O. TYPHOON EMMA (05-13 NOVEMBER 1959)

As a suspect area, Typhoon EMMA was first detected south of Kwajalein on 30 October. EMMA, as a large area of squally weather, was tracked for the next 6 days by reconnaissance aircraft. Finally on the 7th day (November 5th) a reconnaissance aircraft reported a definite closed surface circulation with wall clouds developing and surface winds near the center of 30 knots. Based on this information the first warning on Tropical Depression EMMA was issued at 050600Z. Moving to the west-northwest at a speed of 9 to 10 knots, EMMA passed approximately 20 miles south of Guam on the 6th. The pressure at Guam dropped to 995 millibars, but the sustained winds reached only 30 knots. It was not until 10 October, or 12 days after EMMA was first detected as a suspect area, that she finally reached typhoon intensity, approximately 800 miles west of Guam.

As a full-blown typhoon EMMA recurved gradually to the north at an average speed of 11 knots. She apparently reached peak intensity on 11 November with maximum surface winds near the center of 110 knots and a sea level pressure of 962 millibars. As EMMA reached 23 degrees north she came under the influence of strong westerlies aloft, and accelerated rapidly to the northeast. At 121800Z EMMA passed within 35 miles of Okinawa and caused considerable damage on the island. Kadena Air Base reported maximum sustained winds of 55 knots with gusts to 85 knots, while the Ryukyu Weather Bureau station, located on a hill near Naha, reported a maximum gust of 106 knots. Following her passage to the south and east of Okinawa, EMMA continued to accelerate and began to weaken rapidly. The final tropical warning was

issued at 131800Z at which time EMMA was moving east-northeasterly at 35 knots.

One interesting fact concerning EMMA was the out-of-phase vertical slope which persisted for a considerable period of time i.e., from the time EMMA passed Guam on 6 October until she reached typhoon intensity on the 10th. During this period both the surface and 700 millibar centers were carefully tracked by reconnaissance, and it was observed that the 700 millibar center was consistently located about 45 miles to the west-southwest of the surface center. Although a November typhoon, EMMA followed late October climatology very closely. Thirty-five warnings were issued covering a period of 9 days.

For damage caused by Typhoon EMMA see Section VI, "Destructive Effects of Typhoons."

RECONNAISSANCE AIRCRAFT FIXES - TYPHOON EMMA

FIX NO.	TIME	LAT.	LONG.	*UNIT METHOD & ACCY	MIN SLP MBS	MAX SFC WND	MIN 700MB HGT	MAX FLT LVL WND	700MB TEMP (°C)	700MB DEWPT (°C)	EYE CHARACTERISTICS
1	050730Z	12.1N	148.1E	54-P-5	1003	30	10090	30	12	10	EYE ILL DEFINED
2	060000Z	12.9N	145.8E	54-P-5	993	30	- -	32	25	18	EYE ILL DEFINED
3	060200Z	12.7N	145.4E	54-P-1	993	30	9990	36	13	08	EYE WELL DEFINED
4	060800Z	13.0N	144.4E	54-P-5	993	30	9910	42	16	10	CIRC DIA 75 MI
5	061400Z	12.7N	142.3E	54-T-25	- -	- -	- -	35	- -	- -	———————
6	070200Z	13.5N	140.9E	54-P-10	996	45	10010	35	13	07	EYE ILL DEFINED
7	070700Z	14.0N	139.7E	54-P-5	994	55	10010	30	10	08	EYE ILL DEFINED
8	071400Z	13.8N	138.1E	54-T-15	- -	- -	- -	- -	- -	- -	700MB WIND FIX
9	072130Z	14.3N	137.9E	54-P-5	994	55	10020	45	14	13	EYE ILL DEFINED
10	080200Z	14.5N	137.6E	54-P-5	995	40	10010	45	14	11	EYE ELLIP 75X40MI
11	080800Z	14.9N	137.5E	54-P-5	995	50	10000	42	16	12	EYE ILL DEFINED
12	082100Z	15.4N	134.5E	54-P-5	985	35	9980	30	14	00	EYE OPEN
13	090200Z	15.3N	133.3E	54-P-10	988	45	9930	30	14	04	EYE OPEN
14	090900Z	15.6N	131.9E	54-P-5	989	55	9860	48	14	10	EYE ILL DEFINED
15	092200Z	16.0N	129.9E	54-P-5	986	50	9730	- -	12	12	EYE ELLIP 20X30 MI
16	100100Z	15.8N	129.1E	54-P-5	980	80	9640	65	15	14	CIRC DIA 20 MI
17	100800Z	16.4N	128.1E	54-P-15	983	75	9560	65	14	10	EYE ILL DEFINED
18	101125Z	16.6N	127.0E	12-R-10	- -	- -	- -	- -	- -	- -	CIRC DIA 65 MI
19	102000Z	17.6N	126.2E	54-R-10	- -	- -	- -	70	- -	- -	EYE ELLIP 30X40 MI
20	102200Z	17.9N	125.6E	54-P-2	966	80	9210	100	15	11	CIRC DIA 60 MI

