



ROYAL OBSERVATORY, HONG KONG

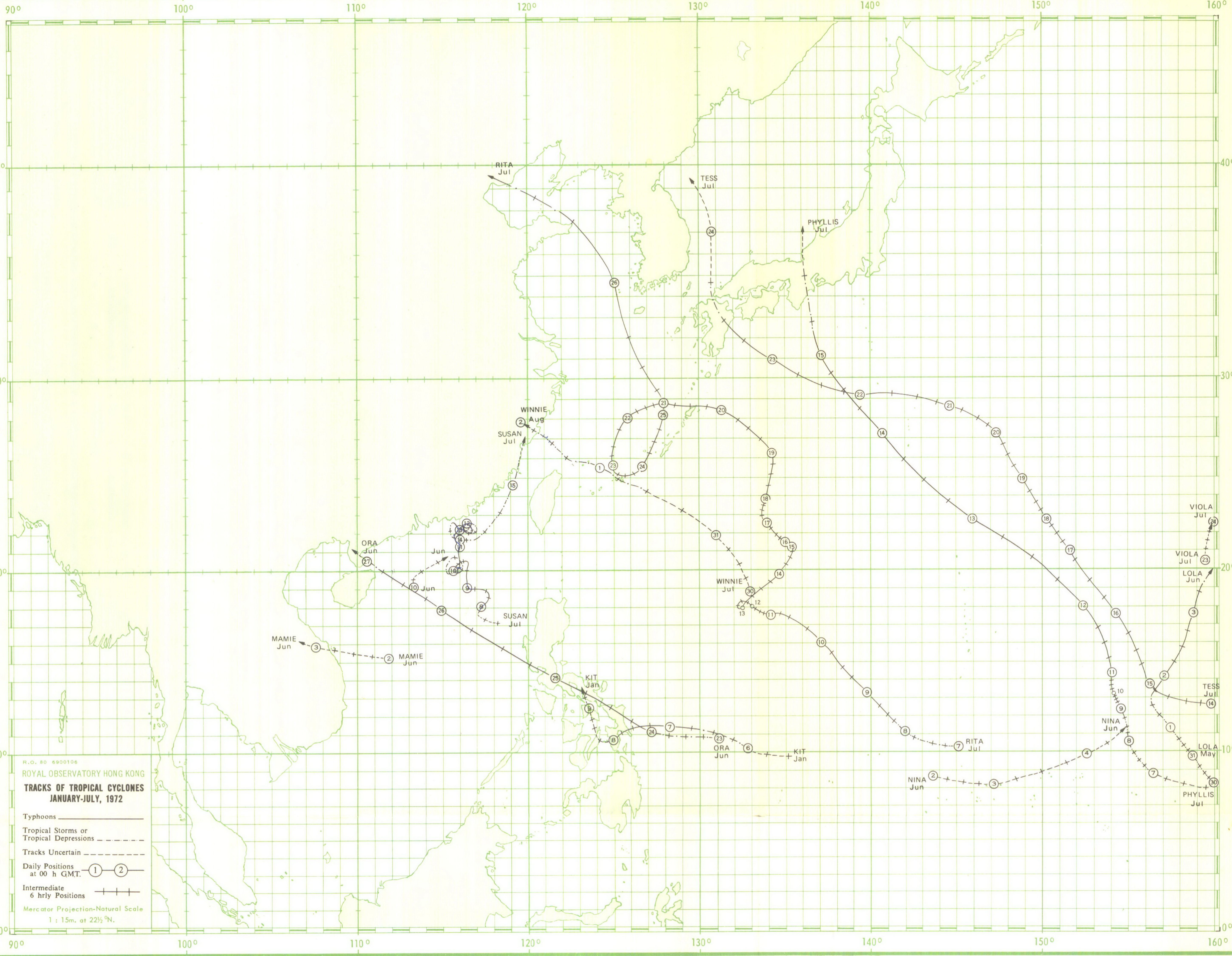
METEOROLOGICAL RESULTS
1972

PART III—TROPICAL CYCLONE SUMMARIES



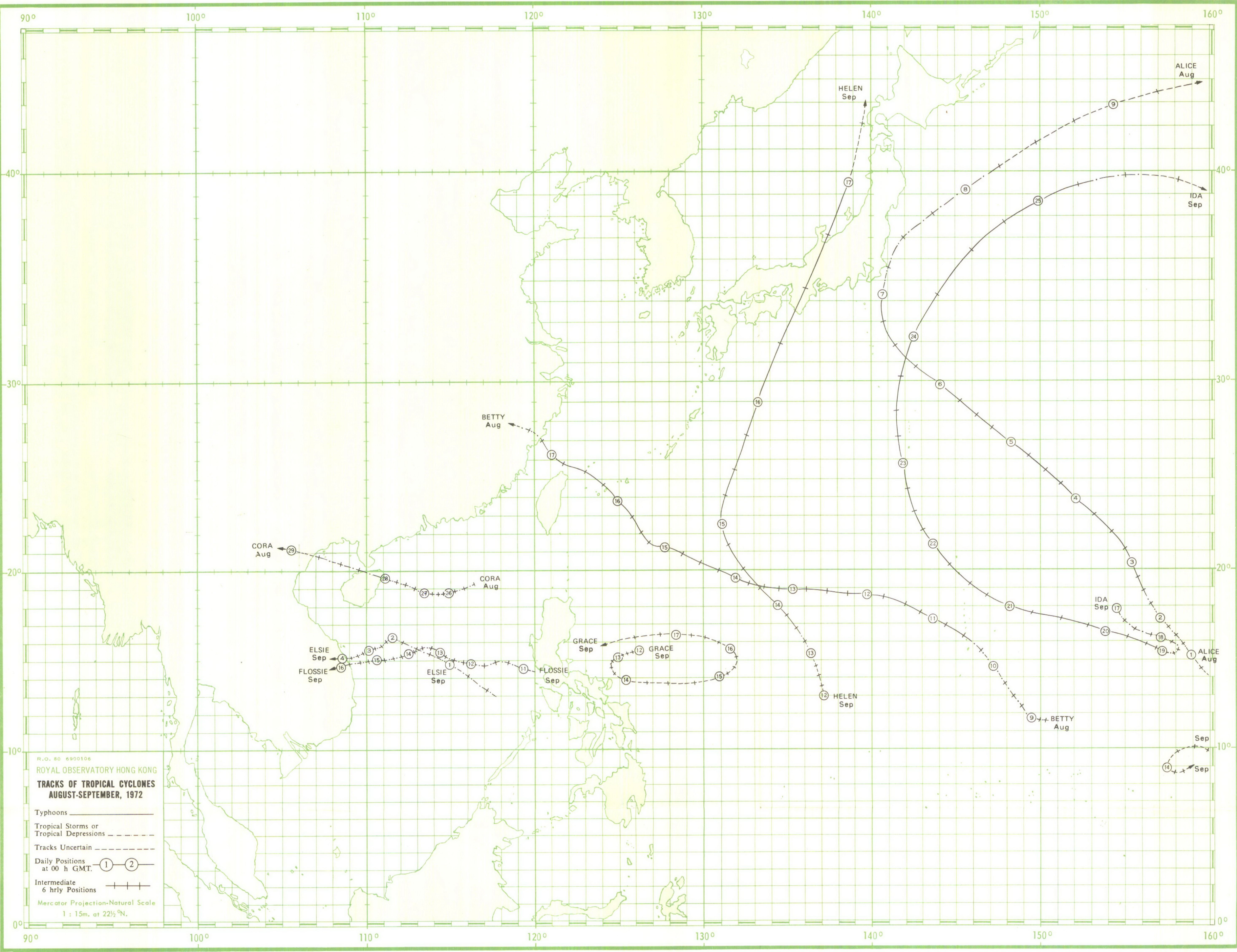
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R.O. 80 6900106
 ROYAL OBSERVATORY HONG KONG
TRACKS OF TROPICAL CYCLONES
JANUARY-JULY, 1972

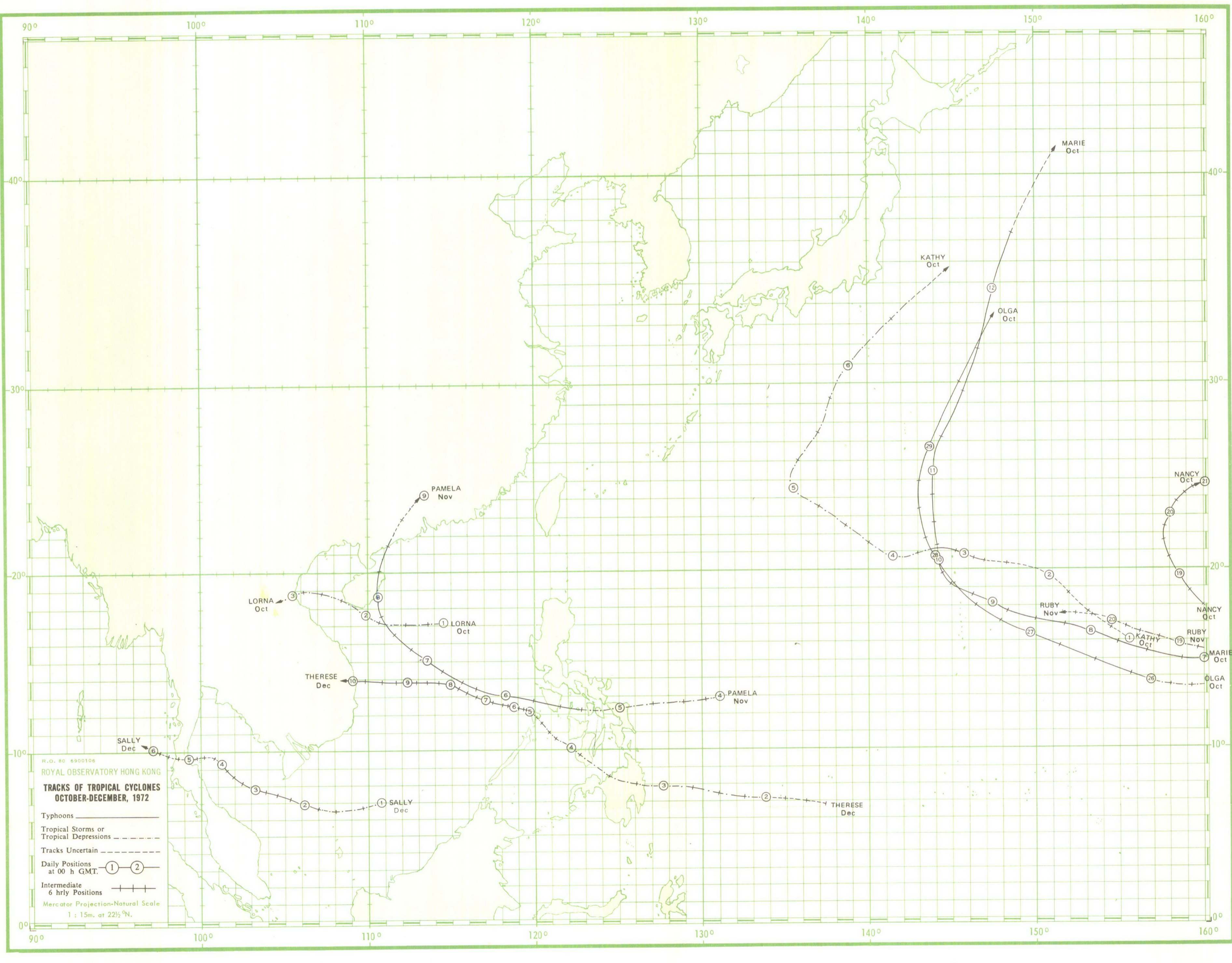
- Typhoons —————
- Tropical Storms or
Tropical Depressions - - - - -
- Tracks Uncertain - - - - -
- Daily Positions
at 00 h GMT. (1) (2) ———
- Intermediate
6 hrly Positions — + + + —
- Mercator Projection-Natural Scale
1 : 15m. at 22½°N.



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 ROYAL OBSERVATORY HONG KONG
**TRACKS OF TROPICAL CYCLONES
 AUGUST-SEPTEMBER, 1972**

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R.O. # 6900106
ROYAL OBSERVATORY HONG KONG
TRACKS OF TROPICAL CYCLONES
OCTOBER-DECEMBER, 1972

Typhoons ———
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SALLY
Dec

LORNA
Oct

THERESE
Dec

PAMELA
Nov

LORNA
Oct

PAMELA
Nov

KATHY
Oct

OLGA
Oct

MARIE
Oct

RUBY
Nov

KATHY
Oct

RUBY
Nov

NANCY
Oct

NANCY
Oct

MARIE
Oct

OLGA
Oct

METEOROLOGICAL RESULTS
1972

PART III—TROPICAL CYCLONE SUMMARIES

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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 began 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. In 1971, 'Meteorological Results, Part III—Tropical Cyclone Summaries' was introduced and the first issue of the series was concerned with tropical cyclones which formed over the western North Pacific and the South China Sea in 1968.

During the period 1884–1939, reports on destructive typhoons were occasionally prepared and were included in the Appendices of Meteorological Results. However, since 1947, this practice was extended and information on all tropical cyclones which caused gales in Hong Kong was contained in the Annual Departmental Reports of the Director of the Royal Observatory.

