

551.515.2:551.506.1 (512.317)

ROYAL OBSERVATORY, HONG KONG

---

**METEOROLOGICAL RESULTS**  
**1975**

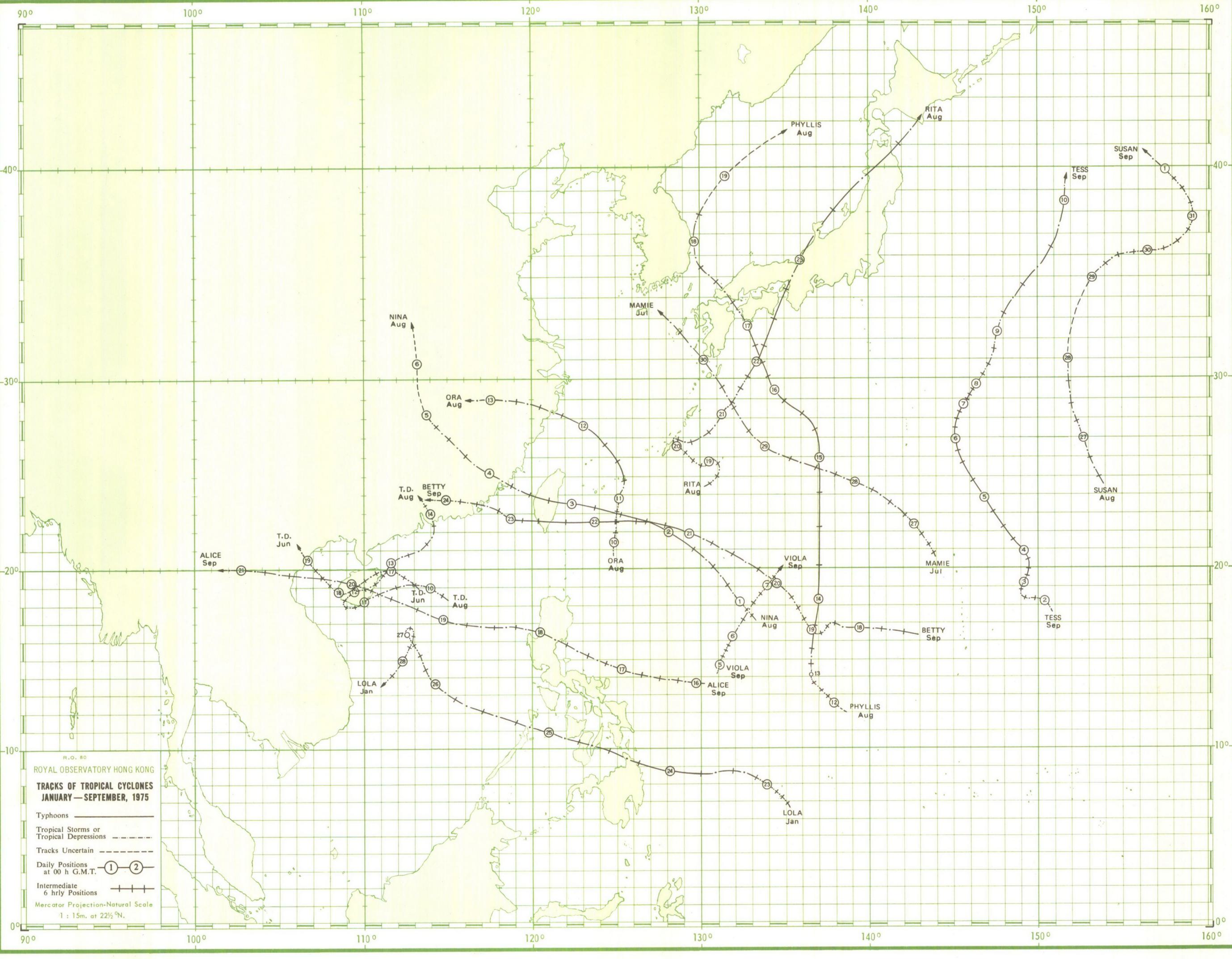
**PART III—TROPICAL CYCLONE SUMMARIES**



PRINTED AND PUBLISHED BY J. R. LEE, GOVERNMENT PRINTER  
AT THE GOVERNMENT PRESS  
JAVA ROAD, HONG KONG

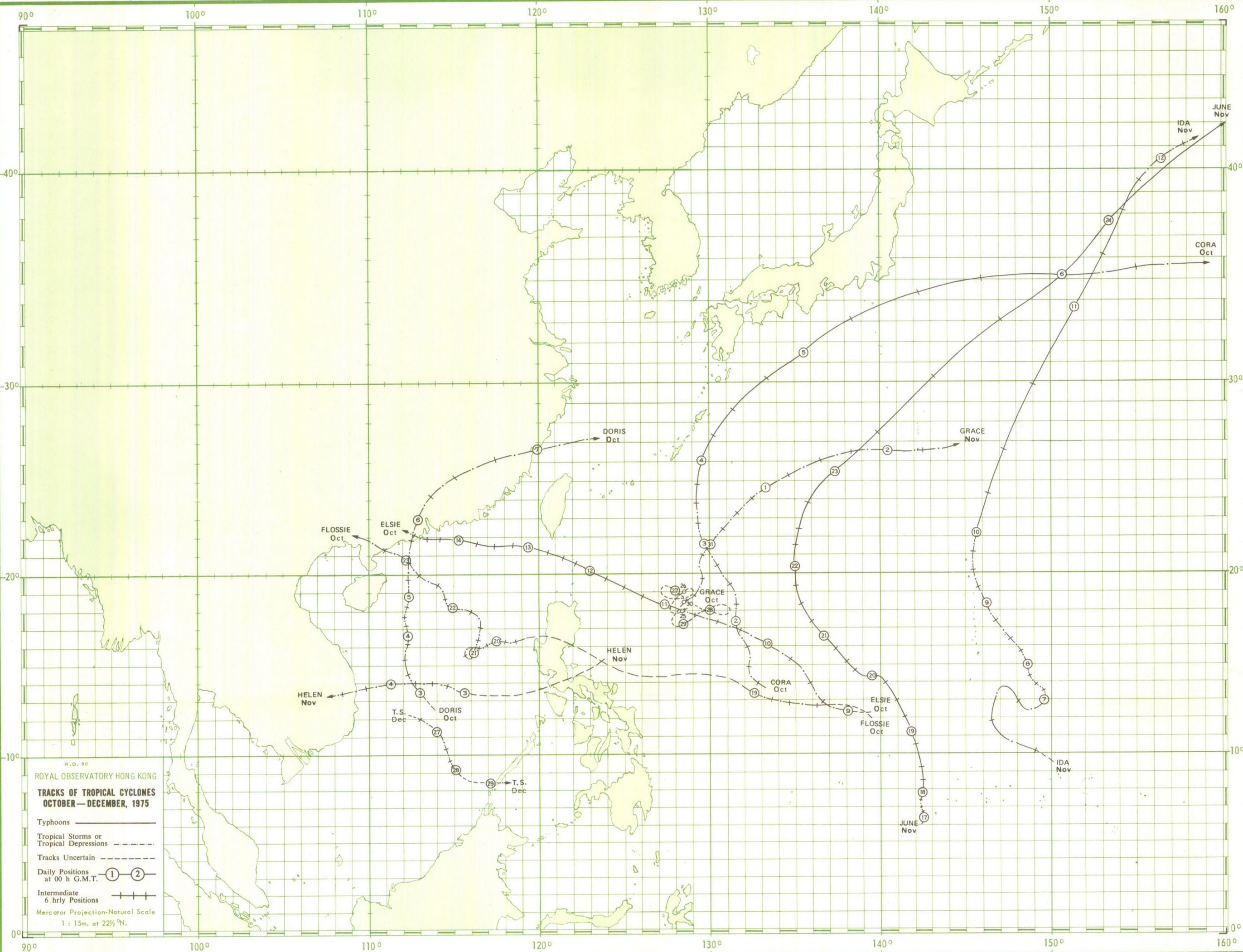
---

**1976**



R.O. 80  
**ROYAL OBSERVATORY HONG KONG**  
**TRACKS OF TROPICAL CYCLONES**  
**JANUARY — SEPTEMBER, 1975**

- 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  
 OCTOBER—DECEMBER, 1975**

- 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.

# **METEOROLOGICAL RESULTS**

## **1975**

### **PART III—TROPICAL CYCLONE SUMMARIES**

**CROWN COPYRIGHT RESERVED**

## CONTENTS

SECTION	<i>Page</i>
FRONTISPIECE: Tracks of tropical cyclones in the western North Pacific and the South China Sea, 1975.	
1. INTRODUCTION .....	1
2. DESCRIPTION OF TABLES.....	3
3. LIST OF FIGURES.....	4
4. TROPICAL CYCLONE SUMMARIES FOR 1975 .....	5
5. REPORTS ON TROPICAL CYCLONES AFFECTING HONG KONG IN 1975	
(a) Tropical Depression: June 16–19 .....	6
(b) Tropical Depression: August 10–14 .....	8
(c) Severe Tropical Storm Alice: September 16–21 .....	11
(d) Typhoon Betty: September 17–24 .....	13
(e) Severe Tropical Storm Doris: October 3–7 .....	16
(f) Typhoon Elsie: October 9–14 .....	21
(g) Severe Tropical Storm Flossie: October 15–23 .....	31
6. TABLES	
Table 1. List of tropical cyclones in the western North Pacific and the South China Sea in 1975	35
Table 2. Tropical cyclone warnings for shipping issued in 1975 .....	36
Table 3. Tropical cyclone warning signals hoisted in Hong Kong and number of warning bulletins issued in 1975.....	36
Table 4. Frequency of hoisting and total duration of display of tropical cyclone warning signals: 1946–1975 .....	37
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: 1946–1975 .....	37
Table 6. Duration of display of tropical cyclone warning signals in Hong Kong: 1946–1975	38
Table 7. Casualties and damage caused by tropical cyclones in Hong Kong: 1937–1975 ...	38
Table 8. Ships sunk, damaged, grounded, etc., by tropical cyclones in Hong Kong: 1974–1975 .....	39
Table 9. A summary of meteorological observations recorded in Hong Kong during the passages of tropical cyclones in 1975 .....	40

## 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.

During the period 1884–1939, reports on destructive typhoons were occasionally prepared and were included as Appendices to the Meteorological Results. However, after 1947, this practice was extended and an account of all tropical cyclones which caused gales in Hong Kong was included in the Annual Departmental Reports. The first issue of a new series—'Meteorological Results, Part III—Tropical Cyclone Summaries' was introduced in 1971. It contained 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) that occurred in the year 1968.

Tracks of tropical cyclones in the western North Pacific and the South China Sea were published in Meteorological Results, Part I up 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 was done in order to meet the immediate needs of the press, shipping companies and others. These reports were cyclostyled and were supplied on request. Initially, reports were only written on those tropical cyclones for which gales 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 fixed 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.

The Royal Observatory has a network of anemographs to record surface winds in Hong Kong. Except at Centre Island, 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				
Royal Observatory	22° 18'	114° 10'	33	32	61	Dines, 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
Cape D'Aguilar	22° 13'	114° 15'	*	5	14	Cup
Castle Peak	22° 23'	113° 59'	*	5	16	Dines
Centre Island	22° 27'	114° 13'	*	—	—	Lambrecht Cup

\* No barometer.

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

Wind measurements are also made by China Light & Power Co. Ltd. at Hok Un and Tsing Yi Island, by Cable & Wireless Ltd. at Stanley, by the R.A.F. at Tai Mo Shan and by the Chinese University at Ma Liu Shui.

The reports in Section 5 present a general description of the life history of each tropical cyclone affecting Hong Kong from formation to dissipation including:

- (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 winds recorded at various stations in Hong Kong;
- (d) the lowest barometric pressure recorded in Hong Kong;
- (e) the daily amount of rainfall recorded at the Royal Observatory; and
- (f) the times and heights of the highest tides and maximum storm surges recorded in Hong Kong.

Whenever practical, radar photographs and pictures received from weather satellites are included together with information and data\* obtained from reconnaissance aircraft.

It has proved necessary to use different times in different contexts in this publication. The reference times of tropical cyclone warnings for shipping are given in G.M.T., records of meteorological observations are kept in Hong Kong Standard Time (G.M.T.+8 hours), while Local Time used is either Hong Kong Standard Time or Hong Kong Summer Time (G.M.T.+9 hours). In 1975, Hong Kong Summer Time was in use from 3.30 a.m. (Hong Kong Standard Time) on April 20 until 3.30 a.m. (Hong Kong Summer Time) on October 19.

The following convention is used in this publication:

- (a) Unlabelled times given in hours and minutes (e.g. 1454) on a 24-hour clock are in Hong Kong Standard Time;
- (b) Times expressed as a.m. or p.m. are in Hong Kong Local Time;
- (c) Times labelled 'G.M.T.' are in Greenwich Mean Time.

Distances are generally given in international nautical miles (n mile), 1 international nautical mile being 1852 metres exactly. In order to shorten the text, the words 'international' and 'nautical' are usually omitted. The unit of speed is one international knot (kn), which is equal to 1.852 km/h or about 0.514 m/s.

---

\* The data from reconnaissance aircraft were taken directly from eye-fix messages received operationally at the Royal Observatory, Hong Kong. No attempt has been made to convert the wind speeds into equivalent '10-minute mean winds' to make them comparable with reports from surface stations.

## DESCRIPTION OF TABLES

**Table 1** is a list of tropical cyclones in 1975 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. Fleet Weather Central/Joint Typhoon Warning Center, Guam. The dates cited cover the period during which the track of each tropical cyclone lay within the above-stated 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 1975, the duration of these warnings and the time of validity 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 the tropical cyclone warning signals were hoisted during 1975. 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 Standard Time which is 8 hours ahead of G.M.T.

**Table 4** presents a summary of the occasions on which the tropical cyclone warning signals were hoisted between 1946 and 1975. The Strong Wind Signal, No 3, was not introduced until 1956 and the 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 January 1, 1973.

**Table 5** gives the annual number of tropical cyclones in Hong Kong's area of responsibility between 1946 and 1975. 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 1946-1975.

**Table 7** presents the casualties and damage figures associated with tropical cyclones in Hong Kong for the period 1937-1975. The information is compiled from local newspapers and from the Marine Department's records.

**Table 8** contains the particulars of ships sunk, damaged, grounded, etc., by various tropical cyclones during the period 1974-1975. The information is compiled from local newspapers and from the Marine Department's records.

**Table 9** presents the maximum storm surge (the difference between the actual water level and that predicted in the Tide Table) for each tropical cyclone affecting Hong Kong in 1975. Data on the nearest approach, the maximum winds at the Royal Observatory and Waglan Island, the minimum sea-level pressure and the total rainfall are also tabulated. All data, other than the rainfall, refer to the period when tropical cyclone warning signals were hoisted.

**LIST OF FIGURES**

- Figure 1. Monthly distribution of the frequency of occurrence of tropical cyclones and typhoons in the western North Pacific and the South China Sea in 1975.
- Figure 2. Track of the Tropical Depression: June 16–19, 1975.
- Figure 3. Radar picture of the Tropical Depression taken at 3.30 p.m. on June 16, 1975.
- Figure 4. Track of the Tropical Depression: August 10–14, 1975.
- Figure 5. Track of Severe Tropical Storm Alice: September 16–21, 1975.
- Figure 6. ESSA–8 APT picture of Severe Tropical Storm Alice taken at 10.48 a.m. on September 17, 1975.
- Figure 7. NOAA–4 APT picture of Severe Tropical Storm Alice taken from 10.15 p.m. to 10.23 p.m. on September 19, 1975.
- Figure 8. Track of Typhoon Betty: September 17–24, 1975.
- Figure 9. ESSA–8 APT picture of Typhoon Betty taken at 10.24 a.m. on September 21, 1975.
- Figure 10. ESSA–8 APT picture of Typhoon Betty taken at 10.12 a.m. on September 23, 1975.
- Figure 11. Track of Severe Tropical Storm Doris: October 3–7, 1975.
- Figure 12. ESSA–8 APT picture of Severe Tropical Storm Doris taken at 11.57 a.m. on October 4, 1975.
- Figure 13. Radar picture of Severe Tropical Storm Doris taken at 9.17 p.m. on October 5, 1975.
- Figure 14. ESSA–8 APT picture of Severe Tropical Storm Doris taken at 10.53 a.m. on October 5, 1975.
- Figure 15. Track of Typhoon Elsie: October 9–14, 1975.
- Figure 16. NOAA–4 APT picture of Typhoon Elsie taken from 9.42 a.m. to 9.50 on October 10, 1975.
- Figure 17. ESSA–8 APT picture of Typhoon Elsie taken at 10.16 a.m. on October 11, 1975.
- Figure 18. NOAA–4 APT picture of Typhoon Elsie taken from 9.37 a.m. to 9.45 a.m. on October 12, 1975.
- Figure 19. Radar pictures of Typhoon Elsie taken at the Royal Observatory on October 13–14, 1975.
- Figure 20. NOAA–4 APT picture of Typhoon Elsie taken from 9.32 a.m. to 9.40 a.m. on October 14, 1975.
- Figure 21. Hourly rainfall distribution and pressure profile as recorded at the Royal Observatory during the passage of Typhoon Elsie on October 13–15, 1975.
- Figure 22. Huge waves burst into the air off the praya in Kennedy Town.
- Figure 23. Track of Severe Tropical Storm Flossie: October 15–23, 1975.
- Figure 24. NOAA–4 APT picture of Severe Tropical Storm Flossie taken from 9.51 p.m. to 9.59 p.m. on October 22, 1975.
- Figure 25. Radar picture of Severe Tropical Storm Flossie taken at 9.00 a.m. on October 23, 1975.

## TROPICAL CYCLONE SUMMARIES FOR 1975

During the year twenty-two tropical cyclones were detected in the western North Pacific and the South China Sea, and eleven attained typhoon intensity. Seven tropical cyclones crossed the coast into China and three into Vietnam. Four tropical cyclones crossed the Philippines and two passed over Taiwan. Two typhoons struck Japan while Korea was not affected. The monthly distribution of these tropical cyclones is shown in Figure 1 and a brief summary of their tracks is contained in Table 1.

