liberian tanker WARWICK TRADER drug anchor and became lodged in the soft sand off the southwestern coast of Taiwan.

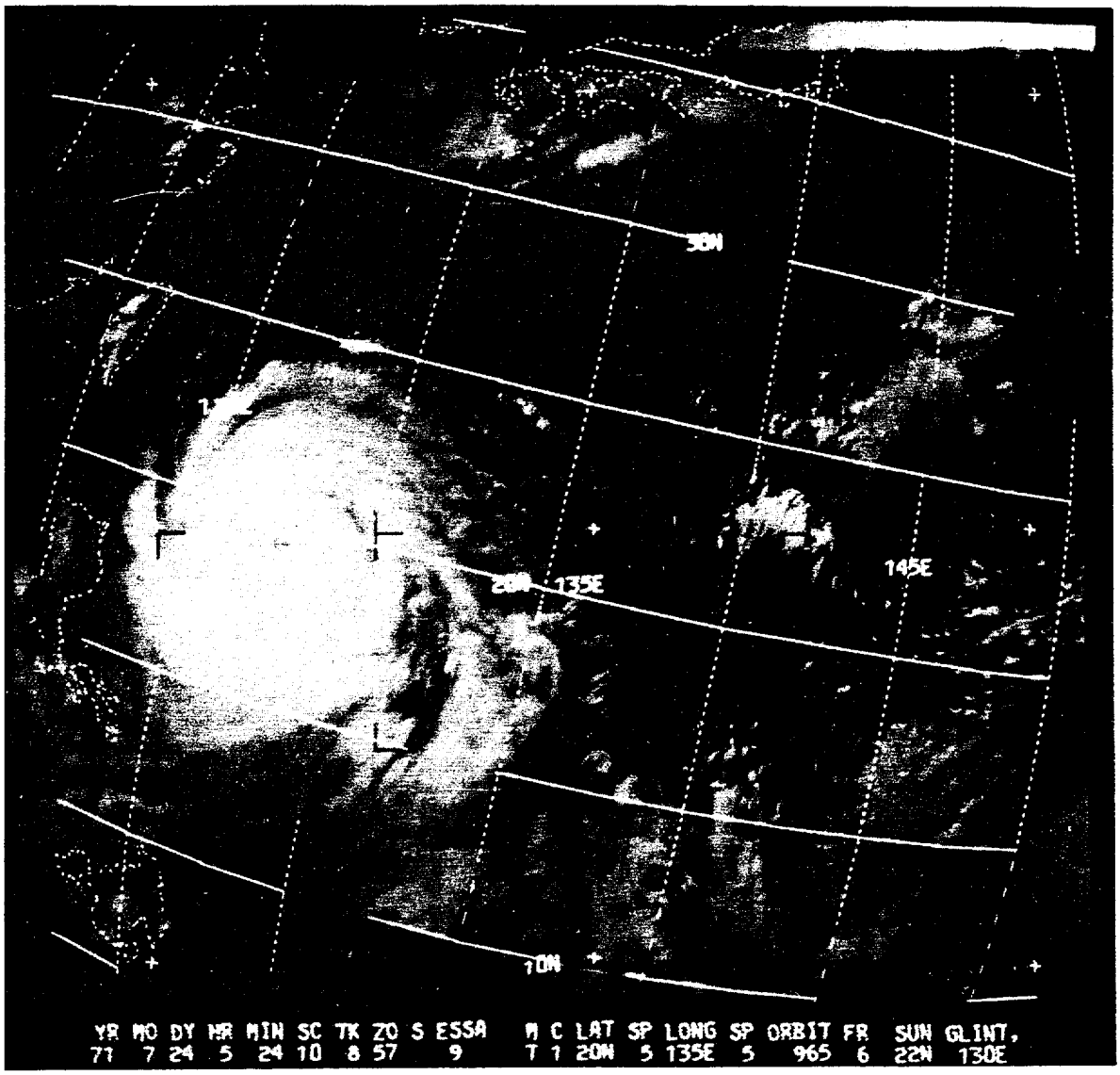

FIGURE 5-27. ESSA-9 VIEW OF NADINE AT HER PEAK AS A SUPER TYPHOON ON 24 JULY.