Tracks of tropical cyclones in the western North Pacific and the South China Sea were published in Meteorological Results, Part I up to 1967. For the period 1884–1960, the tracks were plotted with day circle positions only. The day circle time varied to some extent but had remained fixed at 0000 G.M.T. since 1944. The day circle time used for each tropical cyclone is given in the Royal Observatory Technical Memoir No. 11, Volume 1. From 1961 onwards, 6-hourly intermediate positions were also 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 in cyclostyled form and were supplied on request. Initially, reports were only written on those tropical cyclones causing gale or storm signals to be hoisted in Hong Kong, but by 1968 it had become necessary to produce individual reports for every tropical cyclone for 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.

Surface wind observations are made regularly at 6 stations in the Colony. Each station is equipped with a Dines pressure-tube anemograph incorporating a twin-pen direction recorder, manufactured by R. W. Munro Limited. Quick-run mechanisms are also fitted to the anemometers at the Hong Kong Airport, 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. (m)	Elevation of ground above M.S.L. (m)	Head of anemometer above M.S.L. (m)
	Latitude N	Longitude E			
Royal Observatory	22° 18'	114° 10'	33	32	61
Hong Kong Airport	22° 20'	114° 11'	24	4	10
Waglan Island	22° 11'	114° 18'	56	55	74
Tate's Cairn	22° 22'	114° 13'	*	576†	589
Cheung Chau	22° 12'	114° 01'	79	72	92
Cape Collinson	22° 16'	114° 15'	48	46	59

* No barometer.

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

‡ Information on the operation of Hong Kong's system of visual Tropical Cyclone Warning Signals is contained in other publications of the Royal Observatory, Hong Kong.

In order to obtain more representative surface wind observations in the harbour area, a M.O. Mark IV Cup generator type anemograph, manufactured by R. W. Munro Limited, was installed on the roof of the east wing of the Star Ferry Pier, Kowloon. The speed unit was operational with effect from August 5, 1972 and the direction unit was erected towards the end of the year. Surface wind observations were made from the recorder by the duty staff at the Star Ferry at the request of the forecaster at the Central Forecasting Office at the Observatory and the requisite information was passed by means of telephone.

The reports in Section 5 present a general description of the life history of each tropical cyclone affecting Hong Kong from formation to dissipation. In more detail it states:

- (a) how the tropical cyclone affected Hong Kong;
- (b) the sequence of display of Tropical Cyclone Warning Signals;
- (c) the maximum gust peak speeds recorded at various stations in the Colony;
- (d) the lowest barometric pressure recorded in the Colony; and
- (e) the daily amount of rainfall recorded at the Royal Observatory.

Whenever practical, radar photographs and cloud pictures of the tropical cyclone received from weather satellites are included along with information and data obtained from aircraft reconnaissance reports.*

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 1972 Hong Kong Summer Time was in force during the period between 3.30 (Hong Kong Standard Time) in the morning of April 16 and 3.30 (Hong Kong Summer Time) in the morning of October 22.

The following conventions are 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 wind speed reports by reconnaissance aircraft included in this publication were taken directly from the Annual Typhoon Report published by the Fleet Weather Central/Joint Typhoon Warning Center at Guam and no attempt was made to convert these observations into equivalent '10-minute mean winds' as normally reported by all surface stations.

DESCRIPTION OF TABLES

Table 1 is a list of tropical cyclones in 1972 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 1972, 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 number of occasions each of the Tropical Cyclone Warning Signals was hoisted, and also the total time throughout the year 1972 that each signal was displayed. The sequence in which signals were displayed in each tropical cyclone affecting Hong Kong and the number of Tropical Cyclone Warning Bulletins issued in each case 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 shows the number of occasions on which Tropical Cyclone Warning Signals were hoisted and their annual total duration during the period 1946–1972. The Strong Wind Signal, No. 3, was not introduced until 1956.

Table 5 gives the annual number of tropical cyclones in Hong Kong's Area of Responsibility between 1946–1972. 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 1946–1972.

Table 7 presents the casualties and damage figures associated with tropical cyclones in Hong Kong for the period 1937–1972. The information is compiled from local newspapers and the figures should only be considered as approximations.

Table 8 contains the particulars of ships sunk, damaged, grounded, etc., by various tropical cyclones which gave rise to persistent gales at the Royal Observatory, Hong Kong for the period 1971–1972. The information is compiled from local newspapers.

Table 9 presents some features of tropical cyclones which gave gales or winds of greater force at the Observatory since 1884. In this context, the criterion used is the hourly mean wind speed centred on the hour recorded at the Royal Observatory. In each case, data are tabulated in chronological order according to the date and time of minimum pressure recorded at the Royal Observatory. The information presented includes lowest hourly reading of the barometer (reduced to M.S.L.), the maximum gust peak speed, duration of gale, direction of strongest winds and the sequence of wind direction in terms of veering and backing. Statements on storm surges and additional information, where applicable, are included as remarks. Information on gusts was not available before the installation of the Dines anemograph in 1911.

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TROPICAL CYCLONE SUMMARY FOR 1972

During the year 30 tropical cyclones were detected in the western North Pacific (west of 160°E) and the South China Sea, of which 18 reached typhoon intensity. A total of 9 tropical cyclones affected China, 3 passed over Japan, 1 crossed the Malay Peninsula, 4 devastated the Philippines and 6 entered the east coast of Indo-China, while none affected Korea. The monthly distribution of these tropical cyclones is shown in Figure 1 and a brief summary of their tracks is contained in Table 1.

A total of 7 tropical cyclones entered Hong Kong's Area of Responsibility for Tropical Cyclone Warnings for Shipping while another 7 developed within this area. Altogether, 285 Warnings for Shipping were issued on these 14 tropical cyclones by the Royal Observatory, Hong Kong. Five tropical cyclones necessitated the display of warning signals in Hong Kong. However, only Typhoon 'Pamela' caused gales in the Colony.

In the first 5 months of the year, there were only two tropical cyclones and both were typhoons. Typhoon 'Kit' affected the central Philippines on January 8-9 while Typhoon 'Lola' followed a recurving track and crossed the 160°E meridian twice during the period May 30-June 3.

Four tropical cyclones formed in June, of which three were relatively short-lived. The fourth one, Typhoon 'Ora', formed over the western North Pacific to the east of the Philippines on June 24. It moved northwestwards across the central Philippines and dissipated over the Luichow Peninsula on June 27.

There were 6 tropical cyclones in July. 'Phyllis', 'Rita', 'Susan', and 'Tess' developed into typhoons and they coexisted during the period July 14-15. 'Susan' was the first tropical cyclone which remained within 200 miles of Hong Kong for more than five days while Typhoon 'Rita' also broke several records. It was the most persistent tropical cyclone ever observed in this area and maintained typhoon intensity for an exceptionally long period of 18 days. The lowest central sea-level pressure recorded in 'Rita' was 911 millibars. Both Typhoons 'Phyllis' and 'Tess' recurved to the north and affected Japan on July 15 and 23 respectively. Tropical Storm 'Viola' was short-lived. It formed and dissipated near the 160°E meridian on July 23-24. Towards the end of July, Tropical Storm 'Winnie' formed in the Pacific east of the Bashi Channel. It followed a northwesterly course and crossed the east China coast near Foochow on August 2.

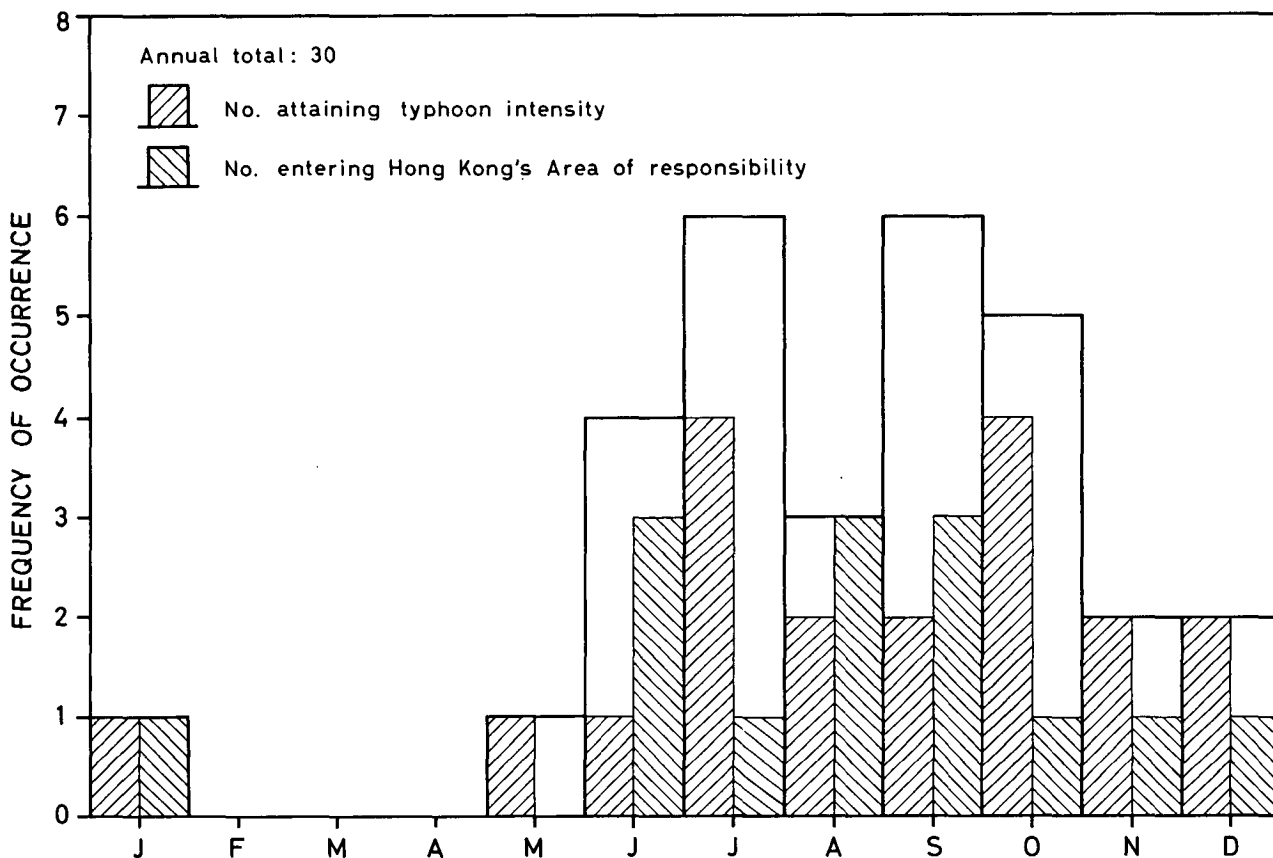


Figure 1. Monthly distribution of the frequency of occurrence of tropical cyclones in the western North Pacific and the South China Sea in 1972 (classified in accordance with the month of the first day circle of each track).

There were three tropical cyclones in August. Typhoon 'Alice' was located just west of 160°E in the Pacific on August 1. It passed close to the east Japan coast on August 7 and then recurved rapidly to the northeast. Typhoon 'Betty' developed over the western North Pacific on August 8 and moved on a northwesterly course. It crossed the east China coast near Foochow on August 18 and dissipated rapidly. Tropical Storm 'Cora' formed over the South China Sea on August 25. It moved along a west-northwesterly track and passed south of Hong Kong. 'Cora' finally dissipated over North Vietnam on August 29.

A total of 6 tropical cyclones was reported in September. 'Elsie' and 'Flossie' were severe tropical storms. They formed in the South China Sea and crossed the east coast of South Vietnam on September 4 and 16 respectively. Tropical Depression 'Grace' followed an erratic track to the east of the Philippines. Typhoon 'Helen' passed over central Japan on September 16. The other two were tropical storms and were both located east of 140°E.

In October, 5 tropical cyclones were observed, of which 4 developed into typhoons. Tropical Storm 'Lorna' formed in the South China Sea on October 1. It followed a west-northwesterly course and crossed the North Vietnam coast two days later. The others, 'Nancy', 'Marie', 'Olga' and 'Kathy' recurved to the south-east of Japan and dissipated over the Pacific.

Only four tropical cyclones developed in the last two months of the year, and they were all typhoons. Typhoon 'Ruby' followed a west-northwesterly course and weakened to a tropical depression before crossing the 160°E meridian. Typhoon 'Pamela' formed to the east of the Philippines on November 4 and moved westwards, entering the South China Sea on November 6. It then started to move northwestwards and after passing over the eastern coast of Hainan, it turned onto a north-northeasterly course and crossed the south China coast about 180 miles west-southwest of Hong Kong. During the passage of 'Pamela', gales were experienced in exposed places in Hong Kong for five hours and the maximum gust peak speed recorded was 83 knots at Tate's Cairn. Since records began in 1884, Typhoon 'Pamela' was the sixth tropical cyclone to affect Hong Kong in November.

Typhoons 'Sally' and 'Therese' appeared in the South China Sea at the beginning of December and both moved across the South China Sea on a westerly course. 'Sally' crossed the Malay Peninsula on December 5, while 'Therese' entered the South Vietnam coast on December 10.