RECONNAISSANCE AIRCRAFT FIXES - TYPHOON EMMA (CONT'D)

FIX NO.	TIME	LAT.	LONG.	*UNIT METHOD & ACCY	MIN SLP MBS	MAX SFC WND	MIN 700MB HGT	MAX FLT LVL WND	700MB TEMP (°C)	700MB DEWPT (°C)	EYE CHARACTERISTICS
21	110200Z	18.2N	125.1E	54-P-2	970	75	9260	60	15	11	CIRC DIA 75 MI
22	110730Z	19.5N	125.2E	54-P-5	966	130	9180	105	15	13	CIRC DIA 60 MI
23	111125Z	19.8N	124.6E	12-R-25	- -	- -	- -	- -	- -	- -	CIRC DIA 25 MI
24	111415Z	20.8N	124.8E	54-T-35	- -	- -	- -	95	- -	- -	----------
25	112210Z	21.9N	124.0E	54-P-2	962	70	9040	110	17	13	CIRC DIA 60 MI
26	120100Z	22.3N	123.8E	54-P-2	959	75	8980	115	19	14	CIRC DIA 60 MI
27	120234Z	22.8N	124.4E	54-P-3	- -	- -	- -	- -	- -	- -	EYE ILL DEFINED
28	121048Z	24.2N	126.0E	12-R-0	- -	- -	- -	- -	- -	- -	CIRC DIA 60 MI
29	121400Z	24.5N	126.5E	54-R-10	- -	- -	- -	85	- -	- -	CIRC DIA 50 MI
30	122256Z	26.6N	129.7E	12-R-5	- -	- -	- -	- -	- -	- -	CIRC DIA 70 MI
31	130213Z	26.9N	131.5E	54-P-2	974	65	- -	- -	- -	- -	EYE ILL DEFINED
32	130842Z	28.1N	134.5E	54-R-5	986	- -	- -	- -	- -	- -	EYE ILL DEFINED

