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ROYAL OBSERVATORY, HONG KONG

METEOROLOGICAL RESULTS 1984

PART III—TROPICAL CYCLONE SUMMARIES

90° 100° 110° 120° 130° 140° 150° 160°

40° 30° 20° 10° 0°

HOLLY Aug

ED Aug

ALEX Jul

DINAH Jul

CARY Jul

FREDA Aug

ED (8407) Jul

T.D. Aug

IKE Sep

JUNE Aug

GERALD Aug

T.D. (I) Aug

T.D. (II) Aug

BETTY Jul

WYNNE Jun

HOLLY (8410) Aug

GERALD (8409) Aug

WYNNE (8402) Jun

T.D. Aug

DINAH (8406) Jul

JUNE (8412) Aug

T.D. (I) Aug

CARY (8405) Jul

VERNON Jun

ALEX (8403) Jul

BETTY (8404) Jul

FREDA (8408) Aug

IKE (8411) Aug

VERNON (8401) Jun

R.O. 80

ROYAL OBSERVATORY HONG KONG

TRACKS OF TROPICAL CYCLONES
JANUARY–AUGUST, 1984

Typhoons

Tropical Storms or Tropical Depressions

Tracks Uncertain

Daily Positions at 00 h G.M.T. (1) 2

Intermediate 6 hrly Positions

Mercator Projection-Natural Scale
1 : 15m. at 22½ °N.

R.O. 80

ROYAL OBSERVATORY HONG KONG

TRACKS OF TROPICAL CYCLONES
SEPTEMBER–DECEMBER, 1984

Typhoons

Tropical Storms or Tropical Depressions

Tracks Uncertain

Daily Positions at 00 h G.M.T. (1) (2)

Intermediate 6 hrly Positions

Mercator Projection-Natural Scale
1 : 15m. at 22½ °N.

VANESSA Oct

MAURY Oct

PHYLLIS Oct

THAD Oct

NINA Oct

OGDEN Oct

CLARA Nov

DOYLE Dec

ROY Oct

LYNN Sep

LYNN (8414) Sep

AGNES Nov

WARREN Nov

SUSAN Oct

BILL Nov

NINA (8415) Sep

MAURY (8416) Sep

PHYLLIS (8418) Oct

OGDEN (8417) Oct

SUSAN (8420) Oct

WARREN (8423) Oct

ROY (8419) Oct

THAD (8421) Oct

BILL (8425) Nov

DOYLE (8427) Dec

VANESSA (8422) Oct

AGNES (8424) Nov

CLARA (8426) Nov

METEOROLOGICAL RESULTS

1984

PART III—TROPICAL CYCLONE SUMMARIES

1985

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1. INTRODUCTION

Apart from a short break 1940–1946, surface observations of meteorological elements since 1884 have been summarized and published in the Royal Observatory's Meteorological Results. Upper-air observations were begun in 1947 and from then onwards the annual volumes were divided into two parts, namely Part I—Surface Observations and Part II—Upper-air Observations. The publication of Meteorological Results Part II was terminated in 1981. Upper-air data are now archived on magnetic tape.

During the period 1884–1939, reports on some destructive typhoons were printed as Appendices to the Meteorological Results. This practice was extended and accounts of all tropical cyclones which caused gales in Hong Kong were included in the Director's Annual Departmental Reports from 1947 until 1967 inclusive. The current series—'Meteorological Results, Part III—Tropical Cyclone Summaries' was then introduced. It contains information about all tropical cyclones over the western North Pacific and the South China Sea (i.e. the area bounded by the Equator, 45°N, 100°E and 160°E). The first issue containing reports on tropical cyclones occurring during 1968, was published in 1971.

Tracks of tropical cyclones in the western North Pacific and the South China Sea were published in Meteorological Results, up to 1939 and in Meteorological Results, Part I from 1947 to 1967. During the period 1884–1960, the tracks were plotted with day circle positions only. The time of the day circle varied to some extent but remained fixed at 0000 G.M.T. after 1944. The day circle times used for earlier tropical cyclones are given in the Royal Observatory Technical Memoir No. 11, Volume 1. From 1961 onwards, 6-hourly positions were shown on the tracks of all tropical cyclones.

Provisional reports on individual tropical cyclones affecting Hong Kong have been prepared since 1960: this is done in order to meet the immediate needs of the press, shipping companies and others. These reports are cyclostyled and supplied on request. Initially, reports were only written on those tropical cyclones for which gale or storm signals had been hoisted in Hong Kong, but by 1968 it had become necessary to produce a report on every tropical cyclone during which any tropical cyclone warning signal was raised.

In this publication, tropical cyclones are classified into the following four categories according to the maximum sustained winds within their circulations:

A TROPICAL DEPRESSION (T.D.) has maximum sustained winds of less than 34 knots and at this stage the centre is often not very clearly defined and cannot always be located precisely.

A TROPICAL STORM (T.S.) has maximum sustained winds in the range 34–47 knots.

A SEVERE TROPICAL STORM (S.T.S.) has maximum sustained winds in the range 48–63 knots.

A TYPHOON (T.) has maximum sustained winds of 64 knots or more.

At the thirteenth session of the ESCAP/WMO Typhoon Committee held in December 1980, a common system for identification of tropical cyclones in the western North Pacific and the South China Sea was adopted. Since 1 January 1981, the Japan Meteorological Agency has undertaken the responsibility of assigning to each tropical cyclone which has attained tropical storm intensity a common number which is composed of 4 digits. For example, (8404) means the fourth tropical cyclone of tropical storm intensity or above in 1984. The appropriate number follows the name of the tropical cyclone in this publication.

The Royal Observatory has a network of anemographs to record surface winds in Hong Kong. The instruments used are all Dines pressure-tube anemographs or M.O. Mark IV cup-generator type anemographs manufactured by R.W. Munro Ltd. Quick-run mechanisms are also fitted to the anemographs at the Hong Kong Airport (Southeast), Waglan Island, Tate's Cairn, and Cheung Chau for recording the fine structure of the wind flow in typhoons for research purposes. Details of these stations are given below.

Station	Position		Elevation of barometer above M.S.L.	Elevation of ground above M.S.L.	Head of anemometer above M.S.L.	Type of anemometer
	Latitude N	Longitude E	(m)	(m)	(m)	
Royal Observatory	22°18′	114°10′	62	32	72	Cup
Hong Kong Airport (Southeast)	22°20′	114°11′	24	4	16	Dines, Cup
Hong Kong Airport (Northwest)	22°20′	114°11′	24	4	14	Dines, Cup
Waglan Island	22°11′	114°18′	62	55	75	Dines, Cup
Tate's Cairn	22°22′	114°13′	*	575†	588	Dines
Cheung Chau	22°12′	114°01′	79	72	92	Dines
King's Park	22°19′	114°10′	66	65	78	Cup
Star Ferry	22°18′	114°10′	*	3	17	Cup
Green Island	22°17′	114°07′	*	76	90	Cup
Tsim Bei Tsui	22°29′	114°00′	*	26	44	Dines
Tai O	22°15′	113°51′	*	76	90	Cup
Chek Lap Kok[Δ]	22°19′	113°56′	53	51	65	Cup
Lei Yue Mun	22°17′	114°14′	*	54	73	Cup
Yau Yat Chuen	22°20′	114°10′	*	27	64	Cup
Kowloon Tsai Hill	22°20′	114°11′	*	91	105	Cup

Δ Automatic weather station; commenced operation on 6 September 1984.

* No barometer.

† Level of the ground floor of the building of the Radar Station.

Royal Observatory wind data presented in this report were obtained from an anemometer installed at the top of a mast which is about 93 metres west-southwest of the previous location on top of the old headquarters building. It became operational on 1 June 1982. Anemometers at Lei Yue Mun, Yau Yat Chuen and Kowloon Tsai Hill formed part of the Wind Analyzer System for the warning of low-level wind shear at the airport. 2-minute mean winds are measured at these stations and no maximum gust peak speeds were available. Wind measurements are also made by Hong Kong International Terminals Ltd. using a cup anemometer at Kwai Chung. Wind speed measurements have not been corrected for the reduced density of the air for Dines anemometers but in most cases this would increase the figures in the tables by less than 5 per cent.

The reports in Section 3 present a general description of the life history of each tropical cyclone which affected Hong Kong in 1984 and include the following information:—

(*a*) how the tropical cyclone affected Hong Kong;
(*b*) the sequence of display of tropical cyclone warning signals;
(*c*) the maximum gust peak speeds and maximum mean hourly winds recorded at various stations in Hong Kong;
(*d*) the lowest barometric pressure recorded at the Royal Observatory;
(*e*) the daily amounts of rainfall recorded at the Royal Observatory, Cheung Chau and Tate's Cairn;
(*f*) the times and heights of the highest tides and maximum storm surges recorded in Hong Kong.

Whenever practical, radar displays and pictures received from weather satellites are included together with information and data obtained from reconnaissance aircraft. With a view to providing further information on the characteristics of tropical cyclones, 6-hourly positions together with the corresponding estimated minimum central pressures and maximum sustained surface winds for individual tropical cyclones are tabulated and presented in Section 5.

In this publication different times are used in different contexts. The reference times of tropical cyclone warnings for shipping are given in G.M.T. Unlabelled times given in hours and minutes (e.g. 1454) on a 24-hour clock or times expressed as a.m. or p.m. are in Hong Kong Time. Hong Kong Time is 8 hours ahead of G.M.T. Times labelled 'G.M.T.' are in Greenwich Mean Time. For most practical purposes, the difference between Greenwich Mean Time and Co-ordinated Universal Time may be neglected.

Throughout this publication, maximum sustained surface winds when used without qualification refer to wind speeds averaged over a period of ten minutes. Wind data from reconnaissance aircraft have been converted into equivalent 10-minute mean winds to make them comparable with reports from surface stations. Mean hourly winds were obtained by averaging the winds over a 60-minute interval ending on the hour. Daily rainfall amounts are rainfall recorded in a 24-hour period ending at midnight Hong Kong Time.

2. TROPICAL CYCLONE SUMMARIES FOR 1984

In 1984 twenty-eight tropical cyclones formed over the western North Pacific and the South China Sea (i.e. the area between the equator and 45°N and between 100°E and 160°E). Thirteen of them attained typhoon intensity, which was close to the average of fifteen per year. Eight tropical cyclones landed over China but none seriously affected Hong Kong. Four tropical cyclones crossed the Philippines, four affected Taiwan, and another four crossed Vietnam. Only two tropical cyclones affected Japan.

The monthly distribution of the frequency of first occurrence of tropical cyclones is shown in Figure 1 and a brief summary is contained in Table 1. Six-hourly positions of these tropical cyclones together with their estimated minimum central pressures and maximum sustained surface winds are tabulated in Section 5. The monthly mean frequency of first occurrence of tropical cyclones during the years 1946–1983 is given in Figure 2.

During the year there were fourteen tropical cyclones in Hong Kong's area of responsibility for tropical cyclone warnings for shipping, (i.e. the area bounded by 10°N, 30°N, 105°E and 125°E) compared with an annual average of seventeen over the past 38 years. Seven tropical cyclones moved into this area and seven developed within it. Altogether 412 warnings for shipping were issued by the Royal Observatory in connection with these tropical cyclones.

Tropical cyclone warning signals were displayed in Hong Kong for five tropical cyclones. Two tropical cyclones came within 100 nautical miles of Hong Kong but there was only minor damage. The Gale Signal was hoisted for 2 hours and 40 minutes during the passage of Severe Tropical Storm Wynne (8402), the shortest duration for a single tropical cyclone since 1946.

The total tropical cyclone rainfall (defined as the total rainfall recorded at the Royal Observatory, Hong Kong from the first day when a tropical cyclone was centred within 300 nautical miles of Hong Kong to the end of the third day after the tropical cyclone has dissipated or moved outside 300 nautical miles of Hong Kong) during the year 1984 amounted to 370.4 mm, which is 35 per cent below the annual average value of 566.9 mm (1884–1939 and 1947–70). It accounted for only 18 per cent of the year's total rainfall of 2 017.0 mm.

In 1984, there were no tropical cyclones during the first five months over the western North Pacific and the South China Sea. The same situation had only occurred twice before since 1946, that is, in 1973 and 1983.

In June, two tropical cyclones developed over the western North Pacific and the South China Sea. Tropical Storm Vernon (8401) was the first tropical cyclone of the year. It formed near Nansha on 8 June and dissipated about 60 nautical miles southeast of Vientiane on 11 June. Severe Tropical Storm Wynne (8402) developed about 730 nautical miles southeast of Taibei on 19 June. It skirted the southern tip of Taiwan on 24 June and passed about 70 nautical miles south of Hong Kong early on 25 June. Wynne crossed the China coast near Zhanjiang in the evening of 25 June and brought heavy rain to neighbouring areas. Many paddy fields were inundated, and more than 1 000 houses were damaged. Wynne dissipated near Hanoi on 26 June.

There were five tropical cyclones during July. Typhoon Alex (8403) formed near Luzon on 1 July and crossed Taiwan on 3 July. It recurved and became an extratropical cyclone near Shanghai on 4 July, and finally dissipated over Korea the next day. Severe Tropical Storm Betty (8404) formed about 220 nautical miles east of Manila on 5 July. It passed about 120 nautical miles southwest of Hong Kong early on 9 July and dissipated overland near Zhanjiang in the evening. Typhoon Cary (8405) originated near the Mariana Islands on 7 July. It recurved about 270 nautical miles southeast of Iwo Jima on 10 July and then moved northeastwards. It dissipated over the Pacific east of Japan on 14 July. Typhoon Dinah (8406) developed about 900 nautical miles northeast of Guam on 24 July. It recurved to move northeastwards and became an extratropical cyclone south of the Aleutian Islands on 2 August. Typhoon Ed (8407) formed about 250 nautical miles southeast of Kagoshima on 25 July. During the next few days, it remained to the south of Japan as it moved round a loop in an anticlockwise direction. Ed eventually took a westward course and passed about 100 nautical miles south of Kagoshima late on 29 July. A 1 200-tonne South Korean ship 'Ilsin Glory' sank in the Korea Strait near Nagasaki on the same day. One person was killed and 11 were missing. A 4 800-tonne Singaporean container ship, 'Gloria Express', ran aground in southern Kyushu and one person was missing. The passage of Typhoon Ed also caused the postponement of the launching of the Japanese weather satellite GMS-3. On 31 July, Ed passed about 60 nautical miles northeast of Shanghai and moved northwestwards along the coast during the night. Ed finally dissipated over Shandong on 2 August.

Altogether eight tropical cyclones occurred over the western North Pacific and the South China Sea during August. Severe Tropical Storm Freda (8408) formed about 250 nautical miles east of Luzon on 5 August. It passed close to Taibei on 7 August and dissipated near Fuzhou on 8 August. In Taiwan, 2 people were drowned and 4 were missing in extensive floods caused by Freda. A tropical depression formed about 400 nautical miles east of Luzon on 11 August. It moved northwestward and weakened into an area of low pressure two days later over the coastal waters east of Taiwan. However, on the same day, a new circulation centre developed from the low pressure area and reintensified into a tropical depression. It moved round the southern coast of Taiwan and dissipated near Tainan on 15 August. Severe Tropical Storm Gerald (8409) and Typhoon Holly (8410) both formed on 16 August. Gerald formed over the South China Sea about 110 nautical miles east-southeast of Dongsha. It moved in a generally westward direction at first, but owing to the influence of Typhoon Holly centred near the Ryukyus, Gerald slowed down late on 19 August and recurved towards the northeast. Gerald passed about 25 nautical miles southeast of Hong Kong early on 21 August but caused only minor damage. It dissipated about 70 nautical miles northwest of Shantou during the night. Typhoon Holly (8410) formed south of Japan and

crossed the Ryukyus near Okinawa on 18 August and stranded an estimated 15 000 holiday-makers. It passed the Korea Strait on 21 August and brought torrential rain to Kyushu and southern Korea. In Korea, 9 people were killed or missing and hundreds were made homeless. At least 10 fishing boats were destroyed, hundreds of hectares of farmland were flooded and some roads were damaged. Holly became an extratropical cyclone over the Sea of Japan near Hokkaido on 23 August. A tropical depression formed near Iwo Jima on 24 August but dissipated the next day. Typhoon Ike (8411) originated about 120 nautical miles south of Guam on 27 August and moved westwards towards southern Philippines. Severe Tropical Storm June (8412) developed about 420 nautical miles east of Luzon on 27 August. It crossed Luzon on 29 August and caused heavy rain and floods in northern Philippines. 72 people were killed, 222 injured and more than 11 000 were made homeless. A total of about 340 000 people were affected. June crossed the south China coast close to Shantou early on 31 August and dissipated overland north of Hong Kong in the evening. Active southwest monsoon winds associated with the remnant of June brought heavy rain in eastern Guangdong and caused the inundation of 66 000 hectares of farmland and the damage of 1 500 houses.

Four tropical cyclones occurred during September. Typhoon Ike (8411) crossed the northeastern tip of Mindanao on 2 September. 1 426 people were killed and 1 161 were missing in the Philippines. More than 200 000 were left homeless and 1.66 million people were severely affected. Most of the casualties were in Surigao del Norte, the worst hit province on Mindanao Island. The total damage to property in the Philippines amounted to about US$111 million. Ike was the worst typhoon to hit the Philippines since Typhoon Amy in December 1951. Ike moved northwestward over the South China Sea and crossed northeastern Hainan on 5 September. On Hainan Island, all power and communications lines were severed. Vast fields of rice paddies, rubber trees and sugar cane were ruined. Ike passed close to Beihai and Nanning on 6 September and became the most devastating tropical cyclone to hit Guangxi since 1954. 14 people were killed and 6 were missing. Homes, factories and boats were destroyed and communications lines were broken. Sugar cane and vegetables were ruined. Ike finally dissipated about 180 nautical miles northwest of Nanning early on 7 September. Tropical Depression Lynn (8414) developed over the South China Sea about 240 nautical miles east-northeast of Xisha on 24 September. It moved westwards and dissipated about 140 nautical miles north-northeast of Xisha on 26 September. Tropical Storm Nina (8415) formed about 150 nautical miles south-southwest of Iwo Jima on 27 September and Tropical Storm Maury (8416) formed about 590 nautical miles east of Iwo Jima on 28 September. Maury moved northwards while Nina recurved to move northeastwards. Maury dissipated over the ocean east of Japan on 1 October, about 150 nautical miles north of Nina which in turn became an extratropical cyclone later the same day.

There were nine tropical cyclones over the western North Pacific and the South China Sea during October. Severe Tropical Storm Ogden (8417) formed about 540 nautical miles northeast of Guam on 7 October. It moved north-northeastwards and became an extratropical cyclone on 10 October. Typhoon Phyllis (8418) developed on 10 October around the same area where Ogden formed. It moved northwards and dissipated about 650 nautical miles east of Tokyo on 14 October. Tropical Storm Roy (8419) formed near Guam on 11 October and dissipated about 400 nautical miles north of Guam two days later. Tropical Storm Susan (8420) developed near Nansha on 12 October. It crossed the Vietnam coast in the evening and weakened into an area of low pressure about 80 nautical miles north of Ho Chi Minh Ville early on 13 October. Heavy rain and floods brought by Susan caused major crop losses and the destruction of facilities in central Vietnam. Typhoon Thad (8421) originated about 240 nautical miles east-southeast of Guam on 19 October. It recurved near Iwo Jima on 21 October and became an extratropical cyclone over the Pacific on 24 October. Typhoon Vanessa (8422) developed near the Caroline Islands on 23 October. It passed near Guam on 24 October and recurved south of the Ryukyus on 28 October. It finally became an extratropical cyclone tracking towards the Aleutian Islands on 31 October. Severe Tropical Storm Warren (8423) formed over the South China Sea on 23 October. It moved north-northwestwards at first but became slow-moving about 200 nautical miles southeast of Xisha between 25 and 27 October. Under the influence of Typhoon Vanessa, Warren moved eastwards on 28 October towards the Philippines. 44 people were killed in floods and landslips. A Philippino ferry boat carrying 240 people sank in heavy seas on 28 October. 18 people were drowned and 207 were rescued. Warren reverted to a westward course across the South China Sea on 29 October as Vanessa recurved and moved away northeastwards towards the Ogasawara Islands. Warren finally dissipated after crossing over Vietnam on 2 November.

Altogether four tropical cyclones occurred over the western North Pacific and the South China Sea during November. Typhoon Agnes (8424) originated near the Caroline Islands on 1 November. It hit the central Philippines on 5 November, bringing a death toll of at least 727. Several hundred people were reported missing and about 600 000 were made homeless. After crossing the South China Sea, Agnes landed over Vietnam on 7 November and weakened into an area of low pressure over Thailand on 8 November. Typhoon Bill (8425) developed to the east of the Mariana Islands on 9 November. It moved towards the Philippines at first but turned northwestwards on 14 November. On the same day, Typhoon Clara (8426) formed near the Caroline Islands and moved west-northwestwards. Bill became slow-moving northeast of Luzon on 17–18 November. It weakened on 19 November and moved southeastwards under the influence of Clara. At the same time, Clara recurved to the northeast about 640 nautical miles east of Manila. Clara became an extratropical cyclone about 620 nautical miles southeast of Tokyo late on 21 November. Bill dissipated about 360 nautical miles east of Manila on 22 November.

Typhoon Doyle (8427) was the only tropical cyclone over the western North Pacific during December. It developed near Yap on 5 December, recurved about 430 nautical miles east of Luzon on 9 December and moved northeastwards. It dissipated over the ocean south of Japan two days later.