Six tropical cyclones entered 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) while another six developed within this area. Altogether 219 warnings for shipping were issued by the Royal Observatory, Hong Kong to warn these twelve tropical cyclones. Seven of these affected Hong Kong and necessitated the display of tropical cyclone warning signals.

The first tropical cyclone reported in the year was Typhoon Lola which developed near the Caroline Islands on January 23. It moved west-northwestwards into the South China Sea and dissipated off the coast of south Vietnam. No tropical cyclones were reported in the region from February to May.

The tropical depression which developed near the Paracels on June 16 was the only tropical cyclone reported over the region in June. As the tropical depression moved slowly northwestwards towards the Luichow Peninsula, a period of fresh to strong easterly winds accompanied by heavy squally showers were experienced in Hong Kong. The depression crossed the coast of north Vietnam on the morning of June 17 and rapidly dissipated overland near Haiphong.

In July, two tropical cyclones were reported over the western North Pacific. Tropical Storm Mamie developed near the Mariana Islands on July 26 and moved in a northwesterly direction towards the Ryukyu Islands. It passed about 30 miles to the southwest of Kagoshima on the morning of July 30 and degenerated into an area of low pressure off the coast of Korea. Typhoon Nina developed on the last day of the month about 700 miles east-northeast of Manila and moved slowly northwestwards towards Taiwan. It crossed the southeast coast of China near Amoy and continued to move inland, causing widespread flooding in central China.

A total of five tropical cyclones developed over the western North Pacific and the South China Sea in August. Typhoon Ora formed to the southeast of Taiwan and crossed the east coast of China near Wenchow causing serious floods in central China. Typhoons Phyllis and Rita formed near the Ryukyu Islands and the Caroline Islands respectively; they both moved north and struck Japan, leaving widespread damage and heavy death tolls especially in Shikoku. Tropical Storm Susan formed east of Iwo Jima but dissipated without encountering land. Of these five tropical cyclones, only one tropical depression came near enough for tropical cyclone warning signals to be hoisted in Hong Kong. The tropical depression developed about 220 miles to the south of Hong Kong and moved westwards towards Hainan Island. However, when it reached the southwestern tip of the Island, it turned around and moved northeastwards towards the Pearl River Estuary. The depression passed between Lantau Island and Kowloon and then degenerated into an area of low pressure near Canton.

A total of four tropical cyclones was reported over the western North Pacific in September. Severe Tropical Storm Alice and Typhoon Betty entered the South China Sea and affected Hong Kong. The other two tropical cyclones, Typhoon Tess and Tropical Storm Viola, moved northwards and dissipated east of Japan and southeast of the Ryukyu Islands respectively.

Altogether there were five tropical cyclones in October and three resulted in the hoisting of tropical cyclone warning signals. Typhoon Elsie passed about 27 miles to the south of the Royal Observatory around 2.30 p.m. on October 14. Although storm to hurricane force winds were experienced in Hong Kong, little damage to property was reported.

A total of three tropical cyclones developed over the western North Pacific and the South China Sea in November, but none came close enough to threaten Hong Kong. Typhoons Ida and June developed near the Caroline Islands and moved northwards; they both dissipated well to the east of Japan without encountering land. Tropical Storm Helen originated as an area of low pressure to the east of the Philippines. It moved westwards across the South China Sea and dissipated over south Vietnam.

The tropical storm which developed near Nansha Island on December 26, was the only tropical cyclone reported over this region in December. It remained quasi-stationary over the southern part of the South China Sea for about four days and then dissipated near Palawan.

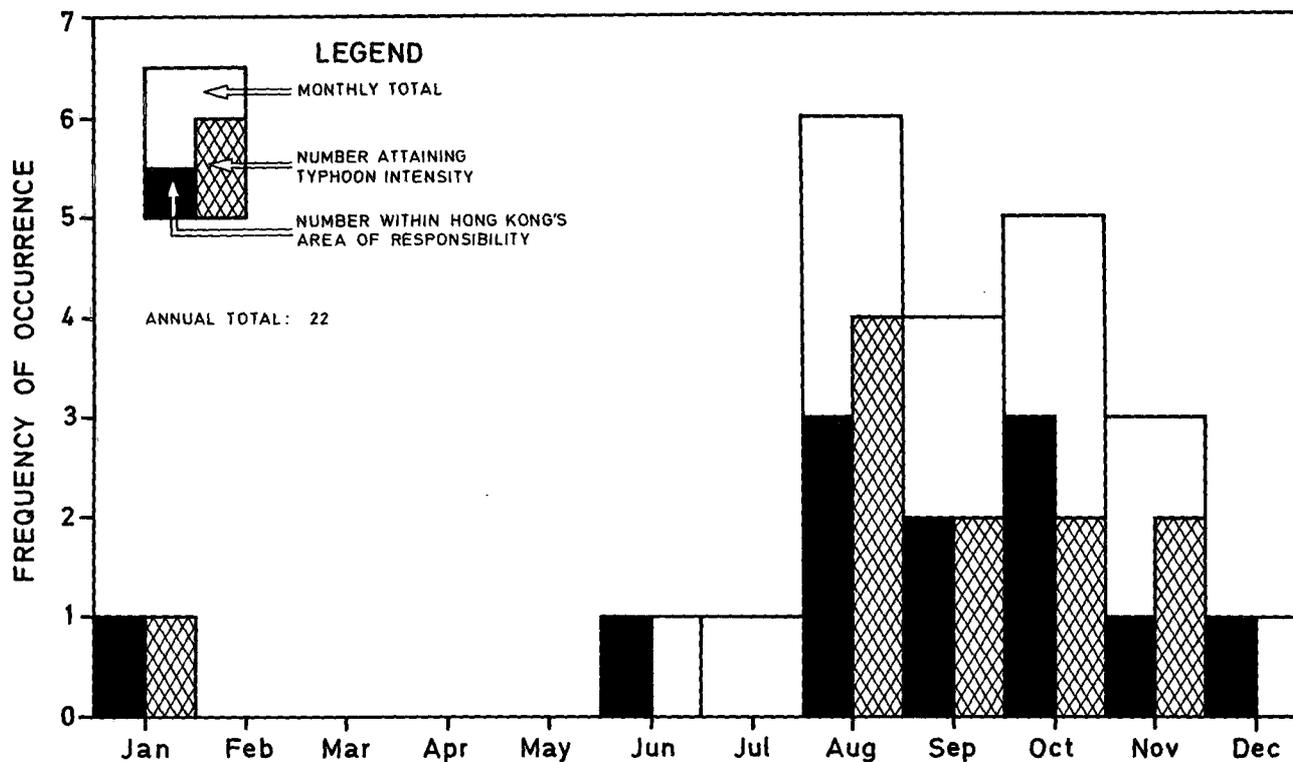


Figure 1. Monthly distribution of the frequency of occurrence of tropical cyclones and typhoons in the western North Pacific and the South China Sea in 1975 (classified in accordance with the month of the first day circle of each track).

## REPORTS ON TROPICAL CYCLONES AFFECTING HONG KONG IN 1975

### TROPICAL DEPRESSION

June 16-19, 1975

*The track of this tropical depression is shown in Figure 2*

A trough of low pressure crossed the south China coast from the north on June 12 and remained almost stationary over the northern part of the South China Sea during the following five days. On the afternoon of June 16, a tropical depression developed on the trough to the south-southwest of Hong Kong and moved slowly northwestwards towards the Luichow Peninsula.

In Hong Kong, the Stand By Signal, No. 1, was hoisted at 8.45 p.m. on June 16 when the tropical depression was centred about 200 miles to the south-southwest. Radar observations at the Royal Observatory indicated that the depression was weak and its centre ill defined (Figure 3). On the morning of June 17, the depression came near the northeastern tip of Hainan Island and then took a southwesterly course across the Island. The Stand By Signal was lowered at 11.00 p.m. on June 17 when the depression was centred over Hainan Island about 300 miles southwest of Hong Kong.

The tropical depression entered the Gulf of Tonkin on the morning of June 18 and then moved northwestwards again at about 6 knots towards Haiphong. The depression crossed the coast of north Vietnam early next morning and rapidly dissipated overland near Haiphong.

In Hong Kong, fresh to strong easterly winds were experienced on June 16 and 17 but the winds gradually moderated as the tropical depression moved further away. However, from June 16-19 the weather was cloudy with heavy squally showers.

The following amounts of rainfall were recorded at the Royal Observatory:

June 16	8.8 mm
June 17	30.2 mm
June 18	75.9 mm
June 19	24.1 mm
Total:	139.0 mm

The times and heights of the highest tides and maximum storm surges recorded at various locations in Hong Kong during the display of tropical cyclone warning signals were as follows:

Location	Highest Tide Above Chart Datum			Maximum Storm Surge Above Predicted Level		
	Height (m)	Date	Time	Height (m)	Date	Time
North Point	2.0	June 16	3.00 p.m.	0.4	June 18	1.30 a.m.
Tai Po Kau	2.1	June 16	3.30 p.m.	0.5	June 17	12.00 noon
Chi Ma Wan (Lantau Island)	2.1	June 16	3.00 p.m.	0.5	June 18	8.45 a.m.

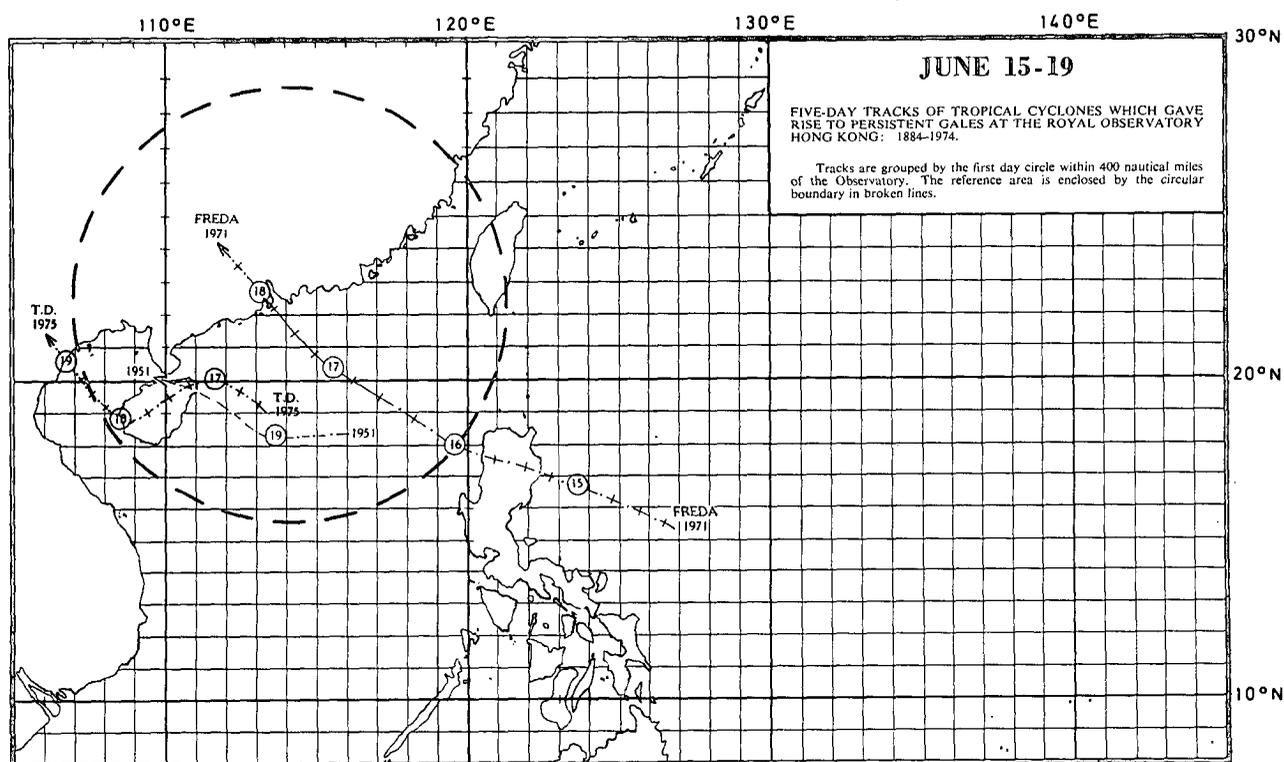


Figure 2. Track of the Tropical Depression: June 16-19, 1975.

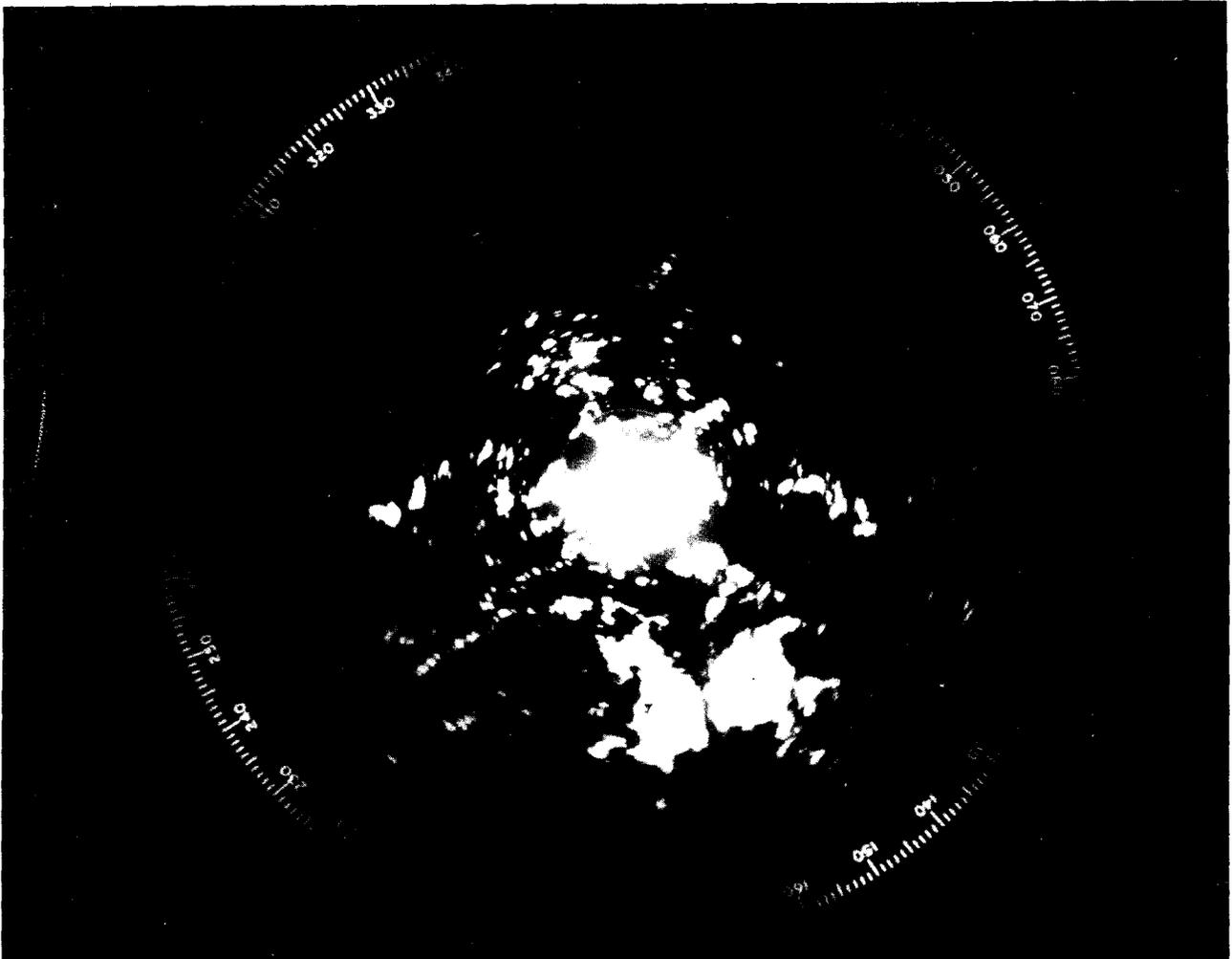


Figure 3. Radar picture of the Tropical Depression taken at 3.30 p.m. on June 16, 1975.

## TROPICAL DEPRESSION

August 10-14, 1975

*The track of this tropical depression is shown in Figure 4*

During the night of August 9, an area of low pressure over the northern part of the South China Sea developed into a tropical depression and moved west-northwestwards at about 8 knots. In Hong Kong, the Stand By Signal, No. 1, was hoisted at 5.00 a.m. on August 10 when the tropical depression was centred about 220 miles south of Hong Kong. Later in the afternoon, the tropical depression took a west-southwesterly course and headed towards southern Hainan Island at a speed of about 10 knots. The Stand By Signal was lowered at 4.50 a.m. on August 11 when the depression was centred just off the eastern coast of Hainan Island about 300 miles southwest of Hong Kong.

During the evening of August 11, the tropical depression slowed down near the southwestern tip of Hainan Island and then turned around and moved northeastwards at about 7 knots towards the Pearl River Estuary. The depression entered the South China Sea early on August 13 and later appeared on the Royal Observatory's weather radar which indicated that the depression was weak with only an ill-defined centre and a few spiral rainbands. The Stand By Signal was hoisted again at 4.45 p.m. on the same day when the depression was centred about 100 miles to the southwest of Hong Kong. Later in the evening, the depression turned on a northerly course and moved at about 12 knots towards Hong Kong. At 11.00 p.m. the Stand By Signal was replaced by the Strong Wind Signal, No. 3, when the depression was centred about 50 miles to the south of the

Royal Observatory. At this time, the Observatory's radar indicated that the eye of the depression remained ill defined with a diameter of about 40 miles. A few hours later, around 3.00 a.m. on August 14, it passed between Lantau Island and Kowloon. The minimum mean sea-level pressure recorded at the Royal Observatory was 990.4 millibars.

The depression continued to move northwards and quickly degenerated into an area of low pressure near Canton. In Hong Kong, all signals were lowered by 8.10 a.m. on August 14 when the depression was overland about 55 miles to the north-northwest of the Royal Observatory.

In Hong Kong, fresh to strong gusty easterly winds set in during the night of August 9 and persisted until the next evening. Winds then gradually moderated as the tropical depression moved further away from Hong Kong. However, with the return of the tropical depression on August 13, winds increased again and became strong in the evening. A temporary lull was experienced in many places around Hong Kong when the depression was centred near Lantau Island. This was followed by a period of fresh to strong southwesterlies on August 14.