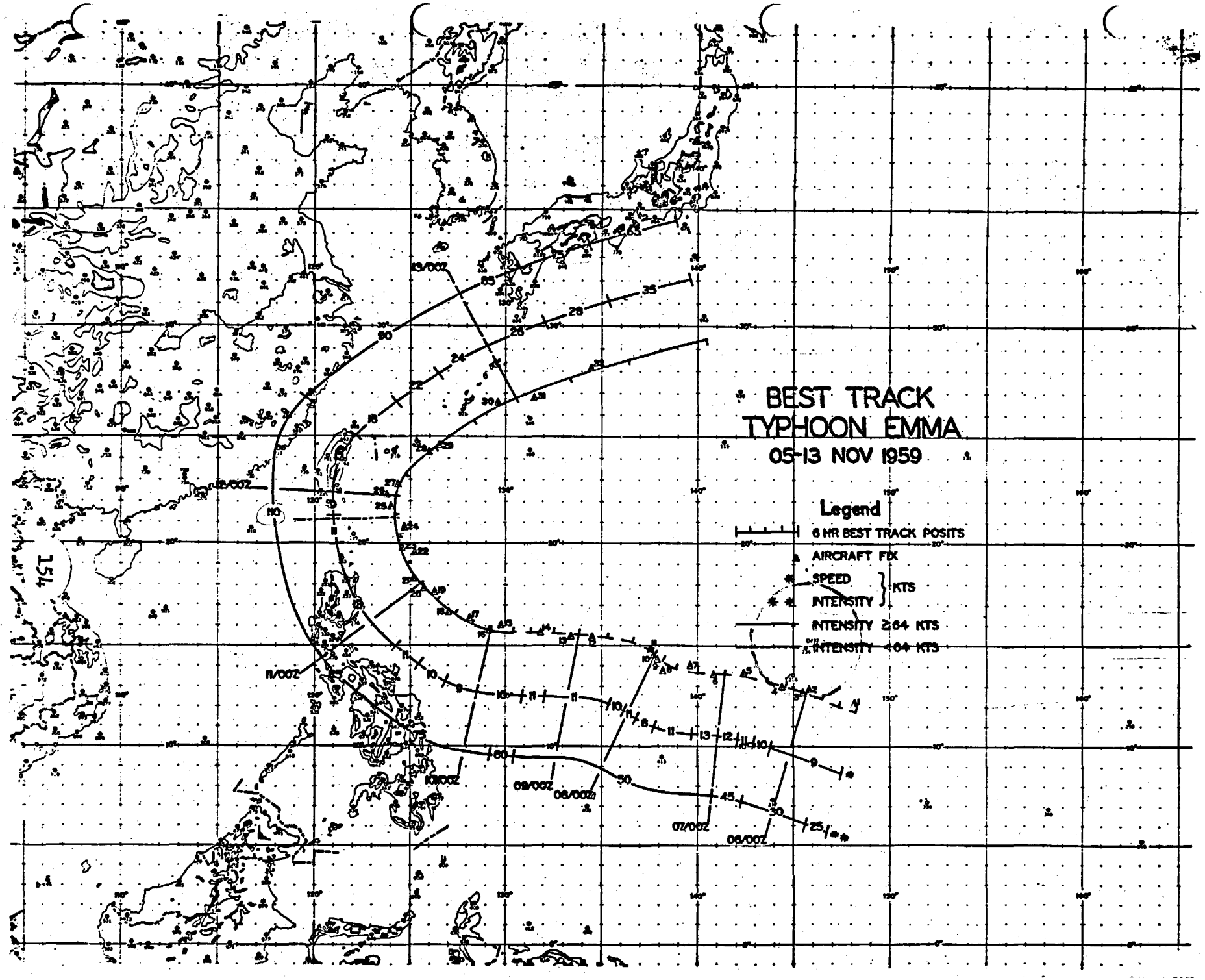
TYPHOON EMMA 05 - 13 NOV. 1959
POSITION AND FORECAST VERIFICATION DATA

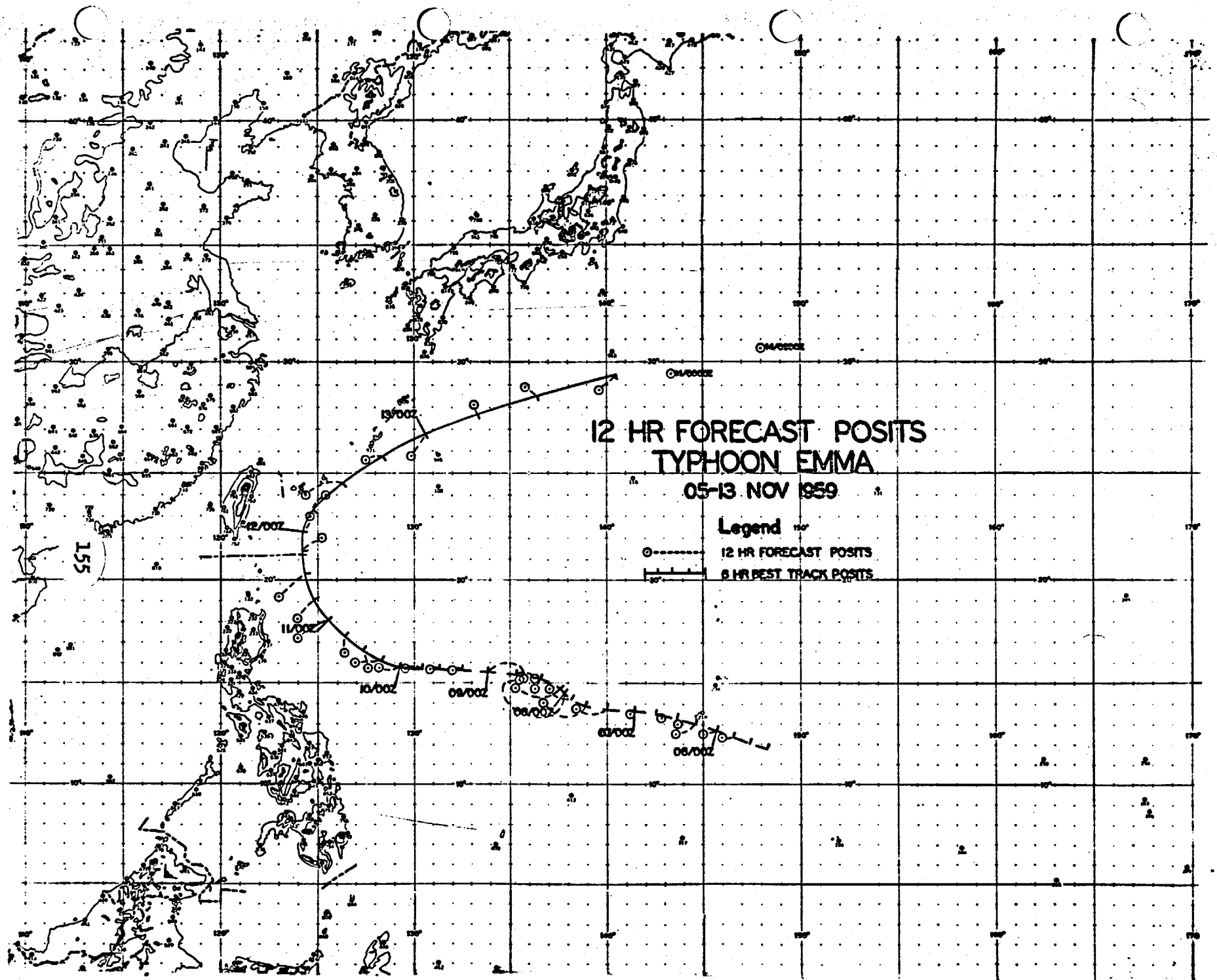
DTG	STORM POSITION LAT. LONG.	12 HR ERROR DEG. DISTANCE	24 HR ERROR DEG. DISTANCE
050600Z	11.8N 148.2E	- - - -	- - - -
051200Z	12.0N 147.3E	- - - -	- - - -
051800Z	12.3N 146.5E	- - - -	- - - -
060000Z	12.7N 145.6E	- - - -	- - - -
060600Z	12.9N 144.7E	- - - -	- - - -
061200Z	13.2N 143.7E	- - - -	- - - -
061800Z	13.4N 142.6E	- - - -	- - - -
070000Z	13.6N 141.3E	- - - -	- - - -
070600Z	13.7N 140.0E	273 - 101	- - - -
071200Z	13.9N 138.9E	273 - 121	- - - -
071800Z	14.2N 138.2E	298 - 75	272 - 162
080000Z	14.5N 137.8E	285 - 137	270 - 236
080600Z	14.7N 137.6E	273 - 135	282 - 211
081200Z	15.1N 136.6E	230 - 30	283 - 240
081800Z	15.3N 135.2E	103 - 61	272 - 144
090000Z	15.5N 133.9E	279 - 102	111 - 44
090600Z	15.5N 132.5E	275 - 30	274 - 146
091200Z	15.6N 131.3E	270 - 28	272 - 180
091800Z	15.7N 130.3E	275 - 47	292 - 87
100000Z	15.8N 129.2E	273 - 66	275 - 72
100600Z	16.1N 128.3E	276 - 78	268 - 98
101200Z	16.6N 127.4E	164 - 46	259 - 130
101800Z	17.2N 126.4E	195 - 40	247 - 147
110000Z	18.0N 125.5E	240 - 103	170 - 131
110600Z	19.0N 124.9E	224 - 74	197 - 134
111200Z	20.2N 124.4E	232 - 103	230 - 240
111800Z	21.2N 124.2E	049 - 70	228 - 185
120000Z	22.2N 124.2E	029 - 60	237 - 231
120600Z	23.3N 124.8E	036 - 48	042 - 126
121200Z	24.3N 126.2E	258 - 104	354 - 78
121800Z	25.7N 128.2E	260 - 38	353 - 73