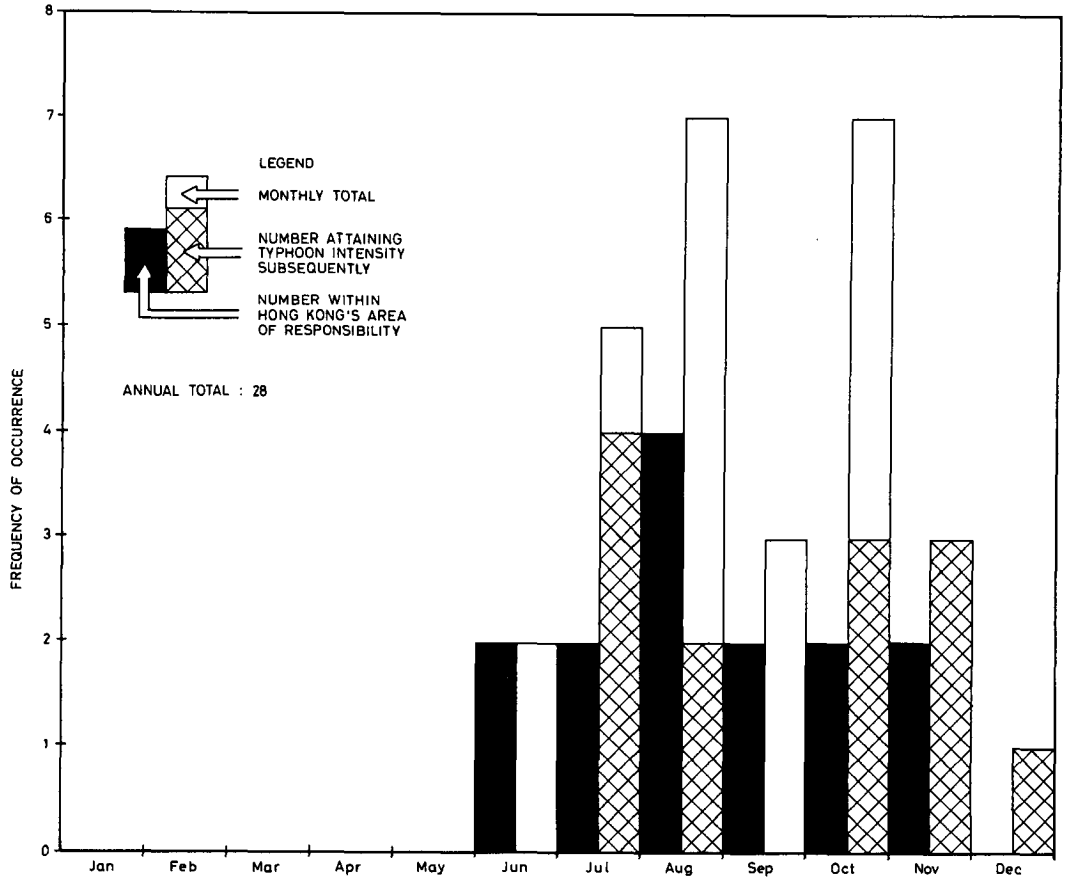

Figure 1. **Monthly distribution of the frequency of first occurrence of tropical cyclones in the western North Pacific and the South China Sea in 1984.**

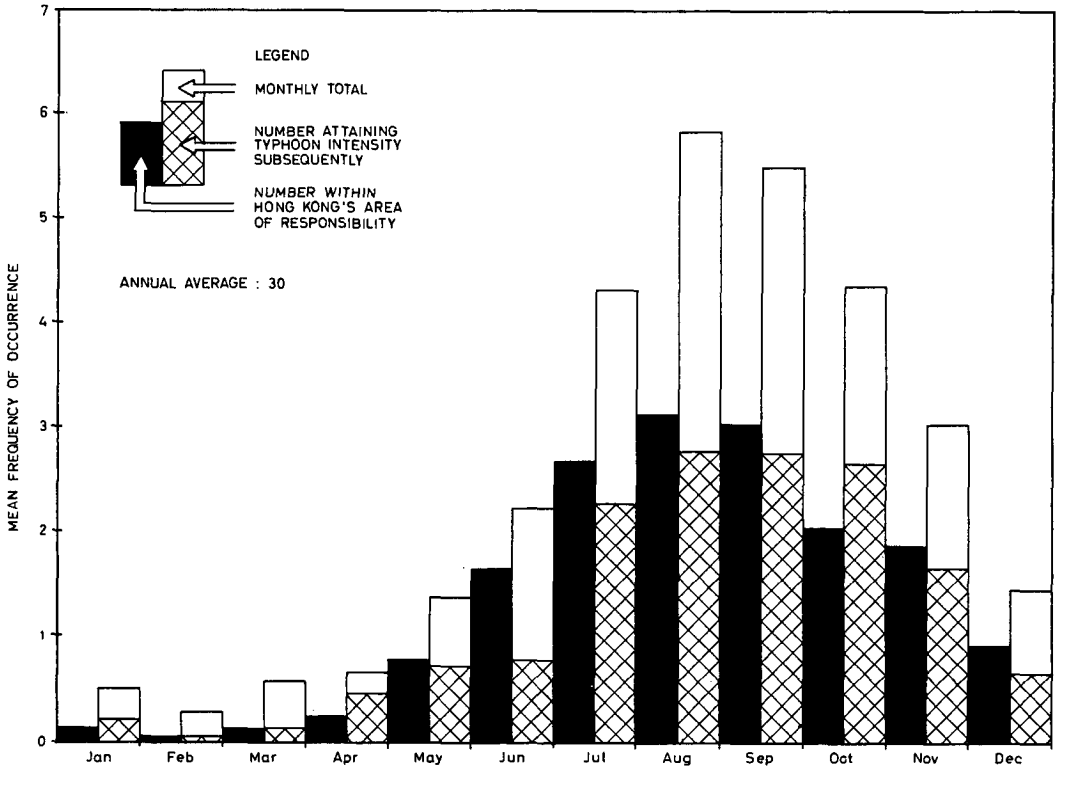

Figure 2. **Monthly distribution of the mean frequency of first occurrence of tropical cyclones in the western North Pacific and the South China Sea, 1946–1983.**

3. REPORTS ON TROPICAL CYCLONES AFFECTING HONG KONG IN 1984

(a) Severe Tropical Storm Wynne (8402)

19–26 June 1984

The track of this severe tropical storm is shown in Figure 3

Wynne developed as a tropical depression over the western North Pacific about 730 nautical miles east-southeast of Taibei on 19 June and moved northwestward at about 7 knots during the next two days. It became a tropical storm on 21 June and slowed down to about 3 knots while moving towards the west. It accelerated to 8 knots on 22 June and moved towards southern Taiwan. Wynne further intensified into a severe tropical storm on 23 June. At 4.24 p.m. a reconnaissance aircraft reported a minimum sea-level pressure of 982 millibars and sustained winds of 50 knots near the centre. Wynne accelerated to about 14 knots during the evening. Around 11.00 p.m. on 23 June, Wynne passed over Lan Yu, where a minimum sea-level pressure of 984.2 millibars and maximum sustained winds of 45 knots were recorded. Wynne skirted the southern tip of Taiwan and entered the South China Sea in the morning on 24 June.

Satellite pictures received on 24 June showed that Wynne was better organised and the main cloud mass was about 110 nautical miles in diameter (Figure 4). At 11.00 a.m. hail in thunderstorms was reported at Dongsha when Wynne was about 100 nautical miles to its northeast. At 5.00 p.m. Wynne passed about 40 nautical miles north of Dongsha where a minimum sea-level pressure of 985.3 millibars and sustained surface winds of 42 knots were recorded. The severe tropical storm maintained its westward movement at about 13 knots off the south China coast. Thunderstorms were observed over coastal regions to the northwest of the centre during the evening of 24 June. Wynne passed about 70 nautical miles south of Hong Kong early on 25 June (Figure 5). It crossed the coast near Zhanjiang in the evening (Figure 6) and brought heavy rain to neighbouring areas. Many paddy fields were inundated, and more than 1 000 houses were damaged. There were also power failures and interruptions in communication near Zhanjiang. At 2.00 a.m. on 26 June, Wynne passed over Beihai, on the northern coast of the Gulf of Tonkin, where a minimum sea-level pressure of 980.4 millibars was reported. Wynne finally dissipated near Hanoi on 26 June.

In Hong Kong, the Stand By Signal, No. 1, was hoisted at 3.20 a.m. on 24 June, when Wynne was centred about 340 nautical miles east of Hong Kong. Winds were moderate westerly. They turned northwesterly later in the morning and the Strong Wind Signal, No. 3, was hoisted at 3.30 p.m. on 24 June when Wynne was about 170 nautical miles to the east-southeast. Winds were light and variable inside the harbour at first but moderate northerly winds started to blow off shore around 10.00 p.m. Winds turned northeasterly and became strong around 2.00 a.m. on 25 June. The Northeasterly Gale or Storm Signal, No. 8 NE, was hoisted at 4.30 a.m. on 25 June as winds reached gale force off shore. Gusts reached 82 knots at Tate's Cairn. In western Victoria harbour, an hourly mean wind of 46 knots and gusts reaching 72 knots were recorded at Green Island. However, gales subsided rapidly as Wynne moved away westwards. The Northeasterly Gale or Storm Signal, No. 8 NE, was replaced by the Strong Wind Signal, No. 3, at 7.10 a.m. on 25 June. Easterly winds remained strong during the rest of the morning. All signals were lowered at 1.32 p.m. on 25 June when Wynne was about 130 nautical miles southwest of Hong Kong. Winds gradually turned east-southeasterly and moderated. The rapid westward movement of Wynne resulted in the shortest duration of the Gale Signal (2 hours and 40 minutes) since 1946. The minimum sea-level pressure at the Royal Observatory was 990.6 millibars recorded at 5.00 a.m. on 25 June when Wynne was closest to Hong Kong and centred about 70 nautical miles to the south. The maximum mean hourly wind speeds, the maximum gust peak speeds and the associated wind directions recorded at selected locations during the passage of Severe Tropical Storm Wynne were as follows:

Location	*Maximum mean hourly wind speed in knots with direction in points*		*Maximum gust peak speed in knots with direction in points*	
Royal Observatory	E	25	ENE	54
Hong Kong Airport (SE)	ENE	28	NE	60
Hong Kong Airport (NW)	NNE	27	NNE	63
Waglan Island	ENE	48	ENE	63
Tate's Cairn	ENE	55	ENE	82
Cheung Chau	NE	35	NE	57
King's Park	ENE	24	ENE	51
Star Ferry	ENE	24	ENE	53
Green Island	ENE	46	ENE	72
Tsim Bei Tsui	N & ENE	24	ENE	43
Tai O	ENE & SSE	26	SSE	54
Lei Yue Mun	E	37	—	
Yau Yat Chuen	E	24	—	
Kowloon Tsai Hill	E	24	—	

The weather was sunny and hot on 23 June. The temperature rose to a maximum of 32.9°C at the Royal Observatory on 24 June. The weather became cloudy with some thunderstorms in the afternoon. A waterspout was sighted between Cheung Chau and Lamma Island around 2.30 p.m. It lasted about ten minutes. Showers became heavier and more frequent on 25 June. The weather improved later in the evening but there were still showers in the following few days. The daily amounts of rainfall recorded were as follows:

	Royal Observatory	*Cheung Chau*	*Tate's Cairn*
24 June	0.1 mm	9.0 mm	0.9 mm
25 June	56.4 mm	25.3 mm	53.7 mm
26 June	0.3 mm	Trace	1.1 mm
27 June	8.0 mm	7.4 mm	28.5 mm
28 June	9.6 mm	2.3 mm	15.1 mm
Total:	74.4 mm	44.0 mm	99.3 mm

The times and heights of the highest tides and maximum storm surges recorded at various locations in Hong Kong during the passage of Wynne were as follows:

Location	Highest tide above chart datum			Maximum storm surge above astronomical tide		
	Height (m)	Date	Time	Height (m)	Date	Time
North Point*	—	—	—	—	—	—
Tai Po Kau*	—	—	—	—	—	—
Chi Ma Wan	2.54	25 Jun	7.00 a.m.	0.73	25 Jun	4.00 a.m.
Lok On Pai	2.35	25 Jun	7.45 a.m.	0.80	25 Jun	11.30 a.m.
Tsim Bei Tsui	2.38	25 Jun	9.30 a.m.	0.88	25 Jun	1.00 p.m.

* Data not available

In Hong Kong, damage was slight. There were several cases of collapsed scaffolding in Cheung Sha Wan, Tai Kok Tsui and Tsim Sha Tsui. There were 4 reports of fallen trees on Victoria Peak and at Stanley. More than 20 people were evacuated when the kitchen wall on the second floor of a pre-war building in Kowloon City collapsed. A wooden hut was destroyed when a minor landslip occurred on Ching Cheung Road. No one was injured. Public transport was disrupted. Most hover-ferry and hydrofoil services to China and Macau were cancelled on 24 and 25 June. At the airport, one flight was diverted and another incoming flight was cancelled. Schools were closed on 25 June. Most open examinations scheduled in the morning of 25 June were postponed.

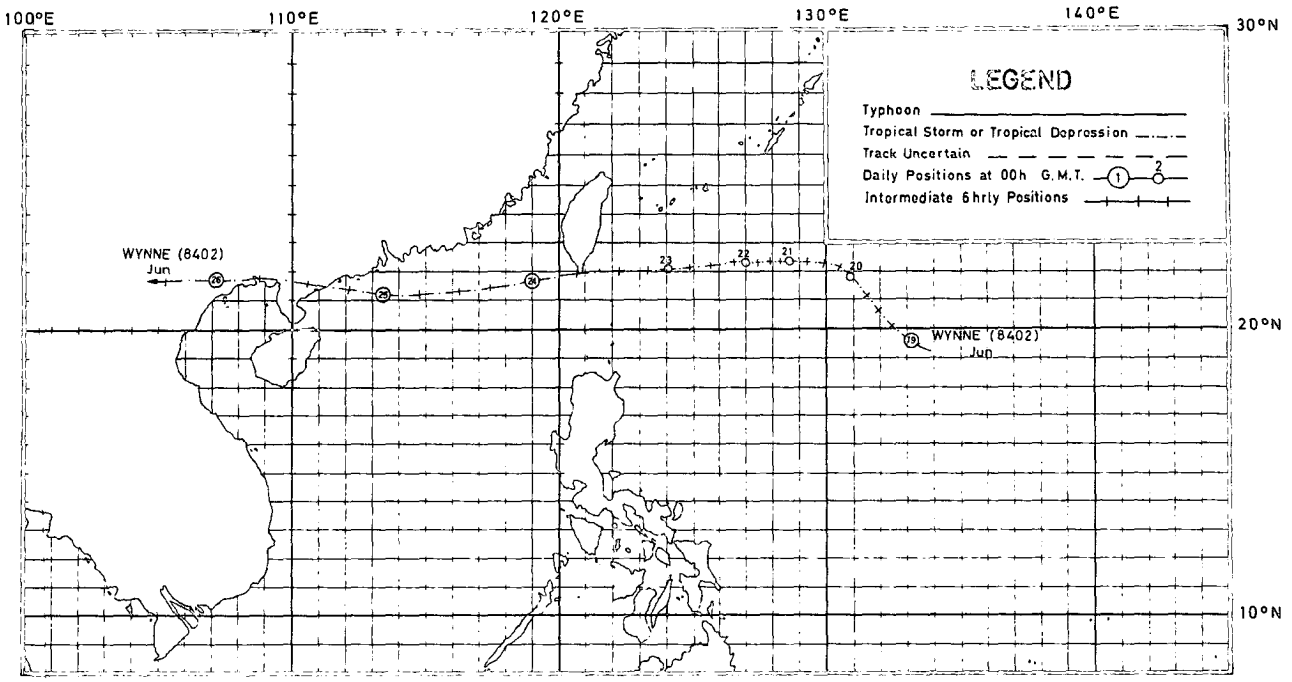

Figure 3. **Track of Severe Tropical Storm Wynne (8402): 19–26 June.**

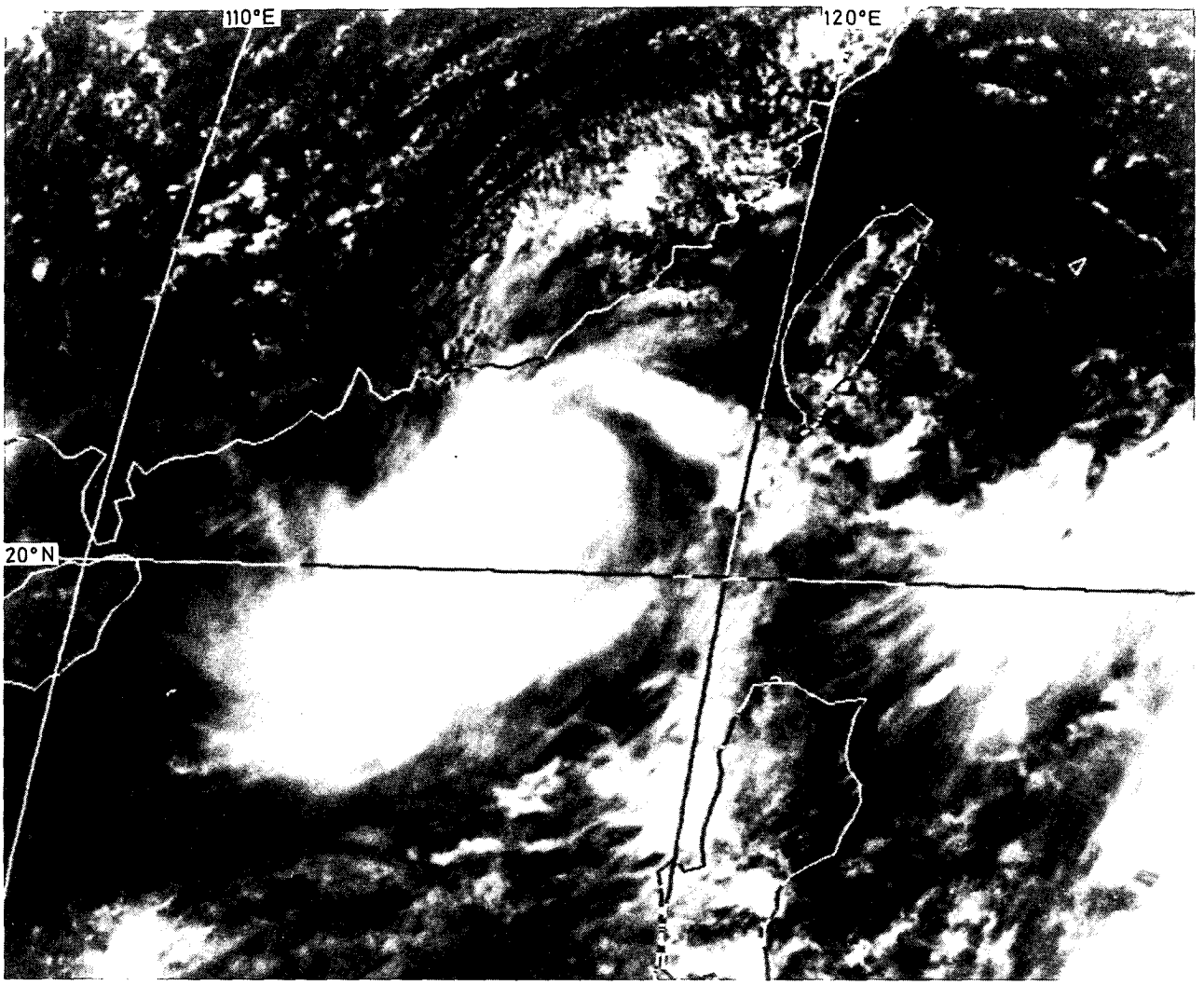

Figure 4. **GMS-2 visible imagery of Severe Tropical Storm Wynne (8402) around 2.00 p.m. on 24 June 1984.**

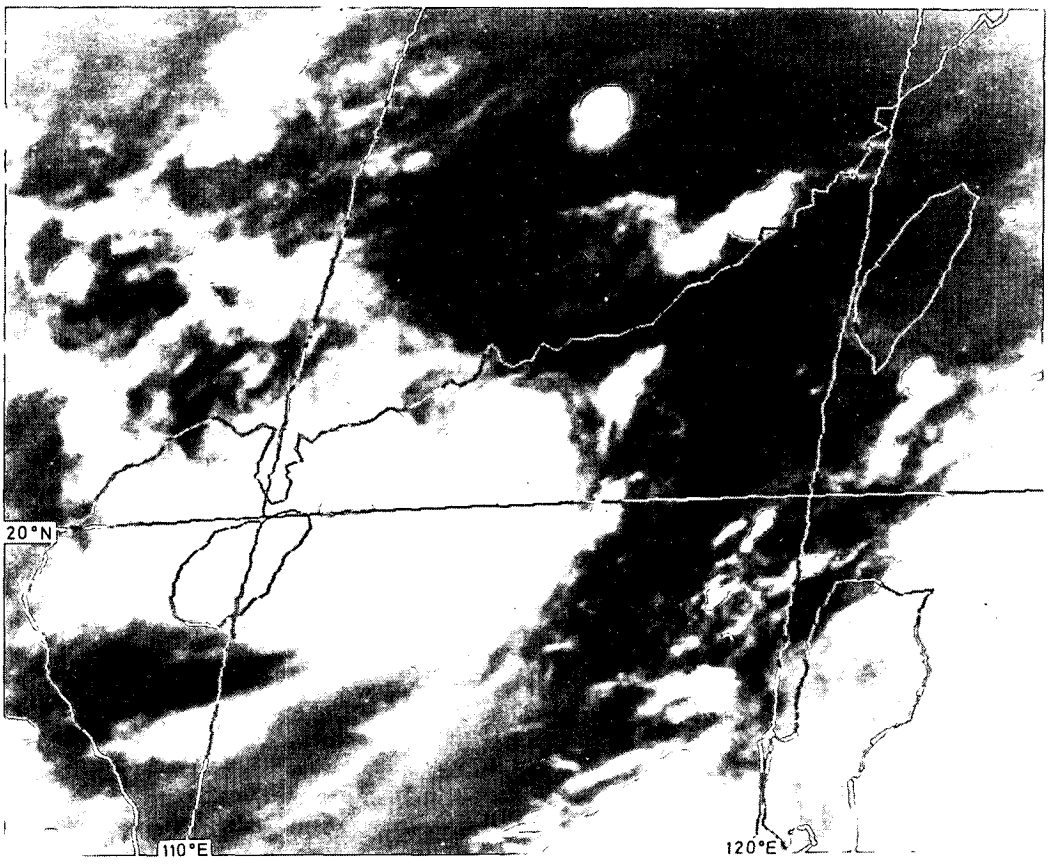

Figure 5. GMS-2 infra-red imagery of Severe Tropical Storm Wynne (8402) around 5.00 a.m. on 25 June 1984.