During the afternoon of August 14, the southwesterlies were enhanced by the intensification of the summer monsoon over the northern part of the South China Sea and the Strong Monsoon Signal was hoisted from 3.50 p.m. to 9.50 p.m. on the same day. The maximum winds and maximum gust peak speeds recorded at various locations were as follows:

<i>Location</i>	<i>Maximum mean hourly wind in points and knots</i>		<i>Maximum gust in points and knots</i>	
Royal Observatory	SW	19	SW	45
Hong Kong Airport (SE)	E	24	E	46
Hong Kong Airport (NW)	ESE	18	E	37
Waglan Island	SW	30	SW	45
Tate's Cairn	SSW	31	SSW	48
Cheung Chau	E	25	E	40
King's Park	E	20	SW	38
Star Ferry	SSW	26	WSW	52
Green Island	SW	31	SW	42
Tsim Bei Tsui	E	22	S	33
Tai O	SSW	23	SW	42
Cape D'Aguilar	—	16	—	29
Castle Peak	SW	18	SW	36

The weather in Hong Kong was mainly fine on August 10 and 11. Showers developed on the night of August 11 and became frequent and squally during the next two days.

The following amounts of rainfall were recorded at the Royal Observatory:

August 10	0.2 mm
August 11	Nil
August 12	41.3 mm
August 13	46.8 mm
August 14	4.9 mm
Total:	93.2 mm

During the passage of the tropical depression, a freighter crashed into a pier and another steamer broke her anchorage and collided with a ship berthed nearby. Three people were drowned when their boat capsized.

The times and heights of the highest tides and maximum storm surges recorded at various locations in Hong Kong during the display of tropical cyclone warning signals were as follows:

Location	Highest Tide Above Chart Datum			Maximum Storm Surge Above Predicted Level		
	Height (m)	Date	Time	Height (m)	Date	Time
North Point	2.4	Aug. 10	12.15 p.m.	0.3	Aug. 10	3.30 p.m.
Tai Po Kau	2.6	Aug. 10	2.30 p.m.	1.0	Aug. 10	2.30 p.m.
Chi Ma Wan (Lantau Island)	2.5	Aug. 10	12.15 p.m.	0.7	Aug. 14	12.15 a.m.

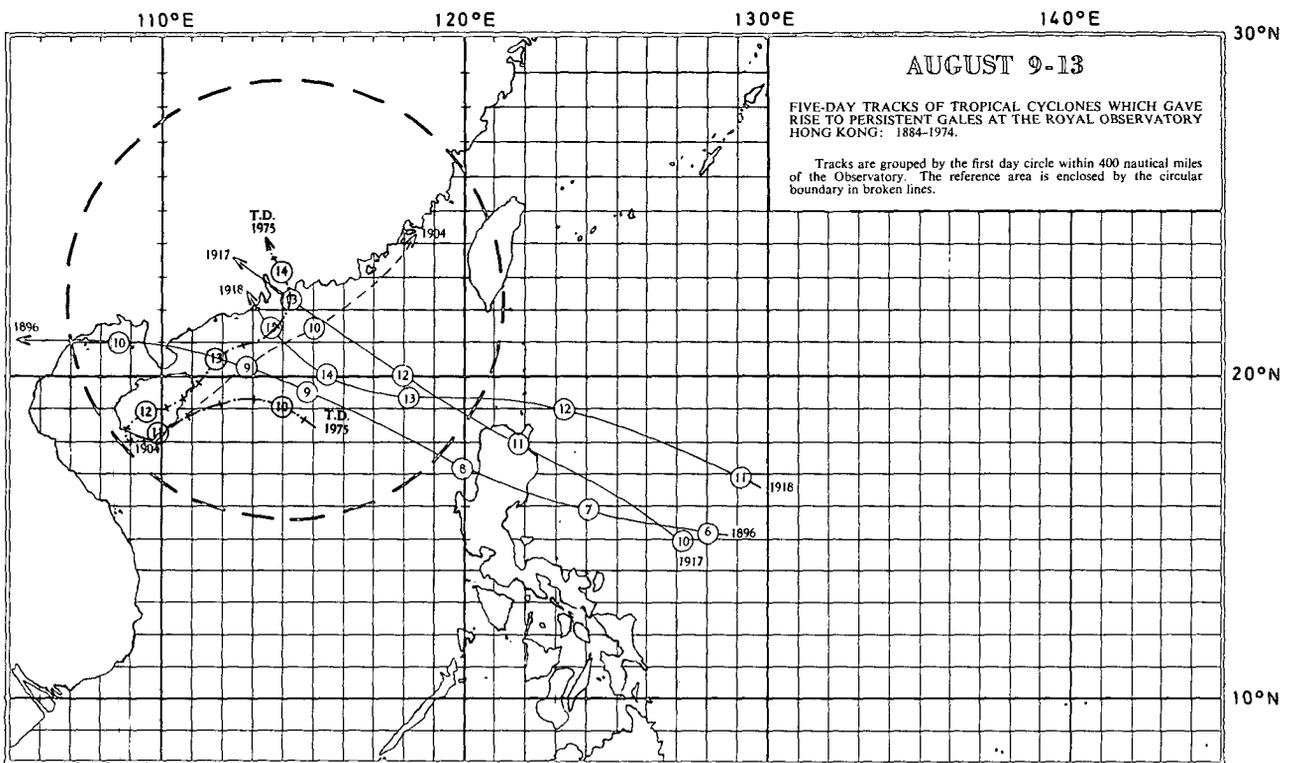


Figure 4. Track of the Tropical Depression: August 10-14, 1975.

## SEVERE TROPICAL STORM ALICE

September 16–21, 1975

*The track of this severe tropical storm is shown in Figure 5*

On September 16, a tropical depression named Alice developed over the western North Pacific about 500 miles east of Manila and moved west-northwestwards at about 10 knots towards Luzon. It intensified into a severe tropical storm the next day when satellite pictures received at the Royal Observatory in the morning indicated that maximum winds near its centre were about 55 knots (Figure 6).

Alice crossed north Luzon during the night of September 17 and took a westerly course when it entered the South China Sea the next morning. Its circulation was extensive covering an area about 500 miles in diameter and winds of 40 knots were reported by a ship about 200 miles north-northwest of its centre. In Hong Kong, the Stand By Signal, No. 1, was hoisted at 4.00 p.m. on September 18 when the severe tropical storm was centred about 400 miles away to the southeast.

Early on September 19, Alice turned onto a west-northwesterly course and headed towards Hainan Island at about 16 knots. Satellite pictures received at the Royal Observatory revealed that Alice still maintained its intensity as a severe tropical storm (Figure 7). At 11.30 a.m. on the same day, the Stand By Signal was replaced by the Strong Wind Signal, No. 3, when Alice was centred about 290 miles south of Hong Kong. Alice crossed Hainan Island early on September 20 and degenerated into an area of low pressure over northern Laos the next morning. All signals were lowered at 5.15 a.m. on September 20 when Alice was centred over central Hainan Island about 310 miles southwest of Hong Kong.

In Hong Kong, winds freshened from the east during the night of September 18 and remained strong throughout the next day. However, later in the evening, winds gradually turned to southeasterly and slowly moderated. The maximum winds and maximum gust peak speeds recorded at various locations were as follows:

Location	Maximum mean hourly wind in points and knots		Maximum gust in points and knots	
	Direction	Speed	Direction	Speed
Royal Observatory	E	16	ENE	41
Hong Kong Airport (SE)	E	23	ESE	48
Hong Kong Airport (NW)	E	16	E	37
Waglan Island	ENE	30	ENE	38
Tate's Cairn	E	26	E	45
Cheung Chau	E	21	ESE	48
King's Park	E	16	E	35
Star Ferry	E	23	E	46
Green Island	ENE	27	ENE	41
Tsim Bei Tsui	E	20	E	31
Tai O	E	18	E	36
Cape D'Aguilar	—	21	—	35
Castle Peak	SW	15	ESE	35

The weather was fine on September 18 but became cloudy the next day with isolated thunderstorms reported in the evening. Scattered showers were experienced throughout the night of September 19 but conditions became mainly fine the following day. The total rainfall recorded at the Royal Observatory on September 19 and 20 amounted to only 12.0 mm.

The times and heights of the highest tides and maximum storm surges recorded at various locations in Hong Kong during the display of tropical cyclone warning signals were as follows:

Location	Highest Tide Above Chart Datum			Maximum Storm Surge Above Predicted Level		
	Height (m)	Date	Time	Height (m)	Date	Time
North Point	2.1	Sep. 19	10.00 a.m.	0.2	Sep. 19	1.30 p.m.
Tai Po Kau	2.2	Sep. 19	10.30 a.m.	0.5	Sep. 19	7.00 p.m.
Chi Ma Wan (Lantau Island)	2.4	Sep. 19	9.30 a.m.	0.6	Sep. 19	9.15 p.m.

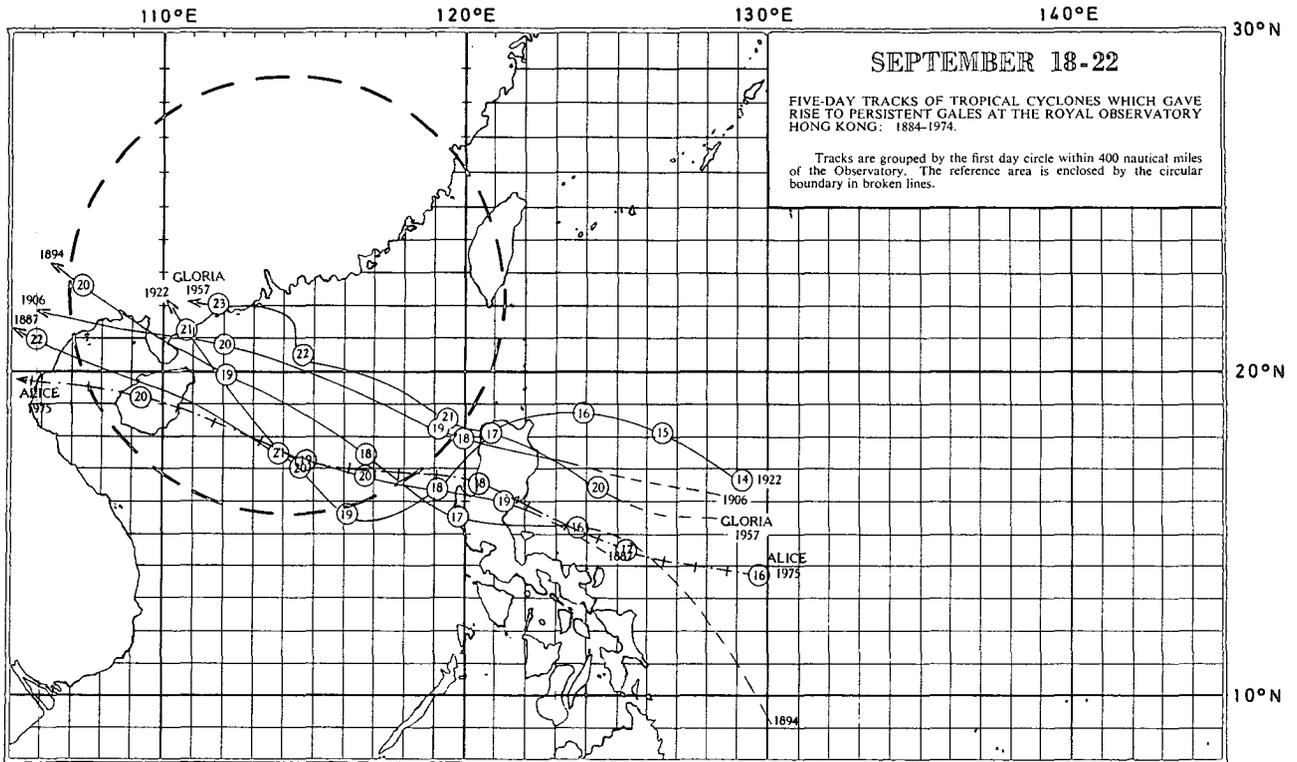


Figure 5. Track of Severe Tropical Storm Alice: September 16-21, 1975.

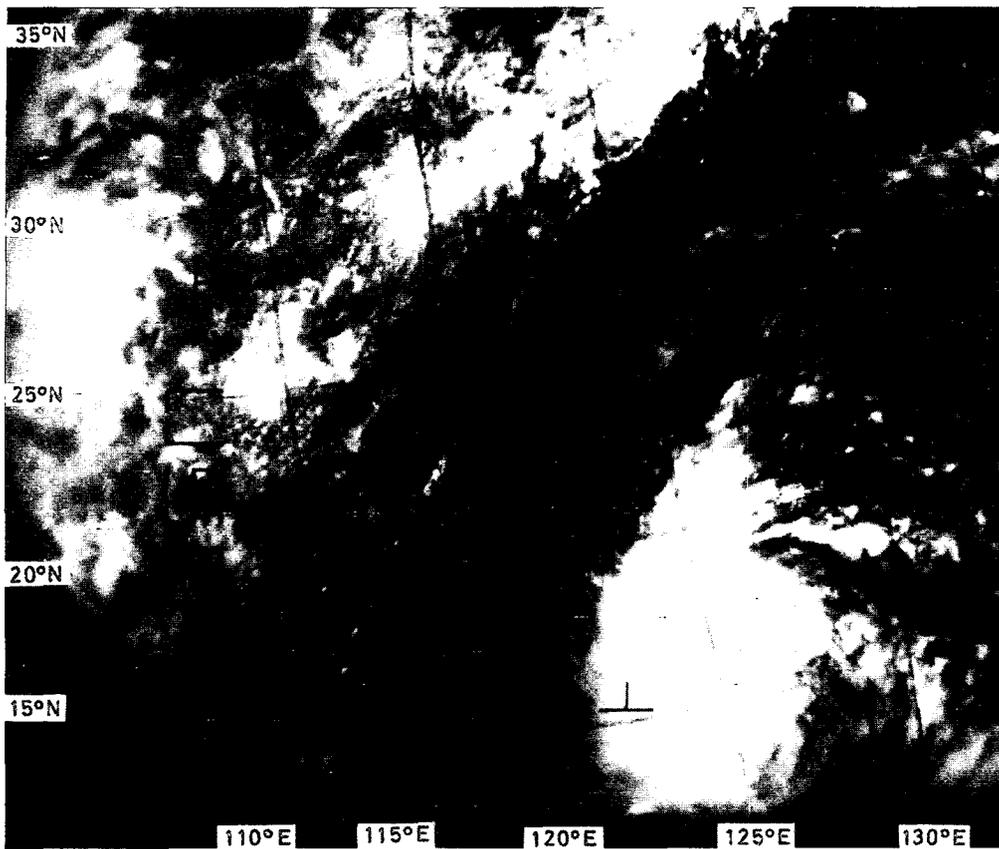


Figure 6. ESSA-8 APT picture of Severe Tropical Storm Alice taken at 10.48 a.m. on September 17, 1975.

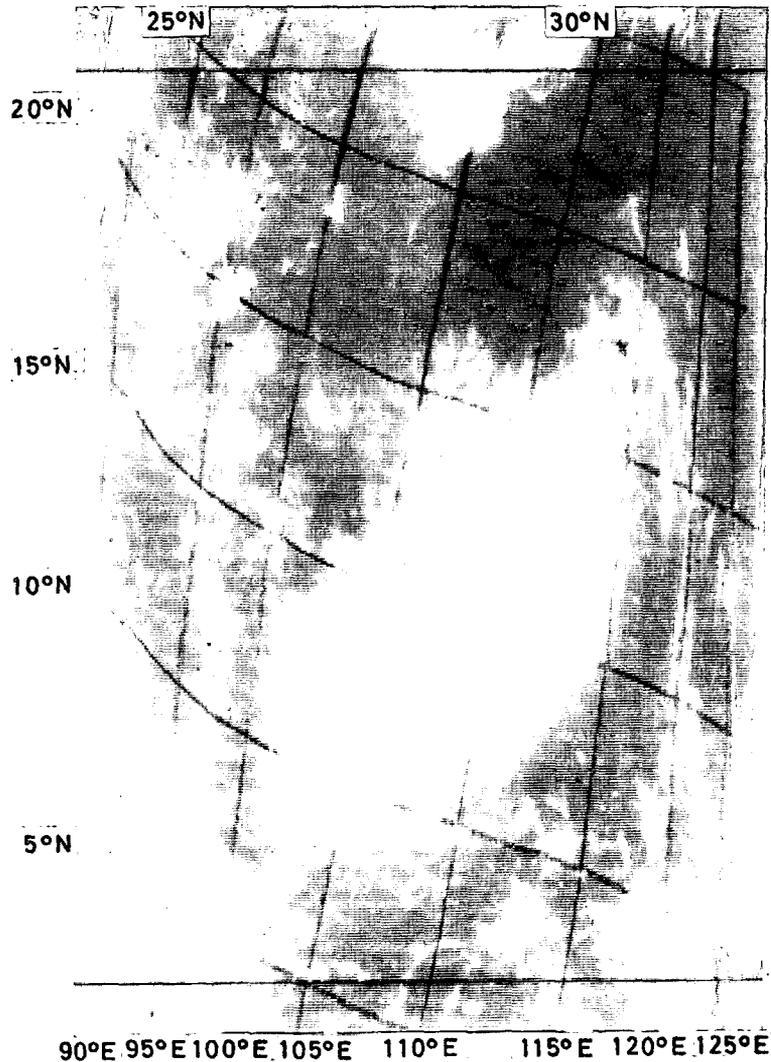


Figure 7. NOAA-4 APT picture of Severe Tropical Storm Alice taken from 10.15 p.m. to 10.23 p.m. on September 19, 1975.

## TYPHOON BETTY

September 17-24, 1975

*The track of this typhoon is shown in Figure 8*

On September 17, a tropical depression named Betty developed from an area of low pressure west of the Mariana Islands and moved westwards at about 12 knots. It turned onto a northwesterly course on September 19 and intensified into a typhoon two days later. At 11.30 a.m. on September 21, a reconnaissance aircraft reported maximum surface winds of 80 knots and a minimum sea-level pressure of 966 millibars near its centre. Satellite pictures received at the Royal Observatory in the morning indicated that Betty was well organized and its central cloud mass covered an area about 250 miles in diameter (Figure 9).