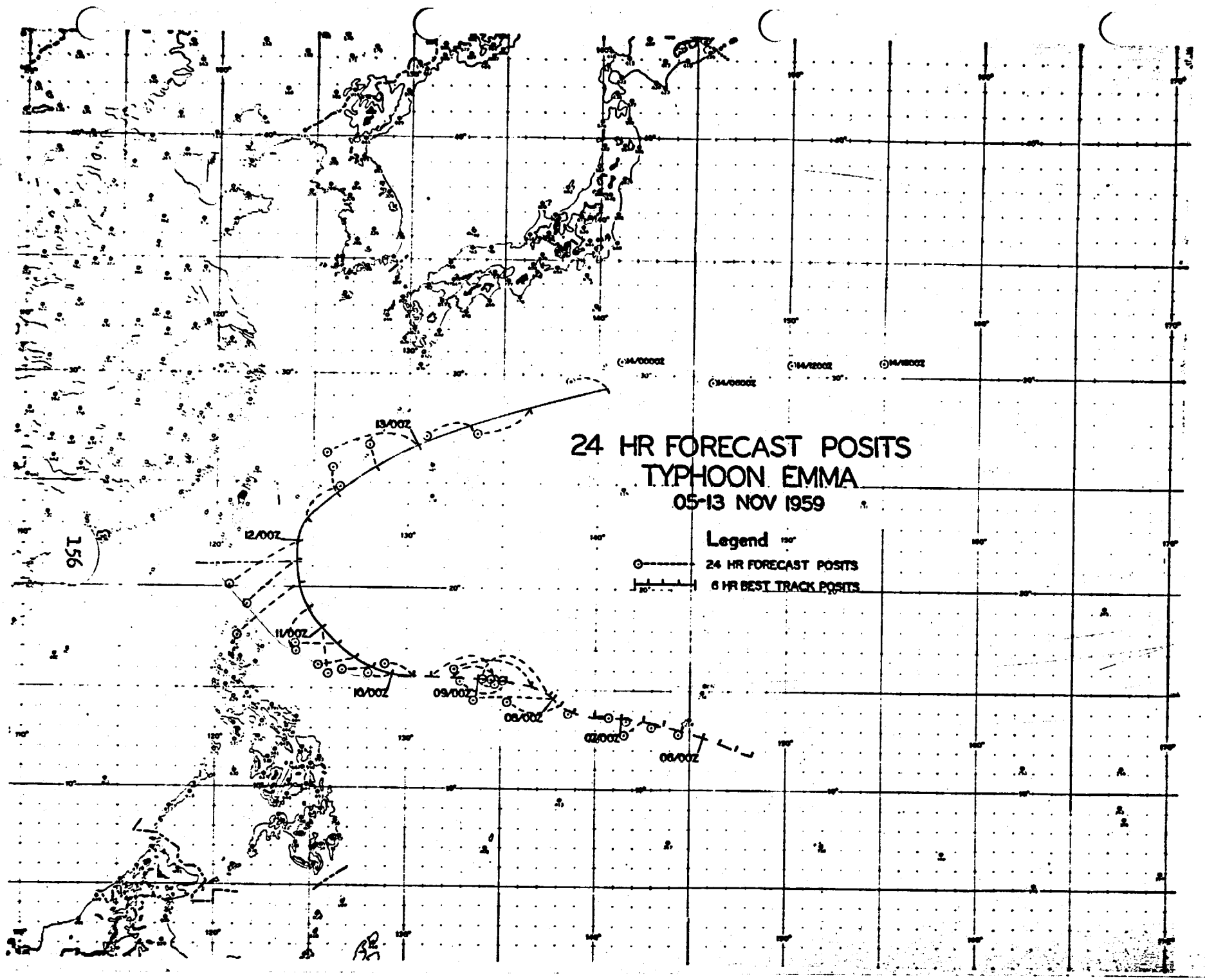
TYPHOON EMMA 05 - 13 NOV. 1959
POSITION AND FORECAST VERIFICATION DATA (CONT'D)

DTG	STORM POSITION LAT.	LONG.	12 HR ERROR DEG.	DISTANCE	24 HR ERROR DEG.	DISTANCE
130000Z	26.8N	130.5E	210	66	264	260
130600Z	27.7N	133.3E	340	29	256	125
131200Z	28.4N	136.3E	315	40	246	159
131800Z	29.4N	140.3E	228	42	288	95

AVERAGE 12 HOUR ERROR 69.4 NM
AVERAGE 24 HOUR ERROR 149.4 NM


BEST TRACK
TYPHOON EMMA
05-13 NOV 1959
Legend
6 HR BEST TRACK POSITS
AIRCRAFT FIX
SPEED
INTENSITY
KTS
INTENSITY ≥64 KTS
INTENSITY <64 KTS
13/00Z
12/00Z
11/00Z
10/00Z
09/00Z
08/00Z
07/00Z
06/00Z
154


12 HR FORECAST POSITS
TYPHOON EMMA
05-13 NOV 1959
Legend
12 HR FORECAST POSITS
6 HR BEST TRACK POSITS
13/00Z
12/00Z
11/00Z
10/00Z
09/00Z
08/00Z
07/00Z
06/00Z
155


24 HR FORECAST POSITS
TYPHOON EMMA
05-13 NOV 1959
Legend
24 HR FORECAST POSITS
6 HR BEST TRACK POSITS
13/00Z
12/00Z
11/00Z
10/00Z
09/00Z
08/00Z
07/00Z
06/00Z
14/00Z
14/12Z
14/18Z
14/06Z