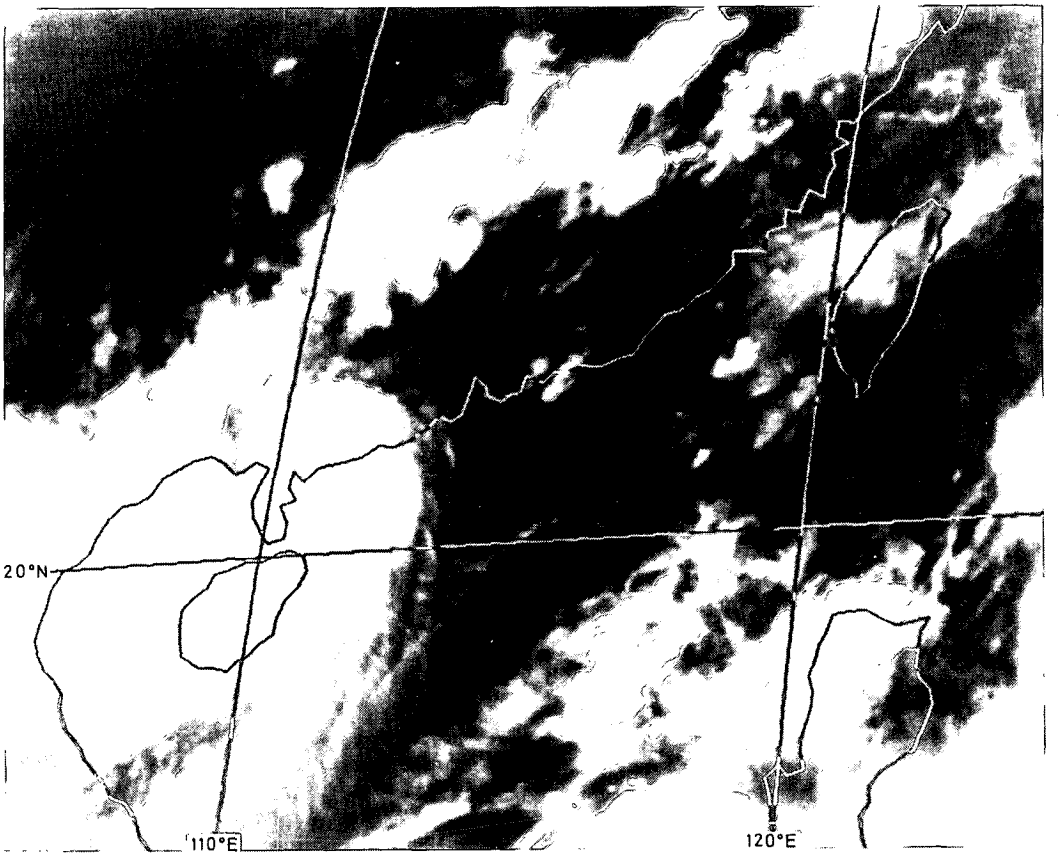

Figure 6. GMS-2 infra-red imagery of Severe Tropical Storm Wynne (8402) around 8.00 p.m. on 25 June 1984.

(b) Severe Tropical Storm Betty (8404)

5–9 July 1984

The track of this severe tropical storm is shown in Figure 7

Betty developed as a tropical depression over the Pacific about 220 nautical miles east of Manila on 5 July. It reached the east coast of Luzon in the morning of 6 July. In the afternoon Betty was located off the west coast of Luzon although its centre was ill-defined during its passage across the mountain ranges of Luzon. Satellite pictures received early on 7 July showed an exposed low-level circulation while most of the clouds were located in the southern semicircle. Betty moved northwestwards at about 8 knots over the South China Sea and intensified into a tropical storm in the evening of 7 July. Satellite pictures early on 8 July indicated that the circulation of Betty covered an area about 350 nautical miles in diameter. Betty further intensified into a severe tropical storm later in the morning of 8 July. At 10.51 a.m. a reconnaissance aircraft reported sustained surface winds of about 50 knots near the centre. At 6.00 p.m. the M.V. 'Bunga Permai' observed sustained winds of 42 knots about 90 nautical miles north of the centre. Figure 8 shows Betty about 130 nautical miles south of Hong Kong around 8.00 p.m. on 8 July. Betty moved steadily northwestwards at about 10 knots during the night. At 5.00 a.m. on 9 July, sustained winds of 46 knots were reported at Shangchuan Dao, about 50 nautical miles north of the centre. Gusts of 70 knots and a minimum sea-level pressure of 994.8 millibars were also recorded there an hour later. Betty crossed the south China coast about 140 nautical miles west-southwest of Hong Kong around 11.00 a.m. on 9 July and dissipated overland about 70 nautical miles north-northwest of Zhanjiang in the evening.

In Hong Kong, the Stand By Signal, No. 1, was hoisted at 11.15 a.m. on 7 July, when Betty was about 360 nautical miles southeast of Hong Kong. Winds were moderate easterly at first. They freshened later in the day and became strong at times off shore the following morning. The Strong Wind Signal, No. 3, was hoisted at 9.40 a.m. on 8 July when Betty was about 200 nautical miles to the south-southeast. Winds became generally strong over Hong Kong in the afternoon and gradually turned east-southeasterly. Winds reached gale force off shore for a brief period around midnight and gusts of 70 knots and 57 knots were recorded at Green Island and Cheung Chau respectively. Betty was closest to Hong Kong around 2.00 a.m. on 9 July when it was about 120 nautical miles to the southwest. Winds turned southeasterly during the morning of 9 July. Violent squally showers around 2.00 p.m. gave rise to gusts of 69 knots and 66 knots at Cheung Chau and Star Ferry Pier, Kowloon respectively. As Betty weakened overland and moved away west-northwestwards, all signals were lowered at 3.40 p.m. on 9 July, when Betty was about 180 nautical miles west of Hong Kong. Winds subsided later in the afternoon and became moderate south-southeasterly the following day. The minimum sea-level pressure at the Royal Observatory was 1 001.2 millibars recorded between 5.00 p.m. and 6.00 p.m. on 8 July when the severe tropical storm was about 150 nautical miles to the south. The maximum mean hourly wind speeds, the maximum gust peak speeds and the associated wind directions recorded at selected locations during the passage of Betty were as follows:

Location	*Maximum mean hourly wind speed in knots with direction in points*		*Maximum gust peak speed in knots with direction in points*	
Royal Observatory	E	23	ESE & S	45
Hong Kong Airport (SE)	E	28	ESE	57
Hong Kong Airport (NW)	SSE	25	SSE	65
Waglan Island	E	36	S	52
Tate's Cairn	S	38	S	66
Cheung Chau	ESE	40	SSE	69
King's Park	ESE	23	ESE	46
Star Ferry	E	29	SE	66
Green Island	S	36	ESE	70
Tsim Bei Tsui	SE	27	SE	47
Tai O	SSE	31	S	63
Kwai Chung	S	25	SSW	51
Lei Yue Mun	E	36	—	
Yau Yat Chuen	—		—	
Kowloon Tsai Hill	E	22	—	

Apart from some cloudy periods and isolated showers, the weather was fine and hot on 7 July. Some thunderstorms were reported early on 8 July and there were frequent showers during the day. The showers became heavy and squally at times on 9 July but the weather improved in the evening. It was sunny on 10 July. The daily amounts of rainfall recorded were as follows:

	Royal Observatory	*Cheung Chau*	*Tate's Cairn*
7 July	Trace	Nil	Nil
8 July	13.9 mm	7.3 mm	13.5 mm
9 July	70.3 mm	31.5 mm	55.9 mm
10 July	Nil	Nil	Nil
Total:	84.2 mm	38.8 mm	69.4 mm

The times and heights of the highest tides and maximum storm surges recorded at various locations in Hong Kong during the passage of Betty were as follows:

Location	Highest tide above chart datum			Maximum storm surge above astronomical tide		
	Height (m)	Date	Time	Height (m)	Date	Time
North Point	2.27	9 July	6.00 a.m.	0.45	9 July	2.45 a.m.
Tai Po Kau	2.06	9 July	4.30 a.m.	0.54	9 July	8.00 p.m.
Chi Ma Wan	2.56	9 July	5.15 a.m.	0.65	9 July	5.15 a.m.
Lok On Pai	2.56	9 July	5.45 a.m.	0.52	9 July	5.45 a.m.
Tsim Bei Tsui	2.78	9 July	8.00 a.m.	0.62	9 July	10.00 a.m.

In Hong Kong, Betty only caused minor damage to crops. Disruption to ferry services was minimal although the hover-ferry and hydrofoil services to China and Macau scheduled in the morning of 9 July were suspended. Schools were closed on 9 July, but all public examinations were held as usual.

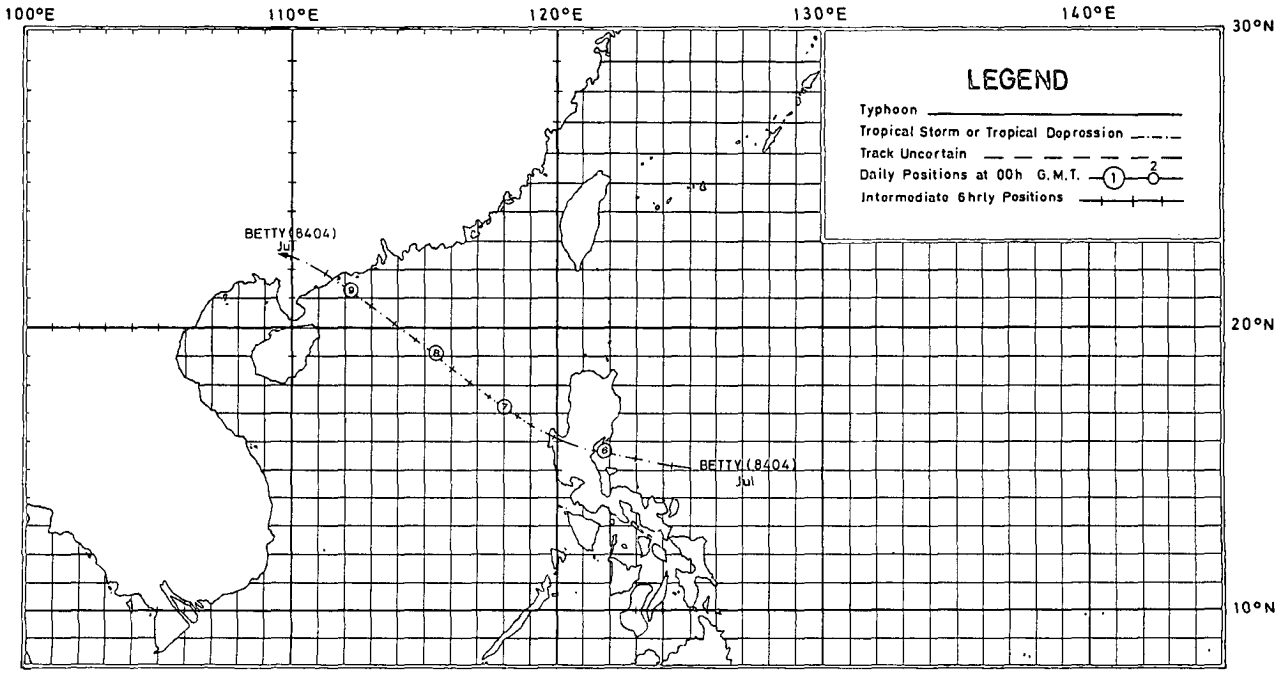

Figure 7. Track of Severe Tropical Storm Betty (8404): 5–9 July.

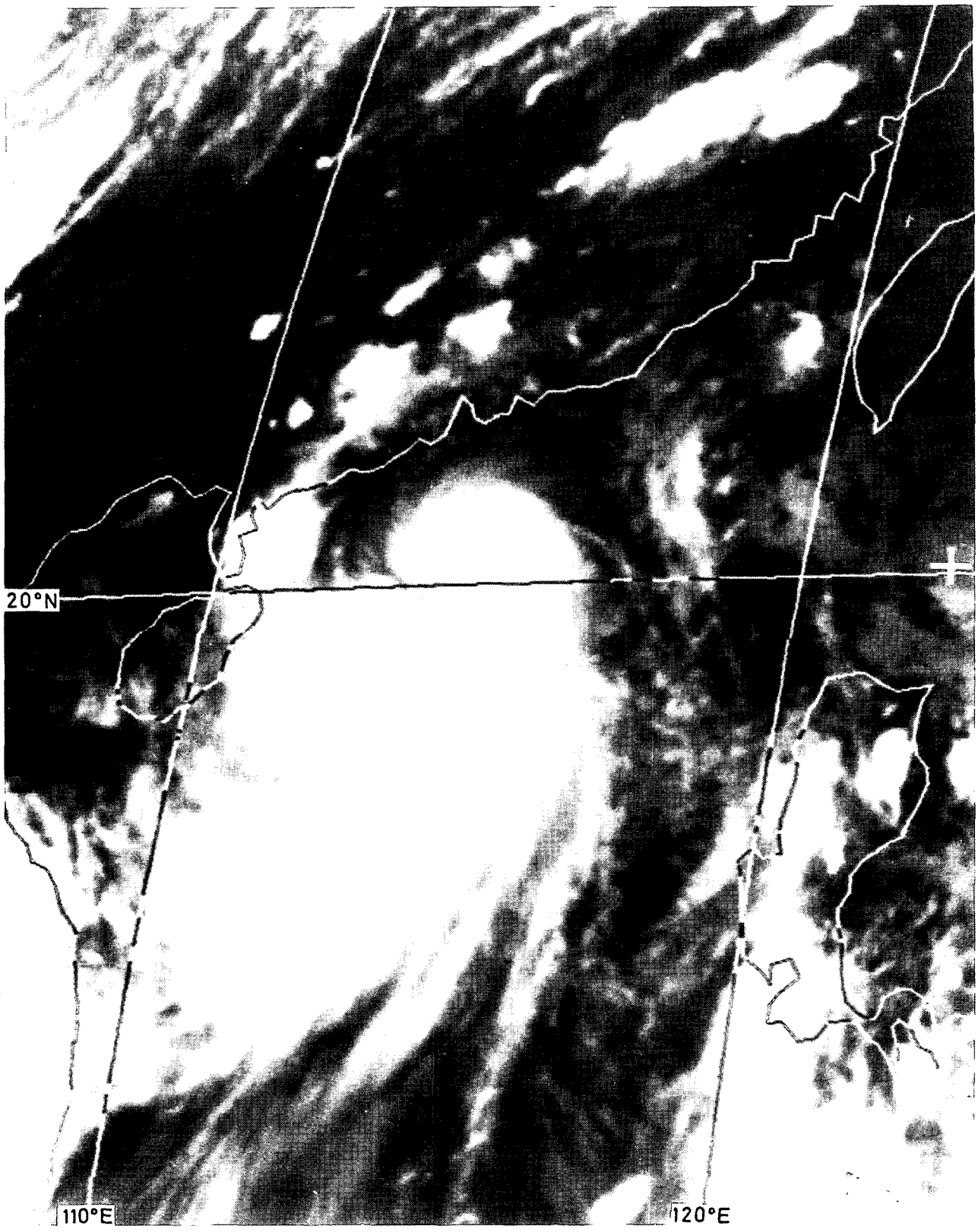

Figure 8. GMS-2 infra-red imagery of Severe Tropical Storm Betty (8404) around 8.00 p.m. on 8 July 1984.

(c) Severe Tropical Storm Gerald (8409)

16–21 August 1984

The track of this severe tropical storm is shown in Figure 9

A broad area of low pressure over the northern part of the South China Sea developed into a tropical depression centred about 110 nautical miles east-southeast of Dongsha on 16 August. It moved southwestwards at about 5 knots at first and intensified into a tropical storm called Gerald that evening. At 2.00 a.m. on 17 August, the M.V. 'Asian Jade' reported sustained winds of 30 knots and a sea-level pressure of 988.8 millibars about 50 nautical miles southwest of the centre. At 7.13 a.m., a reconnaissance aircraft reported maximum sustained winds of 45 knots and a minimum sea-level pressure of 980 millibars near the centre. Gerald moved in a generally westward direction during the evening of 17 August and intensified into a severe tropical storm on 18 August when it was centred about 230 nautical miles south of Hong Kong. At 8.00 p.m., the M.V. 'Mercury Lake' reported a sea-level pressure of 984.5 millibars about 30 nautical miles north of the centre. The movement of Gerald across the northern part of the South China Sea was influenced by the presence of Typhoon Holly centred near the Ryukyus (Figures 10–13). Gerald slowed down to about 2 knots during the evening of 19 August and recurved towards the northeast when its centre was about 250 nautical miles south-southwest of Hong Kong. The severe tropical storm continued on a northeasterly track and accelerated to a speed of about 9 knots on 20 August. Gerald weakened into a tropical storm the next day about 25 nautical miles south of Hong Kong. At 10.00 a.m. on 21 August the M.V. 'Contender Argent' reported sustained winds of 37 knots and a sea-level pressure of 995.1 millibars about 60 nautical miles east-southeast of the centre. Gerald crossed the south China coast close to Shanwei around 2.00 p.m. and dissipated about 70 nautical miles northwest of Shantou during the night.

In Hong Kong, the Stand By Signal, No. 1, was hoisted at 3.45 p.m. on 16 August when Gerald was about 270 nautical miles southeast of Hong Kong. Winds were light and variable at first. They turned northerly on 17 August. Winds became fresh east-northeasterly on 18 August and were strong at times off shore. The Strong Wind Signal, No. 3, was hoisted at 4.15 p.m. on 18 August when the severe tropical storm was about 230 nautical miles to the south. Easterly winds were strong off shore but moderated overnight. The Strong Wind Signal, No. 3, was replaced by the Stand By Signal, No. 1, at 7.30 a.m. on 19 August. Easterly winds remained moderate during the day. Winds freshened early on 20 August as Gerald turned onto a northeasterly track and moved closer to Hong Kong. The Strong Wind Signal, No. 3, was again hoisted at 2.00 p.m. on 20 August when Gerald was about 160 nautical miles to the south-southwest of Hong Kong. Strong easterly winds persisted and they reached gale force for a brief duration off shore around 5.00 a.m. on 21 August. Winds turned through north to northwesterly and became strong around 9.00 a.m. They turned further to westerly around noon and gradually moderated while Gerald weakened overland. All signals were lowered at 4.00 p.m. on 21 August when Gerald was about 85 nautical miles to the northeast. Winds became moderate southwesterly later in the day. Gerald was closest to Hong Kong around 9.00 a.m. on 21 August when it passed about 25 nautical miles to the southeast. However, the minimum sea-level pressure of 992.7 millibars at the Royal Observatory was recorded earlier at 7.00 a.m. when Gerald was about 30 nautical miles to the south. The maximum mean hourly wind speeds, the maximum gust peak speeds and the associated wind directions recorded at selected locations during the passage of Gerald were as follows:

Location	*Maximum mean hourly wind speed in knots with direction in points*		*Maximum gust peak speed in knots with direction in points*	
Royal Observatory	E & W	20	E	44
Hong Kong Airport (SE)	E & W	20	E	41
Hong Kong Airport (NW)	E	23	NE	46
Waglan Island	E	39	ENE	49
Tate's Cairn	NE	36	ENE	61
Cheung Chau	E & NNW	28	NW	52
King's Park	ESE	17	ESE	37
Star Ferry	W	30	E	48
Green Island	ENE	33	WNW	50
Tsim Bei Tsui	W	30	W	45
Tai O	NNW & W	28	NW	52
Lei Yue Mun	E	32	—	
Yau Yat Chuen	E	19	—	
Kowloon Tsai Hill	E	22	—	

In Hong Kong it was sunny and very hot on 16 August. However, some heavy showers and isolated thunderstorms occurred during the night. There were a few scattered showers from 17 to 19 August but the weather was also sunny on 18 August. The weather deteriorated on 20 August with frequent heavy and squally showers which persisted until the evening on 21 August. The weather improved and it was sunny again on 22 August. The daily amounts of rainfall recorded were as follows:

	Royal Observatory	*Cheung Chau*	*Tate's Cairn*
16 August	26.3 mm	17.6 mm	16.1 mm
17 August	5.1 mm	4.3 mm	13.6 mm
18 August	Trace	0.6 mm	0.2 mm
19 August	Trace	Trace	Trace
20 August	14.8 mm	4.6 mm	24.0 mm
21 August	35.0 mm	24.4 mm	33.0 mm
Total:	81.2 mm	51.5 mm	86.9 mm

The times and heights of the highest tides and maximum storm surges recorded at various locations in Hong Kong during the passage of Gerald were as follows:

Location	Highest tide above chart datum			Maximum storm surge above astronomical tide		
	Height (m)	Date	Time	Height (m)	Date	Time
North Point	2.28	21 Aug	3.15 a.m.	0.44	18 Aug	4.15 p.m.
Tai Po Kau	2.13	21 Aug	5.30 a.m.	0.58	18 Aug	3.00 p.m.
Lok On Pai	2.32	21 Aug	3.30 a.m.	0.56	18 Aug	4.45 p.m.