During the afternoon of September 21, Typhoon Betty took a westerly course again and moved towards southern Taiwan at about 13 knots. When it reached the eastern coast of Taiwan on the afternoon of September 22, a station near the centre reported winds of 65 knots and a mean sea-level pressure of 971.3 millibars. Because the circulation of Betty was extensive, the Stand By Signal, No. 1, was hoisted in Hong Kong at 5.45 p.m. on September 22 although the typhoon was still some 430 miles to the east.

Betty crossed southern Taiwan during the evening of September 22 and continued to move westwards over the southern part of the Taiwan Strait where it began to weaken. Satellite pictures received at the Royal

Observatory on the morning of September 23 revealed that the maximum winds associated with Betty had dropped to about 65 knots (Figure 10). Betty changed to a northwesterly course during the morning of September 23 and crossed the coast of southeast China near Swatow later in the evening. Betty then moved westwards across eastern Kwangtung and degenerated into an area of low pressure about 100 miles to the north of Hong Kong on September 24. In Hong Kong, the Stand By Signal was lowered at 10.20 a.m. on the same day.

In Hong Kong, winds freshened from the north on the evening of September 22 and strong gusty northerlies were occasionally experienced in exposed places and on hilltops during the next morning. Winds gradually turned to northwesterly later on September 23 and moderated. The weather was fine and very hot on September 22 but became cloudy with scattered showers on September 23 and 24. The total rainfall recorded at the Royal Observatory on these two days amounted to only 3.8 mm.

The times and heights of the highest tides and maximum storm surges recorded at various locations in Hong Kong during the period when the Stand By Signal was on display were as follows:

Location	Highest Tide Above Chart Datum			Maximum Storm Surge Above Predicted Level		
	Height (m)	Date	Time	Height (m)	Date	Time
North Point	2.3	Sep. 24	12.15 a.m.	0.2	Sep. 23	6.30 p.m.
Tai Po Kau	2.2	Sep. 23	11.30 p.m.	0.4	Sep. 23	5.30 p.m.
Chi Ma Wan (Lantau Island)	2.5	Sep. 24	12.15 a.m.	0.5	Sep. 23	12.45 p.m.

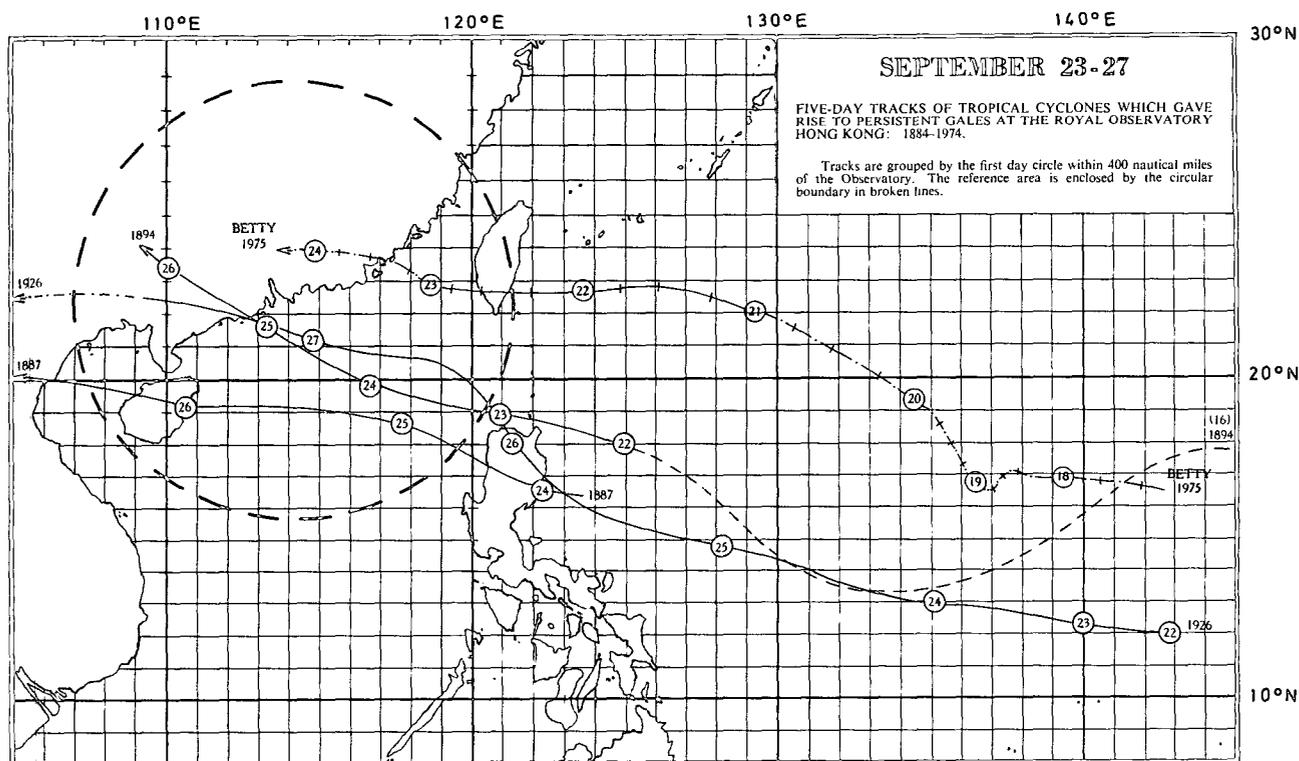


Figure 8. Track of Typhoon Betty: September 17-24, 1975.

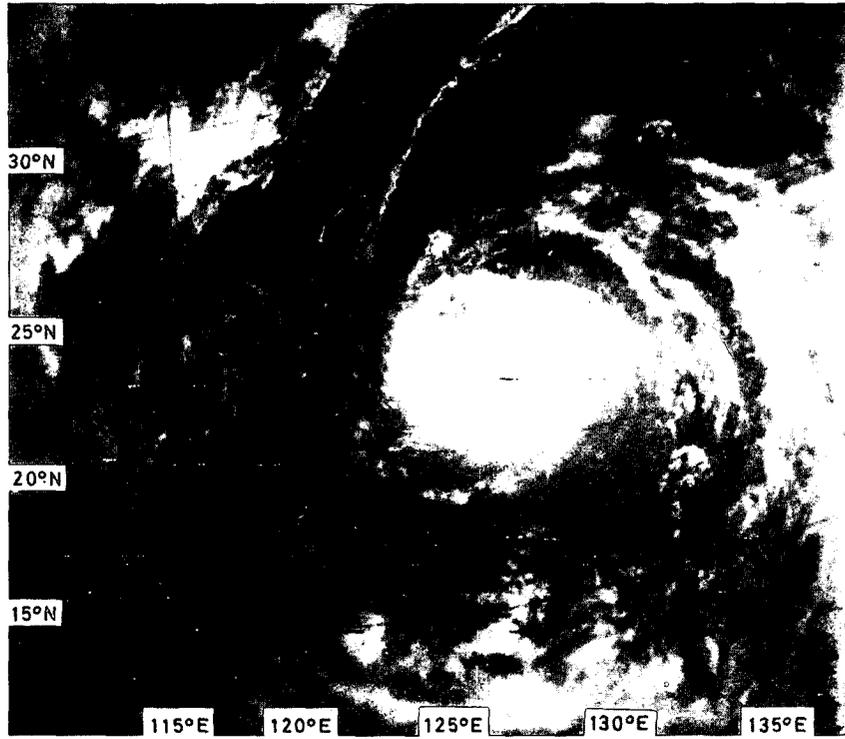


Figure 9. ESSA-8 APT picture of Typhoon Betty taken at 10.24 a.m. on September 21, 1975.

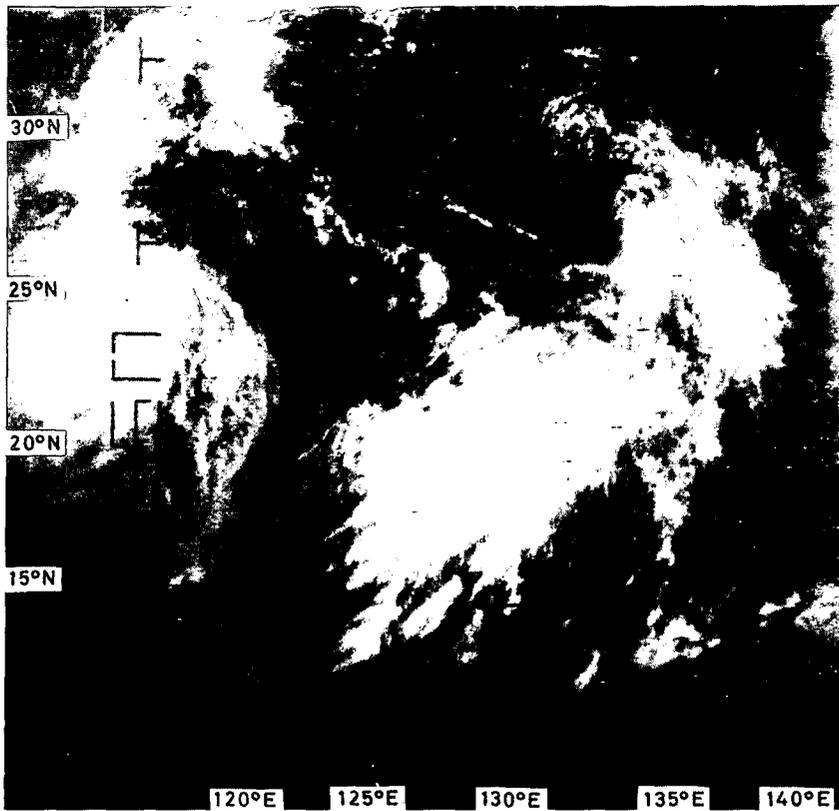


Figure 10. ESSA-8 APT picture of Typhoon Betty taken at 10.12 a.m. on September 23, 1975.

## SEVERE TROPICAL STORM DORIS

October 3-7, 1975

*The track of this severe tropical storm is shown in Figure 11*

Early on October 3, an area of low pressure developed into a tropical depression near Nansha Island in the southern part of the South China Sea and moved north-northwestwards towards St. John's Island. In Hong Kong, the Stand By Signal, No. 1, was hoisted at 6.40 a.m. on October 4 when the tropical depression was centred about 360 miles to the south-southwest.

Satellite pictures received at the Royal Observatory on the morning of October 4 indicated that the tropical depression was not well organized and maximum winds were estimated to be about 35 knots near the centre (Figure 12). The depression intensified over the warm sea and became a tropical storm named Doris around noon when it was centred within a few miles of the Paracel Islands. At 3.00 p.m. on the same day, winds of 45 knots were reported by a ship about 70 miles east of the centre.

Doris continued to move northwards towards St. John's Island on October 5. The Stand By Signal was replaced by the Strong Wind Signal, No. 3, at 11.45 a.m. when the storm was centred about 210 miles to the south-southwest of Hong Kong. Later in the day, the eye of Doris appeared on the Royal Observatory's weather radar. The eye was circular in shape with a diameter of about 40 miles. There were also intense spiral rainbands to the east of the eye (Figure 13).

Satellite pictures received at the Royal Observatory on the morning of October 5 (Figure 14) revealed that Doris had become more organized and, during the afternoon of October 5, it further intensified into a severe tropical storm. Around 3.00 a.m. the next day, it crossed the coast near St. John's Island where a sea-level pressure of 976.9 millibars and sustained winds of 50 knots with gusts of more than 80 knots were reported. Doris began to weaken as it moved northeastwards across south China and finally dissipated over the East China Sea about 200 miles to the east of Foochow on the afternoon of October 7. In Hong Kong, all signals were lowered at 4.20 p.m. on October 6 when Doris was centred about 120 miles to the north.

In Hong Kong, winds were generally moderate to fresh easterly on October 4 but became strong and gusty during the evening of October 5. Winds gradually turned to southwesterly overnight and moderated slowly on the afternoon of October 6. The maximum winds and maximum gust peak speeds recorded at various locations were as follows:

<i>Location</i>	<i>Maximum mean hourly wind in points and knots</i>		<i>Maximum gust in points and knots</i>	
Royal Observatory	ESE	20	SE	52
Hong Kong Airport (SE)	SSE	31	SE	48
Hong Kong Airport (NW)	SE	24	SE	45
Waglan Island	S	39	S	52
Tate's Cairn	S	42	S	72
Cheung Chau	S	36	S	59
King's Park	S	23	S	50
Star Ferry	S	29	SE	57
Green Island	S	40	SSE	63
Tsim Bei Tsui	SSE	34	SSE	50
Tai O	S	31	SSE	55
Cape D'Aguilar	—	27	—	46
Stanley	SW	43	SSW	58
Castle Peak	SSE	36	SSE	59

The weather was fine on October 3 but became cloudy with occasional heavy squally showers during the next three days. However, conditions improved during the afternoon of October 6 and the following day was fine and sunny.

Apart from some interruption in sea traffic, no severe damage to property was caused by Severe Tropical Storm Doris.

The following amounts of rainfall were recorded at the Royal Observatory:

October 3	Trace
October 4	33.2 mm
October 5	91.5 mm
October 6	21.0 mm
October 7	Nil
Total:	145.7 mm

The times and heights of the highest tides and maximum storm surges recorded at various locations in Hong Kong during the display of tropical cyclone warning signals were as follows:

Location	Highest Tide Above Chart Datum			Maximum Storm Surge Above Predicted Level		
	Height (m)	Date	Time	Height (m)	Date	Time
North Point	2.3	Oct. 5	9.45 p.m.	0.4	Oct. 4	1.30 p.m.
Tai Po Kau	2.5	Oct. 5	11.00 p.m.	0.6	Oct. 5	7.00 p.m.
Chi Ma Wan (Lantau Island)	2.5	Oct. 5	11.30 p.m.	0.8	Oct. 5	1.30 p.m.

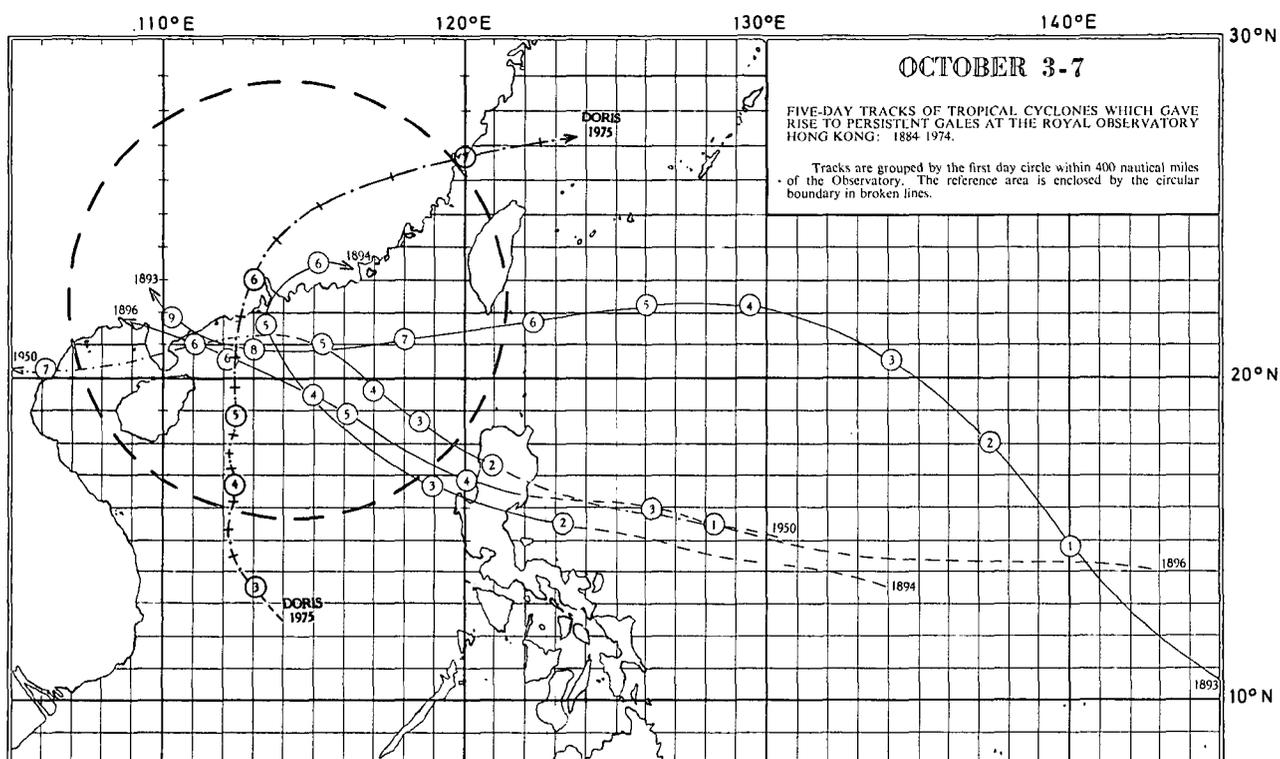


Figure 11. Track of Severe Tropical Storm Doris: October 3-7, 1975.