REPORTS ON TROPICAL CYCLONES AFFECTING HONG KONG IN 1972

TROPICAL DEPRESSION

June 10 - 11, 1972

The track of this tropical depression is shown in Figure 2

A broad trough of low pressure lay from west to east across the northern part of the South China Sea on June 5-8. On June 10, several upper-air disturbances moved eastwards across the South China Sea and these activated the surface trough. By 9 a.m., a weak tropical depression began to form east of Hainan Island about 190 miles south of Hong Kong and drifted slowly northwards. Satellite pictures received at the Royal Observatory on the same day (Figure 3) indicated that the centre was ill-defined. By 2.30 p.m., the circulation of the depression had become better organized and the Stand By Signal, No. 1, was hoisted to notify that a tropical cyclone alert was in force.

Winds over the Colony freshened from the east during the morning of June 10 and the weather was cloudy with some showers. The tropical depression turned onto an east-northeasterly course during the evening when it was about 140 miles south of the Colony and began to weaken. By next morning, it had degenerated into a low pressure area some 90 miles west of Pratas Island and all signals were lowered at 9.40 a.m. on June 11. The remnant of the tropical depression moved erratically across Taiwan into the Pacific during the following 2 days. During the period when the Stand By Signal was hoisted, the maximum gust peak speeds recorded were 51 knots at Tate's Cairn, 43 knots at Waglan Island, 40 knots at the Royal Observatory, 36 knots at Cape Collinson, 34 knots at Hong Kong Airport and 30 knots at Cheung Chau. A total of 10.6 mm of rainfall was recorded at the Royal Observatory on June 10-11. There was no significant rise in the tide height during the passage of this tropical depression.

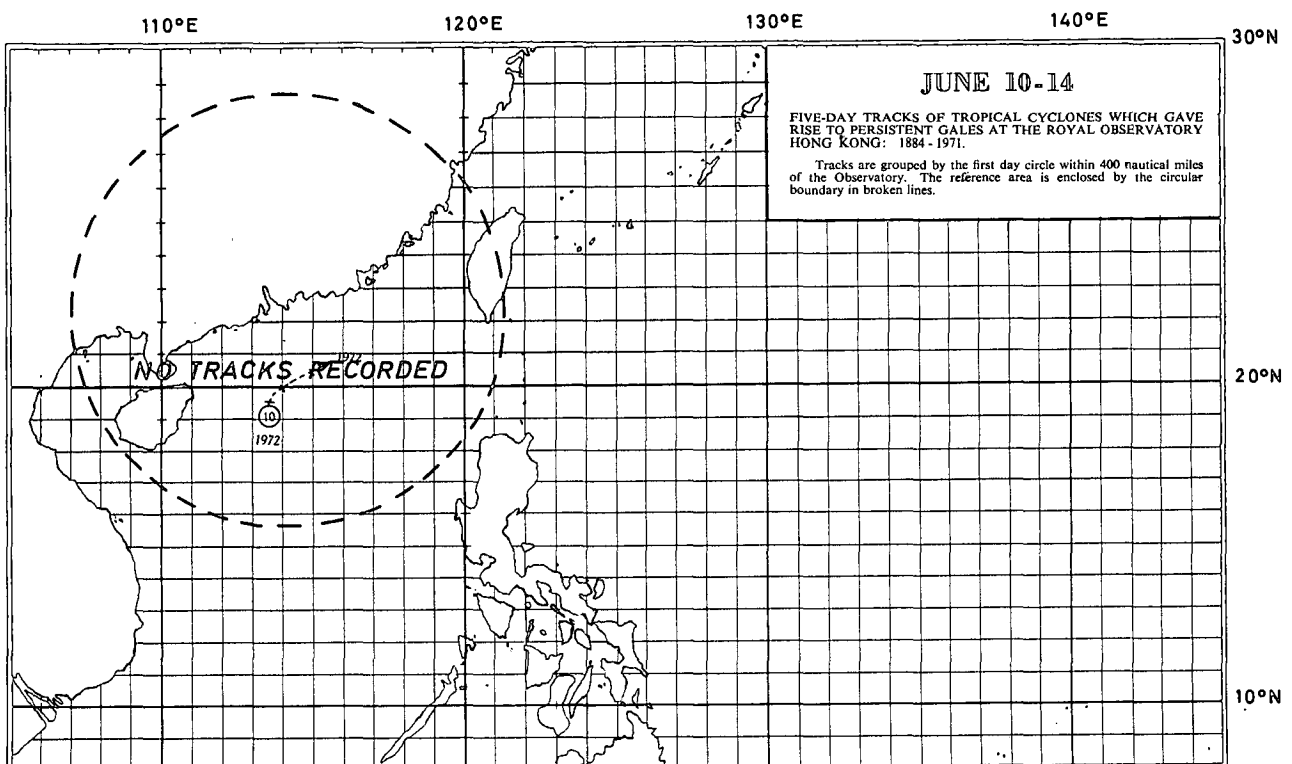


Figure 2. Track of tropical depression of June 10 - 11, 1972.

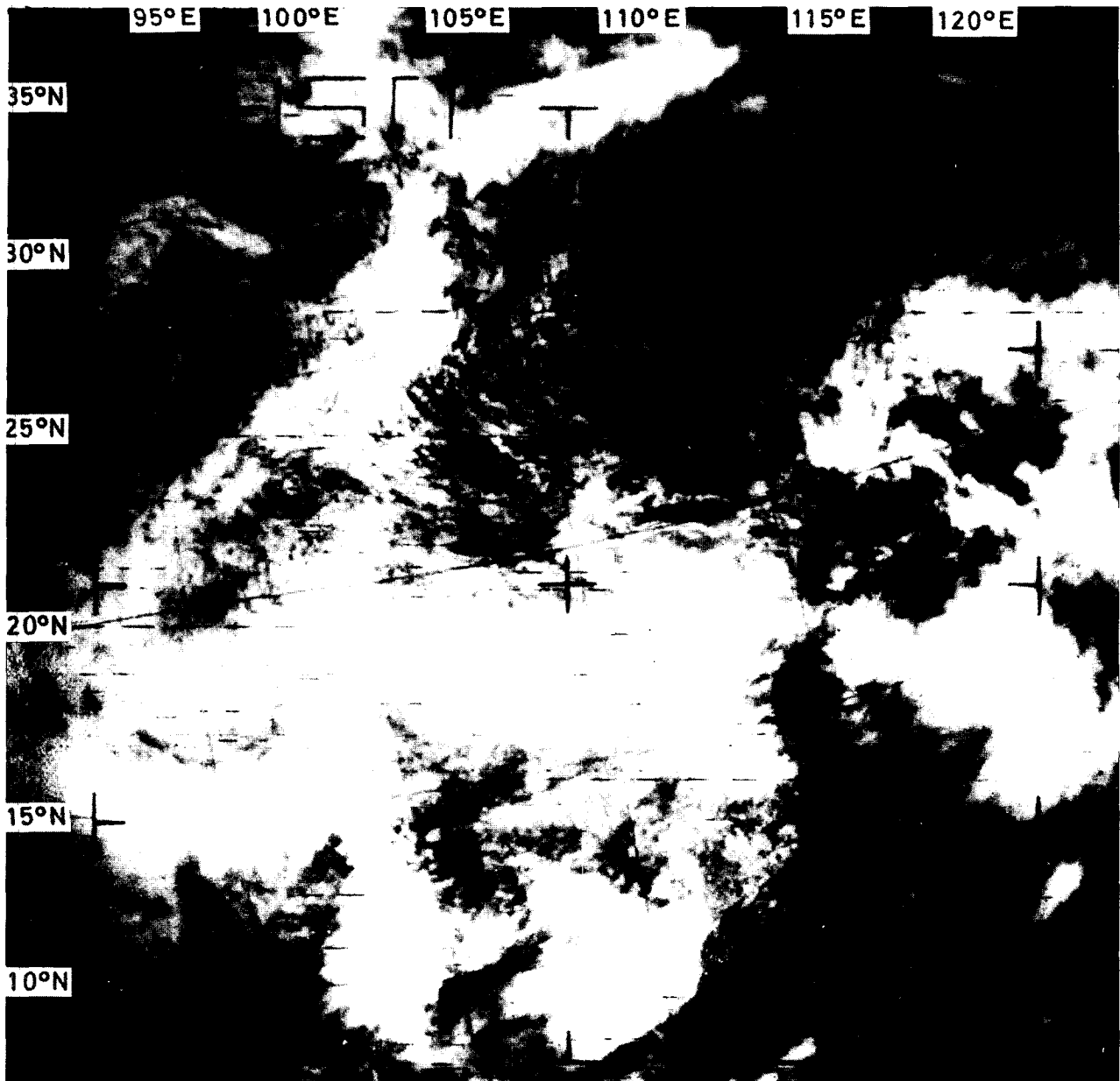


Figure 3. ESSA-8 APT picture of the tropical depression taken at 12.12 p.m. on June 10, 1972.

TYPHOON 'ORA'

June 23 - 27, 1972

The track of this Typhoon is shown in Figure 4

On June 23, a tropical depression developed to the east of the Philippines about 630 miles east-southeast of Manila. It moved westwards at about 9 knots at first and deepened into a typhoon named 'Ora' early next day. At 7.12 a.m. on June 24, a reconnaissance aircraft reported maximum surface winds of about 80 knots and minimum sea-level pressure of 985 millibars near the centre.

On June 24, Typhoon 'Ora' turned to a northwesterly track and crossed the central Philippines at about 15 knots. The typhoon passed close to Manila on June 25 and gave rise to widespread flooding there.

On entering the South China Sea, Typhoon 'Ora' accelerated to a speed of about 22 knots, highest ever recorded in June, and came within 400 miles of Hong Kong early on June 26. The Stand By Signal, No. 1, was hoisted at 6.15 a.m. and was followed at 9.45 a.m. by the Strong Wind Signal, No. 3, as 'Ora' continued to move rapidly northwestwards. At 7.05 a.m. the maximum surface winds reported by a reconnaissance aircraft near the typhoon centre were 85 knots and the minimum sea-level pressure was 987 millibars. During the afternoon, the typhoon slowed down to about 12 knots and appeared to have weakened slightly as shown by the Observatory's radar. A satellite picture received at the Royal Observatory in the afternoon (Figure 5) indicated that the cloud mass of 'Ora' was well organized, but only covered a small area about 180 miles in diameter. The typhoon passed about 200 miles to the southwest of Hong Kong in the late evening of June 26 and at 9 p.m. a ship reported sustained winds of 64 knots and barometric pressure of 995.8 millibars when it was about 55 miles south-southeast of the centre.

On the early morning of June 27, Typhoon 'Ora' weakened to a severe tropical storm and crossed the coast of the Luichow Peninsula, where it degenerated rapidly into an area of low pressure a few hours later. In Hong Kong all signals were lowered by 9.25 a.m. on the same day.

On June 26, winds over the Colony were light and variable, but freshened from the east later in the morning and became strong in exposed places by the afternoon. The easterlies gradually veered to southeasterlies after mid-night and began to moderate after dawn on June 27. The maximum gust peak speeds recorded on these two days were 49 knots at Waglan Island, 44 knots at Tate's Cairn, 42 knots at the Royal Observatory, 40 knots at Cheung Chau, 37 knots at the Hong Kong Airport and 35 knots at Cape Collinson. The weather on June 26 and 27 was mainly cloudy with isolated showers. Although heavy rainbands persisted just to the south of the Colony, they did not move northwards; and at the Royal Observatory the total rainfall recorded during this period amounted to 4.9 mm only. There were no abnormal changes in tide height during the period when Tropical Cyclone Warning Signals were on display.

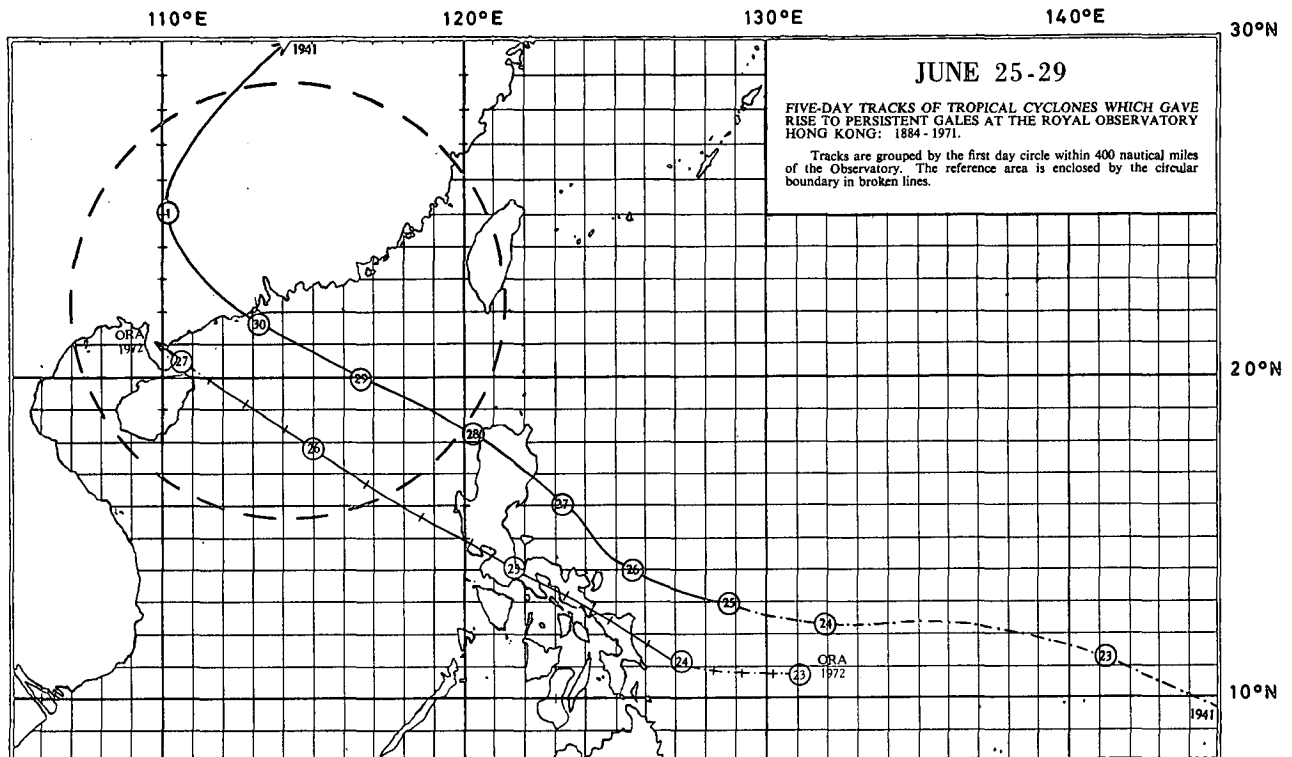


Figure 4. Track of Typhoon 'Ora': June 23 - 27, 1972.