There was only minor damage in Hong Kong during the passage of Gerald. A construction site hoarding, measuring about 15 metres by 3 metres, collapsed on Granville Circuit in Tsim Sha Tsui on 21 August, and a boutique shop window across the road was damaged. A 10-metre-tall tree fell on Mt. Butler Road in Tai Hang and another one at Lion Rock Tunnel Road near San Tin Wai, blocking the traffic there. Public transport operated normally during the display of the No. 3 Signal on 18 August, but ferry services were disrupted on 21 August. Strong westerly winds on 21 August necessitated the suspension of cross-harbour ferries for a few hours. Hover-ferry services to China were cancelled on 21 August while hydrofoil services to Macau were suspended during the morning. At the airport, 2 flights were cancelled and 5 out-going and 2 in-coming flights were delayed.

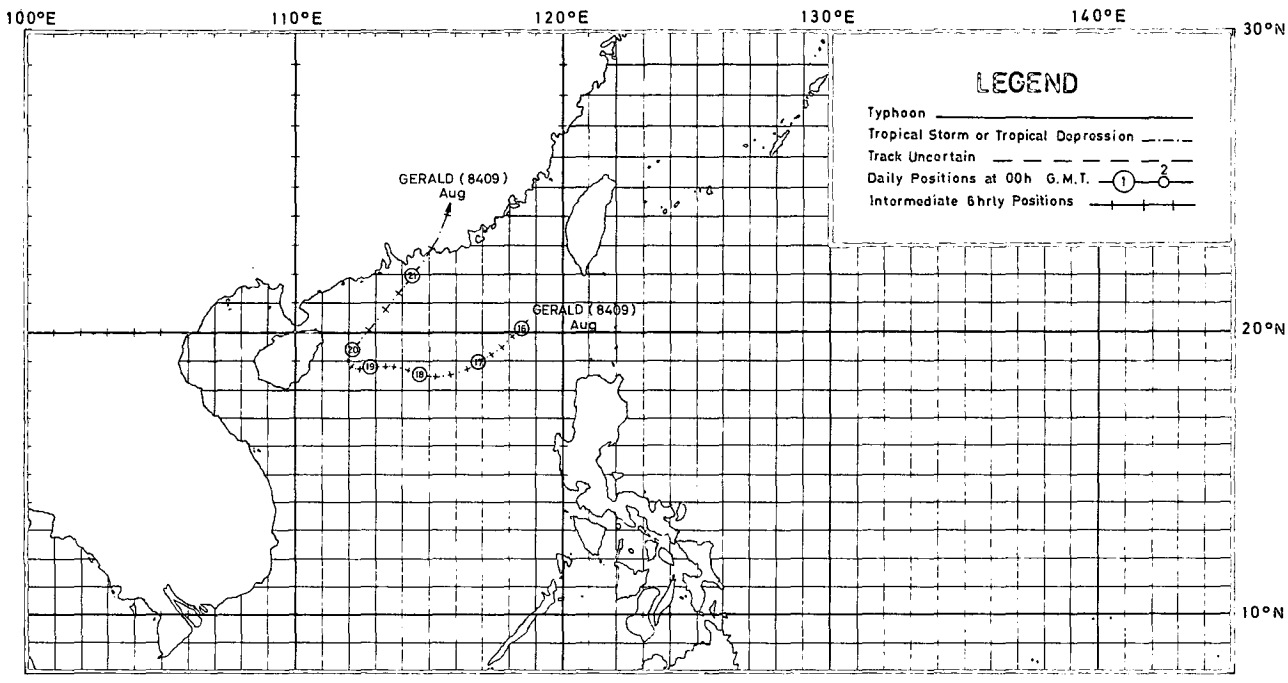

Figure 9. Track of Severe Tropical Storm Gerald (8409): 16–21 August.

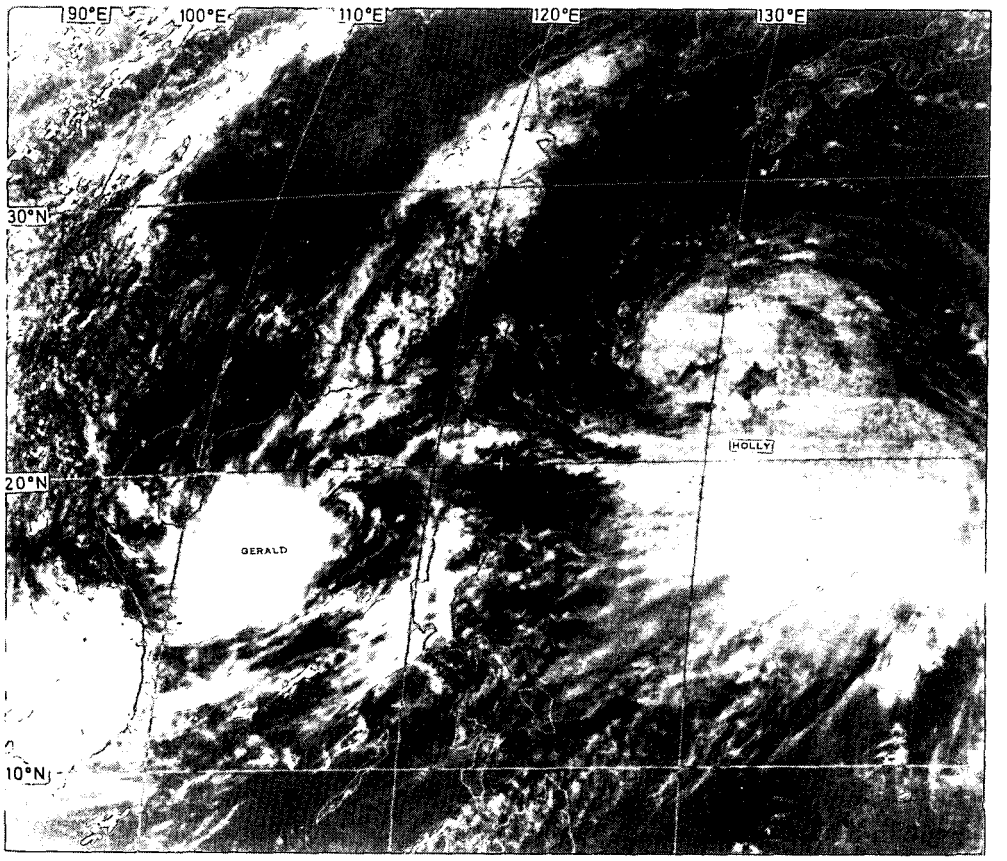

Figure 10. GMS-2 visible imagery of Severe Tropical Storm Gerald (8409) around 2.00 p.m. on 17 August 1984.

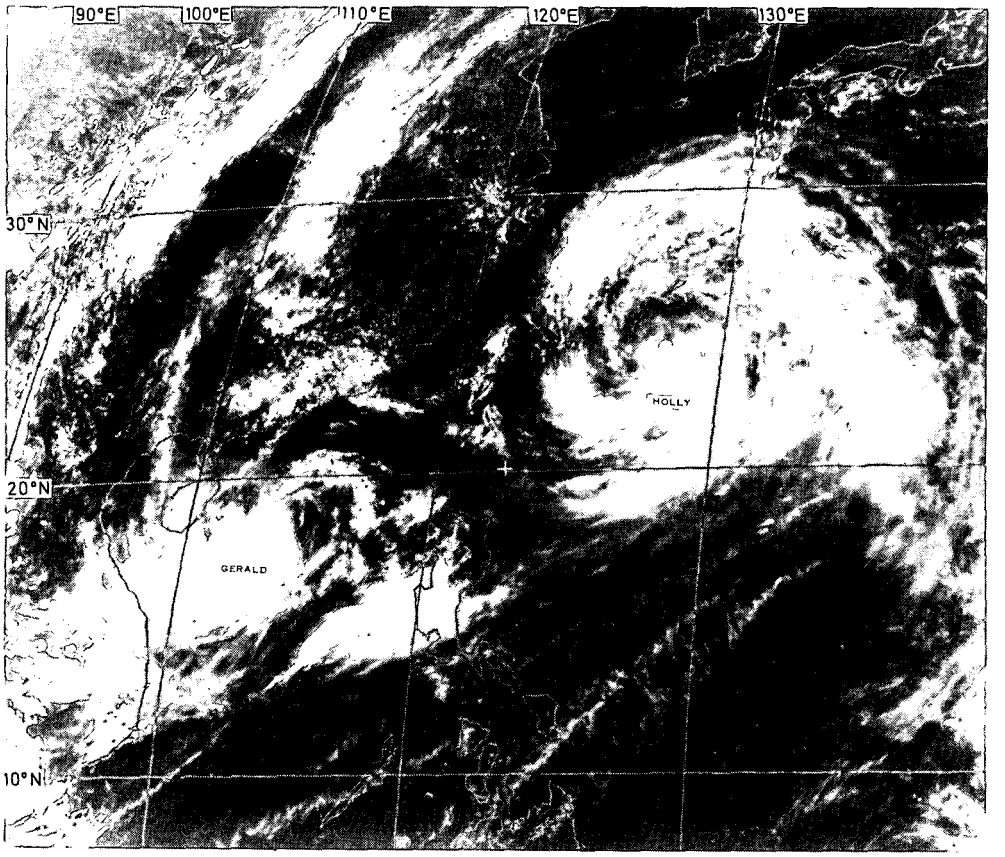

Figure 11. GMS-2 visible imagery of Severe Tropical Storm Gerald (8409) around 2.00 p.m. on 18 August 1984.

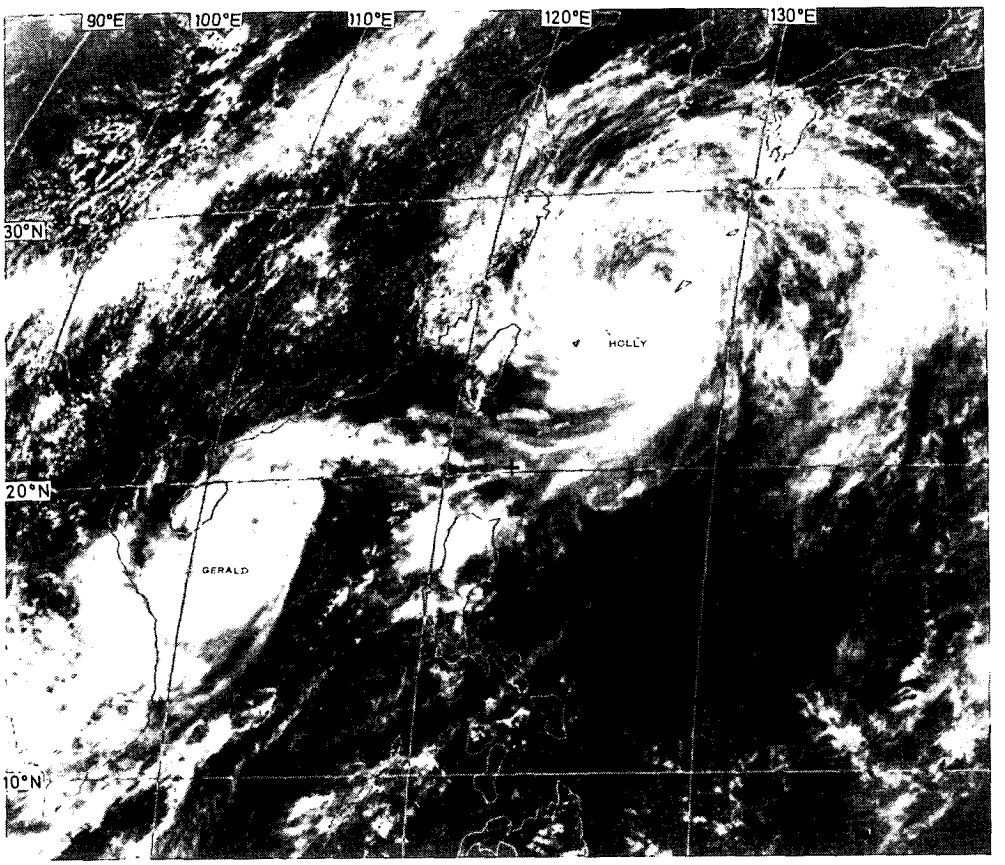

Figure 12. GMS-2 visible imagery of Severe Tropical Storm Gerald (8409) around 2.00 p.m. on 19 August 1984.

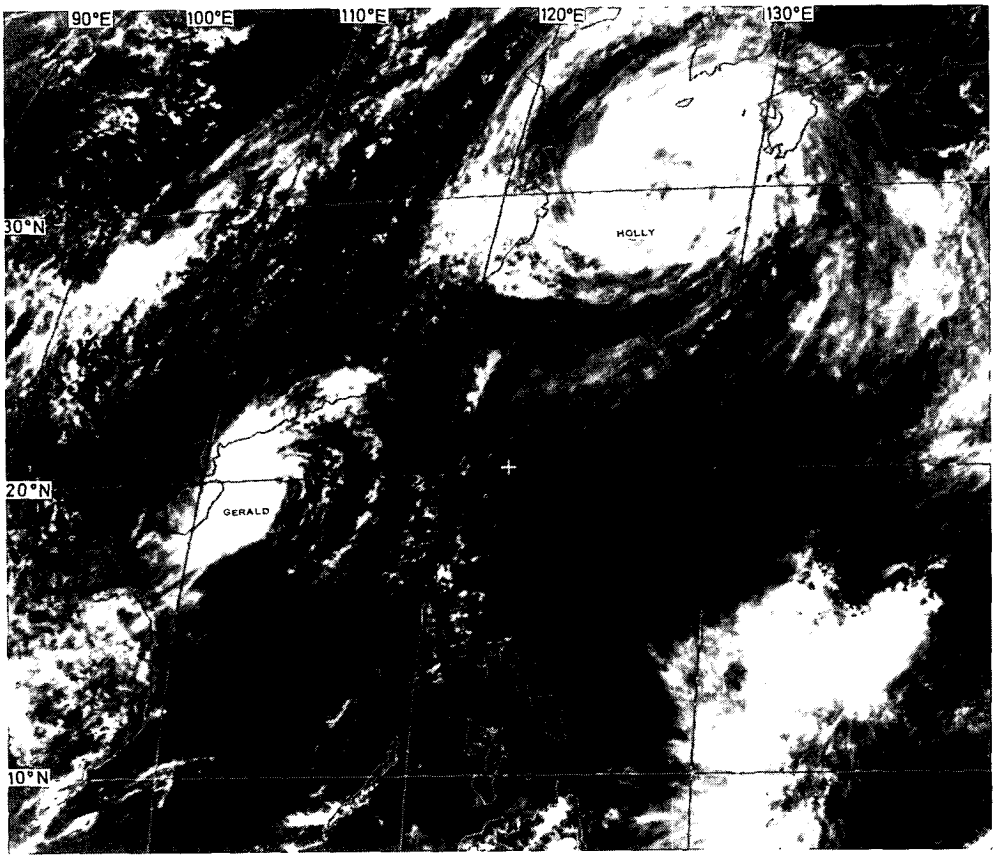

Figure 13. GMS-2 visible imagery of Severe Tropical Storm Gerald (8409) around 2.00 p.m. on 20 August 1984.

(d) Severe Tropical Storm June (8412)

27–31 August 1984

The track of this severe tropical storm is shown in Figure 14

June developed as a tropical depression over the western North Pacific about 600 nautical miles east-northeast of Manila on 27 August. It moved westwards and intensified into a tropical storm early the next day. At 4.20 p.m. on 28 August a reconnaissance aircraft reported sustained surface winds of 45 knots and a sea-level pressure of 986 millibars near its centre. June intensified into a severe tropical storm in the same evening about 60 nautical miles east of Luzon. It skirted the northern coast of Luzon early on 29 August but caused heavy rain and floods in northern Philippines. 72 people were killed, 222 injured and more than 11 000 were made homeless. A total of about 340 000 people were affected. Several major bridges were broken by storm surges and mountain roads were blocked by landslips around Baguio, cutting off the city. 13 towns were flooded in Pangasinan Province, about 90 nautical miles north of Manila. The total damage to crops, livestock, roads, bridges and other property was estimated at more than US$5 million. June weakened into a tropical storm after passing Luzon and turned to move northwestwards at about 9 knots towards the coast of south China. Around 4.00 p.m. on 29 August, June passed about 80 nautical miles southwest of Basco, where a sea-level pressure of 988.6 millibars was recorded. Around 2.00 p.m. on 30 August, June passed about 55 nautical miles northeast of Dongsha, where a sea-level pressure of 986.8 millibars was recorded. At 5.00 p.m. sustained winds of 39 knots were reported by the M.V. 'Shoshin Maru' about 80 nautical miles west of the centre. June crossed the south China coast about 25 nautical miles southwest of Shantou around 3.00 a.m. on 31 August and dissipated overland about 150 nautical miles north of Hong Kong in the evening. Active southwest monsoon winds affected the coastal areas after June had landed (Figure 15) and heavy rain in eastern Guangdong caused the inundation of 66 000 hectares of farmland and the damage of 1 500 houses.

In Hong Kong, the Stand By Signal, No. 1, was hoisted at 3.10 p.m. on 29 August when June was centred about 400 nautical miles east-southeast of Hong Kong. Winds were moderate northerly at first. As June moved closer to Hong Kong on 30 August, the winds locally were only fresh. They turned northwesterly during the night and became moderate early on 31 August. All signals were lowered at 9.30 a.m. on 31 August when June weakened overland and was about 120 nautical miles northeast of Hong Kong. Winds became moderate westerly during the day and they turned southwesterly on 1 September. The minimum sea-level pressure at the Royal Observatory was 991.4 millibars recorded at 5.00 p.m. on 30 August when June was about 180 nautical miles east-southeast of Hong Kong. The same pressure was again registered at 4.00 a.m. on 31 August when June was about 130 nautical miles east-northeast of Hong Kong. The maximum mean hourly wind speeds, the maximum gust peak speeds and the associated wind directions recorded at selected locations during the passage of June were as follows:

Location	*Maximum mean hourly wind speed in knots with direction in points*		*Maximum gust peak speed in knots with direction in points*	
Royal Observatory	N & W	12	N	27
Hong Kong Airport (SE)	WNW	20	N	35
Hong Kong Airport (NW)	N	21	N	36
Waglan Island	N	25	N	33
Tate's Cairn	NNE	27	NNE	38
Cheung Chau	NW	18	N	28
King's Park	NNE	14	NNE	28
Star Ferry	WNW	14	WNW	24
Green Island	NNE	16	NNE	27
Tsim Bei Tsui	WNW	20	WNW	27
Tai O	NNW	15	WNW	25
Lei Yue Mun	ENE	19	—	
Yau Yat Chuen	E	12	—	
Kowloon Tsai Hill	NE	15	—	

The weather was mainly fine on 29 August and temperatures rose to a maximum of 34.4°C, which was the highest of the month. There were a few isolated showers in the evening and on the next day. More showers occurred on 31 August. Active southwesterlies brought periods of heavy rain, frequent heavy showers and occasional thunderstorms on 1 September. Rain continued overnight but the weather improved during the day on 2 September. The daily amounts of rainfall recorded were as follows:

	Royal Observatory	*Cheung Chau*	*Tate's Cairn*
29 August	Nil	Trace	Nil
30 August	Nil	0.2 mm	Nil
31 August	5.9 mm	12.6 mm	7.6 mm
1 September	83.8 mm	135.3 mm	65.0 mm
2 September	23.7 mm	39.2 mm	3.6 mm
Total:	113.4 mm	187.3 mm	76.2 mm

The times and heights of the highest tides and maximum storm surges recorded at various locations in Hong Kong during the passage of June were as follows:

Location	Highest tide above chart datum			Maximum storm surge above astronomical tide		
	Height (m)	Date	Time	Height (m)	Date	Time
North Point	2.54	30 Aug	12.45 p.m.	0.46	30 Aug	9.15 p.m.
Tai Po Kau	2.48	30 Aug	12.50 p.m.	0.73	31 Aug	1.30 a.m.
Chi Ma Wan	2.63	30 Aug	12.30 p.m.	0.62	31 Aug	1.00 a.m.
Lok On Pai	2.70	30 Aug	12.45 p.m.	0.57	31 Aug	2.30 a.m.

Damage in Hong Kong was minimal. Ferry services were only slightly affected while hover-ferry services to China were suspended on 31 August.