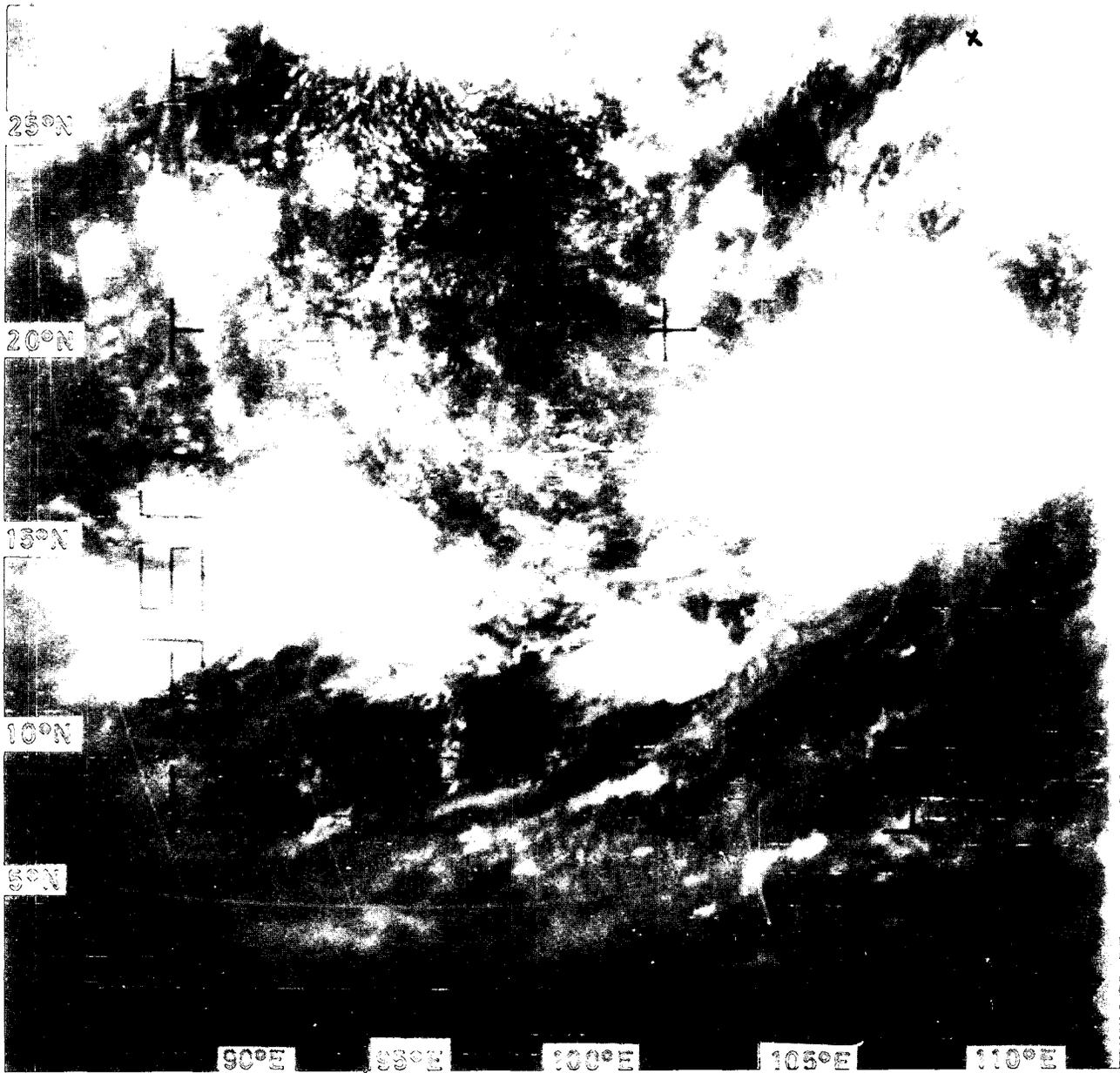


Figure 12. ESSA-8 APT picture of Severe Tropical Storm Doris taken at 11.57 a.m. on October 4, 1975.



Figure 13. Radar picture of Severe Tropical Storm Doris taken at 9.17 p.m. on October 5, 1975.

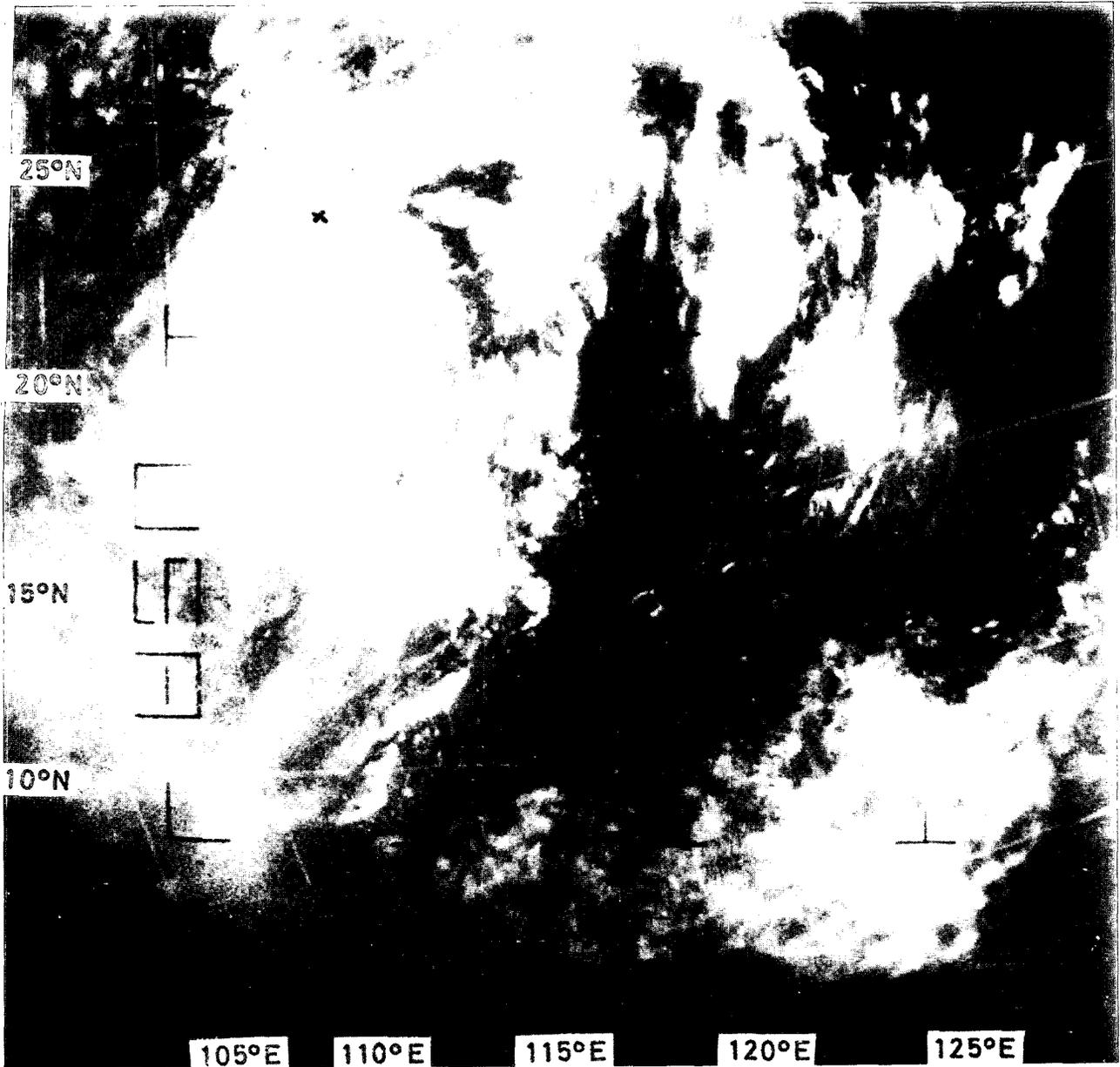


Figure 14. ESSA-8 APT picture of Severe Tropical Storm Doris taken at 10.53 a.m. on October 5, 1975.

**TYPHOON ELSIE****October 9-14, 1975**

*The track of this typhoon is shown in Figure 15*

Typhoon Elsie was one of the most intense typhoons that have affected Hong Kong in October. It was also the first occasion that required the hoisting of the Hurricane Signal, No. 10, since Typhoon Rose in August 1971. Although there were storm to hurricane force winds during the passage of Elsie, relatively minor damage was experienced possibly as a result of the timely warnings issued by the Royal Observatory.

Elsie originated as an area of low pressure about 400 miles west-southwest of Guam on October 9. It moved west-northwest at about 10 knots towards the Bashi Channel and intensified into a severe tropical storm the next day. Early on the morning of October 10, a reconnaissance aircraft reported maximum surface winds of 70 knots and a minimum sea-level pressure of 989 millibars near its centre. Satellite pictures received at the Royal Observatory also indicated that Elsie had become well organized with a circular eye and intense spiral rainbands (Figure 16).

Elsie further intensified into a typhoon on October 11. At 5.52 a.m. on the same day, a reconnaissance aircraft reported that the minimum sea-level pressure near the centre of Elsie had dropped to 974 millibars. Maximum winds estimated from satellite pictures received at the Royal Observatory later in the morning were about 90 knots (Figure 17). The central pressure fell further to 900 millibars and maximum surface winds of 130 knots were reported by a reconnaissance aircraft at 12.40 p.m. on October 12. Meanwhile, the storm slowed down slightly but still continued to move west-northwestwards towards the Bashi Channel. Satellite pictures received at the Royal Observatory earlier in the morning indicated that the cloud mass of Elsie covered an area about 300 miles in diameter and maximum winds were estimated to be about 115 knots (Figure 18).

In Hong Kong, the Stand By Signal, No. 1, was hoisted at 10.45 p.m. on October 12 when Typhoon Elsie was about 400 miles east-southeast of Hong Kong and was moving west-northwest at about eight knots towards the northeastern part of the South China Sea.

Having crossed the Bashi Channel, Elsie turned onto a more westerly track. By late afternoon on October 13, the eye of the typhoon began to appear on the Royal Observatory's weather radar and could be tracked easily as the typhoon was very well organized with good spiral rainbands ahead of the centre and a tight circular eye of about 20 miles in diameter (Figure 19). The eye was located accurately as it was also tracked simultaneously by the Kaohsiung radar.

The Stand By Signal was replaced by the Strong Wind Signal, No. 3, at 8.00 p.m. on October 13 when Elsie was about 190 miles east-southeast of Hong Kong. Statements were issued by the Royal Observatory to warn the public to take precautionary measures as Elsie was expected to remain intense and might pass very close to Hong Kong, although local winds were then generally only light to moderate westerly.

On October 14, the No. 8 Northwest Gale or Storm Signal was raised at 4.30 a.m. when the centre of Elsie was about 100 miles east-southeast of Hong Kong. At this time, winds over Hong Kong were only moderate to fresh in strength from the northwest. Winds increased rapidly as Elsie moved closer during the day and gales were first reported at 9 a.m. on October 14 when Elsie was about 70 miles east-southeast of Hong Kong.

Elsie remained very well organized and continued to move westwards (Figure 20). At 11.00 a.m. on October 14, the Increasing Gale or Storm Signal, No. 9, was hoisted to warn a significant increase in wind speed over Hong Kong when Elsie was centred only about 40 miles to the southeast. The eye of the typhoon had become smaller and was then only 10 miles in diameter. During the early afternoon of that day, as there were definite indications that the eye of the typhoon would pass close to the south of Hong Kong Island and also over the waters of Hong Kong, the Hurricane Signal, No. 10, was hoisted at 2.15 p.m. to warn the public that winds were expected to veer to the east and reach hurricane force offshore and over the southern parts of Hong Kong. Elsie was closest to Hong Kong at 2.30 p.m. when it was centred about 27 miles south of the Royal Observatory and was then moving west at eleven knots. During the afternoon, winds of 69 knots with gust peak speeds of 94 knots were recorded at Waglan Island, 70 knots with gust peak speeds of 97 knots at Tate's Cairn, and 76 knots with gust peak speeds of 118 knots at Stanley. The mean sea-level pressure at the Royal Observatory dropped to a minimum of 996.2 millibars shortly after 3 p.m. and rose sharply after the passage of the typhoon. The lowest mean sea-level pressure in Hong Kong was 987.5 millibars, recorded at Waglan Island around 2.30 p.m. on October 14.

A radiosonde ascent made at 2.02 p.m. on October 14 showed that Elsie began to weaken while passing to the south of Hong Kong. The relatively high sea-level pressure experienced in Hong Kong was probably a result of the entrainment of cold air from an intense anticyclone over China. Radar pictures taken at the Royal Observatory also showed that the eye of the storm gradually filled with rain (Figure 19d). As Elsie started to move away from Hong Kong later in the afternoon, winds turned easterly and began to moderate. The Hurricane Signal was replaced by the No. 8 Southeast Gale or Storm Signal at 5.05 p.m. when Elsie was 29 miles south-southwest of Hong Kong, and was followed by the Strong Wind Signal at 8.10 p.m. when Elsie was about 40 miles southwest of Hong Kong.

During the evening of October 14, Elsie resumed a west-northwesterly track and weakened further to a tropical storm. It crossed the south China coast about 60 miles west-southwest of Hong Kong shortly after 10 p.m. on the same day. Local winds continued to subside and all signals were lowered at 2.00 a.m. on October 15 when the storm was about 80 miles west of Hong Kong. Elsie was downgraded to a tropical depression during the following hour and subsequently dissipated overland about 100 miles west of Hong Kong early on the morning of October 15 as cool northeasterly monsoon began to affect the south China coast.

During the passage of Typhoon Elsie, hurricane force winds were recorded for 2 hours at Tate's Cairn, for 1 hour at Waglan Island and for 4 hours over the southern parts of the Hong Kong Island. Sustained gale force winds were experienced practically everywhere in Hong Kong except in some sheltered urban areas. Cheung Chau recorded continuous gales for the longest period of 13 hours. Gales were also recorded for 8 hours at Waglan Island, 5 hours at the Hong Kong Airport, and 12 hours at Tate's Cairn. The maximum winds and maximum gust peak speeds recorded at various locations were as follows:

<i>Location</i>	<i>Maximum mean hourly wind in points and knots</i>		<i>Maximum gust in points and knots</i>	
Royal Observatory	E	31	NE	76
Hong Kong Airport (SE)	NNW	35	NNW	73
Hong Kong Airport (NW)	N	32	N	76
Waglan Island	ENE	63	ENE	94
Tate's Cairn	NE	70	NNE	97
Cheung Chau	N	52	NE	86
King's Park	N	40 #	N	74
Star Ferry	E	48	E	76
Green Island	NNW	64	NE	84
Tsim Bei Tsui	NNW	39	NNW	54
Cape D'Aguilar	---	52	—	87
Stanley	E	76	E	118
Castle Peak	N	33	N	65
Tai O	not available		not available	

The weather in Hong Kong was fine, sunny and hot on October 12 and 13 before the approach of Elsie. It became cloudy on the morning of October 14 with scattered showers which became more frequent and squally during the day. Early in the afternoon, heavy rain set in as Elsie moved closer to Hong Kong. The rain was heaviest between noon and 2 p.m. when Elsie was passing to the south of Hong Kong. Later in the afternoon, the rain subsided slightly as Elsie moved away from Hong Kong. The weather remained cloudy to overcast with patches of light rain and occasional squally showers on October 15. Because of the onset of an easterly monsoon surge, there was not much improvement in the weather on the following day.

Elsie was an intense typhoon as far as wind strength was concerned, but rainfall was not exceptionally heavy (Figure 21). Although intense spiral rainbands were observed ahead of the eye, Elsie had a comparatively small circulation of about 300 miles in diameter. The total rainfall of 150.6 mm agreed well with the amounts predicted by the Royal Observatory.

The following daily amounts of rainfall were recorded at the Royal Observatory:

October 12	Nil
October 13	Nil
October 14	100.2 mm
October 15	50.4 mm
Total:	150.6 mm

As maximum winds occurred at the time of low tide, no serious flooding was reported although huge waves spilled over many waterfront streets (Figure 22). The maximum wind-generated waves recorded at Waglan Island were about 9.5 metres at noon and around 3 p.m. on October 14. The times and heights of the highest tides and maximum storm surges recorded at various locations in Hong Kong during the passage of Elsie were as follows:

Location	Highest Tide Above Chart Datum			Maximum Storm Surge Above Predicted Level		
	Height (m)	Date	Time	Height (m)	Date	Time
North Point	2.3	Oct. 14	4.45 a.m.	0.6	Oct. 14	1.15 p.m.
Tai Po Kau	2.4	Oct. 14	4.30 p.m.	1.2	Oct. 14	2.00 p.m.
Chi Ma Wan (Lantau Island)	2.5	Oct. 15	6.30 a.m.	0.9	Oct. 14	7.00 p.m.

Five ocean-going vessels drifted from their moorings but no serious damage was reported. One small craft and a fishing junk capsized and another fishing junk ran ashore.

Forty-six people were injured by flying glass and collapsing scaffolding but fortunately there were no fatalities. 1277 people sought refuge in shelters when their homes were threatened by strong winds. Altogether eighty-five incidents were reported mostly of a minor nature involving trees, scaffolding, fallen traffic signs and lamp posts. However, in some places, the winds were so strong that the Hurricane Signals could not be raised and at Waglan Island the signal mast was blown down. Traffic of all kinds was disrupted.

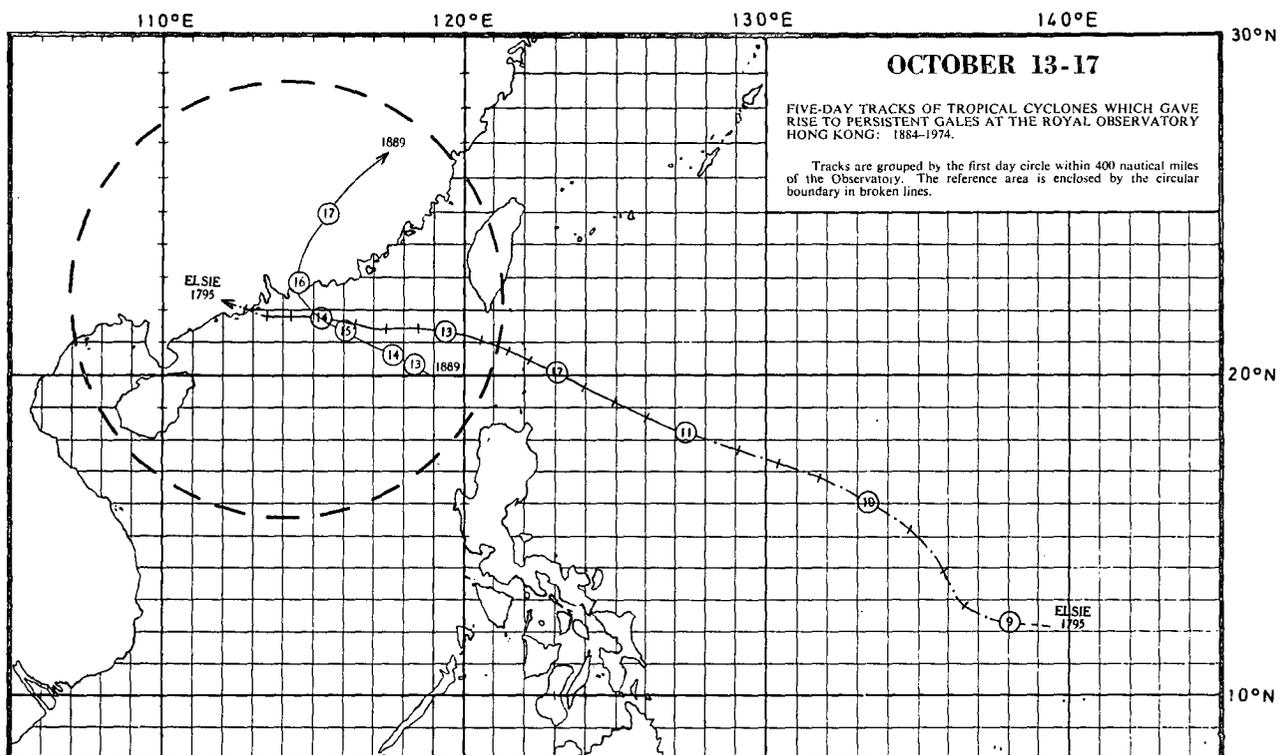


Figure 15. Track of Typhoon Elsie: October 9-14, 1975.