TYPHOON NADINE
EYE FIXES FOR CYCLONE NO. 18
20 JUL - 26 JUL 71

FIX NO.	TIME	POSIT	UNIT-METHOD -ACCY	FLT LVL	FLT LVL WND	OBS SFC WND	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	THKN WALL CLD	REMARKS	POSIT OF RADAR
1	190421Z	12.0N 145.0E	SATELIT---	STG R										FIRST BLTN	
2	192315Z	12.9N 141.0E	54-P------	700MB	----	20	----	----	--/--	----	-----	--	--	BROAD CIRCULATION	
3	200300Z	13.3N 141.3E	54-P- 2-10	700MB	35	35	1006	3103	10/10	----	-----	--	--	NEG RDR PRES	
4	200515Z	14.0N 140.0E	SATELIT---	STG C										MORE INTENSE	
5	200935Z	14.5N 140.7E	54-P- 2-10	700MB	15	----	1001	3057	10/10	----	-----	--	--	POORLY ORGANIZED	
6	201600Z	14.6N 139.8E	54-P- 5-10	700MB	30	----	1003	3048	09/09	----	-----	--	--	WC FORMING W	
7	202200Z	15.1N 138.8E	54-P- 5- 5	700MB	46	30	1000	3072	12/09	----	-----	--	--	700 CNTR 10NM W	
8	210340Z	15.6N 137.8E	VQ-P- 5---	300M	----	70	991	----	27/24	CIRC		45	--	NO WC	
9	210423Z	16.0N 137.0E	SATELIT---	STG C+										MORE INTENSE	
10	211006Z	15.6N 137.0E	54-P- 6- 4	700MB	70	----	983	2905	11/09	CIRC		35	--	WC OPEN S-W	
11	211555Z	15.9N 136.1E	VQ-P- 5---	700MB	60	----	977	2950	17/11	ELIP	E-W	44X34	--	WC OPEN N	
12	212120Z	16.0N 135.7E	54-P- 5---	700MB	65	75	977	2844	12/07	ELIP	SE-NW	40	--	NO WC	
13	220322Z	16.4N 135.0E	54-P- 5---	700MB	70	65	----	2810	13/09	ELIP	SE-NW	30X20	--	WC FORMING E	
14	220522Z	16.5N 134.5E	SATELIT---	STG X	DIA	2 CAT 3.0								EYE VISIBLE	
15	221543Z	17.1N 133.7E	VQ-P-10---	700MB	----	----	953	2743	20/11	CIRC		23	--	CLSD WC-HVY FBS	
16	222150Z	17.5N 133.1E	54-P- 5- 5	700MB	90	100	950	2652	19/14	CIRC		30	--	WC OPEN W 700 MB CNTR 4 NM S	
17	230310Z	17.7N 132.4E	54-P- 5- 5	700MB	93	120	939	2557	19/15	CIRC		30	--	CLSD WC	
18	230617Z	19.0N 132.0E	SATELIT---	STG X	DIA	3 CAT 4.0								EYE VISIBLE	
19	231000Z	18.3N 131.1E	54-P- 5- 2	700MB	115	----	920	2387	23/16	CIRC		20	--	CLSD WC	
20	231132Z	18.4N 130.8E	54-P------	700MB	----	----	----	2356	25/10	----	-----	--	--		
21	231515Z	18.5N 130.3E	54-P- 5- 2	700MB	125	----	907	2289	25/16	CIRC		25	--	CLSD WC-STG FBS	
22	232202Z	19.1N 129.2E	VQ-P- 5---	270M	145	140	903	----	28/25	CIRC		20	9	CLSD WC	
23	240301Z	19.3N 128.2E	VQ-R- 3- 7	------	122	120	----	----	--/--	CIRC		20	9	CLSD WC	20.0N 127.7E
24	240525Z	19.5N 127.5E	SATELIT---	STG X	DIA	4 CAT 4.0								CIRC EYE VSBL	
25	241029Z	19.9N 127.1E	54-P- 3- 3	700MB	100	----	898	2185	21/12	CIRC		20	--	CLSD WC	
26	241200Z	20.0N 126.7E	54-P------	700MB	----	----	900	2210	--/--	----	-----	--	--		
27	241500Z	20.2N 126.2E	54-P- 3- 3	700MB	100	----	904	2243	19/13	CIRC		20	--	CLSD WC	
28	242215Z	20.9N 124.9E	VQ-P- 7- 3	700MB	80	100	919	2240	20/16	ELIP	N-S	35X25	10	CLSD WC-STG FBS	
29	250100Z	21.1N 124.3E	VQ-P- 1- 4	700MB	75	85	923	2243	21/16	ELIP	SE-NW	25X20	8	CLSD WC-TOPS 25K	
30	250300Z	21.4N 124.2E	LND RDR---							----	-----	--	--		
31	250345Z	21.5N 124.0E	VQ-P- 1- 4	700MB	80	100	925	2246	21/16	ELIP	NE-SW	40X25	10	WC OPEN NW	
32	250400Z	21.6N 123.6E	LND RDR---							----	-----	--	--		
33	250500Z	21.8N 123.7E	LND RDR---							----	-----	--	--		
34	250600Z	21.8N 123.4E	LND RDR---							----	-----	--	--		
35	250623Z	22.0N 123.0E	SATELIT---	STG X	DIA	4 CAT 4.0								EYE SMALLER	
36	250659Z	22.2N 123.5E	54-P- 2- 3	700MB	89	----	927	2454	21/14	ELIP	N-S	25X20	7	CLSD WC	
37	250700Z	22.0N 123.3E	LND RDR---							----	-----	--	--		
38	250800Z	22.2N 123.1E	LND RDR---							----	-----	--	--		
39	250900Z	22.3N 123.0E	LND RDR---							----	-----	--	--		
40	250954Z	22.3N 122.7E	VQ-P- 2- 3	330M	100	105	930	----	26/24	ELIP	N-S	34X22	7	WC OPEN NW	
41	251000Z	22.5N 122.7E	LND RDR---							----	-----	--	--		
42	251100Z	22.4N 122.4E	LND RDR---							----	-----	--	--		
43	251200Z	22.5N 122.4E	LND RDR---							----	-----	--	--		
44	251213Z	22.4N 122.2E	VQ-R- 2- 8	-----	50	----	----	----	--/--	ELIP	N-S	25X22	6	WC OPEN SE	21.8N 121.4E
45	251300Z	22.4N 122.1E	LND RDR---							----	-----	--	--		
46	251400Z	22.5N 121.9E	LND RDR---							----	-----	--	--		
47	251500Z	22.6N 121.7E	LND RDR---							----	-----	--	--		
48	251600Z	22.5N 121.6E	LND RDR---							----	-----	--	--		
49	251630Z	22.7N 121.5E	54-P- 5- 8	400MB	30	----	938	----	-6/-7	CIRC		20	--	RAGGED WC	