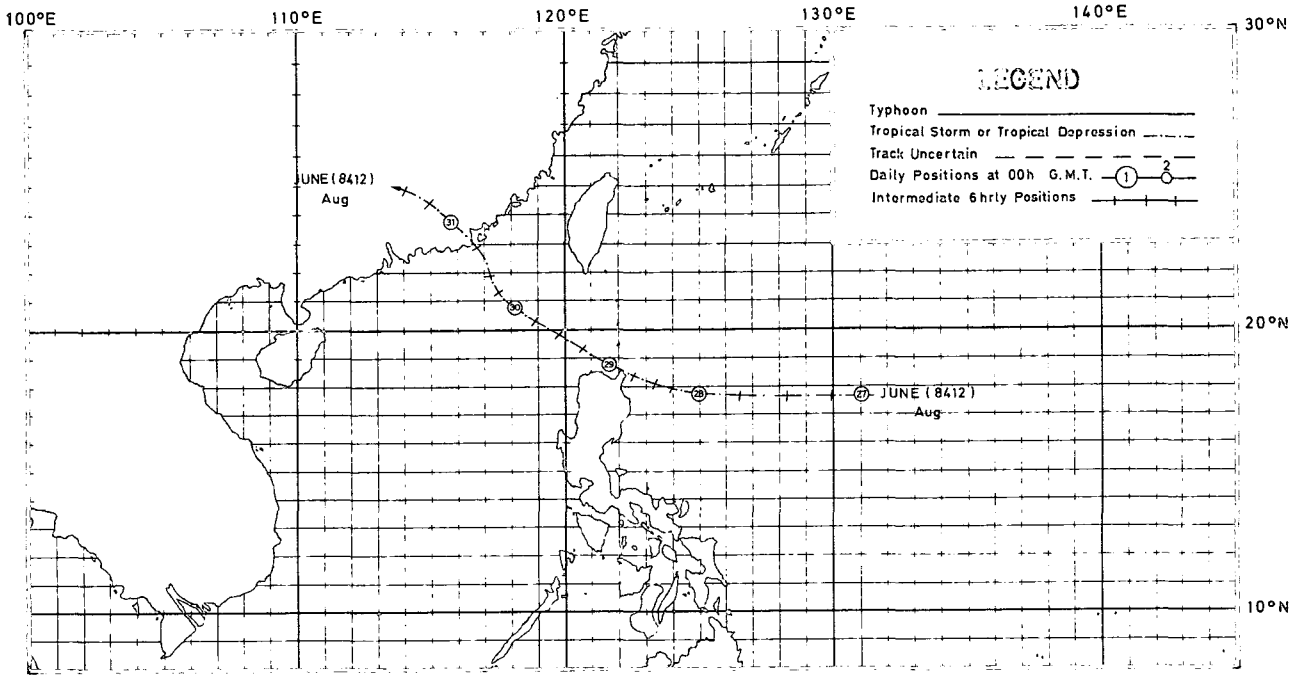

Figure 14. Track of Severe Tropical Storm June (8412): 27–31 August.

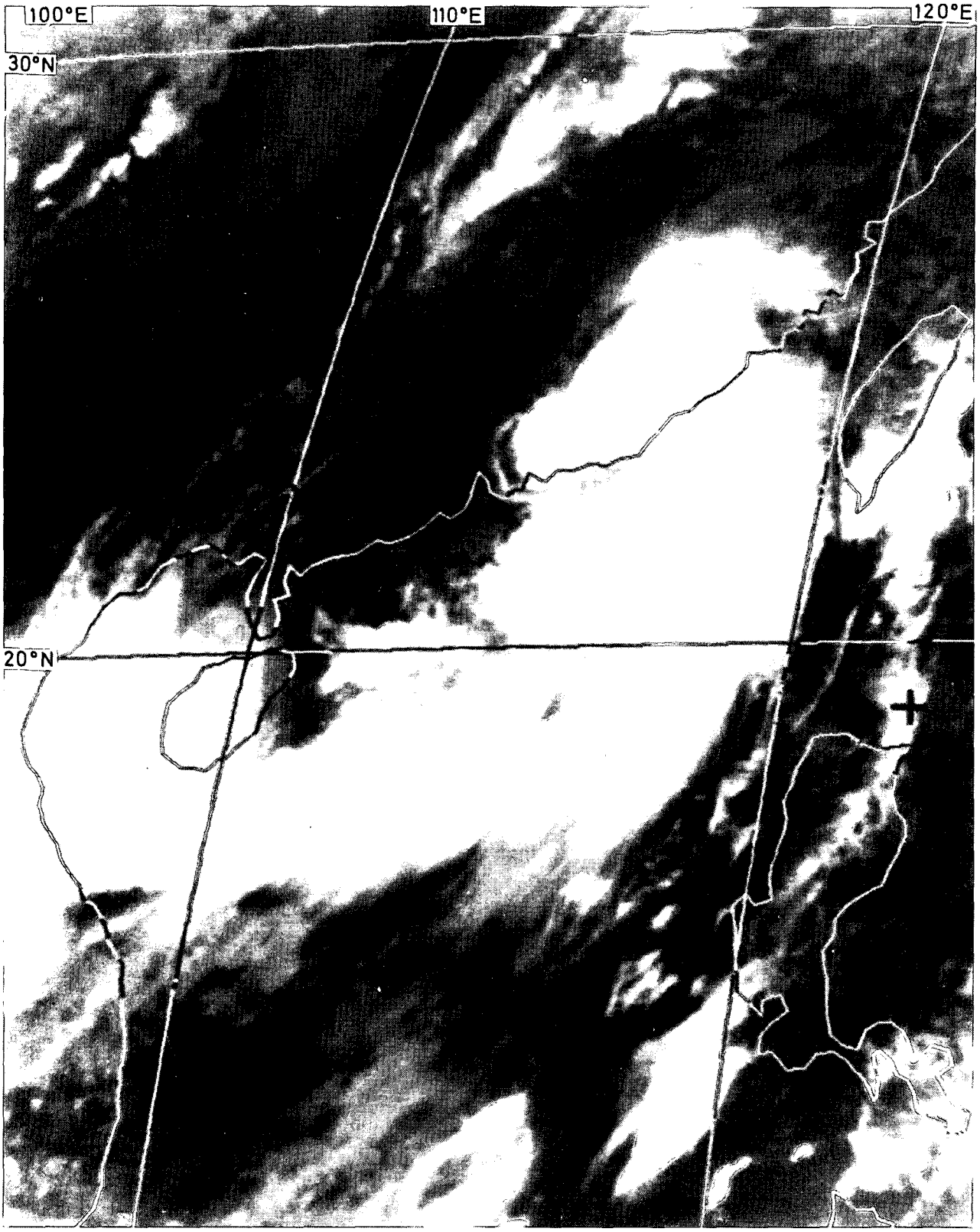

Figure 15. GMS-2 infra-red imagery of Severe Tropical Storm June (8412) around 9.00 a.m. on 31 August 1984.

(e) Typhoon Ike (8411)

27 August–7 September 1984

The track of this typhoon is shown in Figure 16

Ike originated as a tropical depression over the western North Pacific about 120 nautical miles south of Guam on 27 August. It deepened into a tropical storm in the same evening, intensified into a severe tropical storm on 29 August and reached typhoon intensity early on 31 August about 550 nautical miles east of Mindanao. Ike continued to intensify as it moved westwards at about 12 knots towards the central Philippines. At 4.45 p.m. on 1 September, a reconnaissance aircraft reported sustained surface winds of about 115 knots and a minimum sea-level pressure of 947 millibars near the centre when Ike was about 85 nautical miles off the east coast of Mindanao. Ike was most intense around this time. The typhoon crossed the northeastern tip of Mindanao around 2.00 a.m. on 2 September and moved west-northwestwards at about 11 knots across the central Philippines. 1 426 people were killed and 1 161 were missing in the Philippines. More than 200 000 were left homeless and 1.66 million people were severely affected. Most of the casualties were in Surigao del Norte, the worst hit province on Mindanao Island. In Surigao del Norte, more than half of the cattle, goats and pigs were killed, most rice farms and coconut plantations were destroyed and 80 per cent of the buildings were damaged. The total damage to property in the Philippines amounted to about US$111 million. Ike was the worst typhoon to hit the Philippines since Typhoon Amy in December 1951, which left 763 people dead.

Ike weakened into a severe tropical storm after crossing the Philippines on 3 September. It moved northwestwards at about 12 knots and re-intensified into a typhoon over the South China Sea early on 4 September. Ike's movement on 4–5 September over the South China Sea was characterized by its steady northwestward track at about 13 knots. Figure 11 shows Ike approaching Hainan around 8.00 a.m. on 5 September. Ike crossed northeastern Hainan in the afternoon of 5 September, and around 7.00 p.m. it passed over Haikou, where gusts of 64 knots and a sea-level pressure of 977.2 millibars were recorded. On Hainan Island, all power and communications lines were severed. 46 690 hectares of rice paddies were devastated and rubber trees covering an area of similar size were blown down or broken. 30 015 hectares of sugar cane were ruined. Ike weakened into a severe tropical storm after crossing Hainan and continued moving northwestwards at about 10 knots over the Gulf of Tonkin. Sustained winds of 56 knots were recorded at Beihai at 4.00 a.m. on 6 September, when Ike was centred about 25 nautical miles to its south-southeast. Ike landed close to Beihai around 8.00 a.m. and passed about 25 nautical miles southwest of Nanning during the afternoon (Figure 18). Ike was the most devastating tropical cyclone to hit Guangxi since 1954. 14 people were killed and 6 were missing. Homes, factories and boats were destroyed and communications lines were broken. 12 000 hectares of sugar cane were ruined. In Nanning, utility lines were broken, one building collapsed and more than 450 trees were uprooted. About half of the city was left without electricity. An estimated 1.24 million kilograms of vegetables were destroyed in the Nanning area. Ike finally dissipated about 180 nautical miles northwest of Nanning early on 7 September.

In Hong Kong, the Stand By Signal, No. 1, was hoisted at 4.10 p.m. on 4 September when Ike was centred about 370 nautical miles south of Hong Kong. Winds were moderate easterly at first. They freshened during the night and the Strong Wind Signal, No. 3, was hoisted at 11.10 a.m. on 5 September when Ike was about 260 nautical miles southwest of Hong Kong. Winds became strong off shore and were occasionally strong inside the harbour. They gradually turned east-southeasterly during the afternoon. As Ike moved away from Hong Kong after crossing Hainan, all signals were lowered at 11.00 p.m. on 5 September. However, winds remained strong off shore overnight and turned southeasterly. They moderated around noon on 6 September after Ike crossed the south China coast. The variation of sea-level pressure at the Royal Observatory was 1 009.0 millibars recorded between 5.00 p.m. and 6.00 p.m. on 4 September when Ike was about 360 nautical miles south of Hong Kong. The maximum mean hourly wind speeds, the maximum gust peak speeds and the associated wind directions recorded at selected locations during the passage of Ike were as follows:

Location	*Maximum mean hourly wind speed in knots with direction in points*		*Maximum gust peak speed in knots with direction in points*	
Royal Observatory	E	19	ESE	38
Hong Kong Airport (SE)	E	22	ESE	45
Hong Kong Airport (NW)	ESE	21	ESE	40
Waglan Island	ESE	25	ESE	37
Tate's Cairn	SE	25	SE	49
Cheung Chau	ESE	28	ESE	44
King's Park	ESE	19	ESE	38
Star Ferry	E	23	E	42
Green Island	SE	21	ESE	38
Tsim Bei Tsui	SE	23	SE	35
Tai O	E	29	E	48
Lei Yue Mun	E	27	—	
Yau Yat Chuen	E	16	—	
Kowloon Tsai Hill	E	17	—	

Apart from some morning showers, the weather was mainly fine on 4 September. There were scattered showers, heavy at times, on 5 and 6 September but the weather improved in the afternoon of 6 September. The daily amounts of rainfall recorded were as follows:

	Royal Observatory	*Cheung Chau*	*Tate's Cairn*
4 September	4.4 mm	6.2 mm	6.1 mm
5 September	11.0 mm	8.0 mm	10.2 mm
6 September	5.2 mm	1.1 mm	7.9 mm
Total:	20.6 mm	15.3 mm	24.2 mm

The times and heights of the highest tides and maximum storm surges recorded at various locations in Hong Kong during the passage of Ike were as follows:

Location	Highest tide above chart datum			Maximum storm surge above astronomical tide		
	Height (m)	Date	Time	Height (m)	Date	Time
North Point*	—	—	—	—	—	—
Tai Po Kau	2.24	5 Sep	7.20 a.m.	0.62	5 Sep	8.00 a.m.
Chi Ma Wan	2.20	5 Sep	5.15 a.m.	0.21	5 Sep	7.45 p.m.
Lok On Pai	2.20	5 Sep	5.05 a.m.	0.40	5 Sep	7.30 p.m.

* Data not available

In Hong Kong, one woman was injured by a fallen wooden plank in Belcher Street, Western District. A scaffolding and hoardings were blown down at a construction site in Java Road, North Point. There were no other reports of damage.

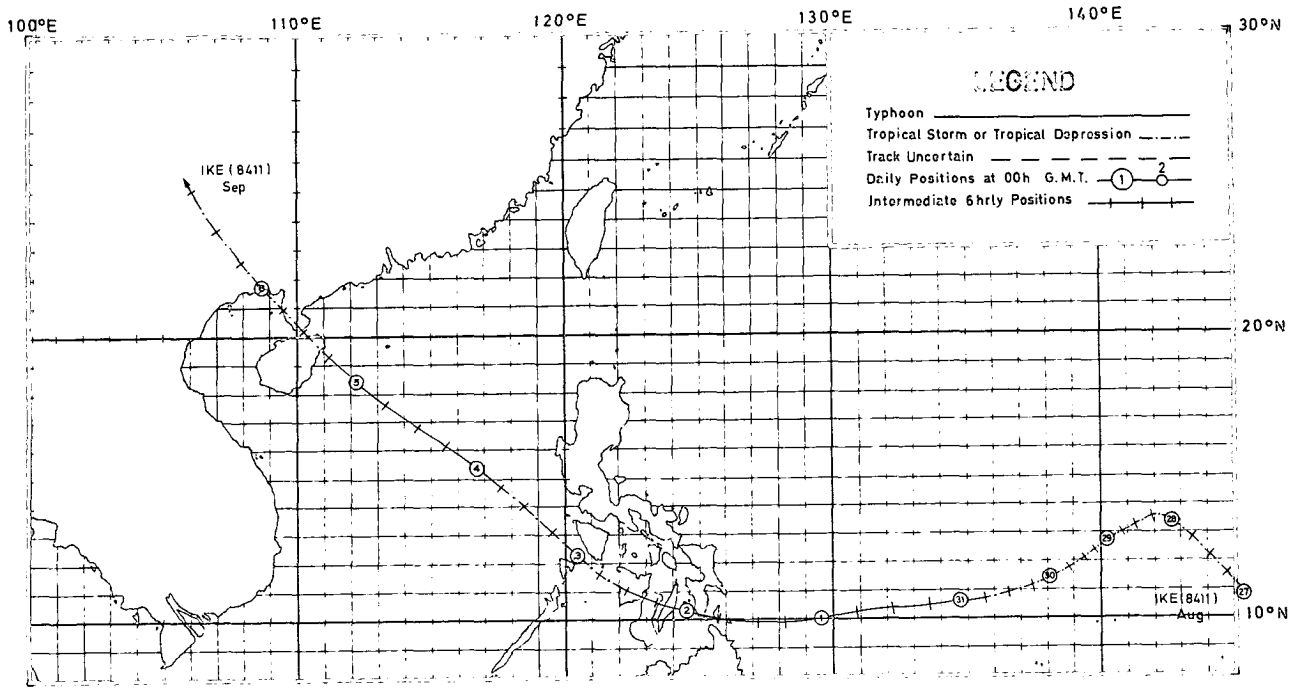

Figure 16. **Track of Typhoon Ike (8411): 27 August–7 September.**

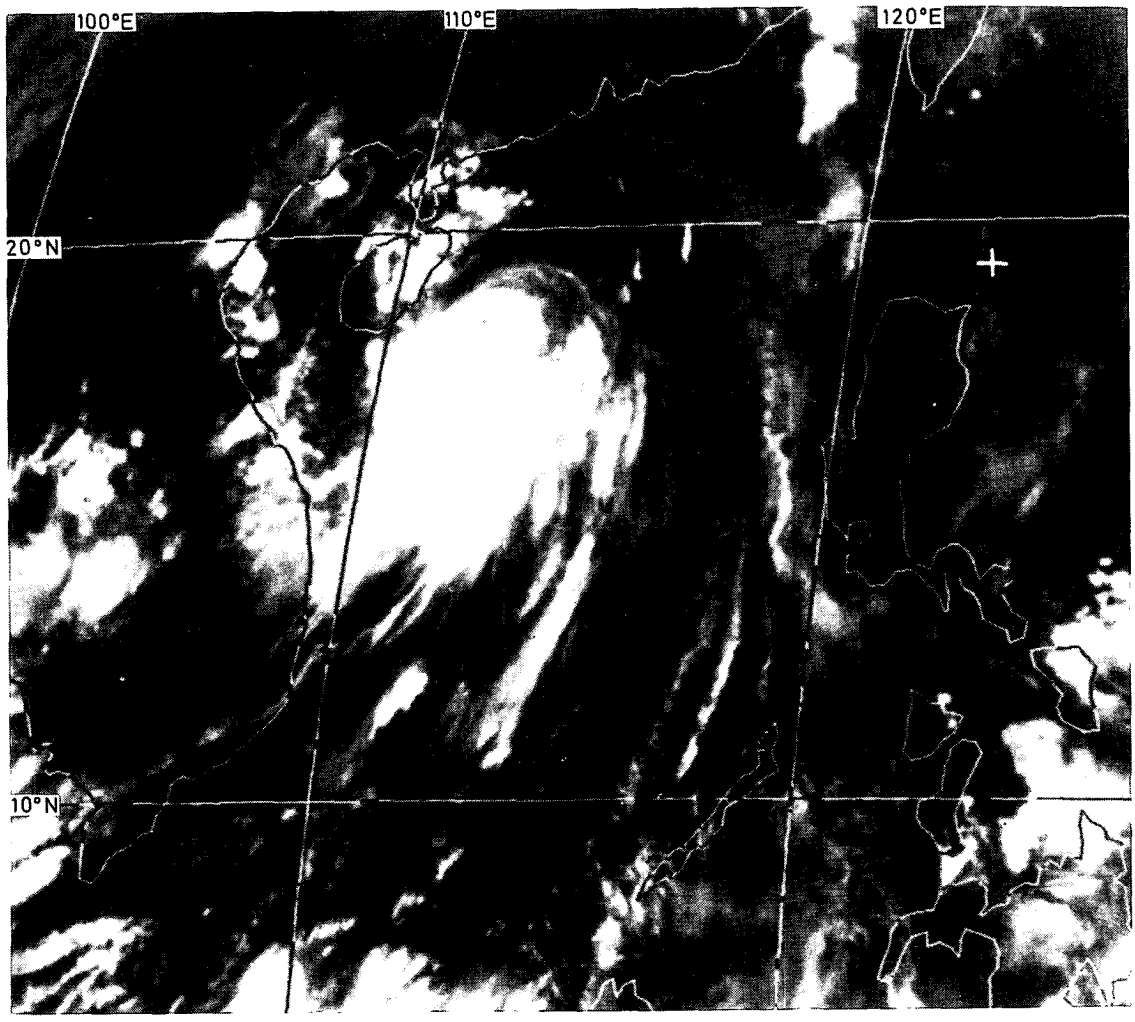

Figure 17. **GMS-2 infra-red imagery of Typhoon Ike (8411) around 8.00 a.m. on 5 September 1984.**

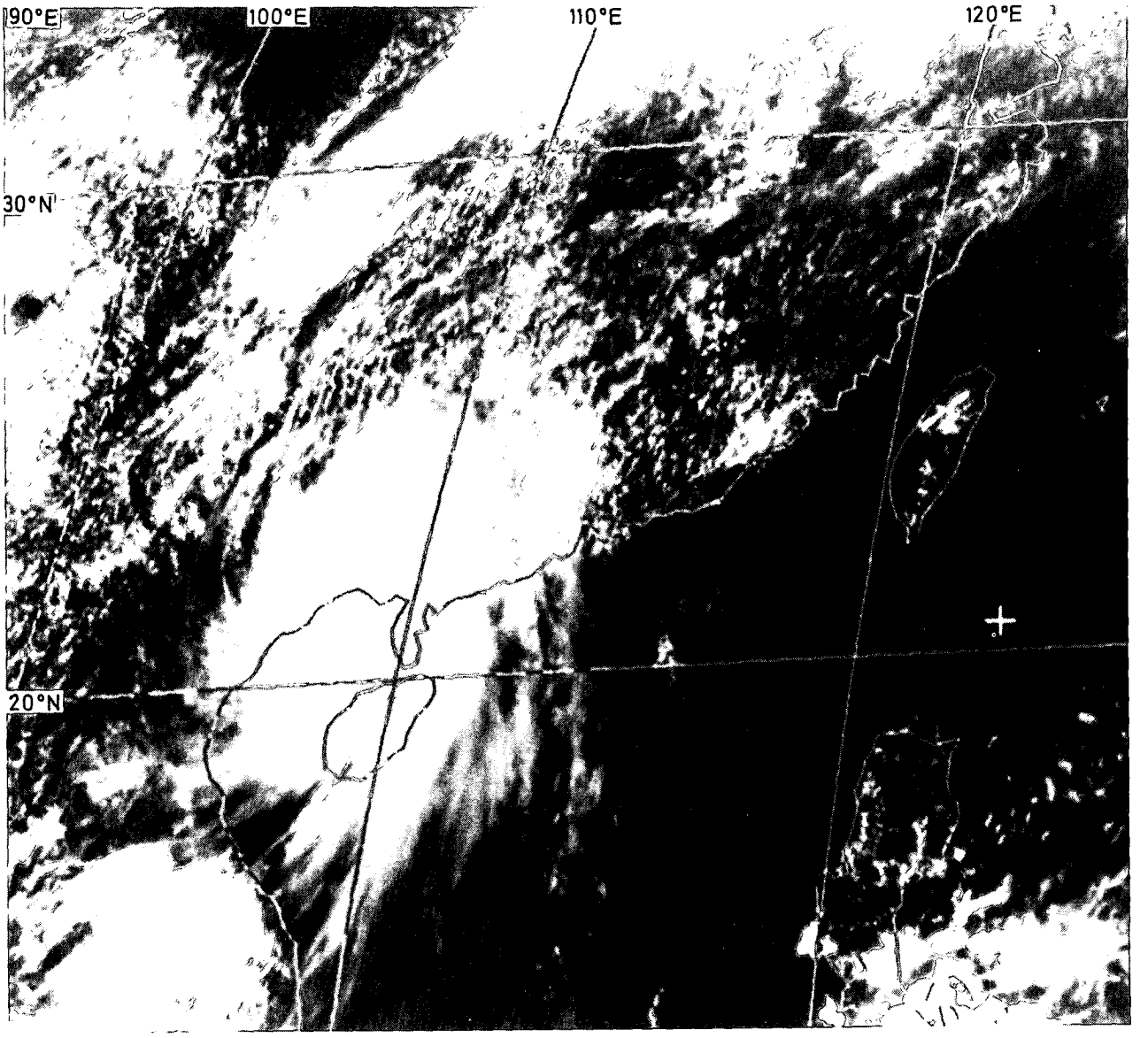

Figure 18. GMS-2 visible imagery of Typhoon Ike (8411) around 2.00 p.m. on 6 September 1984.