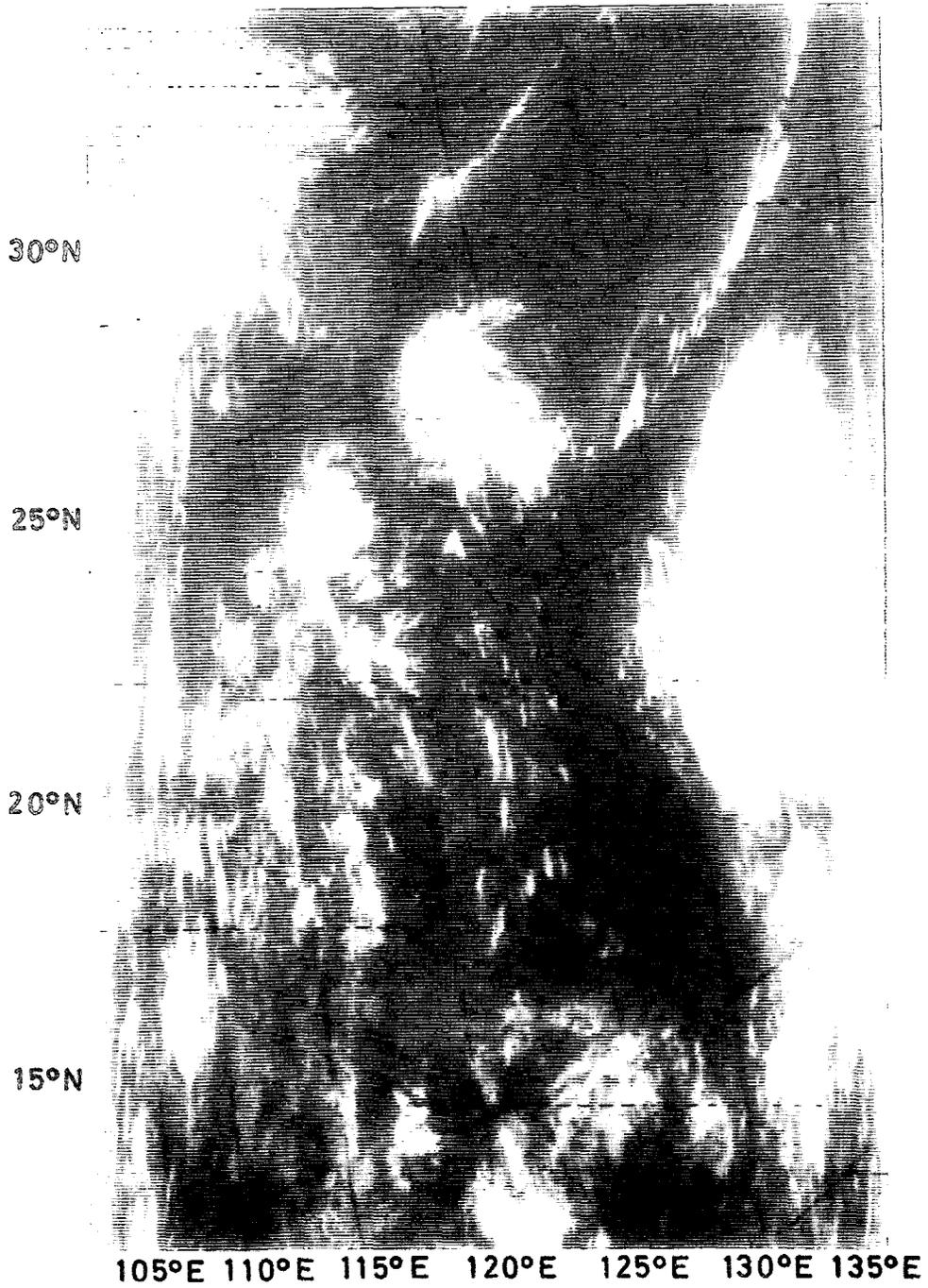


Figure 16. NOAA-4 APT picture of Typhoon Elsie taken from 9.42 a.m. to 9.50 a.m. on October 10, 1975.

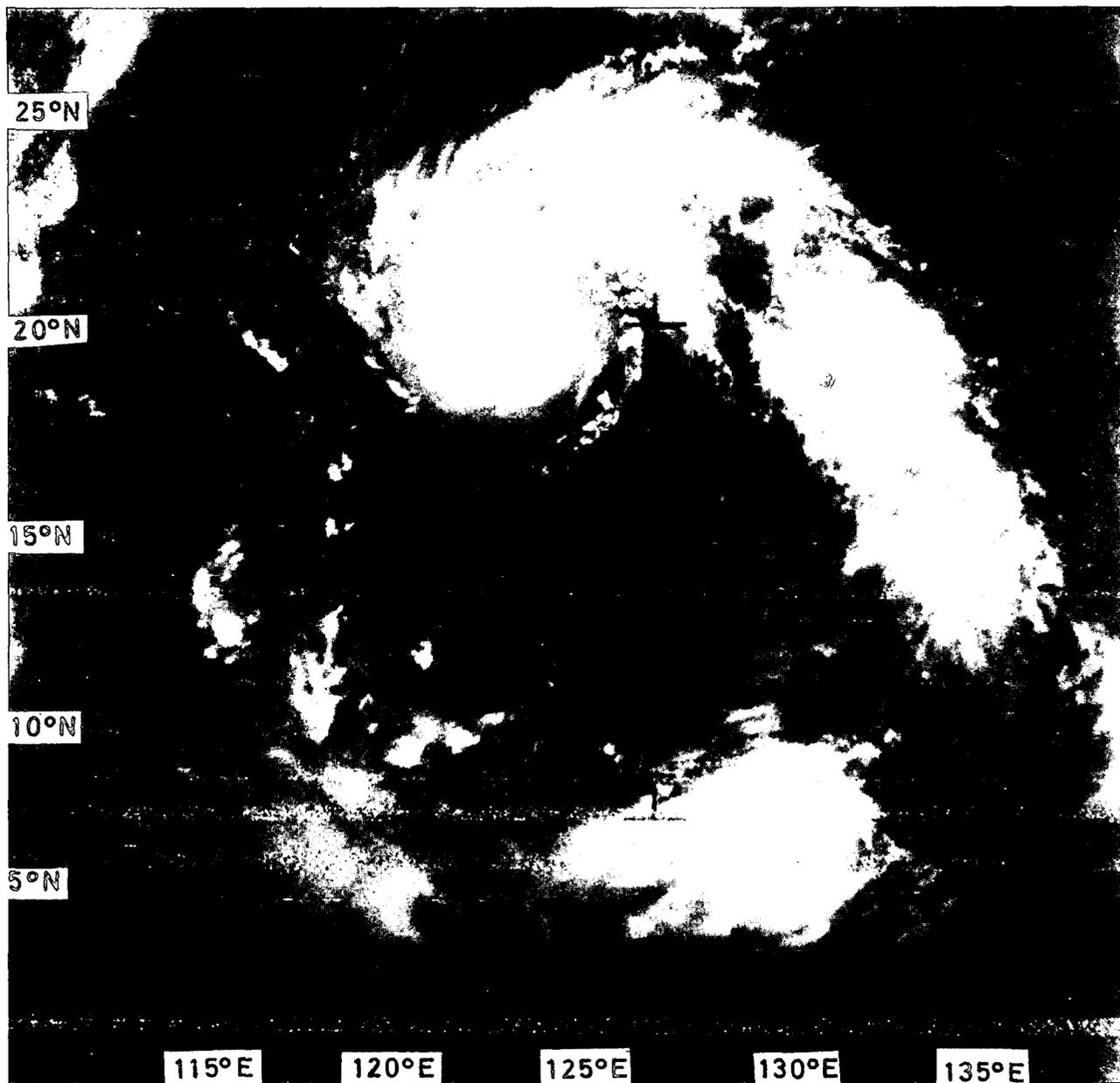


Figure 17. ESSA-8 APT picture of Typhoon Elsie taken at 10.16 a.m. on October 11, 1975.

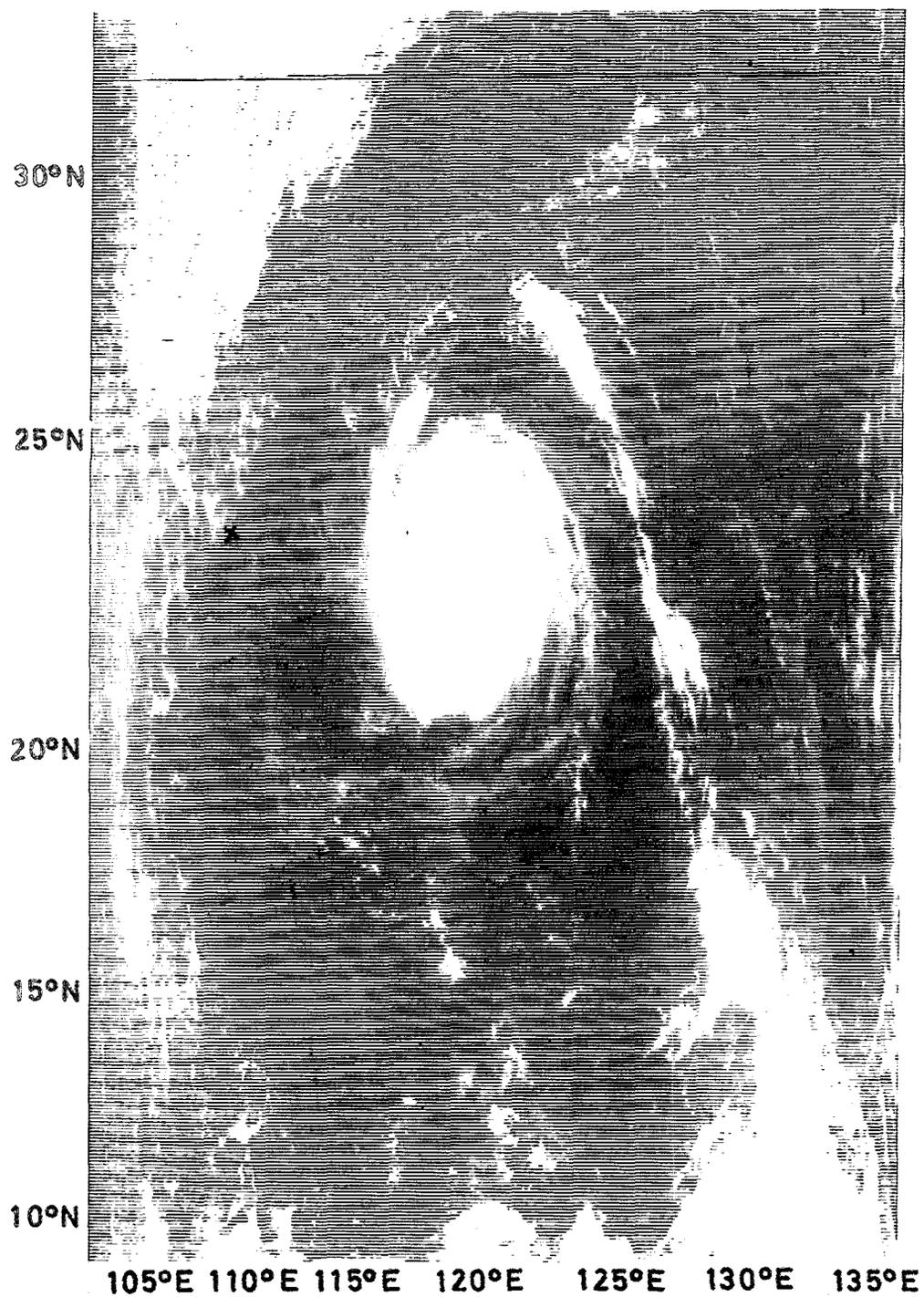


Figure 18. NOAA-4 APT picture of Typhoon Elsie taken from 9.37 a.m. to 9.45 a.m. on October 12, 1975.



Figure 19. Radar pictures of Typhoon Elsie taken at the Royal Observatory on October 13-14, 1975.

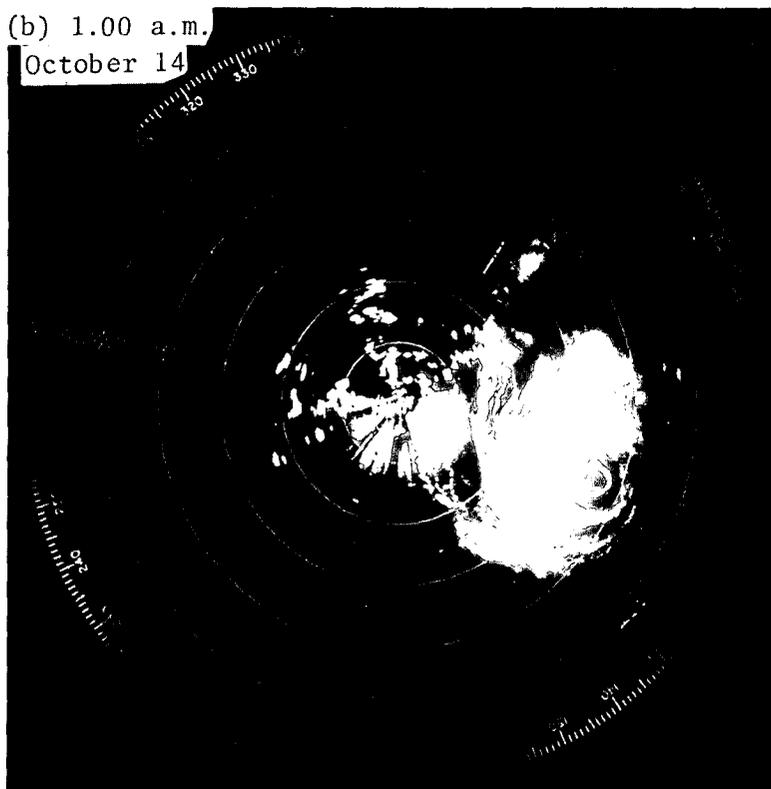


Figure 19. (continued)

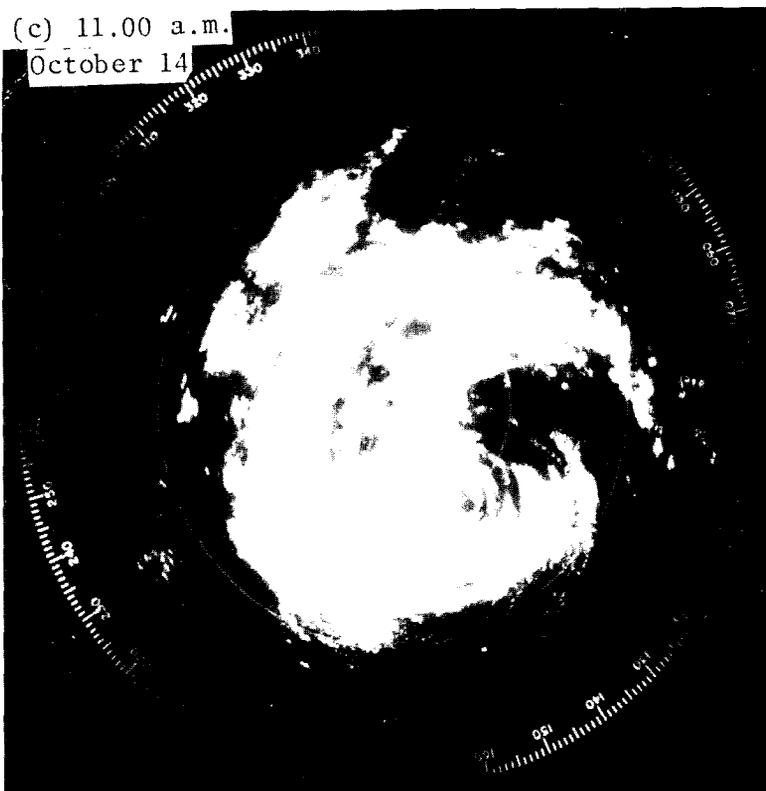


Figure 19. (continued)

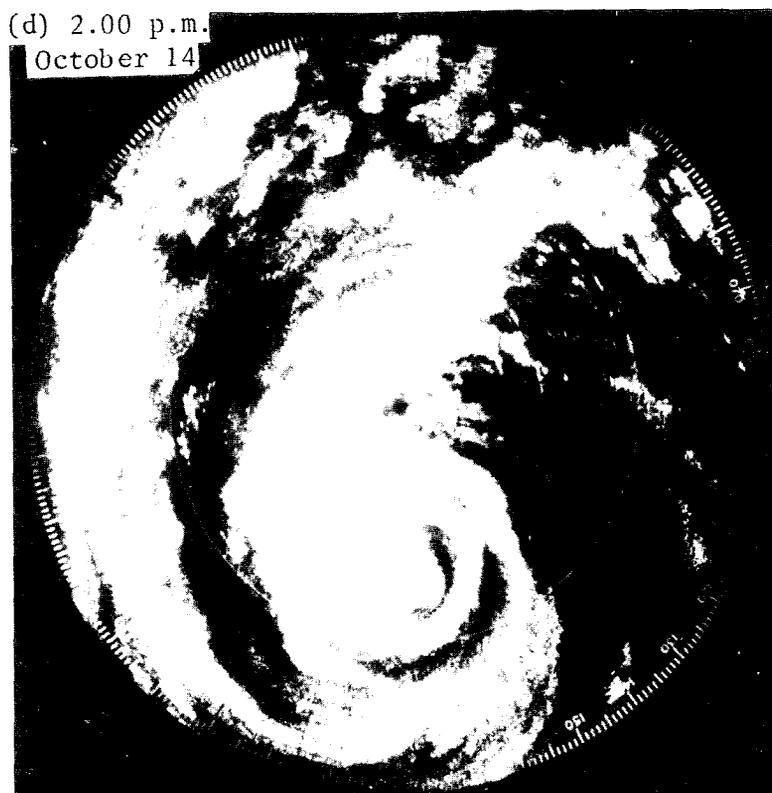


Figure 19. (continued)