TYPHOON NADINE
EYE FIXES FOR CYCLONE NO. 18
20 JUL - 26 JUL 71

FIX NO.	TIME	POSIT	UNIT-METHOD -ACCY	FLT LVL	FLT LVL WND	OBS SFC WND	OBS MIN SLP	MIN 700MB HGT	FLT LVL TI/TO	EYE FORM	ORIEN-TATION	EYE DIA	THKN WALL CLD	REMARKS	POSIT OF RADAR
50	251700Z	22.8N 121.4E	LND RDR---							----	-----	--	--		
51	251800Z	22.9N 121.2E	LND RDR---							----	-----	--	--		
52	251900Z	22.9N 121.1E	LND RDR---							----	-----	--	--		
53	251900Z	22.9N 121.1E	54-P- 3- 7	400MB	60	----	----	----	-7/-9	CIRC		30	--	POORLY DEFINED	
54	252100Z	22.9N 120.5E	----------	-----	----	----	----	----	--/--	----	-----	--	--	EST SFC POSIT	
55	252300Z	23.4N 119.8E	LND RDR---							----	-----	--	--		
56	260000Z	23.6N 119.7E	LND RDR---							----	-----	--	--		
57	260100Z	23.8N 119.4E	LND RDR---							----	-----	--	--		
58	260200Z	24.0N 119.2E	LND RDR---							----	-----	--	--		
59	260500Z	24.2N 118.6E	LND RDR---							----	-----	--	--		