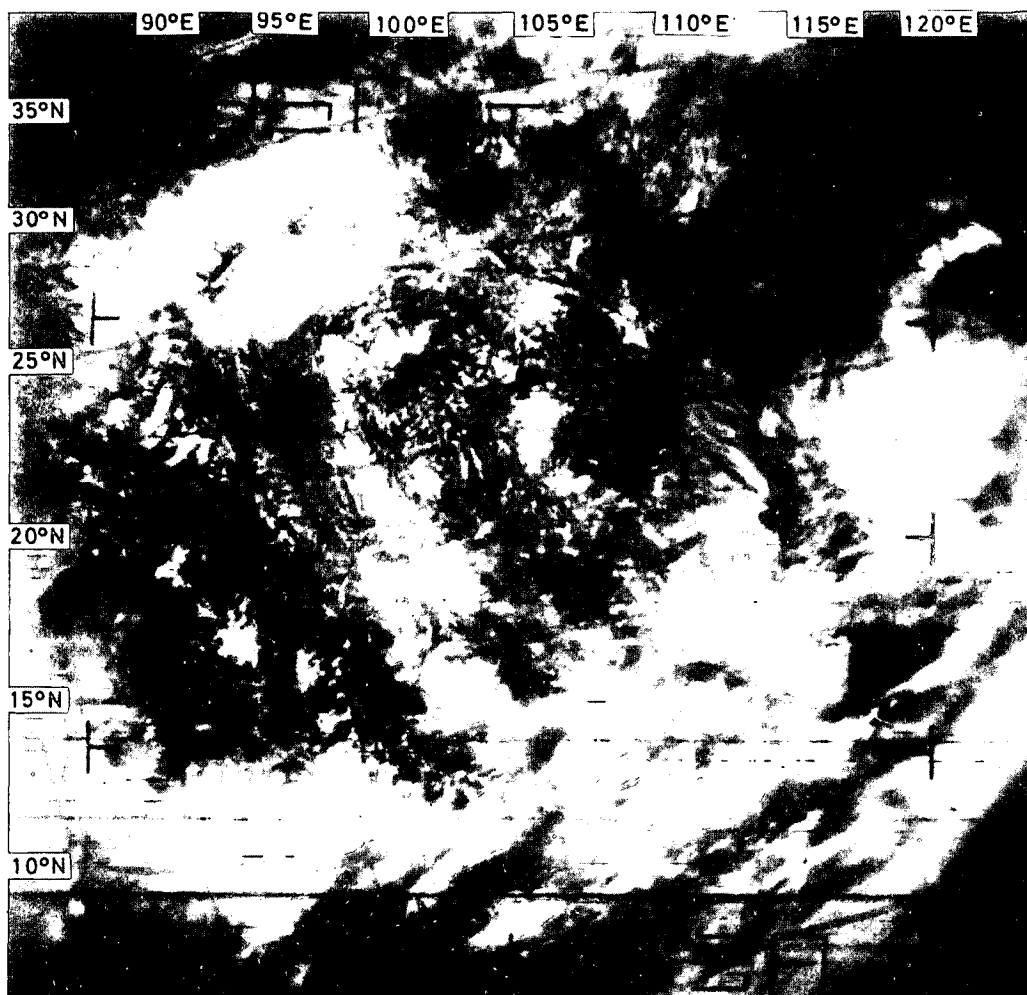


Figure 5. ESSA-8 APT picture of Typhoon 'Ora' taken at 12.28 p.m. on June 26, 1972.

TYPHOON 'RITA'*

July 7-26, 1972

The track of this typhoon is shown in Figure 6

On July 7, a tropical depression formed about 210 miles south of Guam. It soon deepened into a tropical storm named 'Rita' and further intensified to a typhoon early next day. At 7.00 a.m. on July 9, a reconnaissance aircraft reported maximum surface winds of 130 knots and a minimum sea-level pressure of 953 millibars near its centre.

During the period July 8-15, three other tropical cyclones, namely Typhoon 'Phyllis', Typhoon 'Tess' and Typhoon 'Susan', were reported in the western North Pacific and the South China Sea. Typhoon 'Rita' moved north-westwards at about 8 knots for the first few days and then turned onto a more westerly course late on July 10. Under the influence of 'Phyllis', 'Susan' and 'Tess', Typhoon 'Rita' then followed a meandering track during the period July 11-20 and moved in a loop over the East China Sea just to the west of the Ryukyu Islands during the next 5 days. Satellite pictures received at the Royal Observatory on July 21-25 (Figures 7-11) revealed that the circulation of Typhoon 'Rita' was well organized and covered an area of about 400-500 miles in diameter.

On July 25, Typhoon 'Rita' moved rapidly north-northwestwards towards the eastern part of the Yellow Sea and passed within 30 miles west of Cheju Island early on July 26. During the afternoon 'Rita' weakened into a tropical storm as it turned to a northwesterly course and passed over the Yellow Sea. It crossed the northeast coast of China about 130 miles east-southeast of Peking in the evening and rapidly dissipated overland a few hours later.

According to aircraft reconnaissance reports, the minimum central sea-level pressures in Typhoon 'Rita' fell below 960 millibars on 8 days during the periods July 9-13 and 23-25; and the lowest value of 911 millibars was reported at 8.15 a.m. on July 11. The maximum surface wind speed observed at the same time was 85 knots. Typhoon 'Rita' was the most persistent tropical cyclone ever observed and maintained typhoon intensity for an exceptionally long period of 18 days.

* Reports are normally issued only for tropical cyclones which cause warning signals to be hoisted at Hong Kong. No signals were displayed for Typhoon 'Rita' but a report had been compiled because 'Rita' was unusual in several respects.

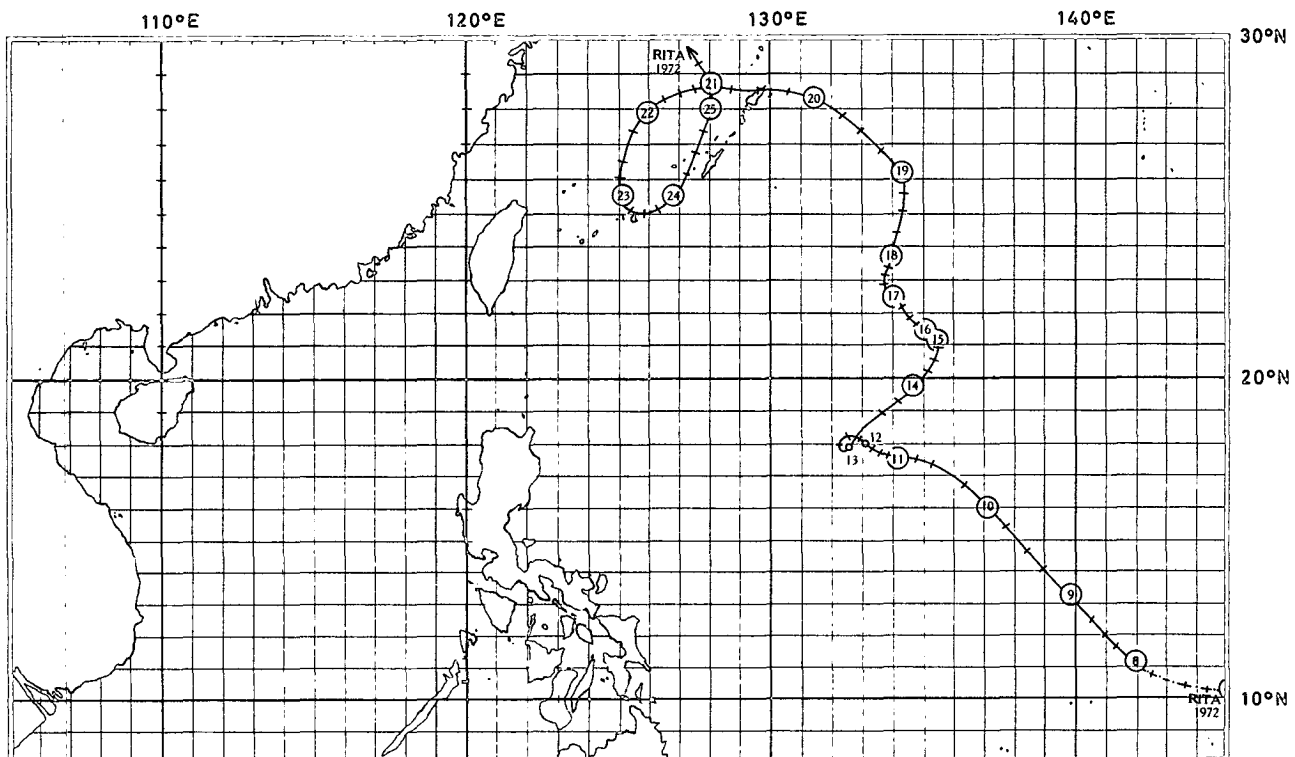


Figure 6. Track of Typhoon 'Rita': July 7 - 26, 1972.

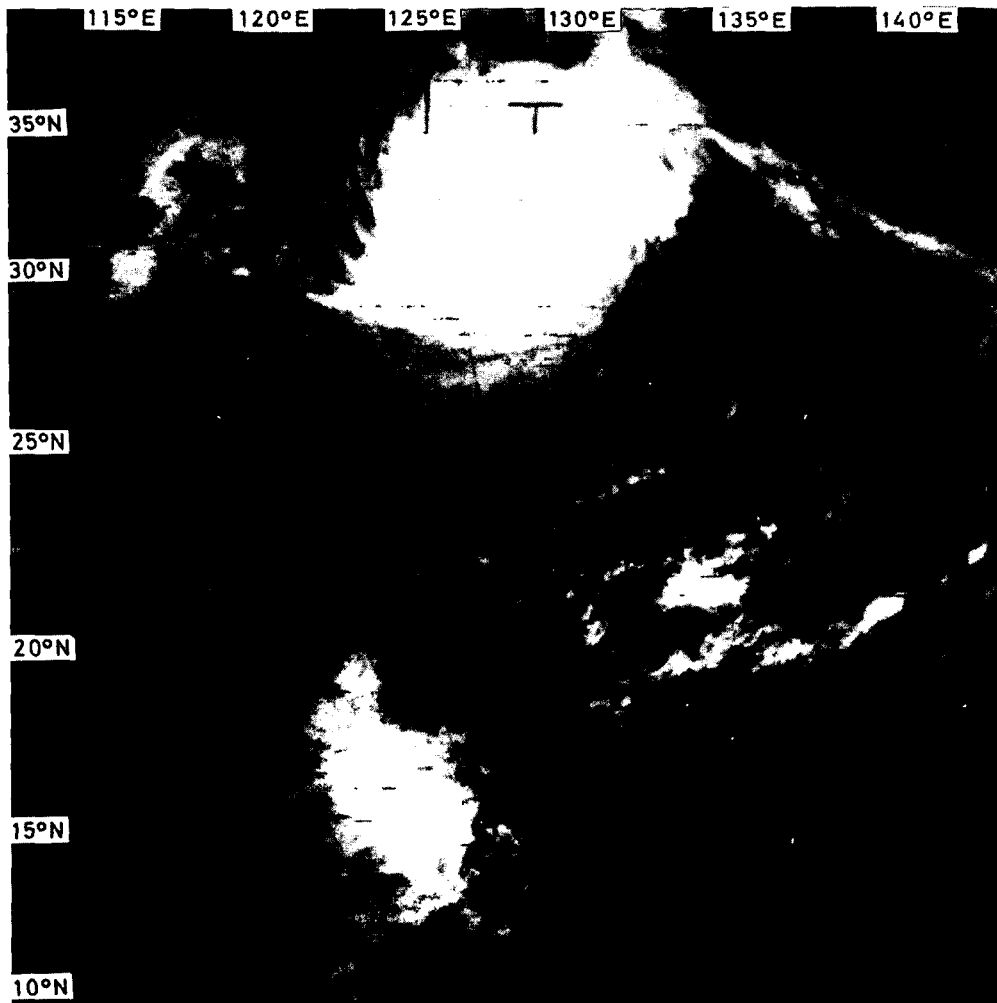


Figure 7. ESSA-8 APT picture of Typhoon 'Rita' taken at 10.49 a.m. on July 21, 1972.