4. DESCRIPTION OF TABLES

TABLE 1 is a list of tropical cyclones in 1984 in the western North Pacific and the South China Sea (i.e. in the area bounded by the Equator, 45°N, 100°E and 160°E). The names of these tropical cyclones are those used by the U.S. Naval Oceanography Command Center/Joint Typhoon Warning Centre, Guam. The four-digit numbers in parentheses are numbers assigned to each tropical cyclone of tropical storm intensity or above by the Japan Meteorological Agency. The dates cited cover the period during which the track of each tropical cyclone lay within the above-mentioned region and may not necessarily represent its full life-span. This limitation applies to all other elements in the table.

TABLE 2 gives the number of tropical cyclone warnings for shipping issued by the Royal Observatory, Hong Kong in 1984, the duration of these warnings and the time of issue of the first and last warnings for all tropical cyclones in Hong Kong's area of responsibility (i.e. the area bounded by 10°N, 30°N, 105°E and 125°E). Times are given in hours G.M.T.

TABLE 3 presents a summary of the occasions on which tropical cyclone warning signals were hoisted during 1984. The sequence of the signals displayed and the number of tropical cyclone warning bulletins issued for each tropical cyclone are also given. Times are given in hours and minutes in Hong Kong Time.

TABLE 4 presents a summary of the occasions on which tropical cyclone warning signals were hoisted between 1946 and 1984. Between 1946 and 1955 the Stand By Signal, No. 1, was also used to warn strong winds. A Strong Wind Signal was introduced in 1950 to warn the onset of strong winds which were not expected to reach gale force (the symbol used was a black ball). The figures in the column under the No. 3 Signal for the years between 1950 and 1955 refer to occasions for which Strong Wind Signals were hoisted due to tropical cyclones. The Strong Wind Signal, No. 3, (represented by the symbol ⊥) was introduced in 1956 and the Stand By Signal, No. 1, was redefined the same year. At the same time the black ball symbol was utilized to warn strong or gale monsoon winds and was named the Strong Monsoon Signal. With effect from 1 January 1973 the Gale or Storm Signals 5, 6, 7 and 8 were renumbered as 8 NW, 8 SW, 8 NE and 8 SE respectively.

TABLE 5 gives the annual number of tropical cyclones in Hong Kong's area of responsibility between 1946 and 1984. The annual number of tropical cyclones which caused tropical cyclone warning signals to be raised in Hong Kong is also included.

TABLE 6 shows the maximum, mean and minimum duration of display of each tropical cyclone warning signal during the period 1946–1984.

TABLE 7 presents the casualties and damage figures associated with tropical cyclones in Hong Kong for the period 1937–1984. The information is compiled from local newspaper reports and from the Marine Department's records.

TABLE 8 presents the maximum storm surge (the excess, in metres, of the actual water level over that predicted in the Tide Tables) for each tropical cyclone affecting Hong Kong in 1984. Information on the nearest approach, the maximum winds at the Royal Observatory and Waglan Island, the minimum mean sea-level pressure and the total rainfall recorded at the Royal Observatory are also included together with an estimate of the minimum central pressure of each tropical cyclone during its closest approach.

TABLE 9 presents some meteorological information for those typhoons which required the hoisting of the Hurricane Signal, No. 10, in Hong Kong since 1946. The information presented includes the distances and the bearings of nearest approach, the minimum mean sea-level pressures recorded at the Royal Observatory and the maximum 60-minute mean winds and maximum gust peak speeds recorded at some selected stations in Hong Kong.

TABLE 1. LIST OF TROPICAL CYCLONES IN THE WESTERN NORTH PACIFIC AND THE SOUTH CHINA SEA IN 1984

Name of tropical cyclone		Beginning of track				First day circle Date	Last day circle Date	End of track				Remark
		Date	Time G.M.T.	Position °N	Position °E			Date	Time G.M.T.	Position °N	Position °E	
Tropical Storm Vernon	(8401)	8 Jun	0000	12.4	112.5	8	11	11 Jun	0600	17.4	103.3	dissipated
Severe Tropical Storm Wynne	(8402)	19 Jun	0000	19.6	133.0	19	26	26 Jun	0600	21.6	105.4	dissipated
Typhoon Alex	(8403)	1 Jul	0000	16.1	124.6	1	4	4 Jul	1200	31.2	122.4	became extratropical
Severe Tropical Storm Betty	(8404)	5 Jul	1200	15.0	124.2	6	9	9 Jul	1200	22.4	110.0	dissipated
Typhoon Cary	(8405)	7 Jul	0000	18.0	146.8	7	14	14 Jul	1200	31.0	153.0	became extratropical
Typhoon Dinah	(8406)	24 Jul	0000	21.5	157.2	24	31	31 Jul	0600	35.7	159.6	moved east of 160°E
Typhoon Ed	(8407)	25 Jul	0600	28.8	135.2	26	2	2 Aug	0600	35.0	119.5	dissipated
Severe Tropical Storm Freda	(8408)	4 Aug	0000	11.2	132.6	4	8	8 Aug	0600	29.1	117.4	dissipated
Tropical Depression (I)		11 Aug	0600	17.2	129.7	12	13	13 Aug	0600	22.8	122.1	dissipated
(II)		13 Aug	0600	21.3	121.7	14	15	15 Aug	0000	22.8	119.6	dissipated
Severe Tropical Storm Gerald	(8409)	16 Aug	0000	20.0	118.4	16	21	21 Aug	1200	24.0	115.6	dissipated
Typhoon Holly	(8410)	15 Aug	1800	21.5	133.4	16	22	22 Aug	1200	42.0	138.5	became extratropical
Tropical Depression		24 Aug	0000	19.9	138.4	24	25	25 Aug	0600	25.1	130.6	dissipated
Typhoon Ike	(8411)	27 Aug	0000	10.5	145.0	27	6	6 Sep	1800	25.0	106.2	dissipated
Severe Tropical Storm June	(8412)	27 Aug	0000	17.5	130.8	27	31	31 Aug	1200	24.8	114.0	dissipated
Tropical Depression Lynn	(8414)	24 Sep	0000	18.6	116.0	24	26	26 Sep	0000	19.0	113.3	dissipated
Tropical Storm Nina	(8415)	27 Sep	0000	21.0	141.5	27	1	1 Oct	1200	34.8	156.0	became extratropical
Tropical Storm Maury	(8416)	28 Sep	0000	23.6	152.0	28	1	1 Oct	0600	36.2	153.1	dissipated
Severe Tropical Storm Ogden	(8417)	7 Oct	0000	18.5	152.2	7	9	9 Oct	0600	30.8	159.8	moved east of 160°E
Typhoon Phyllis	(8418)	10 Oct	1200	19.6	151.7	11	14	14 Oct	0000	35.6	153.4	dissipated
Tropical Storm Roy	(8419)	11 Oct	0000	12.7	143.3	11	13	13 Oct	0600	20.0	145.0	dissipated
Tropical Storm Susan	(8420)	11 Oct	1800	11.7	113.1	12	12	12 Oct	1800	12.2	107.0	dissipated
Typhoon Thad	(8421)	19 Oct	0000	11.4	148.3	19	23	23 Oct	1200	34.8	157.9	moved east of 160°E
Typhoon Vanessa	(8422)	22 Oct	1800	9.0	154.5	23	30	30 Oct	1800	36.0	156.0	moved east of 160°E
Severe Tropical Storm Warren	(8423)	23 Oct	0600	11.3	116.2	24	2	2 Nov	0000	13.4	107.0	dissipated
Typhoon Agnes	(8424)	1 Nov	0000	5.3	143.8	1	8	8 Nov	0000	15.2	105.6	dissipated
Typhoon Bill	(8425)	9 Nov	0000	13.8	153.7	9	22	22 Nov	0000	13.6	127.0	dissipated
Typhoon Clara	(8426)	14 Nov	0600	5.5	155.5	15	21	21 Nov	1200	27.3	147.8	became extratropical
Typhoon Doyle	(8427)	5 Dec	0000	8.6	137.5	5	11	11 Dec	0000	23.9	133.5	dissipated

Note : Typhoon Kelly (8413) occurred east of 160° E

TABLE 2. TROPICAL CYCLONE WARNINGS FOR SHIPPING ISSUED IN 1984

Tropical cyclone	No. of warnings issued	Date and time+ of issue of		Duration of warnings (hours)
		First warning	Last warning	
Tropical Storm Vernon	29	7 Jun 1800	11 Jun 0600	84
Severe Tropical Storm Wynne*	29	22 Jun 1800	26 Jun 0600	84
Typhoon Alex	28	1 Jul 0600	4 Jul 1200	78
Severe Tropical Storm Betty*	30	5 Jul 1800	9 Jul 0900	87
Severe Tropical Storm Freda	19	6 Aug 0000	8 Aug 0600	54
Tropical Depression	20	12 Aug 1800	15 Aug 0300	57
Severe Tropical Storm Gerald*	45	16 Aug 0300	21 Aug 1500	132
Typhoon Ike*	37	2 Sep 0600	6 Sep 1800	108
Severe Tropical Storm June*	29	28 Aug 0000	31 Aug 1200	84
Tropical Depression Lynn	9	25 Sep 0300	26 Sep 0300	24
Tropical Storm Susan	7	12 Oct 0300	12 Oct 2100	18
Severe Tropical Storm Warren	82	23 Oct 0600	2 Nov 0300	237
Typhoon Agnes	26	4 Nov 2100	8 Nov 0000	75
Typhoon Bill	22	16 Nov 1500	19 Nov 0600	63
Total	412			1 185

* Tropical cyclones for which tropical cyclone warning signals were hoisted in Hong Kong

+ Times are given in hours G.M.T.

TABLE 3. TROPICAL CYCLONE WARNING SIGNALS HOISTED IN HONG KONG AND NUMBER OF WARNING BULLETINS ISSUED IN 1984

SUMMARY

Signal	No. of occasions	Total duration
1	6	174 h 55 min
3	6	102 h 27 min
8 NORTHWEST	-	-
8 SOUTHWEST	-	-
8 NORTHEAST	1	2 h 40 min
8 SOUTHEAST	-	-
9	-	-
10	-	-
Total	13	280 h 2 min

DETAILS

Tropical cyclone	No. of warning bulletins issued	Signal	Hoisted		Lowered	
			Date	Time*	Date	Time*
Severe Tropical Storm Wynne	20	1	24 Jun	0320	24 Jun	1530
		3	24 Jun	1530	25 Jun	0430
		8 NE	25 Jun	0430	25 Jun	0710
		3	25 Jun	0710	25 Jun	1332
Severe Tropical Storm Betty	26	1	7 Jul	1115	8 Jul	0940
		3	8 Jul	0940	9 Jul	1540
Severe Tropical Storm Gerald	58	1	16 Aug	1545	18 Aug	1615
		3	18 Aug	1615	19 Aug	0730
		1	19 Aug	0730	20 Aug	1400
		3	20 Aug	1400	21 Aug	1600
Severe Tropical Storm June	21	1	29 Aug	1510	31 Aug	0930
Typhoon Ike	15	1	4 Sep	1610	5 Sep	1110
		3	5 Sep	1110	5 Sep	2300

* Hong Kong Time (G.M.T. + 8)

TABLE 4. FREQUENCY AND TOTAL DURATION OF DISPLAY OF TROPICAL CYCLONE WARNING SIGNALS : 1946-1984

Year \ Signals	1*	3*	8 NW+	8 SW+	8 NE+	8 SE+	9	10	Total	Total duration (hours)
1946	7	-	1	0	1	2	1	1	13	154.2
1947	6	-	1	0	1	0	0	0	8	124.2
1948	5	-	1	1	3	2	0	0	12	111.5
1949	4	-	0	0	1	1	1	0	7	67.1
1950	2	3	0	0	1	1	1	0	5	153.8
1951	4	3	0	0	2	3	1	0	10	182.8
1952	2	7	0	0	1	1	0	0	4	212.7
1953	2	4	1	1	2	1	1	0	8	251.2
1954	5	4	0	0	3	2	2	0	12	210.7
1955	0	3	0	0	0	0	0	0	0	100.8
1956	5	4	0	0	0	0	0	0	9	191.4
1957	4	9	1	1	2	2	0	1	20	295.8
1958	4	5	0	0	1	0	0	0	10	214.1
1959	1	1	0	0	0	0	0	0	2	36.6
1960	11	7	0	2	2	2	1	1	26	432.6
1961	6	7	1	2	1	0	1	1	19	192.9
1962	4	3	0	1	1	0	1	1	11	158.2
1963	4	5	0	0	1	0	0	0	10	175.8
1964	11	14	1	3	5	3	3	2	42	570.3
1965	7	6	0	0	1	1	0	0	15	239.7
1966	6	5	0	0	2	2	0	0	15	284.7
1967	8	6	0	0	2	1	0	0	17	339.2
1968	7	7	0	1	1	0	1	1	18	290.2
1969	4	2	0	0	0	0	0	0	6	110.3
1970	6	8	2	1	2	0	0	0	19	286.8
1971	9	10	1	3	2	2	1	1	29	325.4
1972	8	6	0	0	1	1	0	0	16	288.3
1973	8	6	1	1	1	0	1	0	18	416.8
1974	12	10	0	0	2	1	1	0	26	525.3
1975	8	6	1	0	0	1	1	1	18	292.3
1976	6	6	0	0	1	2	0	0	15	351.5
1977	8	6	0	0	1	0	0	0	15	395.2
1978	8	9	1	1	3	2	0	0	24	462.2
1979	5	5	1	0	2	2	1	1	17	281.3
1980	10	8	0	0	1	1	0	0	20	414.1
1981	5	4	0	0	1	1	0	0	11	202.3
1982	7	4	0	0	0	0	0	0	11	247.6
1983	8	7	0	1	2	2	1	1	22	289.7
1984	6	6	0	0	1	0	0	0	13	280.0
Total Δ	196	182	14	19	54	39	20	12	573	10 157.0
Mean Δ	6.8	6.3	0.4	0.5	1.4	1.0	0.5	0.3	14.7	260.4

* Figures in the columns under Signals No. 1 and No. 3 have different meanings prior to 1956 and care is required in interpreting these figures. Reference may be made to paragraph 4 on page 30

\+ Gale or Storm Signals, 5, 6, 7 and 8 were renumbered as 8 NW, 8 SW, 8 NE, 8 SE respectively with effect from 1 January 1973.

Δ The total and annual mean values for the frequency of display of Stand By Signal No. 1 and the Strong Wind Signal No. 3 are calculated for the period 1956-1984. The corresponding values for higher signals and the total duration are calculated for the period 1946-1984.

TABLE 5. NUMBER OF TROPICAL CYCLONES IN HONG KONG'S AREA OF RESPONSIBILITY AND THE NUMBER THAT NECESSITATED THE DISPLAY OF TROPICAL CYCLONE WARNING SIGNALS IN HONG KONG : 1946-1984

Year	Number in Hong Kong's Area of responsibility	Number necessitating the display of signals in Hong Kong
1946	13	6
1947	21	6
1948	15	4
1949	17	4
1950	14	5
1951	13	7
1952	21	9
1953	19	6
1954	18	7
1955	14	3
1956	23	5
1957	12	6
1958	15	5
1959	18	2
1960	18	9
1961	24	6
1962	20	4
1963	13	4
1964	26	10
1965	16	6
1966	17	6
1967	17	8
1968	12	6
1969	11	4
1970	21	6
1971	20	9
1972	15	5
1973	17	9
1974	21	11
1975	12	7
1976	10	5
1977	10	8
1978	20	8
1979	18	6
1980	17	10
1981	15	5
1982	16	5
1983	15	7
1984	14	5
Total	648	244
Mean	16.6	6.3

TABLE 6. DURATION OF DISPLAY OF TROPICAL CYCLONE WARNING SIGNALS IN HONG KONG : 1946 - 1984

Signal	Duration of each occasion			Duration per year		
	Mean	Maximum	Minimum	Mean	Maximum	Minimum
1*	20 h 46 min	124 h 40 min	1 h 20 min	140 h 19 min	273 h 15 min	12 h 40 min
3*	20 29	71 45	1 00	128 32	267 45	23 55
8 NW+	6 39	13 00	1 30	2 23	13 00	0 0
8 SW+	5 15	11 10	2 30	2 33	16 10	0 0
8 NE+	10 41	35 35	2 15	14 47	61 45	0 0
8 SE+	7 41	21 45	0 20	7 41	31 15	0 0
Gale or Storm Signals	16 42	55 17	2 40	27 25	82 25	0 0
9	3 31	6 30	0 25	1 48	11 00	0 0
10	6 03	9 10	2 30	1 52	12 10	0 0

* 1956-1984

+ Gale or Storm Signals, 5, 6, 7, and 8 were renumbered as 8 NW, 8 SW, 8 NE, and 8 SE respectively with effect from 1 January 1973

TABLE 7. CASUALTIES AND DAMAGE CAUSED BY TROPICAL CYCLONES IN HONG KONG : 1937 - 1984

Year	Date	Name of tropical cyclone	Ocean-going vessels in trouble	Small craft sunk or wrecked	Small craft damaged	Persons dead	Persons missing	Persons injured
1937	1 - 2 Sep	Typhoon	28	1 255	600	11 000	*	*
1957	20 - 23 Sep	T. Gloria	5	2	Several	8	*	111
1960	4 - 12 Jun	T. Mary	6	352	462	45	11	127
1961	17 - 21 May	T. Alice	*	*	*	4	0	20
	7 - 10 Sep	S.T.S. Olga	0	1	0	7	0	0
1962	28 Aug - 2 Sep	T. Wanda	36	1 297	756	130	53	*
1963	1 - 9 Sep	T. Faye	0	2	0	3	0	51
1964	26 - 28 May	T. Viola	5	18	18	0	0	41
	2 - 9 Aug	T. Ida	3	7	60	5	4	56
	2 - 6 Sep	T. Ruby	20	32	282	38	6	300
	4 - 10 Sep	T. Sally	0	0	0	9	0	24
	7 - 13 Oct	T. Dot	2	31	59	26	10	85
1965	6 - 16 Jul	T. Freda	0	1	0	2	0	16
	25 - 28 Sep	T.S. Agnes	0	0	0	5	0	3
1966	12 - 14 Jul	S.T.S. Lola	0	*	6	1	0	6
1967	19 - 22 Aug	S.T.S. Kate	3	1	0	0	0	3
1968	17 - 22 Aug	T. Shirley	1	*	3	0	0	4
1969	22 - 29 Jul	T. Viola	0	3	0	0	0	0
1970	1 - 3 Aug	T. D.	0	0	0	2*	0	0
	8 - 14 Sep	T. Georgia	2	0	*	0	0	0
1971	15 - 18 Jun	T. Freda	8	0	0	2	0	30
	16 - 22 Jul	T. Lucy	10	2	13	0	0	38
	10 - 17 Aug	T. Rose	33**	303	*	110	5	286
1972	4 - 9 Nov	T. Pamela	3	0	0	1	0	8
1973	14 - 20 Jul	T. Dot	14	*	*	1	0	38
1974	7 - 14 Jun	T. Dinah	1	*	*	0	0	0
	18 - 22 Jul	T. Ivy	2	*	*	0	0	0
	15 - 19 Oct	T. Carmen	5	*	*	1	0	0
	21 - 27 Oct	T. Della	2	*	*	0	0	0
1975	10 - 14 Aug	T. D.	3	1	*	2	1	0
	9 - 14 Oct	T. Elsie	7	2	1	0	0	46
	16 - 23 Oct	S.T.S. Flossie	1	*	*	0	0	0
1976	22 Jun - 4 Jul	T. Ruby	0	0	0	3	2	2
	21 - 26 Jul	S.T.S. Violet	0	0	0	2	1	1
	5 - 6 Aug	S.T.S. Clara	0	0	0	0	0	4
	21 - 24 Aug	T.S. Ellen	0	4	7	27	3	65
	15 - 21 Sep	T. Iris	6	0	1	0	0	27
1977	4 - 6 Jul	T. D.	0	0	0	0	0	2
	3 - 5 Sep	T.S. Carla	1	0	0	0	0	1
	22 - 25 Sep	S.T.S. Freda	2	0	0	1	0	37
1978	24 - 30 Jul	S.T.S. Agnes	0	25	42	3	0	134
	9 - 12 Aug	T.S. Bonnie	2	0	0	0	0	0
	23 - 28 Aug	S.T.S. Elaine	8	5	8	1	0	51
	22 - 26 Sep	S.T.S. Kit	0	1	0	0	7	0
	7 - 16 Oct	S.T.S. Nina	0	0	0	0	0	2
	17 - 29 Oct	T. Rita	1	5	0	0	0	3
1979	1 - 6 Jul	T. Ellis	0	2	0	0	0	0
	26 - 30 Jul	T.S. Gordon	0	2	0	0	0	0
	28 Jul - 3 Aug	T. Hope	29	167	207	12	0	260
	6 - 9 Aug	T. D.	0	3	0	0	0	0
	16 - 24 Sep	S.T.S. Mac	2	12	0	1	0	67
1980	5 - 12 Jul	S.T.S. Ida	1	0	0	0	0	0
	18 - 23 Jul	T. Joe	4	0	1	2	1	59
	20 - 28 Jul	T. Kim	0	2	1	0	0	0
	29 Oct - 2 Nov	T.S. Cary	0	0	2	0	0	0
1981	3 - 7 Jul	S.T.S. Lynn	0	0	3	0	0	32
1982	27 Jun - 2 Jul	T.S. Tess	0	1	0	0	0	16
	22 - 30 Jul	T. Andy	0	0	1	0	0	0
	5 - 16 Sep	T. Irving	0	0	2	0	0	0
1983	12 - 19 Jul	T. Vera	0	1	0	0	0	0
	29 Aug - 9 Sep	T. Ellen	44	135	225	10	12	333
	10 - 14 Oct	T. Joe	2	0	3	0	0	58
	20 - 26 Oct	S.T.S. Lex	0	0	1	0	0	0
1984	27 Aug - 7 Sep	T. Ike	0	0	0	0	0	1