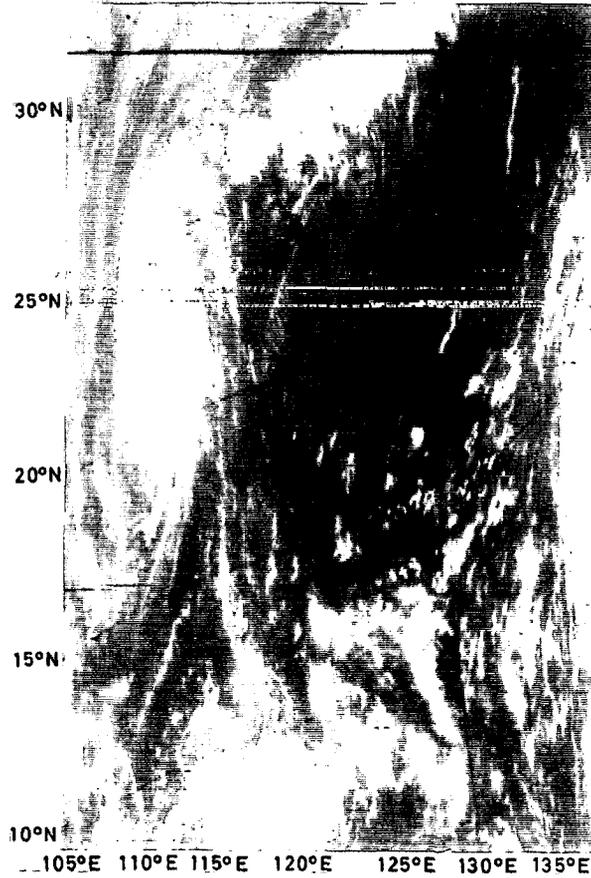


Figure 20. NOAA-4 APT picture of Typhoon Elsie taken from 9.32 a.m. to 9.40 a.m. on October 14, 1975.

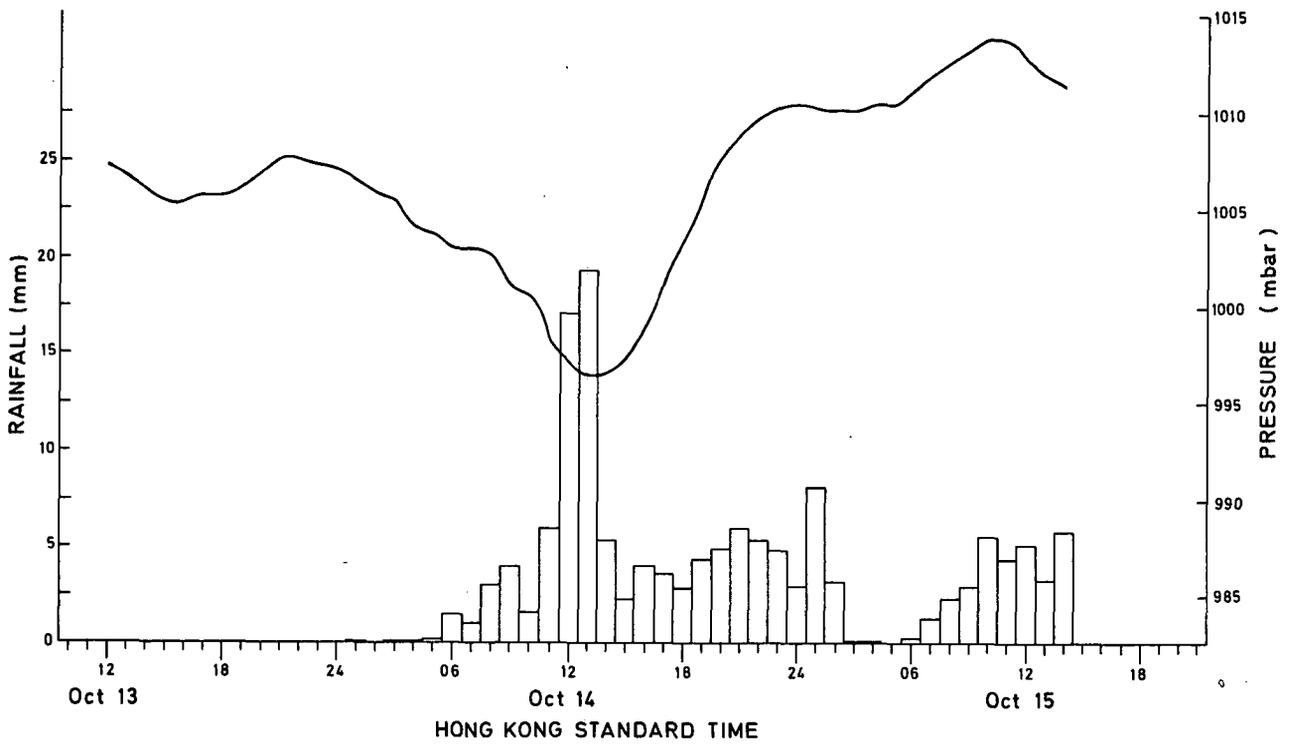


Figure 21. Hourly rainfall distribution and pressure profile as recorded at the Royal Observatory during the passage of Typhoon Elsie on October 13-15, 1975.

版權照片刊登於印刷本內，該刊物可在香港天文台資源中心查閱。

天文台資源中心網址：

[http://www.weather.gov.hk/education/edu04other/edu04\\_rcentre\\_c.htm](http://www.weather.gov.hk/education/edu04other/edu04_rcentre_c.htm)  
(電話: 2926 8250)

The copyrighted photo is available in the published version. The publication can be accessed at the Hong Kong Observatory Resource Centre.

Website of the Observatory Resource Centre:

[http://www.weather.gov.hk/education/edu04other/edu04\\_rcentre\\_e.htm](http://www.weather.gov.hk/education/edu04other/edu04_rcentre_e.htm)  
(Tel.: 2926 8250)

## SEVERE TROPICAL STORM FLOSSIE

October 15-23, 1975

*The track of this severe tropical storm is shown in Figure 23*

On October 15, a tropical depression developed about 420 miles west of Guam and moved west at 15 knots. It weakened slightly on October 16, but continued to move west or west-northwest as an area of low pressure during the following three days.

On October 19, this low pressure area regenerated into a tropical depression over the warm South China Sea and drifted slowly westwards. It intensified to a tropical storm named Flossie the next day. Flossie made a loop about 210 to 240 miles east-southeast of the Paracel Islands and then took a northerly track. On October 21, Flossie further intensified to a severe tropical storm. At 6.05 p.m. that day, a reconnaissance aircraft reported a minimum sea-level pressure of 984 millibars and maximum surface winds of 60 knots near the centre of Flossie. Later in the evening, Flossie changed to a northwesterly course and moved at about 10 knots towards the south China coast to the west of Hong Kong.

In Hong Kong, the Stand By Signal, No. 1, was hoisted at 11.05 p.m.# on October 21 when Flossie was about 340 miles to the south-southeast. At 5.35 a.m. on October 22, a reconnaissance aircraft reported that the central pressure of the storm fell to 977 millibars and the maximum surface winds reached 60 knots. A U.S. container ship, the 'Mayaguez' reported winds of 65 knots at 9 a.m. and 60 knots at 3 p.m. A pressure of 980 millibars was recorded at 2.25 p.m. when this ship was about 35 miles south-southwest of the storm centre. Satellite pictures received at the Royal Observatory around 10 p.m. showed that Flossie had become well organized with intense spiral rainbands (Figure 24).

In Hong Kong, the Stand By Signal was replaced by the Strong Wind Signal, No. 3, at 7.00 a.m. on October 22 when Flossie was 250 miles south-southeast of Hong Kong and was moving north or north-northwest at eight knots.

During the evening of October 22, Flossie turned to a more westerly course and was closest to Hong Kong around 9 a.m. on October 23 when it was about 140 miles to the southwest (Figure 25). The eye of Flossie was not clearly discernible on the radar displays at the Royal Observatory and there were only a few intense rainbands. Flossie weakened to a tropical storm in the afternoon and crossed the south China coast about 200 miles west-southwest of Hong Kong shortly afterwards and soon dissipated overland. All signals were lowered in Hong Kong at 3.10 p.m. on October 23.

Local winds were moderate to fresh northerly at first, gradually freshening to strong easterly on October 22. Gales were reported at times in some exposed places early on the morning of October 23. Winds moderated during that day and turned southeasterly. The maximum winds and maximum gusts peak speeds recorded at various locations were as follows:

<i>Location</i>	<i>Maximum mean hourly wind in points and knots</i>		<i>Maximum gust in points and knots</i>	
Royal Observatory	NE	26	NE	67
Hong Kong Airport (SE)	E	33	E	59
Hong Kong Airport (NW)	NE	28	NE	56
Waglan Island	E	40	ENE	69
Tate's Cairn	NE	50	ENE	80
Cheung Chau	E	36	E	61
King's Park	E	28	ENE	51
Star Ferry	E	36	E	57
Green Island	E	40	ENE	64
Tsim Bei Tsui	SE	36	ESE	49
Tai O	ESE	27	ESE	61
Cape D'Aguilar	—	32	—	48
Stanley	ENE	50	ENE	84
Castle Peak	N	24	N	45

The weather in Hong Kong was mainly fine on October 21. It became cloudy with patches of rain and occasional squally showers during the next two days, but conditions improved gradually towards the evening of October 23.

The following daily amounts of rainfall were recorded at the Royal Observatory:

October 20	Nil
October 21	Nil
October 22	4.5 mm
October 23	22.1 mm
Total:	26.6 mm

No serious flooding was reported during the passage of Flossie. The times and heights of the highest tides and maximum storm surges recorded at various locations in Hong Kong during the display of tropical cyclone warning signals were as follows:

Location	Highest Tide Above Chart Datum			Maximum Storm Surge Above Predicted Level		
	Height (m)	Date	Time	Height (m)	Date	Time
North Point	2.9	Oct. 22	11.15 p.m.	0.7	Oct. 22	11.45 p.m.
Tai Po Kau	3.0	Oct. 22	10.30 p.m.	0.9	Oct. 23	12.30 a.m.
Chi Ma Wan (Lantau Island)	—	—	—	—	—	—

Practically no damage was reported in Hong Kong apart from one incident when a freighter, the 'Shinpoku Maru', ran aground off Stonecutters Island early on October 23. However, tragedy befell two cargo freighters about 70 to 100 miles south of Hong Kong on October 21. The 2999-ton 'Kinabalu Satu' and the 891-ton 'Ming Sing' both sank and there were only three survivors.

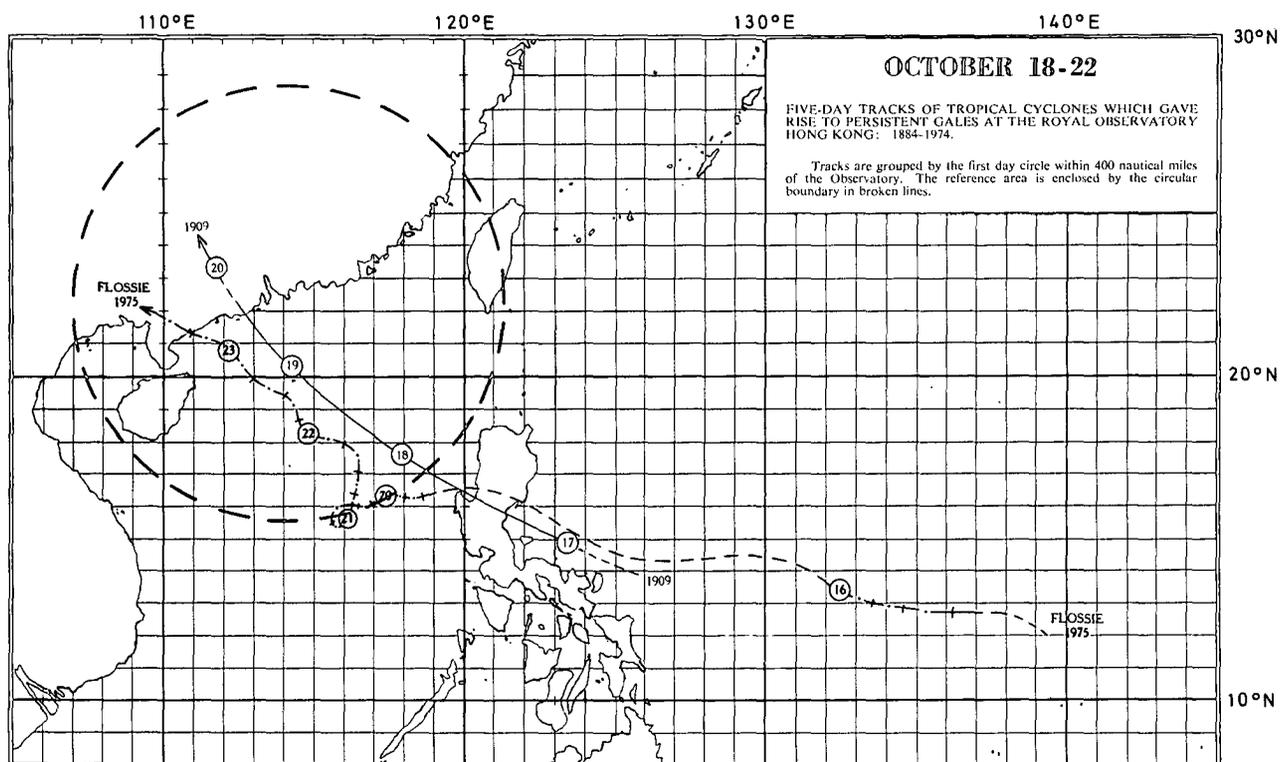


Figure 23. Track of Severe Tropical Storm Flossie: October 15-23, 1975.

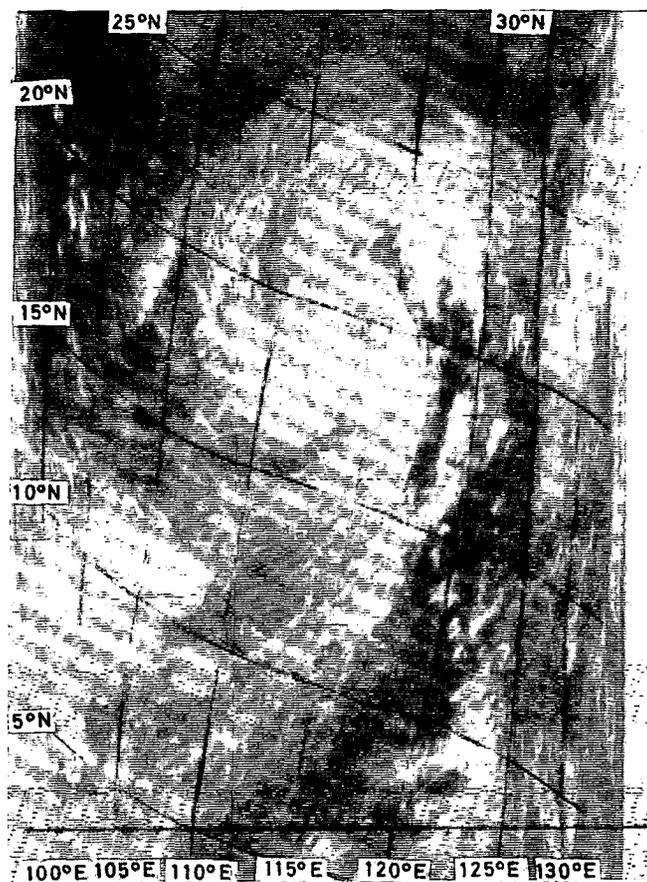


Figure 24. NOAA-4 APT picture of Severe Tropical Storm Flossie taken from 9.51 p.m. to 9.59 p.m. on October 22, 1975.