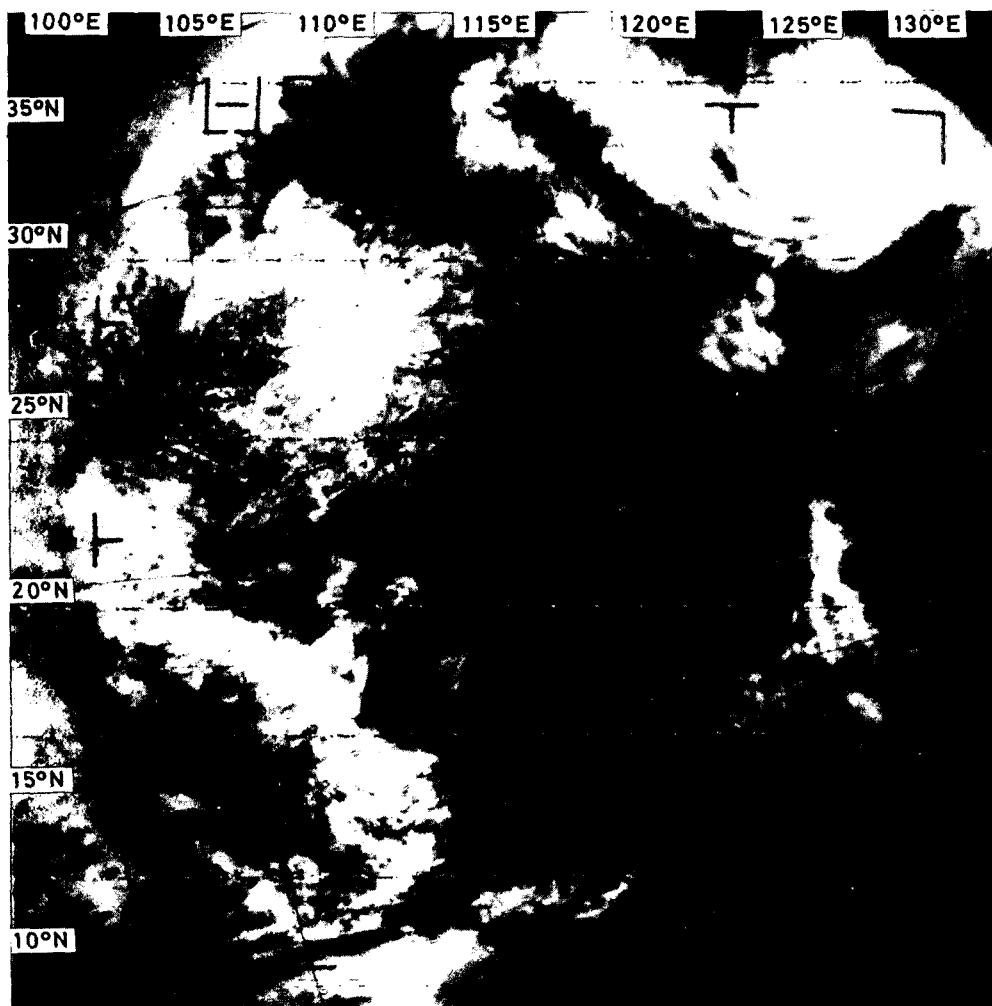


Figure 8. ESSA-8 APT picture of Typhoon 'Rita' taken at 11.40 a.m. on July 22, 1972.

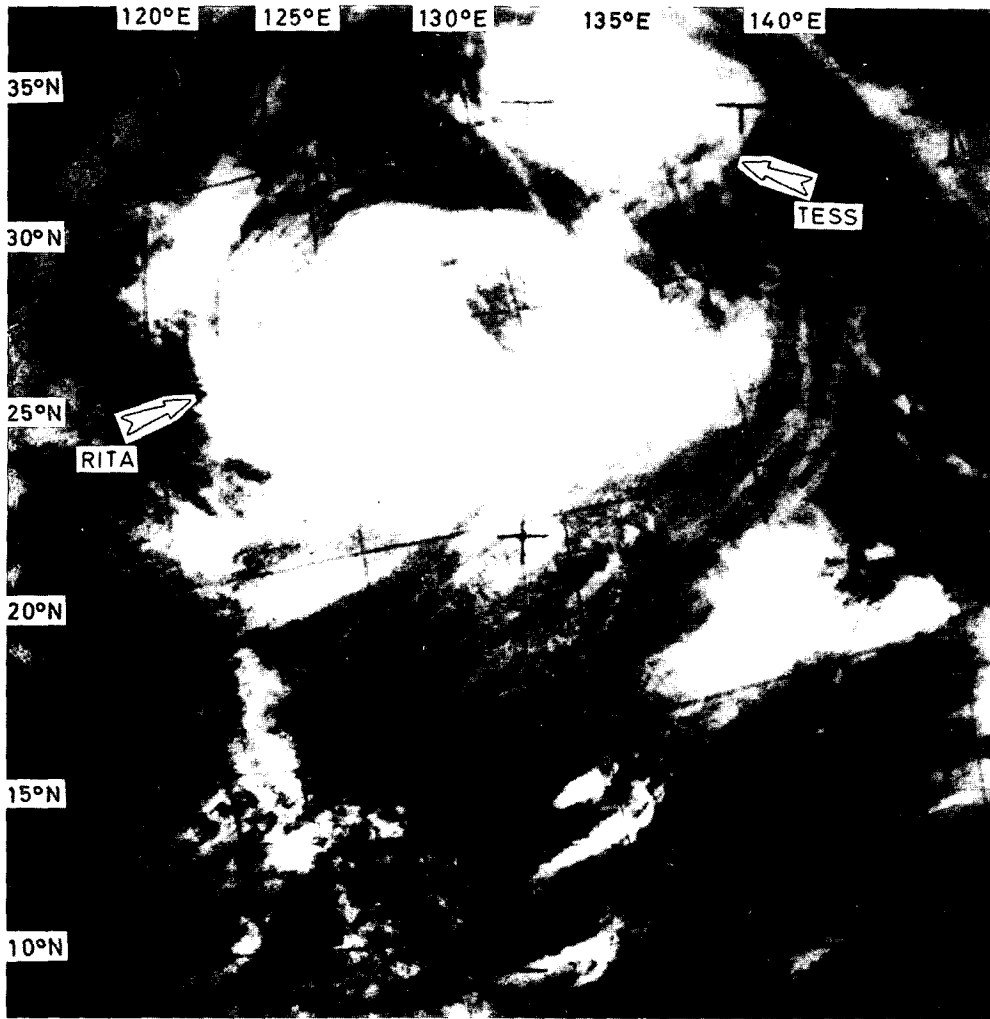


Figure 9. ESSA-8 APT picture of Typhoon 'Rita' taken at 10.36 a.m. on July 23, 1972.

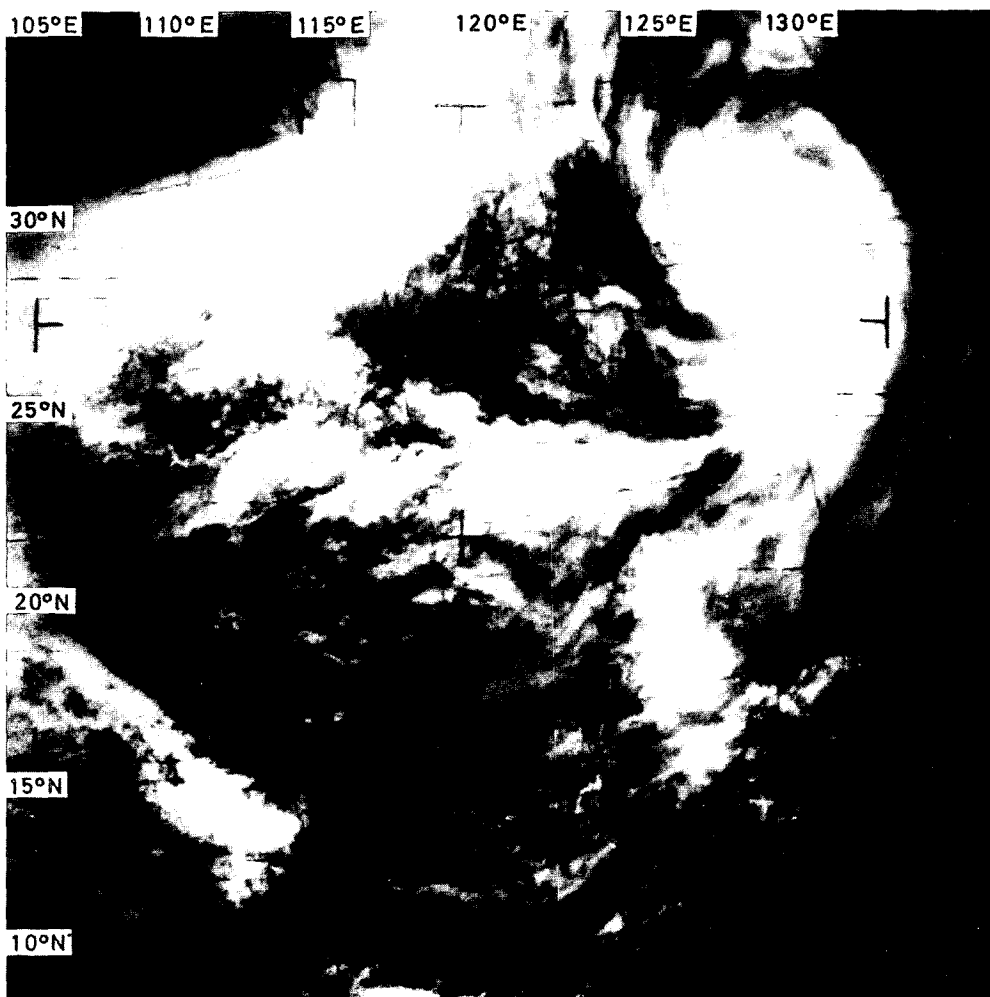


Figure 10. ESSA-8 APT picture of Typhoon 'Rita' taken at 11.28 a.m. on July 24, 1972.

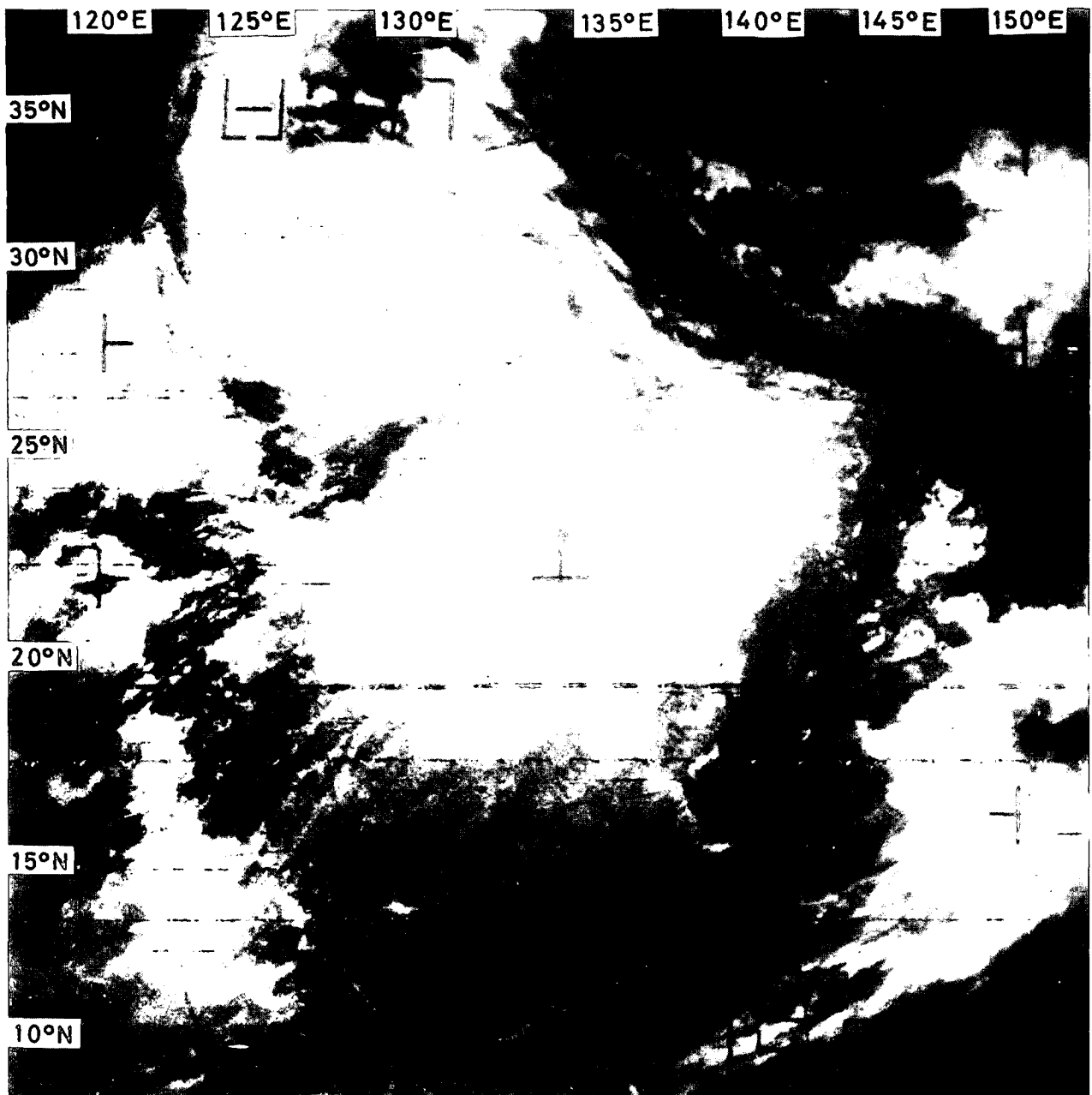


Figure 11. ESSA-8 APT picture of Typhoon 'Rita' taken at 10.24 a.m. on July 25, 1972.