TYPHOON NADINE

0000Z 20 JUL TO 1200Z 26 JUL

	BEST TRACK		WARNING				24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
					ERRORS				ERRORS				ERRORS				ERRORS	
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
200000Z	13.0N 141.7E	25	12.9N 141.5E	25	13	0	13.4N 139.6E	50	125	5	--.- ---.-	--	--	--	--.- ---.-	--	--	--
200600Z	13.7N 140.9E	30	13.3N 141.1E	30	27	0	14.3N 139.2E	55	113	-5	--.- ---.-	--	--	--	--.- ---.-	--	--	--
201200Z	14.3N 140.2E	30	14.9N 140.4E	30	38	0	17.2N 137.6E	60	101	-10	--.- ---.-	--	--	--	--.- ---.-	--	--	--
201800Z	14.8N 139.4E	35	15.1N 139.7E	30	25	-5	17.0N 136.8E	65	80	-10	--.- ---.-	--	--	--	--.- ---.-	--	--	--
210000Z	15.2N 138.5E	45	15.3N 138.5E	30	6	-15	16.5N 134.7E	70	39	-10	--.- ---.-	--	--	--	--.- ---.-	--	--	--
210600Z	15.4N 137.6E	60	15.6N 137.4E	65	17	5	17.0N 133.3E	95	91	10	18.4N 129.4E	125	144	5	--.- ---.-	--	--	--
211200Z	15.7N 136.8E	70	15.7N 136.7E	75	6	5	16.6N 133.1E	100	64	10	17.9N 129.6E	120	80	-15	19.6N 126.3E	130	33	-20
211800Z	15.9N 136.0E	75	16.0N 135.7E	75	18	0	17.0N 132.1E	105	81	10	18.4N 128.6E	125	77	-15	--.- ---.-	--	--	--
220000Z	16.2N 135.3E	80	16.3N 134.8E	80	29	0	17.3N 131.2E	110	93	5	18.8N 127.7E	130	70	-15	20.6N 124.4E	130	32	0
220600Z	16.5N 134.8E	85	16.6N 134.7E	85	8	0	18.1N 131.7E	105	13	-15	19.4N 128.7E	125	45	-25	--.- ---.-	--	--	--
221200Z	16.8N 134.2E	90	17.0N 134.0E	90	17	0	18.5N 130.9E	115	6	-20	19.7N 127.9E	130	63	-20	20.9N 124.2E	130	143	10
221800Z	17.2N 133.5E	95	17.2N 133.5E	95	0	0	18.6N 130.7E	120	47	-20	19.8N 127.6E	130	114	-10	--.- ---.-	--	--	--
230000Z	17.6N 132.8E	105	17.8N 132.9E	100	13	-5	19.5N 130.3E	125	82	-20	20.8N 127.3E	130	152	0	22.1N 124.1E	130	256	10
230600Z	18.0N 131.9E	120	17.9N 132.1E	110	13	-10	19.2N 129.1E	130	69	-20	20.5N 125.9E	130	155	-5	--.- ---.-	--	--	--
231200Z	18.4N 130.9E	135	18.5N 130.8E	125	8	-10	19.9N 127.4E	140	34	-10	21.1N 123.8E	125	118	5	22.1N 120.1E	110	244	15
231800Z	18.8N 129.9E	140	18.7N 129.9E	135	6	-5	20.5N 126.0E	135	17	-5	21.7N 122.0E	120	91	30	--.- ---.-	--	--	--
240000Z	19.1N 128.9E	145	19.3N 128.9E	140	12	-5	20.8N 125.0E	140	29	10	22.1N 120.4E	120	92	60	--.- ---.-	--	--	--
240600Z	19.4N 127.9E	150	19.6N 127.7E	150	16	0	21.1N 123.8E	135	45	0	22.3N 119.4E	115	126	65	--.- ---.-	--	--	--
241200Z	19.9N 126.8E	150	20.0N 126.8E	150	6	0	21.4N 122.8E	130	68	10	22.5N 118.3E	110	172	75	--.- ---.-	--	--	--
241800Z	20.5N 125.7E	140	20.4N 125.6E	150	8	10	21.9N 121.1E	130	60	40	--.- ---.-	--	--	--	--.- ---.-	--	--	--
250000Z	21.1N 124.6E	130	20.9N 124.5E	130	13	0	22.2N 119.8E	105	78	45	--.- ---.-	--	--	--	--.- ---.-	--	--	--
250600Z	21.8N 123.5E	135	21.8N 123.7E	125	11	-10	24.0N 118.9E	80	30	30	--.- ---.-	--	--	--	--.- ---.-	--	--	--
251200Z	22.4N 122.2E	120	22.6N 122.3E	120	13	0	23.9N 117.3E	65	78	30	--.- ---.-	--	--	--	--.- ---.-	--	--	--
251800Z	22.9N 121.0E	90	22.8N 121.3E	105	18	15	--.- ---.-	--	--	--	--.- ---.-	--	--	--	--.- ---.-	--	--	--
260000Z	23.5N 119.7E	60	23.4N 119.6E	70	8	10	--.- ---.-	--	--	--	--.- ---.-	--	--	--	--.- ---.-	--	--	--
260600Z	24.2N 118.4E	50	24.2N 118.6E	55	11	5	--.- ---.-	--	--	--	--.- ---.-	--	--	--	--.- ---.-	--	--	--
261200Z	25.2N 117.2E	35	24.9N 117.8E	50	37	15	--.- ---.-	--	--	--	--.- ---.-	--	--	--	--.- ---.-	--	--	--

	TYPHOONS WHILE WIND OVER 35KTS				ALL FORECASTS			
	WARNING	24-HR	48-HR	72-HR	WARNING	24-HR	48-HR	72-HR
AVERAGE FORECAST ERROR	13NM	63NM	107NM	142NM	15NM	63NM	107NM	142NM
AVERAGE RIGHT ANGLE ERROR	8NM	34NM	41NM	36NM	9NM	34NM	41NM	36NM
AVERAGE MAGNITUDE OF WIND ERROR	5KTS	15KTS	25KTS	35KTS	5KTS	15KTS	25KTS	35KTS
AVERAGE BIAS OF WIND ERROR	0KTS	3KTS	10KTS	27KTS	0KTS	3KTS	10KTS	27KTS
NUMBER OF FORECASTS	24	23	14	5	27	23	14	5