N.B. Information compiled from Hong Kong newspapers and from Marine Department records

* Data unavailable

+ Struck by lightning

**Note: Number of Ocean-going vessels in trouble is revised on 30 Jul 2021.

TABLE 8. A SUMMARY OF METEOROLOGICAL OBSERVATIONS RECORDED IN HONG KONG DURING THE PASSAGES OF TROPICAL CYCLONES IN 1984

(a)

Name of tropical cyclone	Month	Nearest approach to Hong Kong						Minimum hourly M.S.L. pressure at the Royal Observatory			Maximum storm surge		
		Day	Time*	Direction	Distance	Movement	Estimated minimum central pressure	Day	Time*	Pressure	North Point	Tai Po Kau	Chi Ma Wan
					n miles	kn	mbar			mbar	m	m	m
S.T.S. Wynne	Jun	25	0500	S	70	W 13	980	25	0500	990.6	-	-	0.7
S.T.S. Betty	Jul	9	0200	SW	120	NW 9	980	8	1800	1 001.2	0.5	0.5	0.7
S.T.S. Gerald	Aug	21	0900	SE	25	NE 12	985	21	0700	992.7	0.4	0.6	0.6
S.T.S. June	Aug	31	0930	NE	120	NW 10	988	30	1700	991.4	0.5	0.7	0.6
T. Ike	Sep	5	1600	SW	260	NW 13	955	4	1800	1 009.0	-	0.6	0.2

* Hong Kong Time (G.M.T. + 8)

(b)

Name of tropical cyclone	Month	Maximum 60-min mean wind in points and knots		Maximum 10-min mean wind in points and knots		Maximum gust peak speed in knots with direction in points		Rainfall at the Royal Observatory (mm)				
		Royal Observatory	Waglan Island	Royal Observatory	Waglan Island	Royal Observatory	Waglan Island	(i) 300 n miles	(ii) 24 hours	(iii) 48 hours	(iv) 72 hours	(i)+(iv)
S.T.S. Wynne	Jun	E 25	ENE 48	E 26	ENE 48	ENE 54	ENE 63	56.5	4.5	8.3	18.9	75.4
S.T.S. Betty	Jul	E 23	E 36	E 25	S 44	ESE 45 S 45	S 52	84.2	Nil	Trace	Trace	84.2
S.T.S. Gerald	Aug	E 21	E 40	E 22	E 41	E 44	ENE 49	81.2	Nil	Nil	Nil	81.2
S.T.S. June	Aug	WNW 13	N 26	WNW 15	N 29	NNE 27 N 27	N 33	5.9	75.1	107.5	107.5	113.4
T. Ike	Sep	E 19	ESE 25	E 20	ESE 30	ESE 38	ESE 37	16.2	Nil	Nil	Nil	16.2

N.B. (i) during the period when the tropical cyclone was centred within 300 n miles of Hong Kong
(ii) during the 24-hour period after the tropical cyclone moved outside (or dissipated within) the 300-n mile radius
(iii) during the 48-hour period after the tropical cyclone moved outside (or dissipated within) the 300-n mile radius
(iv) during the 72-hour period after the tropical cyclone moved outside (or dissipated within) the 300-n mile radius

TABLE 9. TYPHOONS WHICH REQUIRED THE HOISTING OF THE HURRICANE SIGNAL NO. 10 DURING THE PERIOD 1946-1984

Name of typhoon	Date	Nearest approach to Royal Observatory n miles	Minimum M.S.L. pressure (mbar)		Maximum 60-min mean winds in points and knots								Maximum gust peak speed in knots with direction in points							
			Hourly	Inst.	Royal Observatory	Hong Kong Airport	Waglan Island	Cheung Chau	Tate's Cairn	Cape Collinson	Green Island	Castle Peak	Royal Observatory	Hong Kong Airport	Waglan Island	Cheung Chau	Tate's Cairn	Cape Collinson	Green Island	Castle Peak
-	18 Jul 1946	S 37	985.7	-	NE -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gloria	22 Sep 1957	SW 30	986.2	984.3	ESE 62	ESE 39	E 61	-	-	-	-	-	E 101	ENE 86	ENE 100	-	-	-	-	-
Mary	9 Jun 1960	WNW 5	974.3	973.8	SSE 52	SSE 50	SSW 60	-	-	-	-	-	SSE 103	SE 88	SSW 105	-	-	-	-	-
Alice	19 May 1961	0	981.6	981.1	ENE 45	E 38	ESE 49	ENE 41	-	-	-	-	E 89	ENE 75	SW 69	ENE 73	-	-	-	-
Wanda	1 Sep 1962	SSW 10	955.1	953.2	N 72	N 58	NW 80	NW 64	SE 102	-	-	-	N 140	N 123	NNW 117	NW 125	ESE 154	-	-	-
Ruby	5 Sep 1964	SW 17	971.0	968.2	E 59	N 64	ENE 80	NE 61	ESE 90	SSE 83	-	-	NNE 122	NW 110	E 124	NNE 117	E 145	S 120	-	-
Dot	13 Oct 1964	E 18	978.9	977.3	NNW 48	N 36	N 63	NNW 52	NNE 85	N 54	-	-	N 94	N 107	N 99	WNW 111	NE 119	NNE 101	-	-
Shirley	21 Aug 1968	0	968.7	968.6	N 37	N 40	NNE 67	SSW 49	NNE 68	SSW 46	-	-	N 72	N 82	NE 113	SSW 90	NNE 110	N 93	-	-
Rose	17 Aug 1971	WSW 11	984.5	982.8	SE 55	SE 66	ESE 76	SE 71	S 80	SSW 74	-	-	ESE 121	ESE 114	ESE 102	SE 105	S 120	S 103	-	-
Elsie	14 Oct 1975	S 27	996.4	996.2	ENE 31	NNW 36	NNE 64	N 57	NE 70	-	NNW 64	N 35	NE 76	N 76	ENE 95	NE 86	NNE 97	-	NE 90	N 65
Hope	2 Aug 1979	NNW 6	961.8	961.6	W 40	W 62	SW 78	SSW 63	NW 62	-	W 58	- 52	W 94	WNW 98	SW 107	WSW 100	WNW 123	-	W 90	- 93
Ellen	9 Sep 1983	SW 24	983.9	983.1	E 50	E 60	ESE 91	ESE 92	E 68	-	S 74	SE 51	E 100	E 110	E 122	SSE 128	ENE 118	-	S 119*	SE 92

* estimated, exceeding upper limit of anemogram.

5. TROPICAL CYCLONE POSITION AND INTENSITY DATA, 1984

Six-hourly position and intensity data are tabulated for the following tropical cyclones in 1984 in the western North Pacific and the South China Sea (i.e. the area between the Equator and 45°N, and between 100°E and 160°E).

Data for Typhoon Kelly (8413) which occurred east of 160°E are not included. Surface winds in this section refer to wind speeds averaged over a period of 10 minutes.

SIX-HOURLY POSITION AND INTENSITY DATA
OF TROPICAL STORM VERNON (8401)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Jun	8	0000	T.D.	1002	30	12.4	112.5
		0600	T.D.	1002	30	12.8	112.4
		1200	T.D.	1000	30	13.2	112.3
		1800	T.D.	998	30	13.6	112.2
	9	0000	T.S.	996	35	13.9	112.1
		0600	T.S.	996	35	14.3	111.9
		1200	T.S.	996	35	14.6	111.6
		1800	T.S.	996	35	14.9	110.9
	10	0000	T.S.	996	35	15.2	110.1
		0600	T.S.	997	35	15.6	109.3
		1200	T.S.	997	35	16.2	108.6
		1800	T.S.	998	35	16.8	107.5
	11	0000	T.D.	1000	30	17.4	105.7
		0600	T.D.	1002	25	17.4	103.3

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA
OF SEVERE TROPICAL STORM WYNNE (8402)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Jun	19	0000	T.D.	1002	25	19.6	133.0
		0600	T.D.	1002	25	20.1	132.3
		1200	T.D.	1000	25	20.6	131.8
		1800	T.D.	999	25	21.1	131.3
	20	0000	T.D.	998	30	21.8	130.8
		0600	T.D.	998	30	22.1	130.3
		1200	T.D.	997	30	22.2	129.8
		1800	T.D.	996	30	22.3	129.1
	21	0000	T.S.	992	35	22.3	128.5
		0600	T.S.	990	35	22.3	128.1
		1200	T.S.	988	35	22.3	127.8
		1800	T.S.	987	40	22.3	127.3
	22	0000	T.S.	987	40	22.3	126.9
		0600	T.S.	986	40	22.3	126.5
		1200	T.S.	988	40	22.2	125.7
		1800	T.S.	987	45	22.1	124.9
	23	0000	T.S.	985	45	22.1	124.0
		0600	S.T.S.	982	50	22.0	123.2
		1200	S.T.S.	982	50	22.0	122.1
		1800	S.T.S.	982	50	21.9	120.6
	24	0000	S.T.S.	980	50	21.6	119.0
		0600	S.T.S.	980	50	21.4	117.4
		1200	S.T.S.	980	50	21.3	116.2
		1800	S.T.S.	980	50	21.2	114.8
	25	0000	S.T.S.	980	50	21.1	113.4
		0600	T.S.	980	45	21.3	112.1
		1200	T.S.	980	45	21.5	110.7
		1800	T.S.	980	45	21.7	108.9
	26	0000	T.S.	985	40	21.6	107.3
		0600	T.D.	990	25	21.6	105.4

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON ALEX (8403)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. ^{o}N	Long. ^{o}E
Jul	1	0000	T.D.	1000	30	16.1	124.6
		0600	T.D.	996	30	16.3	124.4
		1200	T.S.	992	40	16.6	124.2
		1800	T.S.	990	45	16.8	124.0
	2	0000	S.T.S.	985	50	17.2	123.7
		0600	S.T.S.	980	55	18.0	123.2
		1200	S.T.S.	975	55	19.0	122.9
		1800	T.	970	65	20.6	121.9
	3	0000	T.	960	75	21.7	121.6
		0600	T.	965	70	23.3	121.4
		1200	S.T.S.	985	60	24.9	121.2
		1800	S.T.S.	988	55	26.4	121.0
	4	0000	T.S.	990	45	28.0	121.0
		0600	T.S.	996	35	29.2	121.4
		1200	T.D.	1000	30	31.2	122.4

Became extratropical

SIX-HOURLY POSITION AND INTENSITY DATA
OF SEVERE TROPICAL STORM BETTY (8404)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Jul	5	1200	T.D.	1003	25	15.0	124.2
		1800	T.D.	1003	25	15.3	122.9
	6	0000	T.D.	1002	25	15.5	121.6
		0600	T.D.	1000	30	16.0	119.7
		1200	T.D.	1000	30	16.5	119.0
		1800	T.D.	1000	30	16.8	118.5
	7	0000	T.D.	998	30	17.1	118.0
		0600	T.D.	998	30	17.5	117.4
		1200	T.S.	995	35	18.0	116.7
		1800	T.S.	992	40	18.5	116.0
	8	0000	T.S.	990	45	19.0	115.4
		0600	S.T.S.	985	50	19.5	114.7
		1200	S.T.S.	980	55	20.1	113.9
		1800	S.T.S.	980	55	20.7	113.0
	9	0000	S.T.S.	980	55	21.2	112.2
		0600	S.T.S.	985	50	21.9	111.3
		1200	T.D.	995	25	22.4	110.0

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA
OF TYPHOON CARY (8405)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Jul	7	0000	T.D.	1004	25	18.0	146.8
		0600	T.D.	1002	25	18.5	146.5
		1200	T.D.	998	30	19.1	146.2
		1800	T.S.	996	35	19.5	146.1
	8	0000	T.S.	991	40	20.0	146.0
		0600	T.S.	990	45	20.5	145.9
		1200	T.S.	990	45	21.1	145.8
		1800	T.S.	988	45	21.5	145.6
	9	0000	S.T.S.	985	50	21.8	145.1
		0600	S.T.S.	980	55	21.8	144.8
		1200	T.	975	65	21.8	144.7
		1800	T.	965	75	21.8	144.6
	10	0000	T.	955	80	21.9	144.5
		0600	T.	960	75	22.0	144.5
		1200	T.	970	70	22.1	144.6
		1800	T.	970	65	22.6	145.0
	11	0000	S.T.S.	975	60	23.1	145.5
		0600	S.T.S.	975	60	23.8	146.1
		1200	S.T.S.	975	60	24.4	146.8
		1800	S.T.S.	975	60	25.1	147.5
	12	0000	S.T.S.	975	60	25.6	148.1
		0600	T.	970	65	26.2	148.9
		1200	T.	970	65	27.0	149.8
		1800	T.	965	70	27.6	150.6
	13	0000	T.	965	70	28.3	151.3
		0600	T.	965	70	28.9	151.8
		1200	T.	970	65	29.6	152.2
		1800	S.T.S.	975	60	30.1	152.6
	14	0000	S.T.S.	980	50	30.4	152.8
		0600	T.S.	980	40	30.7	152.9
		1200	T.S.	985	40	31.0	153.0

Became extratropical

SIX-HOURLY POSITION AND INTENSITY DATA
OF TYPHOON DINAH (8406)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Jul	24	0000	T.D.	1000	25	21.5	157.2
		0600	T.D.	999	30	21.9	156.5
		1200	T.S.	995	35	21.8	155.5
		1800	T.S.	992	40	21.3	154.7
	25	0000	T.S.	992	45	20.8	153.9
		0600	S.T.S.	987	50	20.3	153.1
		1200	S.T.S.	985	50	19.8	152.4
		1800	S.T.S.	982	55	19.5	151.9
	26	0000	S.T.S.	975	60	19.5	151.3
		0600	T.	965	70	19.7	150.9
		1200	T.	960	75	19.9	150.5
		1800	T.	955	80	20.1	150.3
	27	0000	T.	955	80	20.2	150.2
		0600	T.	960	75	20.5	150.3
		1200	T.	965	70	20.7	150.7
		1800	T.	965	70	20.9	151.0
	28	0000	T.	960	80	21.0	151.4
		0600	T.	940	90	21.1	152.0
		1200	T.	915	110	21.4	152.6
		1800	T.	915	110	22.0	153.3
	29	0000	T.	915	110	22.8	153.7
		0600	T.	925	100	24.0	154.2
		1200	T.	935	95	25.2	154.5
		1800	T.	940	90	26.7	154.7
	30	0000	T.	945	90	28.2	155.1
		0600	T.	950	85	29.8	155.5
		1200	T.	960	75	31.4	156.1
		1800	T.	960	70	32.9	156.9
	31	0000	S.T.S.	970	60	34.4	158.0
		0600	S.T.S.	970	60	35.7	159.6

Moved east of 160°E

SIX-HOURLY POSITION AND INTENSITY DATA
OF TYPHOON ED (8407)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Jul	25	0600	T.D.	998	30	28.8	135.2
		1200	T.S.	998	35	27.7	135.5
		1800	T.S.	990	40	26.7	136.2
	26	0000	T.S.	985	45	26.0	137.5
		0600	T.S.	988	45	25.7	138.8
		1200	T.S.	986	45	25.5	140.3
		1800	T.S.	984	45	26.1	140.8
	27	0000	S.T.S.	982	50	27.0	140.7
		0600	S.T.S.	980	50	27.7	140.3
		1200	S.T.S.	975	55	28.3	139.5
		1800	S.T.S.	975	55	28.6	138.8
	28	0000	S.T.S.	975	55	28.9	137.9
		0600	S.T.S.	970	60	29.3	136.7
		1200	S.T.S.	970	60	29.6	135.4
		1800	T.	960	70	29.8	134.2
	29	0000	T.	955	80	29.8	133.0
		0600	T.	950	85	29.7	131.8
		1200	T.	945	90	29.8	130.8
		1800	T.	945	90	30.0	129.6
	30	0000	T.	955	80	30.5	128.3
		0600	T.	960	80	31.0	126.8
		1200	T.	965	75	31.3	125.1
		1800	T.	975	70	31.5	123.8
	31	0000	S.T.S.	980	60	31.8	122.7
		0600	S.T.S.	980	55	32.1	122.0
		1200	S.T.S.	985	50	32.5	121.4
		1800	T.S.	991	40	32.9	120.9
Aug	1	0000	T.S.	992	35	33.4	120.4
		0600	T.S.	994	35	33.6	120.2
		1200	T.S.	995	35	33.8	120.1
		1800	T.D.	996	30	34.1	119.9
	2	0000	T.D.	996	30	34.5	119.7
		0600	T.D.	998	25	35.0	119.5

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA
OF SEVERE TROPICAL STORM FREDA (8408)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Aug	4	0000	T.D.	1004	25	11.2	132.6
		0600	T.D.	1002	25	12.0	132.0
		1200	T.D.	1002	25	13.0	131.3
		1800	T.D.	1002	25	14.0	130.6
	5	0000	T.D.	1002	25	15.0	129.7
		0600	T.D.	998	30	15.9	128.7
		1200	T.D.	998	30	16.7	127.7
		1800	T.D.	998	30	17.6	126.7
	6	0000	T.S.	995	35	18.6	126.0
		0600	T.S.	991	40	20.0	125.3
		1200	T.S.	987	45	21.7	124.8
		1800	T.S.	985	45	23.7	124.5
	7	0000	S.T.S.	984	50	24.6	123.0
		0600	S.T.S.	983	50	24.9	121.7
		1200	T.S.	985	45	25.5	120.7
		1800	T.S.	989	45	26.5	119.8
	8	0000	T.S.	992	35	27.7	118.7
		0600	T.D.	996	25	29.1	117.4

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF THE TROPICAL DEPRESSIONS OF 11 - 15 AUGUST 1984

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
(I)							
August	11	0600	T.D.	1002	25	17.2	129.7
		1200	T.D.	1002	25	17.8	128.8
		1800	T.D.	1002	25	18.5	128.1
	12	0000	T.D.	1002	25	19.4	127.3
		0600	T.D.	1000	25	20.2	126.4
		1200	T.D.	1000	25	21.0	125.4
		1800	T.D.	998	30	21.8	124.2
	13	0000	T.D.	996	30	22.5	122.9
		0600	T.D.	996	30	22.8	122.1
				Dissipated			
(II)							
August	13	0600	T.D.	996	30	21.3	121.7
		1200	T.D.	996	30	21.3	121.5
		1800	T.D.	996	30	21.3	121.4
	14	0000	T.D.	996	30	21.3	121.1
		0600	T.D.	996	25	21.3	120.7
		1200	T.D.	996	25	21.7	120.2
		1800	T.D.	996	25	22.2	119.8
	15	0000	T.D.	998	25	22.8	119.6
				Dissipated			

SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TROPICAL STORM GERALD (8409)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Aug	16	0000	T.D.	997	30	20.0	118.4
		0600	T.D.	995	30	19.7	118.1
		1200	T.S.	990	35	19.4	117.7
		1800	T.S.	984	40	19.1	117.3
	17	0000	T.S.	980	45	18.8	116.9
		0600	T.S.	980	45	18.6	116.4
		1200	T.S.	980	45	18.4	115.8
		1800	T.S.	980	45	18.3	115.2
	18	0000	T.S.	980	45	18.4	114.7
		0600	S.T.S.	980	50	18.5	114.3
		1200	S.T.S.	980	50	18.7	113.7
		1800	S.T.S.	980	50	18.7	113.3
	19	0000	S.T.S.	975	55	18.7	112.8
		0600	S.T.S.	975	55	18.6	112.4
		1200	S.T.S.	975	55	18.7	112.1
		1800	S.T.S.	975	50	18.9	112.0
	20	0000	S.T.S.	980	50	19.3	112.2
		0600	S.T.S.	982	50	20.0	112.8
		1200	S.T.S.	983	50	20.7	113.4
		1800	S.T.S.	984	50	21.3	113.9
	21	0000	T.S.	985	45	21.9	114.4
		0600	T.S.	990	35	22.9	115.1
		1200	T.D.	996	25	24.0	115.6

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA
OF TYPHOON HOLLY (8410)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Aug	15	1800	T.D.	997	30	21.5	133.4
	16	0000	T.S.	994	35	22.0	132.9
		0600	T.S.	990	40	22.3	132.2
		1200	T.S.	986	45	22.5	131.5
		1800	S.T.S.	985	50	22.7	130.7
	17	0000	S.T.S.	982	55	22.9	130.0
		0600	S.T.S.	980	60	23.0	129.3
		1200	T.	975	65	23.1	128.6
		1800	T.	970	65	23.4	128.2
	18	0000	T.	970	65	23.8	127.8
		0600	T.	970	65	24.3	127.4
		1200	T.	975	65	24.9	127.1
		1800	T.	970	65	25.6	126.7
	19	0000	T.	965	65	26.3	126.4
		0600	T.	965	70	26.9	126.3
		1200	T.	965	70	27.7	126.2
		1800	T.	965	70	28.6	126.1
	20	0000	T.	965	70	29.5	126.2
		0600	T.	965	70	30.3	126.3
		1200	T.	965	70	31.1	126.5
		1800	T.	970	65	32.0	126.9
	21	0000	T.	975	65	33.1	127.7
		0600	S.T.S.	980	60	34.1	128.9
		1200	S.T.S.	980	55	35.2	130.6
		1800	S.T.S.	980	50	36.7	132.8
	22	0000	T.S.	980	45	38.5	135.0
		0600	T.S.	980	45	40.3	136.7
		1200	T.S.	985	40	42.0	138.5