TYPHOON 'SUSAN'

July 7 - 15, 1972

The track of this typhoon is shown in Figure 12

On July 5, an area of low pressure developed to the east of the Philippines about 300 miles east-southeast of Manila and drifted westwards across the central Philippines the next day. After entering the South China Sea on July 7, the circulation became well organized and by about 9 p.m. on the same day it deepened into a tropical depression about 400 miles southeast of Hong Kong. The depression moved west-northwest at about 10 knots at first, but soon began to meander towards the north and intensified into a tropical storm named 'Susan' early on July 8.

In Hong Kong the Stand By Signal, No. 1, was hoisted at 11.15 a.m. on July 8 to indicate that a tropical cyclone alert was in force. 'Susan' intensified further to a severe tropical storm in the evening and continued to drift slowly in a general direction towards the Colony. The Strong Wind Signal, No. 3, was hoisted to replace No. 1 at 10.15 p.m. on July 9 when 'Susan' was centred about 160 miles to the southeast of Hong Kong.

Early on July 10, Severe Tropical Storm 'Susan' began to move in a series of loops to the west of Pratas Island. During the morning, several ships to the south of the centre reported winds in excess of 50 knots, but satellite cloud pictures received at the Royal Observatory (Figure 13) showed that the eye of 'Susan' was large and irregular. By the evening, 'Susan' became a typhoon and at 7.16 p.m. a reconnaissance aircraft reported maximum surface winds of 90 knots near its centre. Most of the rain in Typhoon 'Susan' was confined to the southwest sector and the Royal Observatory radar showed that the eye was not well formed (Figure 14).

Typhoon 'Susan' weakened to a severe tropical storm early on July 11 and began to drift slowly away from the Colony. The Strong Wind Signal, No. 3, was replaced by the Stand By Signal, No. 1, at 10.30 a.m. on the same day because there was no longer any immediate threat of strong winds over the Colony. However, during the evening, 'Susan' began to move closer to the Colony again and the Strong Wind Signal was hoisted once more at 9.35 p.m. to warn that strongwinds were again expected.

On July 12, 'Susan' weakened further to a tropical storm and remained almost stationary to the east of Hong Kong. At 6.40 a.m. on the same day the Strong Wind Signal was lowered in order that normal activities could be resumed in the Colony.

By about dawn on July 13, Tropical Storm 'Susan' once again started to move in the general direction towards Hong Kong and the Stand By Signal, No. 1, was raised at 5.20 a.m., followed by the Strong Wind Signal, No. 3, at 7.10 a.m. 'Susan' continued to move slowly in a series of loops about 90 to 120 miles east of Hong Kong until about 9 a.m. on July 14, when it began to move steadily away from the Colony. The Strong Wind Signal was replaced by the Stand By Signal at 10.10 a.m.

By the afternoon of July 14, Tropical Storm 'Susan' accelerated rapidly northeastwards across the Taiwan Strait and all signals were lowered at 6.20 a.m. on July 15. 'Susan' crossed the east coast of China in the late afternoon on July 15 and rapidly degenerated into an area of low pressure near Foochow by the evening.

During the periods when the Strong Wind Signal, No. 3, was on display, the weather in Hong Kong was mainly cloudy with scattered showers. Thunderstorms and squally showers were reported in the evening of July 11. Winds were strong and gusty from the north in exposed places but only moderate to fresh in Victoria Harbour area which is generally sheltered from northerly winds. The maximum gust peak speeds recorded during July 9-13 were 42 knots at Cape Collinson, 41 knots at Tate's Cairn, 40 knots at Cheung Chau, 39 knots at the Hong Kong Airport, 37 knots at the Royal Observatory and 35 knots at Waglan Island. There were no abnormal changes in tide height during the periods when Tropical Cyclone Warning Signals were displayed.

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

July 8	Nil
July 9	13.4 mm
July 10	Trace
July 11	31.4 mm
July 12	8.4 mm
July 13	0.5 mm
July 14	1.1 mm
July 15	Nil

Since records began in 1884, no other tropical cyclone has remained within 200 miles of the Colony for such a long time. During the period July 10 to 11 when 'Susan' was centred to the southeast of Hong Kong, strong to gale force southwesterly winds persisted over the whole of the South China Sea and brought heavy rain and flooding from high tides and large waves over the northwest part of the Philippines. Disastrous floods were reported in many provinces and in Manila some sections of the sea wall were ripped away by gigantic waves on July 11.

The sequence of Tropical Cyclone Warning Signals displayed during the passage of Typhoon 'Susan' is as follows:

Name of Signal	Signal No.	Hoisted		Lowered	
		Date	Time	Date	Time
Stand By Signal	1	July 8	11.15 a.m.	July 9	10.15 p.m.
Strong Wind Signal	3	July 9	10.15 p.m.	July 11	10.30 a.m.
Stand By Signal	1	July 11	10.30 a.m.	July 11	9.35 p.m.
Strong Wind Signal	3	July 11	9.35 p.m.	July 12	6.40 a.m.
Stand By Signal	1	July 13	5.20 a.m.	July 13	7.10 a.m.
Strong Wind Signal	3	July 13	7.10 a.m.	July 14	10.10 a.m.
Stand By Signal	1	July 14	10.10 a.m.	July 15	6.20 a.m.

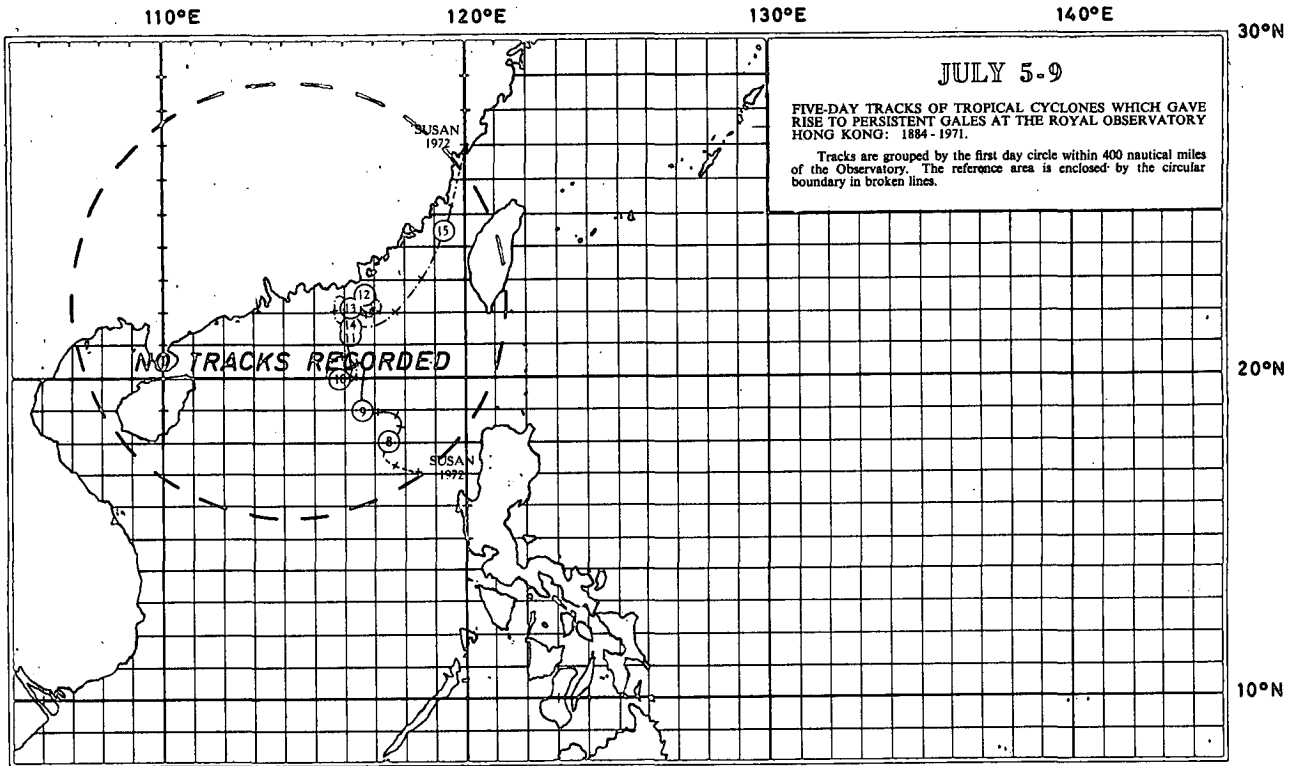


Figure 12. Track of Typhoon 'Susan': July 7 - 15, 1972.

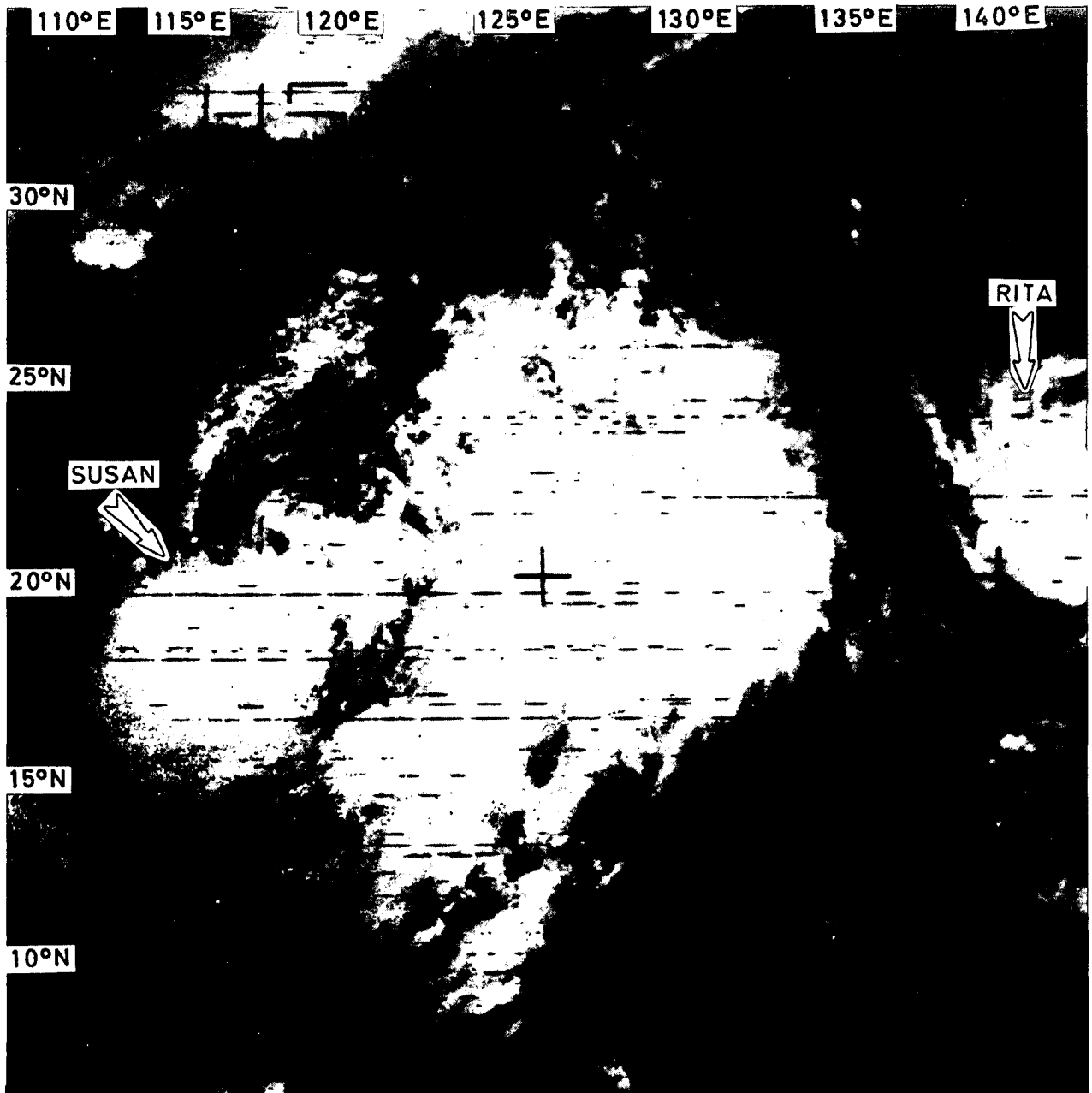


Figure 13. ESSA-8 APT picture of Typhoon 'Susan' taken at 11.00 a.m. on July 10, 1972.