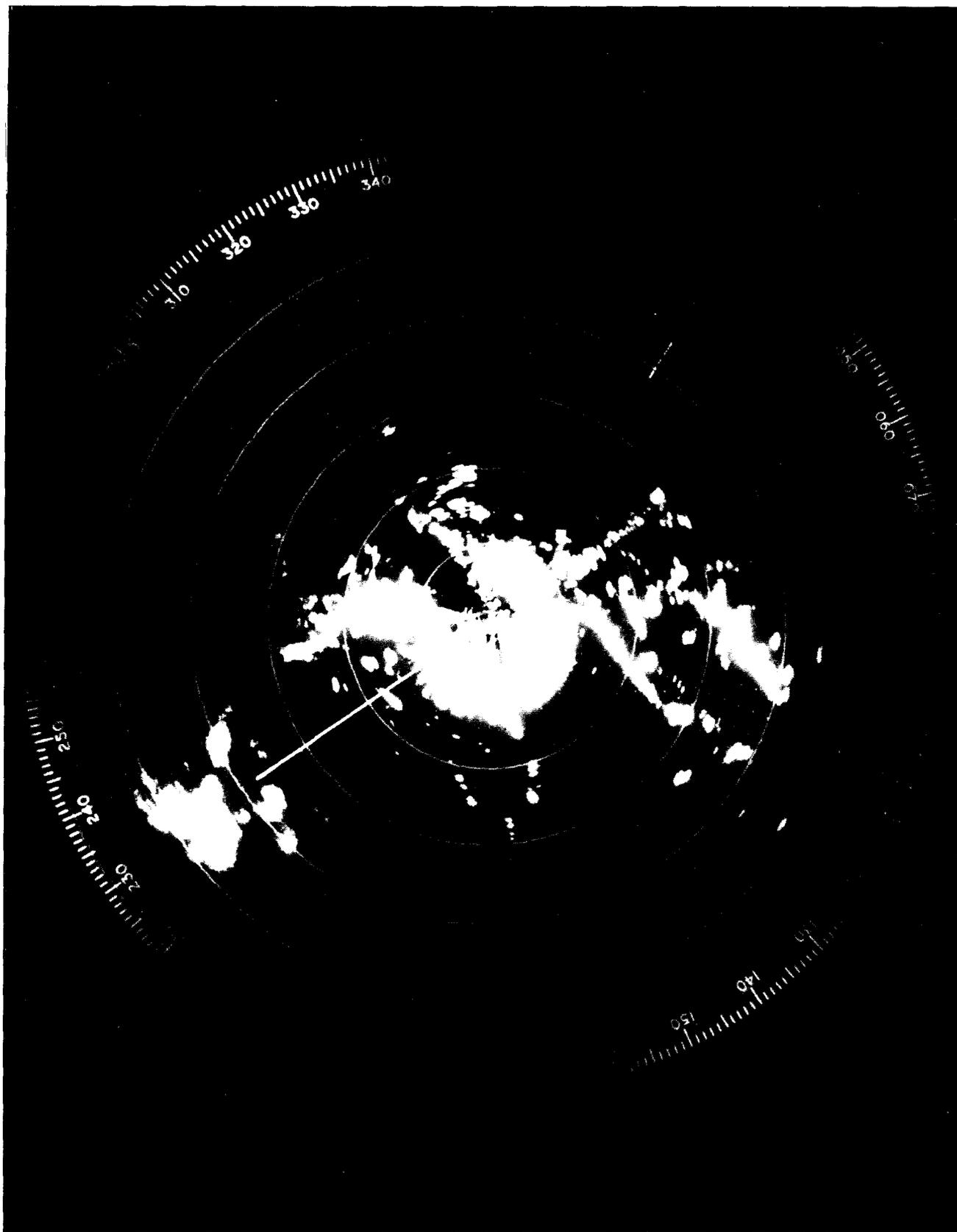


Figure 25. Radar picture of Severe Tropical Storm Flossie taken at 9.00 a.m. on October 23, 1975.

TABLE 1. LIST OF TROPICAL CYCLONES IN THE WESTERN NORTH PACIFIC AND THE SOUTH CHINA SEA IN 1975

Name of Tropical Cyclone	Beginning of Track					First day circle	Last day circle	Ending of Track				
	Date	Time	Position		Date			Time	Position			
			G.M.T.	$^{\circ}$ N					$^{\circ}$ E	G.M.T.	$^{\circ}$ N	$^{\circ}$ E
1 Typhoon Lola	January	22	0600	7.0	135.0	23	28	January	28	0600	14.2	111.6
2 Tropical Depression	June	16	1200	19.3	113.0	17	19	June	19	0000	20.5	106.6
3 Tropical Storm Mamie	July	26	0600	20.9	143.8	27	30	July	30	0600	32.3	128.8
4 Typhoon Nina	July	31	1200	17.5	133.0	1	6	August	6	0000	30.9	113.1
5 Tropical Depression	August	9	1800	18.7	114.6	10	14	August	14	0600	23.5	113.6
6 Typhoon Ora	August	10	0000	21.5	124.8	10	13	August	13	0000	29.1	117.5
7 Typhoon Phyllis	August	12	0000	12.7	137.8	12	19	August	19	0000	39.6	131.5
8 Typhoon Rita	August	18	0600	24.7	130.6	19	23	August	23	1200	41.0	141.9
9 Tropical Storm Susan	August	26	1200	25.1	153.6	27	1	September	1	0000	39.9	157.6
10 Typhoon Tess	September	2	0000	18.3	150.3	2	10	September	10	0000	38.5	151.6
11 Tropical Storm Viola	September	5	0000	14.9	131.1	5	7	September	7	0600	19.6	134.4
12 Severe Tropical Storm Alice	September	16	0000	13.8	129.7	16	21	September	21	0000	20.0	102.7
13 Typhoon Betty	September	17	1200	16.6	142.0	18	24	September	24	0000	23.9	114.9
14 Typhoon Cora	October	1	0600	14.0	132.8	2	6	October	6	0600	35.6	155.1
15 Severe Tropical Storm Doris	October	3	0000	13.6	113.0	3	7	October	7	0600	27.1	122.4
16 Typhoon Elsie	October	9	0000	12.5	138.1	9	14	October	14	1800	22.2	112.7
17 Severe Tropical Storm Flossie	October	15	0600	12.8	136.3	16	23	October	23	0600	21.3	111.0
18 Severe Tropical Storm Grace	October	25	0000	18.0	128.3	25	2	November	2	0600	26.6	142.6
19 Tropical Storm Helen	November	3	0000	13.5	115.6	3	4	November	4	1200	13.4	108.4
20 Typhoon Ida	November	6	0600	10.2	149.2	7	12	November	12	0600	41.1	157.9
21 Typhoon June	November	17	0000	6.6	142.7	17	24	November	24	0000	37.7	153.4
22 Tropical Storm	December	26	1800	12.0	113.0	27	29	December	29	0000	8.5	117.2

\* West of  $160^{\circ}$ E (Typhoon Winnie in September was east of  $160^{\circ}$ E)

TABLE 2. TROPICAL CYCLONE WARNINGS FOR SHIPPING ISSUED IN 1975

Tropical Cyclone	No. of Warnings Issued	Date and Time of Issue of				Duration of Warnings (hours)		
		First Warning		Last Warning				
Typhoon Lola	16	January	24	1800	January	28	0600	84
Tropical Depression*	20	June	16	0900	June	19	0000	63
Typhoon Nina	9	August	2	1800	August	4	0000	30
Tropical Depression*	34	August	9	1800	August	14	0000	102
Typhoon Ora	13	August	10	0600	August	13	0000	66
Severe Tropical Storm Alice*	23	September	17	0600	September	20	1200	78
Typhoon Betty*	16	September	21	1800	September	24	0000	54
Severe Tropical Storm Doris*	25	October	3	0000	October	6	0900	81
Typhoon Elsie*	26	October	11	1200	October	14	2100	81
Severe Tropical Storm Flossie*	26	October	20	0000	October	23	0900	81
Tropical Storm Helen	8	November	3	0000	November	4	1200	36
Tropical Storm	4	December	26	1800	December	27	1200	18
<b>Total</b>	<b>220</b>							<b>774</b>

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

N.B. 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 1975

## SUMMARY

SIGNAL	No. of Occasions	Total Duration	
1	8	174 h	24 min
3	6	102	00
8 NORTHWEST	1	6	30
8 SOUTHWEST	-	-	-
8 NORTHEAST	-	-	-
8 SOUTHEAST	1	3	05
9	1	3	15
10	1	2	50

## DETAILS

Tropical Cyclone	No. of Warning Bulletins Issued	Signal	Hoisted			Lowered		
			Date	Time*		Date	Time*	
Tropical Depression	11	1	June	16	1945	June	17	2200 <sup>#</sup>
Tropical Depression	18	1	August	10	0400	August	11	0350
		1	August	13	1545	August	13	2200
		3	August	13	2200	August	14	0710
Severe Tropical Storm Alice	15	1	September	18	1500	September	19	1030
		3	September	19	1030	September	20	0415
Typhoon Betty	18	1	September	22	1645	September	24	0920
Severe Tropical Storm Doris	29	1	October	4	0540	October	5	1045
		3	October	5	1045	October	6	1520
Typhoon Elsie	32	1	October	12	2145	October	13	1900
		3	October	13	1900	October	14	0330
		8 NW	October	14	0330	October	14	1000
		9	October	14	1000	October	14	1315
		10	October	14	1315	October	14	1605
		8 SE	October	14	1605	October	14	1910
		3	October	14	1910	October	15	0100
Severe Tropical Storm Flossie	20	1	October	21	2305	October	22	0700
		3	October	22	0700	October	23	1510

\* Hong Kong Standard Time

# Revised on 22 December 2016

TABLE 4. FREQUENCY OF HOISTING AND TOTAL DURATION OF DISPLAY OF TROPICAL CYCLONE WARNING SIGNALS : 1946-1975

Signals		1	3*	8 NW†	8 SW†	8 NE†	8 SE†	9	10	Total	Total Duration (hours)
Year											
1946		7	-	1	0	1	2	1	1	13	154
1947		6	-	1	0	1	0	0	0	18	124
1948		5	-	1	1	3	2	0	0	12	112
1949		4	-	0	0	1	1	1	0	7	67
1950		2	-	0	0	1	1	1	0	5	102
1951		4	-	0	0	2	3	1	0	10	133
1952		2	-	0	0	1	1	0	0	4	74
1953		2	-	1	1	2	1	1	0	8	116
1954		5	-	0	0	3	2	2	0	12	133
1955		0	-	0	0	0	0	0	0	0	0
1946 to 1955	Total	37	-	4	2	15	13	7	1	79	1015
	Mean	3.7	-	0.4	0.2	1.5	1.3	0.7	0.1	7.9	101.5
1956*		5	4	0	0	0	0	0	0	9	191
1957		4	5	1	1	2	2	0	1	20	296
1958		4	5	0	0	1	0	0	0	10	214
1959		1	1	0	0	0	0	0	0	2	37
1960		11	7	0	2	2	2	1	1	26	433
1961		6	7	1	2	1	0	1	1	19	193
1962		4	3	0	1	1	0	1	1	11	158
1963		4	5	0	0	1	0	0	0	10	176
1964		11	14	1	3	5	3	3	2	42	570
1965		7	6	0	0	1	1	0	0	15	240
1966		6	5	0	0	2	2	0	0	15	285
1967		8	6	0	0	2	1	0	0	17	339
1968		7	7	0	1	1	0	1	1	18	290
1969		4	2	0	0	0	0	0	0	6	110
1970		6	8	2	1	2	0	0	0	19	287
1971		9	10	1	3	2	2	1	1	29	323
1972		8	6	0	0	1	1	0	0	16	288
1973		8	6	1	1	1	0	1	0	18	417
1974		12	10	0	0	2	1	1	0	26	526
1975		8	6	1	0	0	1	1	1	18	292
1956 to 1975	Total	133	127	8	15	27	16	11	9	346	5665
	Mean	6.7	6.4	0.4	0.8	1.4	0.8	0.6	0.5	17.3	283.3

\* The Strong Wind Signal, No. 3, was introduced in 1956

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

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 : 1946-1975

Year	Number in Hong Kong's Area of Responsibility	Number Necessitating the Display of Signals in Hong Kong
1946	9	6
1947	21	6
1948	15	4
1949	16	4
1950	13	5
1951	12	7
1952	22	9
1953	19	6
1954	17	7
1955	14	3
1956	23	5
1957	12	6
1958	14	5
1959	19	2
1960	20	9
1961	22	6
1962	16	4
1963	13	4
1964	25	10
1965	16	6
1966	16	6
1967	16	8
1968	12	6
1969	11	4
1970	21	6
1971	17	9
1972	14	5
1973	17	9
1974	21	11
1975	12	7
Total	495	185
Mean	16.5	5.9

TABLE 6. DURATION OF DISPLAY OF TROPICAL CYCLONE WARNING SIGNALS IN HONG KONG : 1946-1975

Signal	Duration for each occasion						Duration per year					
	Mean		Maximum		Minimum		Mean		Maximum		Minimum	
1	17h	57min	102h	10min	1h	20min	101h	42min	273h	15min	0h	0min
3*	20	41	71	45	1	00	131	18	268	45	8	45
8 NW †	7	26	13	00	1	30	2	59	13	00	0	
8 SW †	5	30	11	10	2	30	3	07	16	10	0	
8 NE †	11	33	35	35	2	15	16	11	61	45	0	
8 SE †	7	04	17	20	0	20	6	49	28	52	0	
8	8	44	35	35	0	20	29	06	82	25	0	
9	3	49	6	30	1	10	2	18	11	00	0	
10	6	05	9	10	2	30	2	02	12	10	0	

\* 1956 - 1975

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

TABLE 7. CASUALTIES AND DAMAGE CAUSED BY TROPICAL CYCLONES IN HONG KONG : 1937-1975

Tropical Cyclone	Ocean-going Vessels in Trouble	Junks Sunk or Wrecked	Junks Damaged	Persons Dead	Persons Missing	Persons Injured
1937 Typhoon	28	545	1,255	11,000	*	*
1957 T. Gloria	5	2	Several	8	*	111
1960 T. Mary	6	352	462	11	11	127
1961 T. Alice	*	*	*	4	0	20
1962 T. Wanda	36	1,297	756	130	53	*
1964 T. Viola	5	18	18	0	0	41
T. Ida	3	7	60	5	4	56
T. Ruby	20	32	282	38	6	300
T. Sally	0	0	0	9	0	24
T. Dot	2	31	59	26	10	85
1966 S.T.S. Lola	0	*	6	1	0	6
1968 T. Shirley	1	*	3	0	0	4
1970 T.D. (Aug. 1-3)	0	0	0	2†	0	0
T. Georgia	2	0	*	0	0	0
1971 T. Freda	8	0	0	2	0	30
T. Lucy	10	0	0	0	0	38
T. Rose	33**	303	*	110	15	286
1972 T. Pamela	3	0	0	1	0	8
1973 T. Dot	14	*	*	1	0	38
1974 T. Dinah	1	*	*	0	0	0
T. Ivy	2	*	*	0	0	0
T. Carmen	4	*	*	1	0	0
T. Della	1	*	*	0	0	0
1975 T.D. (Aug. 10-14)	2	1	*	2	1	0
T. Elsie	5	3	*	0	0	46
S.T.S. Flossie	1	*	*	0	0	0

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

\* Data unavailable

† Struck by lightning

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

TABLE 8. SHIPS SUNK, DAMAGED, GROUNDED, ETC., BY TROPICAL CYCLONES IN HONG KONG : 1974-1975

Year	Name of Tropical Cyclone	Name of Ship	Location of Grounding, etc.	Nature of Incident	Remarks
1974	Typhoon Dinah	S.S. Silver Shelton	Victoria Harbour	Adrift	Slight damage to both vessels
	Typhoon Ivy	S.S. Asmari S.S. Hwalung	E. of Tsing Yi Kellett Bank	Adrift Dragging Anchor	
	Typhoon Carmen	S.S. Terryusan Maru S.S. Uniparagon S.S. Oriental Hero	Off Po Toi Island S. of Stonecutters Island S.W. of Stonecutters Island	Dragging Anchor Adrift Adrift and in collision with S.S. Bright Sea	
	Typhoon Della	S.S. Pearl Star S.S. Lela	Western Anchorage S. of Stonecutters Island	Dragging Anchor Collision with S.S. Taolin	
1975	T.D. (Aug. 10-14)	S.S. Wuxi S.S. Hong Kong Truth	Hung Hom Ferry Pier N.W. of Stonecutters Island	Aground Adrift and in collision with S.S. Dehua	Slight damage to S.S. Dehua
	Typhoon Elsie	S.S. Man Wah S.S. Sea Concord	Kowloon Bay Western Anchorage	Adrift Dragging anchor and in collision with S.S. Caribbean Sea	
		S.S. Yu Heng S.S. Teresa	North of West Point North of Lantau	Adrift Dragging anchor and in collision with S.S. Olympic Sky	
	S.T.S. Flossie	S.S. Slidre S.S. Shinpoku Maru	N.W. of Green Island Off Stonecutters Island	Adrift Aground	

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

TABLE 9. A SUMMARY OF METEOROLOGICAL OBSERVATIONS RECORDED IN HONG KONG DURING THE PASSAGES OF TROPICAL CYCLONES IN 1975

Name of tropical cyclone	Month	Nearest approach to Hong Kong				Minimum hourly M.S.L. pressure at the Royal Observatory			Maximum storm surge			Max. 60-min mean wind		Max. 10-min mean wind		Maximum gust		Rainfall at the Royal Observatory				
		Day	Time*	Dir.	Dist.	Day	Time*	Pressure	North Point	Tai Po Kau	Chi Ma Wan	Royal Observatory	Waglan Island	Royal Observatory	Waglan Island	Royal Observatory	Waglan Island	(i) 300 n mile	(ii) 24 hours	(iii) 48 hours	(iv) 72 hours	(i) + (iv)
				points	n mile			mbar	m	m	m	points kn	points kn	points kn	points kn	points kn	points kn	mm	mm	mm	mm	mm
T.D.	Jun	16	2100	SW	180	16	1700	1003.8	0.4	0.5	0.5	E 14	ENE 29	E 15	ENE 29	E 33	ENE 34	29.7	78.1	101.5	105.7	135.4
T.D.	Aug	14	0200	-	0	14	0200	990.4	0.3	1.0	0.7	SW 19	SW 33	SW 20	SW 36	SW 45	SW 45	93.2	11.6	17.6	17.6	110.8
S.T.S. Alice	Sep	19	1700	SSW	270	19	1600	1006.5	0.2	0.5	0.6	E 16	ENE 30	E 23	ENE 31	ENE 41	ENE 38	4.1	7.9	7.9	7.9	12.0
F. Betty	Sep	24	1000	N	95	23	1700	1000.0	0.2	0.4	0.5	W 14	N 26	W 15	N 27	N 36	N 34	3.8	Trace	Trace	Trace	3.8
S.T.S. Doris	Oct	6	0800	WNW	85	6	0300	1002.1	0.4	0.6	0.8	ESE 20	S 39	S 27	S 42	SE 52	S 52	119.6	-	0.1	1.3	120.9
T. Elsie	Oct	14	1330	S	27	14	1300	996.4	0.6	1.2	0.9	ENE 31	E 64	ENE 32	E 67	NE 76	ENE 94	111.5	39.1	39.1	39.1	150.6
S.T.S. Flossie	Oct	23	0900	SW	140	23	0400	1003.3	0.7	0.9	-	NE 26	ENE 42	ENE 28	ENE 45	NE 67	ENE 69	22.8	Trace	10.2	10.2	33.0

Note: (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

All data, other than the rainfall, refer to the period when tropical cyclone warning signals were hoisted

\* Hong Kong Standard Time