Became extratropical

SIX-HOURLY POSITION AND INTENSITY DATA OF THE TROPICAL DEPRESSION OF 24 - 25 AUGUST 1984

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Aug	24	0000	T.D.	999	25	19.9	138.4
		0600	T.D.	995	30	20.9	137.3
		1200	T.D.	995	30	21.9	135.9
		1800	T.D.	996	30	23.0	134.2
	25	0000	T.D.	998	25	24.1	132.5
		0600	T.D.	1000	25	25.1	130.6

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON IKE (8411)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Aug	27	0000	T.D.	1000	25	10.5	145.0
		0600	T.D.	999	30	11.2	144.4
		1200	T.S.	998	35	11.9	143.8
		1800	T.S.	998	35	12.5	143.2
	28	0000	T.S.	997	40	13.1	142.4
		0600	T.S.	996	40	13.2	141.8
		1200	T.S.	994	45	13.0	141.1
		1800	T.S.	992	45	12.7	140.6
	29	0000	S.T.S.	991	50	12.4	140.0
		0600	S.T.S.	990	50	12.1	139.5
		1200	S.T.S.	989	50	11.8	139.1
		1800	S.T.S.	988	50	11.4	138.5
	30	0000	S.T.S.	987	50	11.1	137.9
		0600	S.T.S.	983	55	10.8	137.2
		1200	S.T.S.	980	60	10.5	136.3
		1800	T.	975	65	10.4	135.4
	31	0000	T.	970	70	10.2	134.5
		0600	T.	965	75	10.1	133.3
		1200	T.	960	80	10.0	132.0
		1800	T.	955	90	9.8	130.7
Sep	1	0000	T.	950	100	9.6	129.4
		0600	T.	945	115	9.5	128.0
		1200	T.	950	115	9.5	127.0
		1800	T.	955	110	9.7	125.6
	2	0000	T.	960	100	10.0	124.3
		0600	T.	965	80	10.2	123.2
		1200	T.	970	65	10.7	122.1
		1800	S.T.S.	985	55	11.3	121.1
	3	0000	S.T.S.	982	55	12.0	120.3
		0600	S.T.S.	981	55	12.9	119.3
		1200	S.T.S.	980	60	13.8	118.4
		1800	T.	970	65	14.5	117.5
	4	0000	T.	970	70	15.2	116.6
		0600	T.	970	75	16.0	115.5
		1200	T.	960	80	16.7	114.4
		1800	T.	950	90	17.5	113.2
	5	0000	T.	950	90	18.3	112.1
		0600	T.	955	80	19.2	111.1
		1200	S.T.S.	970	60	20.1	110.2
		1800	S.T.S.	970	60	20.9	109.5
	6	0000	S.T.S.	975	55	21.7	108.7
		0600	T.S.	993	40	22.5	108.0
		1200	T.D.	1000	25	23.7	107.1
		1800	T.D.	1003	25	25.0	106.2

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA
OF SEVERE TROPICAL STORM JUNE (8412)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Aug	27	0000	T.D.	994	25	17.5	130.8
		0600	T.D.	993	30	17.5	129.8
		1200	T.D.	992	30	17.5	128.1
		1800	T.S.	991	35	17.5	126.4
	28	0000	T.S.	990	40	17.6	124.9
		0600	T.S.	986	45	17.8	123.9
		1200	S.T.S.	980	50	17.9	123.2
		1800	S.T.S.	980	50	18.2	122.4
	29	0000	S.T.S.	981	50	18.6	121.5
		0600	T.S.	982	45	19.2	120.5
		1200	T.S.	982	45	19.7	119.7
		1800	T.S.	983	45	20.2	118.9
	30	0000	T.S.	983	45	20.7	118.1
		0600	T.S.	983	45	21.2	117.5
		1200	T.S.	984	40	21.9	117.2
		1800	T.S.	985	40	22.9	116.7
	31	0000	T.S.	988	35	23.7	115.7
		0600	T.D.	992	30	24.3	114.9
		1200	T.D.	994	25	24.8	114.0

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF
TROPICAL DEPRESSION LYNN (8414)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
September	24	0000	T.D.	1000	25	18.6	116.0
		0600	T.D.	1000	30	18.7	115.4
		1200	T.D.	1000	30	18.8	114.9
		1800	T.D.	999	30	18.8	114.6
	25	0000	T.D.	998	30	18.9	114.3
		0600	T.D.	998	30	18.9	114.1
		1200	T.D.	999	30	18.9	113.8
		1800	T.D.	1000	30	19.0	113.5
	26	0000	T.D.	1000	30	19.0	113.3

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM NINA (8415)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Sep	27	0000	T.D.	1004	25	21.0	141.5
		0600	T.D.	1000	30	21.8	141.3
		1200	T.D.	998	30	22.6	141.1
		1800	T.S.	996	35	23.3	141.0
	28	0000	T.S.	994	35	23.9	140.9
		0600	T.S.	990	40	24.4	140.8
		1200	T.S.	990	40	24.8	140.7
		1800	T.S.	992	40	25.3	140.7
	29	0000	T.S.	994	40	25.7	140.7
		0600	T.S.	994	40	26.1	140.7
		1200	T.S.	994	40	26.5	140.9
		1800	T.S.	994	40	27.0	141.2
	30	0000	T.S.	994	40	27.6	141.8
		0600	T.S.	994	40	28.5	142.8
		1200	T.S.	994	40	29.5	144.3
		1800	T.S.	992	40	31.2	147.0
Oct	1	0000	T.S.	990	45	32.5	149.8
		0600	T.S.	990	45	33.8	152.8
		1200	T.S.	990	45	34.8	156.0

Became extratropical

SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM MAURY (8416)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Sep	28	0000	T.D.	998	30	23.6	152.0
		0600	T.S.	996	40	23.7	151.7
		1200	T.S.	995	45	23.9	151.4
		1800	T.S.	995	45	24.1	151.1
	29	0000	T.S.	995	45	24.3	150.8
		0600	T.S.	995	45	24.7	150.5
		1200	T.S.	996	45	25.4	150.1
		1800	T.S.	997	40	26.6	149.8
	30	0000	T.S.	997	40	28.1	149.6
		0600	T.S.	996	40	30.7	149.2
		1200	T.S.	996	40	33.2	149.0
		1800	T.S.	991	45	34.5	149.6
Oct	1	0000	T.S.	990	45	35.6	151.2
		0600	T.S.	994	45	36.2	153.1

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TROPICAL STORM OGDEN (8417)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Oct	7	0000	T.D.	999	25	18.5	152.2
		0600	T.D.	999	25	19.5	152.3
		1200	T.D.	999	30	21.1	152.5
		1800	T.S.	996	35	22.6	153.0
	8	0000	T.S.	993	40	24.0	153.7
		0600	T.S.	986	45	25.5	154.7
		1200	T.S.	985	45	26.8	155.8
		1800	S.T.S.	984	50	28.2	157.0
	9	0000	S.T.S.	982	55	29.5	158.2
		0600	S.T.S.	980	55	30.8	159.8

Moved east of 160°E

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON PHYLLIS (8418)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Oct	10	1200	T.D.	1000	25	19.6	151.7
		1800	T.D.	998	25	19.7	152.0
	11	0000	T.D.	992	30	19.7	152.3
		0600	T.S.	988	40	20.1	152.4
		1200	T.S.	987	45	20.7	152.1
		1800	S.T.S.	986	50	21.4	151.7
	12	0000	S.T.S.	982	60	22.2	151.3
		0600	T.	975	75	23.0	151.2
		1200	T.	975	75	23.9	151.1
		1800	T.	982	70	24.9	151.2
	13	0000	T.	988	65	26.1	151.2
		0600	S.T.S.	996	55	27.6	151.3
		1200	T.S.	997	45	29.4	151.5
		1800	T.S.	998	40	32.1	151.8
	14	0000	T.D.	1000	30	35.6	153.4

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM ROY (8419)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Oct	11	0000	T.D.	1000	25	12.7	143.3
		0600	T.D.	999	30	13.7	143.1
		1200	T.S.	999	35	14.4	143.1
		1800	T.S.	998	35	14.9	143.1
	12	0000	T.D.	997	30	15.3	143.3
		0600	T.D.	996	30	16.3	143.5
		1200	T.D.	998	30	17.3	143.8
		1800	T.D.	998	30	18.1	144.1
	13	0000	T.D.	1000	25	19.0	144.5
		0600	T.D.	1000	25	20.0	145.0

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM SUSAN (8420)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Oct	11	1800	T.D.	1000	30	11.7	113.1
	12	0000	T.S.	996	35	12.6	111.8
		0600	T.S.	994	35	12.7	110.4
		1200	T.D.	997	30	12.2	108.9
		1800	T.D.	1000	25	12.2	107.0

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON THAD (8421)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Oct	19	0000	T.D.	1000	25	11.4	148.3
		0600	T.D.	992	30	13.0	147.9
		1200	T.S.	987	40	14.2	147.4
		1800	T.S.	984	45	15.4	146.8
	20	0000	S.T.S.	980	55	16.7	146.2
		0600	S.T.S.	975	60	17.7	145.7
		1200	T.	970	70	18.8	145.2
		1800	T.	960	75	20.2	144.5
	21	0000	T.	950	80	21.8	143.9
		0600	T.	940	85	22.7	143.7
		1200	T.	940	90	23.6	143.7
		1800	T.	935	95	24.8	144.1
	22	0000	T.	935	100	26.1	145.2
		0600	T.	925	105	27.3	146.8
		1200	T.	950	85	28.5	148.8
		1800	T.	965	75	29.7	150.8
	23	0000	T.	980	70	31.5	153.0
		0600	T.	980	65	33.2	155.2
		1200	S.T.S.	985	60	34.8	157.9

Moved east of 160°E

SIX-HOURLY POSITION AND INTENSITY DATA
OF TYPHOON VANESSA (8422)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Oct	22	1800	T.D.	1002	25	9.0	154.5
	23	0000	T.D.	1000	25	9.3	153.3
		0600	T.D.	997	30	9.7	152.0
		1200	T.S.	993	40	10.0	150.6
		1800	T.S.	989	45	10.3	149.2
	24	0000	S.T.S.	985	55	10.7	147.6
		0600	T.	985	65	11.2	145.9
		1200	T.	980	70	11.7	144.1
		1800	T.	970	80	12.1	142.3
	25	0000	T.	955	90	12.6	140.5
		0600	T.	935	100	13.3	138.8
		1200	T.	910	120	14.2	137.2
		1800	T.	900	120	15.0	135.6
	26	0000	T.	890	130	15.4	134.1
		0600	T.	885	130	15.7	132.8
		1200	T.	879	130	16.0	131.8
		1800	T.	885	130	16.4	131.1
	27	0000	T.	895	130	17.2	130.4
		0600	T.	900	120	18.0	129.8
		1200	T.	905	120	18.7	129.3
		1800	T.	910	115	19.6	129.2
	28	0000	T.	915	110	20.4	129.4
		0600	T.	920	105	21.3	130.2
		1200	T.	930	100	22.3	131.2
		1800	T.	925	100	23.1	132.5
	29	0000	T.	925	100	23.5	134.2
		0600	T.	930	100	24.0	136.1
		1200	T.	940	90	25.1	138.0
		1800	T.	950	85	26.3	140.0
	30	0000	T.	960	80	28.3	142.9
		0600	T.	970	75	30.6	146.8
		1200	T.	975	70	32.9	151.0
		1800	T.	965	70	36.0	156.0

Moved east of 160°E

SIX-HOURLY POSITION AND INTENSITY DATA
OF SEVERE TROPICAL STORM WARREN (8423)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Oct	23	0600	T.D.	1002	30	11.3	116.2
		1200	T.D.	1002	30	11.7	116.2
		1800	T.D.	1000	30	12.2	116.1
	24	0000	T.D.	996	30	12.7	116.0
		0600	T.S.	993	35	13.5	115.9
		1200	T.S.	990	40	14.2	115.7
		1800	T.S.	988	40	14.6	115.9
	25	0000	T.S.	985	45	14.9	116.3
		0600	S.T.S.	984	50	14.8	115.8
		1200	S.T.S.	983	55	14.7	115.6
		1800	S.T.S.	982	55	14.6	115.3
	26	0000	S.T.S.	980	55	14.5	115.1
		0600	S.T.S.	982	55	14.5	114.9
		1200	S.T.S.	984	55	14.6	114.6
		1800	S.T.S.	985	55	14.8	114.5
	27	0000	S.T.S.	984	60	15.1	114.7
		0600	S.T.S.	982	60	15.4	115.2
		1200	S.T.S.	980	60	15.5	115.9
		1800	S.T.S.	975	60	15.4	116.5
	28	0000	S.T.S.	975	60	15.5	117.2
		0600	S.T.S.	975	60	15.6	117.8
		1200	S.T.S.	975	60	15.7	118.1
		1800	S.T.S.	980	55	15.8	118.5
	29	0000	S.T.S.	984	55	15.8	118.2
		0600	S.T.S.	985	55	15.6	117.8
		1200	S.T.S.	985	55	15.5	117.3
		1800	S.T.S.	988	55	15.5	117.0
	30	0000	S.T.S.	994	50	15.5	116.6
		0600	S.T.S.	994	50	15.4	116.0
		1200	T.S.	995	45	15.3	115.3
		1800	T.S.	995	45	15.1	114.8
	31	0000	T.S.	995	45	15.0	114.1
		0600	T.S.	996	40	14.6	113.2
		1200	T.S.	996	35	14.0	112.6
		1800	T.D.	997	30	13.6	112.0
Nov	1	0000	T.D.	998	30	13.5	111.6
		0600	T.D.	1000	30	13.5	111.2
		1200	T.D.	1002	30	13.5	110.3
		1800	T.D.	1004	25	13.5	108.7
	2	0000	T.D.	1004	25	13.4	107.0

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA
OF TYPHOON AGNES (8424)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Nov	1	0000	T.D.	998	25	5.3	143.8
		0600	T.D.	996	25	6.0	142.8
		1200	T.D.	994	30	6.7	141.7
		1800	T.S.	992	35	7.3	140.5
	2	0000	T.S.	992	40	7.8	139.4
		0600	S.T.S.	988	50	8.2	138.3
		1200	S.T.S.	985	55	8.5	137.3
		1800	T.	981	65	8.8	136.4
	3	0000	T.	975	80	9.1	135.1
		0600	T.	955	85	9.3	133.9
		1200	T.	945	90	9.6	132.6
		1800	T.	940	95	9.7	131.5
	4	0000	T.	925	100	10.0	130.2
		0600	T.	925	100	10.4	128.8
		1200	T.	925	100	10.8	127.4
		1800	T.	930	100	11.2	125.7
	5	0000	T.	950	90	11.5	124.0
		0600	T.	975	80	11.6	122.5
		1200	T.	980	70	11.7	120.9
		1800	T.	975	75	11.9	119.2
	6	0000	T.	970	80	12.2	117.5
		0600	T.	970	80	12.5	115.8
		1200	T.	965	85	13.0	114.0
		1800	T.	965	85	13.4	112.6
	7	0000	T.	960	90	13.7	111.3
		0600	T.	965	90	13.9	110.2
		1200	T.	985	70	14.2	109.0
		1800	T.S.	995	45	14.4	107.8
	8	0000	T.D.	998	30	15.2	105.6

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA
OF TYPHOON BILL (8425)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Nov	9	0000	T.D.	999	30	13.8	153.7
		0600	T.S.	998	35	13.9	153.8
		1200	T.S.	996	35	14.0	153.9
		1800	T.S.	992	40	14.1	153.9
	10	0000	T.S.	990	40	14.2	153.8
		0600	T.S.	993	45	14.3	153.7
		1200	S.T.S.	994	50	14.4	153.4
		1800	S.T.S.	995	50	14.4	153.2
	11	0000	S.T.S.	986	55	14.4	152.9
		0600	S.T.S.	991	55	14.3	152.2
		1200	S.T.S.	992	55	14.0	151.3
		1800	S.T.S.	992	55	13.7	150.3
	12	0000	S.T.S.	990	55	13.3	149.1
		0600	S.T.S.	985	60	13.1	147.7
		1200	T.	980	65	12.9	146.0
		1800	T.	970	70	12.8	144.1
	13	0000	T.	970	75	12.7	142.2
		0600	T.	965	80	12.7	140.3
		1200	T.	960	90	12.6	138.5
		1800	T.	945	100	12.6	136.8
	14	0000	T.	930	110	12.8	135.3
		0600	T.	920	115	13.1	133.9
		1200	T.	910	120	13.6	132.4
		1800	T.	910	120	14.3	131.0
	15	0000	T.	920	115	15.0	130.0
		0600	T.	930	110	15.8	128.8
		1200	T.	940	100	16.5	127.9
		1800	T.	935	100	17.0	127.2
	16	0000	T.	940	100	17.3	126.5
		0600	T.	945	95	17.5	125.8
		1200	T.	950	90	17.5	125.1
		1800	T.	950	90	17.7	124.3
	17	0000	T.	950	95	18.1	123.7
		0600	T.	935	100	18.8	123.0
		1200	T.	940	100	19.4	122.8
		1800	T.	945	95	19.8	122.6
	18	0000	T.	955	85	20.3	122.7
		0600	T.	960	75	20.6	122.9
		1200	T.	970	70	20.6	123.3
		1800	T.	980	65	20.3	123.7
	19	0000	S.T.S.	990	50	19.3	123.7
		0600	T.D.	993	30	18.0	124.3
		1200	T.D.	997	25	16.8	125.6
		1800	T.D.	998	25	16.3	126.4
	20	0000	T.S.	1000	40	15.7	127.3
		0600	T.S.	1000	40	15.4	127.9
		1200	T.S.	1001	40	15.0	128.5
		1800	T.S.	1002	40	14.7	129.0
	21	0000	T.S.	1002	35	14.3	129.1
		0600	T.S.	1002	35	14.0	128.8
		1200	T.D.	1002	30	14.0	128.1
		1800	T.D.	1002	25	13.9	127.5
	22	0000	T.D.	1002	25	13.6	127.0

Dissipated

SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON CLARA (8426)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Nov	14	0600	T.D.	1003	25	5.5	155.5
		1200	T.D.	1003	30	6.1	154.1
		1800	T.S.	1002	35	6.6	153.1
	15	0000	T.S.	1002	35	7.1	152.0
		0600	T.S.	1000	40	7.8	150.4
		1200	T.S.	996	40	8.3	148.8
		1800	T.S.	993	45	8.7	147.4
	16	0000	S.T.S.	990	50	9.1	145.9
		0600	S.T.S.	989	50	9.5	144.4
		1200	S.T.S.	986	55	9.9	142.8
		1800	S.T.S.	980	55	10.1	141.6
	17	0000	S.T.S.	975	60	10.5	140.4
		0600	T.	965	65	10.9	138.6
		1200	T.	960	75	11.4	137.2
		1800	T.	955	85	11.9	135.9
	18	0000	T.	960	85	12.5	134.6
		0600	T.	960	85	13.2	133.6
		1200	T.	955	85	14.0	133.0
		1800	T.	960	90	14.7	132.6
	19	0000	T.	960	90	15.7	132.3
		0600	T.	950	90	17.2	132.3
		1200	T.	945	90	18.8	132.4
		1800	T.	940	95	19.9	132.6
	20	0000	T.	945	95	20.8	133.1
		0600	T.	950	90	22.1	134.5
		1200	T.	960	85	23.6	136.0
		1800	T.	965	80	24.8	137.8
	21	0000	T.	975	70	25.8	140.5
		0600	S.T.S.	980	55	26.6	143.8
		1200	T.S.	988	40	27.3	147.8

Became extratropical

SIX-HOURLY POSITION AND INTENSITY DATA
OF TYPHOON DOYLE (8427)

Month	Day	Time G.M.T.	Intensity	Estimated minimum central pressure (mbar)	Estimated maximum surface wind (knots)	Lat. °N	Long. °E
Dec	5	0000	T.D.	995	30	8.6	137.5
		0600	T.S.	992	35	9.1	136.7
		1200	T.S.	988	35	9.7	135.8
		1800	T.S.	985	40	10.3	135.0
	6	0000	T.S.	986	40	11.0	134.4
		0600	T.S.	988	40	11.6	134.0
		1200	T.S.	990	40	12.1	133.7
		1800	T.S.	981	45	12.8	133.4
	7	0000	S.T.S.	970	60	13.6	133.2
		0600	T.	960	70	14.3	132.9
		1200	T.	950	85	15.0	132.5
		1800	T.	940	95	15.5	132.1
	8	0000	T.	940	100	15.8	131.8
		0600	T.	940	105	16.1	131.5
		1200	T.	940	105	16.5	131.1
		1800	T.	945	100	17.0	130.7
	9	0000	T.	950	95	17.5	130.4
		0600	T.	965	85	18.2	130.0
		1200	T.	987	70	18.9	129.9
		1800	S.T.S.	991	55	19.4	130.0
	10	0000	T.S.	993	45	20.0	130.1
		0600	T.S.	993	40	20.9	130.6
		1200	T.S.	997	35	21.7	131.2
		1800	T.D.	1000	30	22.7	132.1
	11	0000	T.D.	1003	25	23.9	133.5

Dissipated