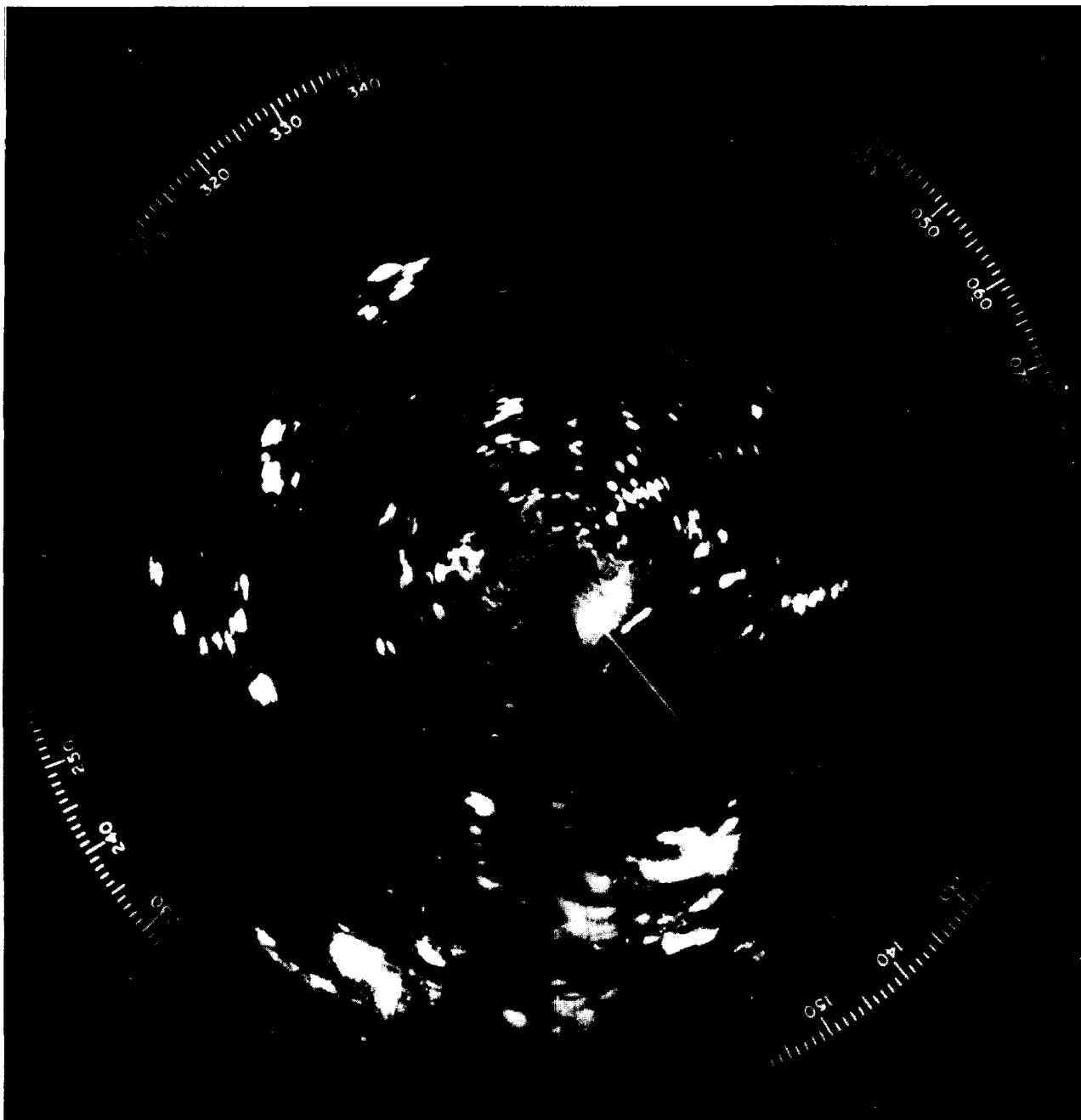


Figure 14. Photograph of Typhoon 'Susan' taken by the Observatory's radar at 3.25 p.m. on July 10, 1972.

SEVERE TROPICAL STORM 'CORA'

August 25 - 29, 1972

The track of this severe tropical storm is shown in Figure 15

A broad trough of low pressure dominated the South China Sea during the period August 23-24. On August 25, a tropical depression formed within this trough about 230 miles southeast of Hong Kong and was named 'Cora'. It moved slowly west-southwestwards and in Hong Kong, the Stand By Signal, No. 1, was hoisted at 11.00 p.m. on August 25 to notify that a tropical cyclone alert was in force.

On August 26, the tropical depression turned onto a westerly course and at 8.20 a.m. on the same day, a reconnaissance aircraft reported maximum surface winds of 35 knots and a minimum sea-level pressure of 988 millibars near the centre. A satellite picture received at the Royal Observatory on the same morning (Figure 16) indicated that the cloud mass associated with 'Cora' covered an area about 240 miles in diameter but was not well organized.

'Cora' deepened to a tropical storm by the afternoon of August 26. The storm passed about 210 miles south of Hong Kong at midnight and further intensified to a severe tropical storm early next day. Maximum surface winds of 60 knots and a minimum sea-level pressure of 976 millibars were reported near its centre by a reconnaissance aircraft around noon on August 27, when 'Cora' began to take up a west-northwesterly track and moved further away from the Colony.

Early on August 28, 'Cora' accelerated to about 14 knots and weakened to a tropical storm as it crossed the northern part of Hainan Island. The storm passed about 10 miles southwest of Hoihow where sustained surface winds of 30 knots and a sea-level pressure of 978.3 millibars were reported. In Hong Kong the Stand By Signal, No. 1, was lowered at 1.30 p.m. on the same day, when 'Cora' was centred over the northern part of the Gulf of Tonkin and no longer constituted any threat to the Colony. The storm crossed the coast of North Vietnam near Haiphong during the night and rapidly degenerated into an area of low pressure some 60 miles west of Hanoi early on August 29.

The weather in Hong Kong was mainly fine on August 25-26 but became cloudy with scattered showers on the following two days. During the period August 25-27 winds were generally moderate to fresh from the east and occasionally strong in exposed places. On August 28, winds began to moderate and turned to southeasterly. The maximum gust peak speeds recorded during the period August 25-28 were 32 knots at Cape Collinson, 41 knots at the Hong Kong Airport, 44 knots at the Royal Observatory, 48 knots at Cheung Chau and Waglan Island, and 49 knots at Tate's Cairn. There were no abnormal changes in tide height during the period when the Stand By Signal, No. 1, was on display.

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

August 25	Nil
August 26	Trace
August 27	23.0 mm
August 28	7.2 mm

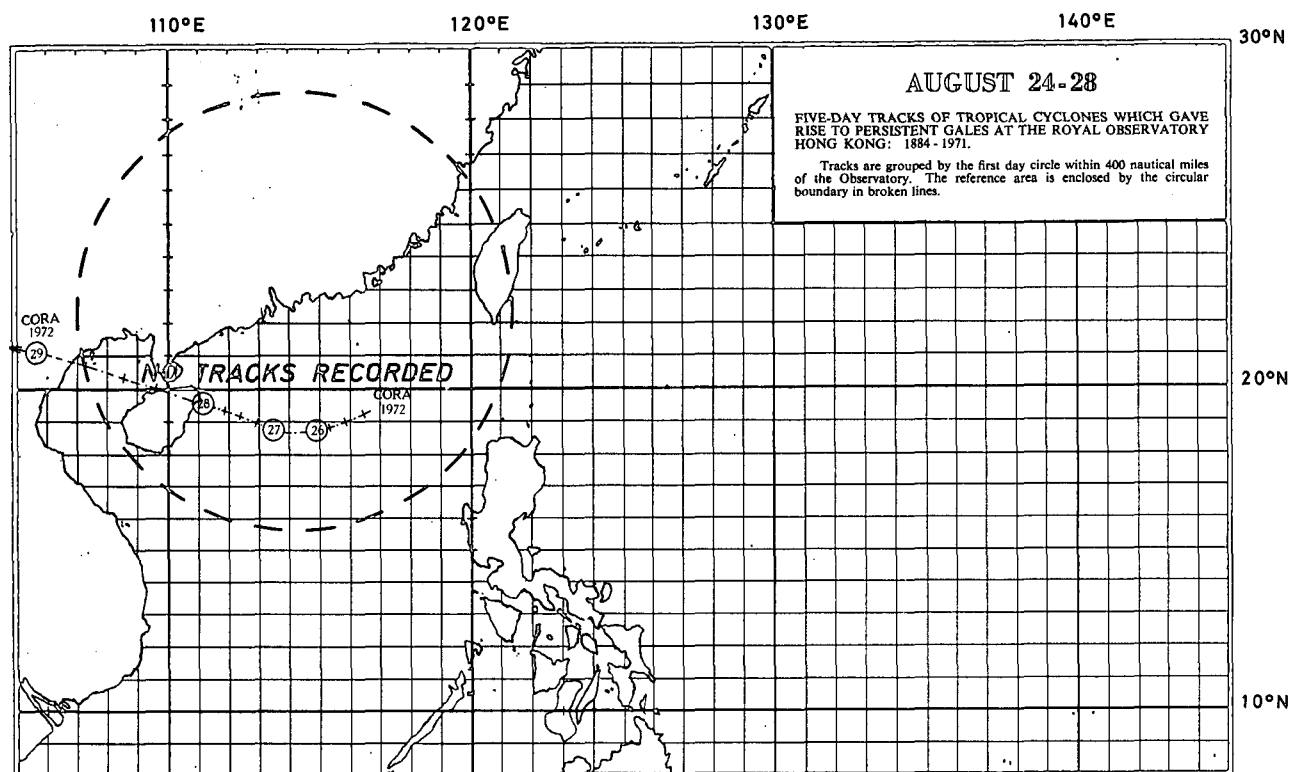


Figure 15. Track of Severe Tropical Storm 'Cora': August 25 - 29, 1972.

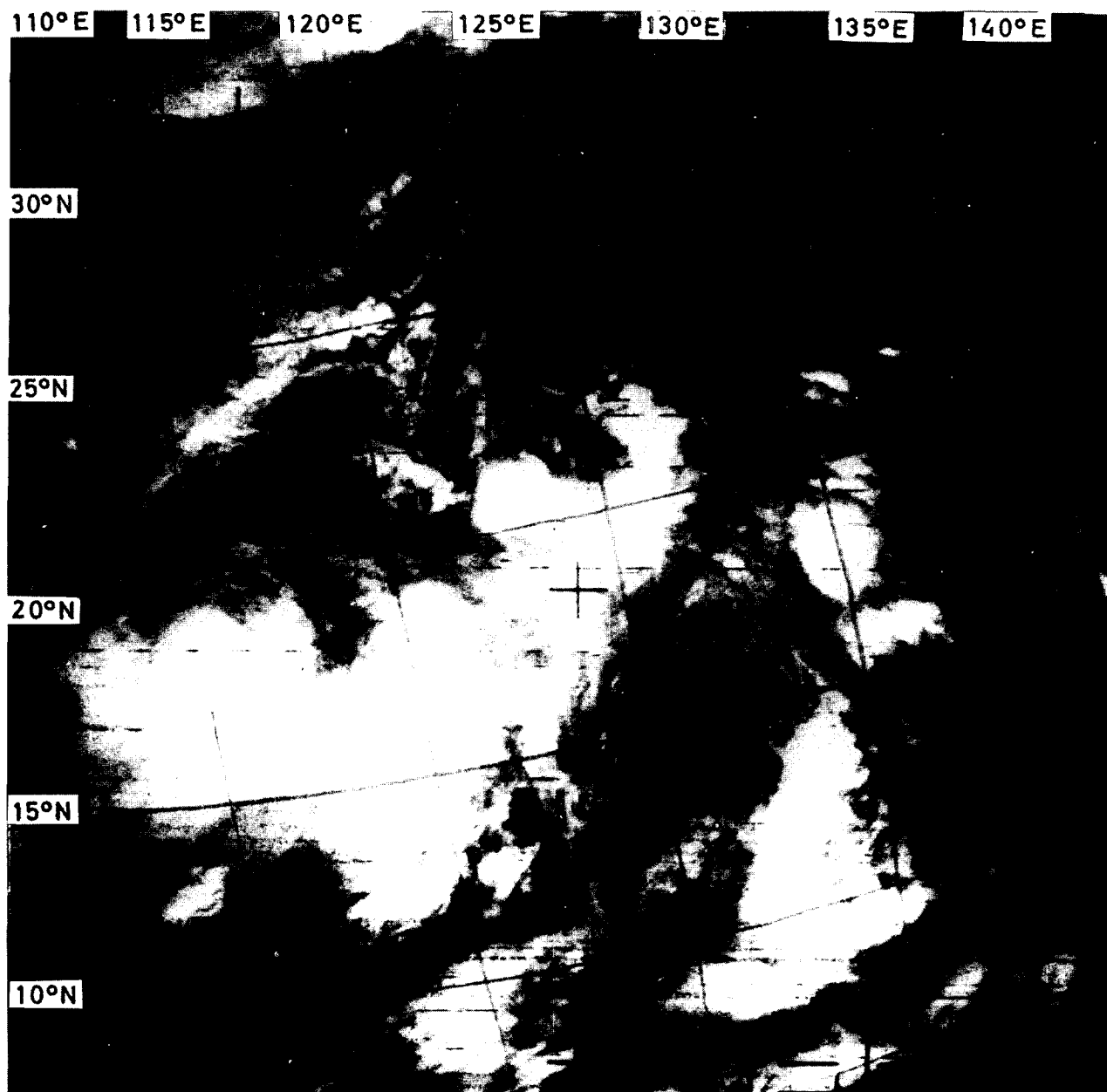


Figure 16. ESSA-8 APT picture of Severe Tropical Storm 'Cora' taken at 10.55 a.m. on August 26, 1972.

TYPHOON 'PAMELA'

November 4 - 9, 1972

The track of this typhoon is shown in Figure 17

On November 4, a tropical depression formed in the Pacific about 580 miles east of Manila. It soon deepened to a tropical storm named 'Pamela' and further intensified to a typhoon early next day.

Under the influence of a ridge of high pressure from the Pacific anticyclone, Typhoon 'Pamela' moved westwards at about 15 knots on November 4. The typhoon crossed the central Philippines on November 5 and entered the South China Sea on the following day. It then slowed down to about 10 knots and turned onto a west-northwesterly course. A satellite picture received at the Royal Observatory on the morning of November 6 (Figure 18) indicated that the circulation of Typhoon 'Pamela' was very extensive and that the associated cloud bands spread more than 500 miles from the centre.

Early on November 7, Typhoon 'Pamela' passed about 450 miles south of the Colony and began to move along a northwesterly course towards Hainan Island. At 8.35 a.m. on the same day, a reconnaissance aircraft reported maximum surface winds of 100 knots and a minimum sea-level pressure of 952 millibars near the centre of the typhoon.

In Hong Kong, the Stand By Signal, No. 1, was hoisted at 4.00 p.m. on November 7 when Typhoon 'Pamela' was centred about 390 miles to the south-southwest of the Colony. This was replaced by the Strong Wind Signal, No. 3, at 8.10 p.m. on the same day. In Hong Kong, surface winds freshened rapidly from the east during the evening and became generally strong later. During the night, a deep westerly trough in the upper troposphere moved rapidly eastwards across the Burma-Indochina Peninsula and 'Pamela' recurved to the north passing over the eastern tip of Hainan Island on November 8. At this stage there was a distinct lack of information as communications in Hainan Island were disrupted and there were no ships or reconnaissance aircraft near the Hainan

coast. By the afternoon it became clear that the typhoon had begun to move north-northeastward and was coming closer to the Colony. The Northeast Gale or Storm Signal, No. 7, was hoisted at 3.15 p.m. on November 8. Warnings were issued that, because of probable storm surge and high tide of about 3.5 metres, some flooding of low-lying coastal areas should be expected. Strong gusty easterly winds continued to blow over the Colony and gales were experienced in exposed places after dark. However, in the evening the centre came within the range of the Royal Observatory's radar. This showed that the eye of 'Pamela' had become ill-defined and that the rainbands were no longer well organized (Figure 19).

Later in the evening, Typhoon 'Pamela' crossed the coast of the Kwangtung Province about 180 miles west-southwest of Hong Kong and rapidly weakened to a severe tropical storm. The Southeast Gale or Storm Signal, No. 8, was hoisted at 10.00 p.m. on November 8 to warn a change in the gale direction to southeast. By about 3.00 a.m. on November 9, 'Pamela' had weakened further to a tropical storm and its eye was no longer discernible on the radar. The No. 8 signal was replaced by the Strong Wind Signal, No. 3, at 5.15 a.m. and the winds became southerly and moderated rapidly towards dawn.

'Pamela' degenerated into an area of low pressure about 120 miles to the north-northwest and all signals were lowered at 7.05 a.m. on November 9. During the morning, winds were moderate in the harbour but remained fresh and gusty in outlying islands for several hours.

The weather in Hong Kong was cloudy with occasional light showers on November 7 and became overcast with squalls the following day. Rain was persistent and heavy in the late evening on November 8 and overnight. However, the weather improved rapidly early on November 9 and no rain was recorded at the Royal Observatory after 8.00 a.m. During the period November 7-9, the highest gust peak speeds recorded were 83 knots at Tate's Cairn, 65 knots at Cheung Chau, 60 knots at the Hong Kong Airport, 59 knots at the Royal Observatory, 52 knots at Waglan Island and 51 knots at Cape Collinson.

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

November 7	Trace
November 8	64.2 mm
November 9	9.6 mm

Typhoon 'Pamela' brought only minor damage in the Colony. One woman was killed and 8 persons were injured. A freighter, S.S. Van Mint, ran aground on the southern shore of Lei Yue Mun while a vehicular ferry, Man On, was grounded in the reclamation near the Hong Kong Airport.

As 'Pamela' approached the Colony during high tide, flooding by sea water occurred in many low-lying areas and some fields of vegetables were washed away or damaged. The areas affected included Yuen Long, Tai Po, Lamma Island, Tsing Lung Tau, Tsuen Wan, Yau Kom Tau, Ping Chau, Cheung Chau and southern Lantau.

The times and heights of the highest tides and maximum storm surges recorded at the various locations in the Colony during Typhoon 'Pamela' 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	2.88	Nov. 8	9.35 p.m.	0.56	Nov. 9	4.40 a.m.
Tai Po Kau	3.06	Nov. 8	11.05 p.m.	1.30	Nov. 9	6.00 a.m.
Chi Ma Wan (Lantau)	Recorder unserviceable.					

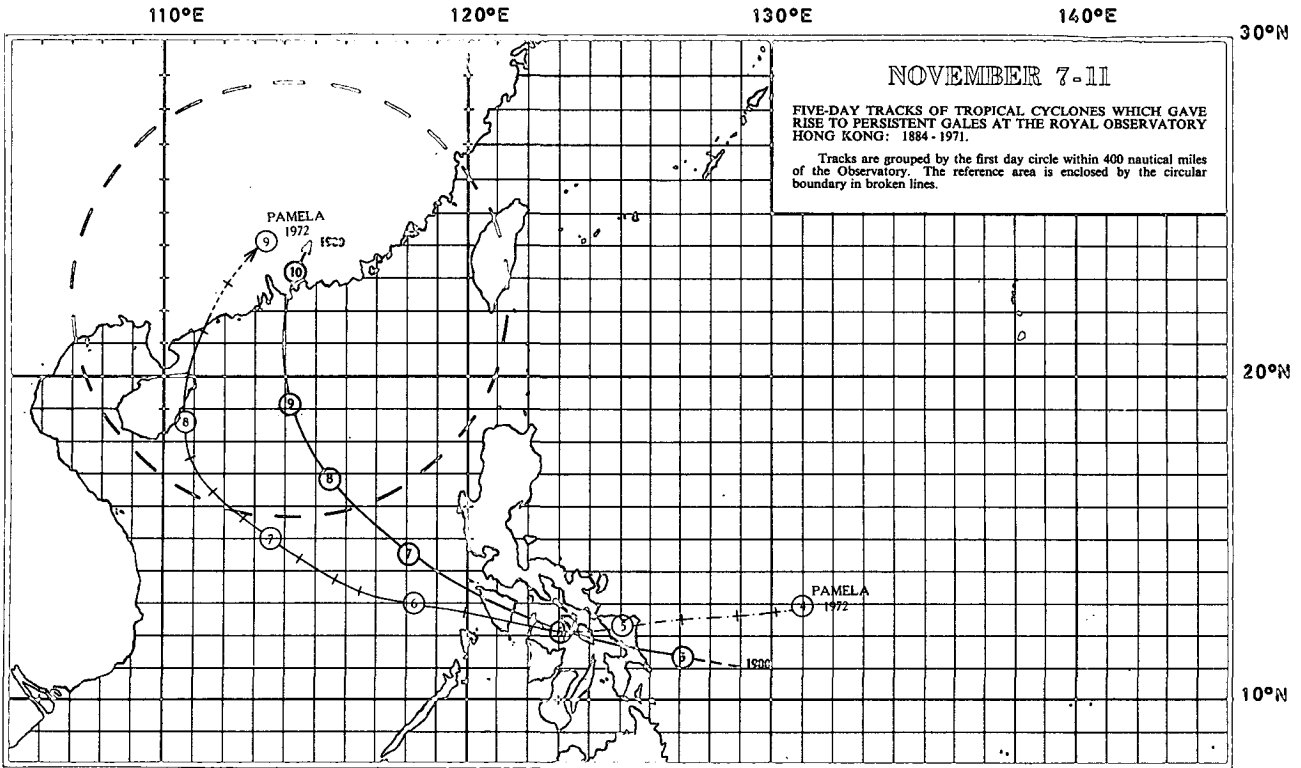


Figure 17. Track of Typhoon 'Pamela': November 4 - 9, 1972.

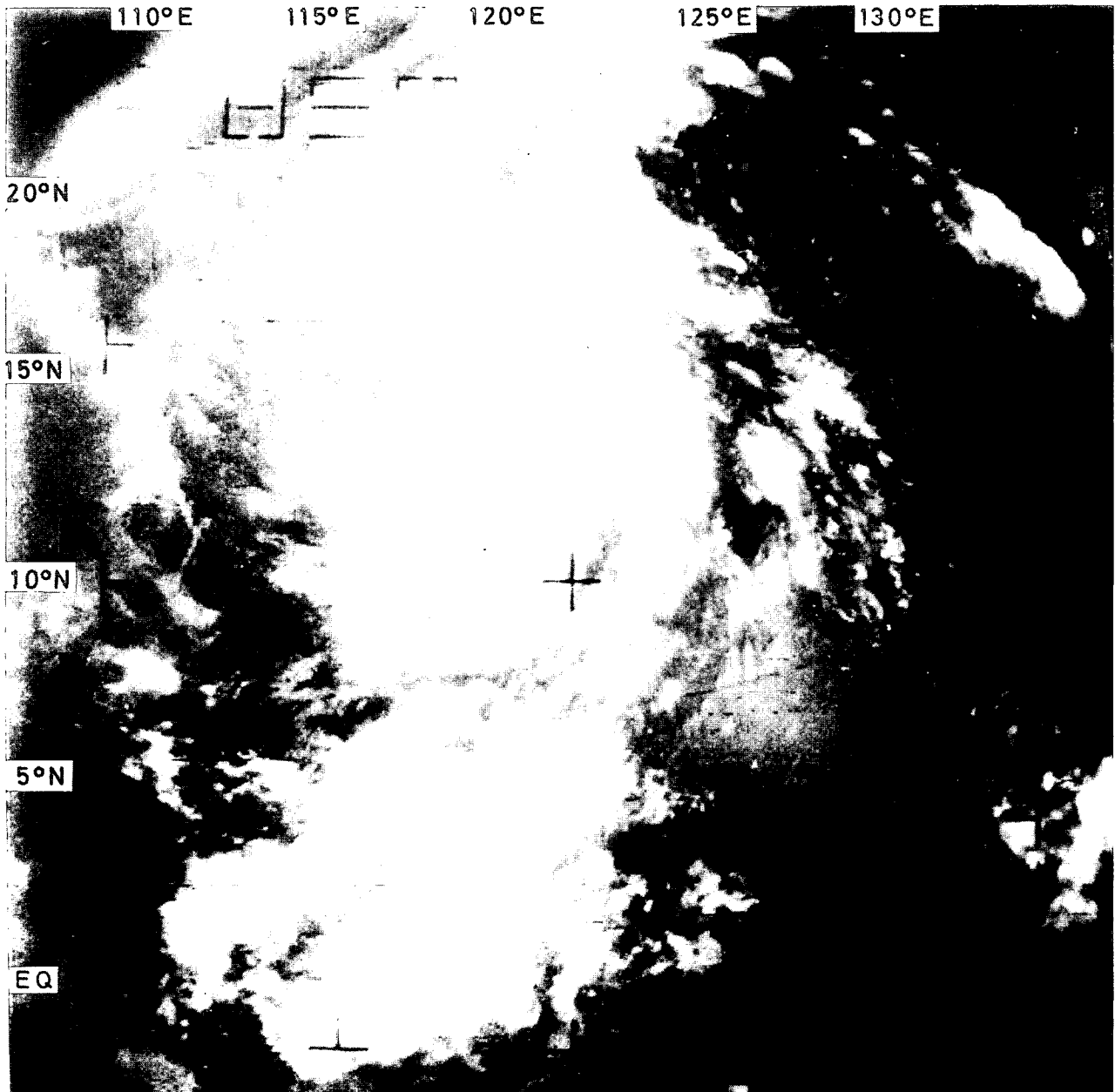


Figure 18. ESSA-8 APT picture of Typhoon 'Pamela' taken at 11.09 a.m. on November 6, 1972.

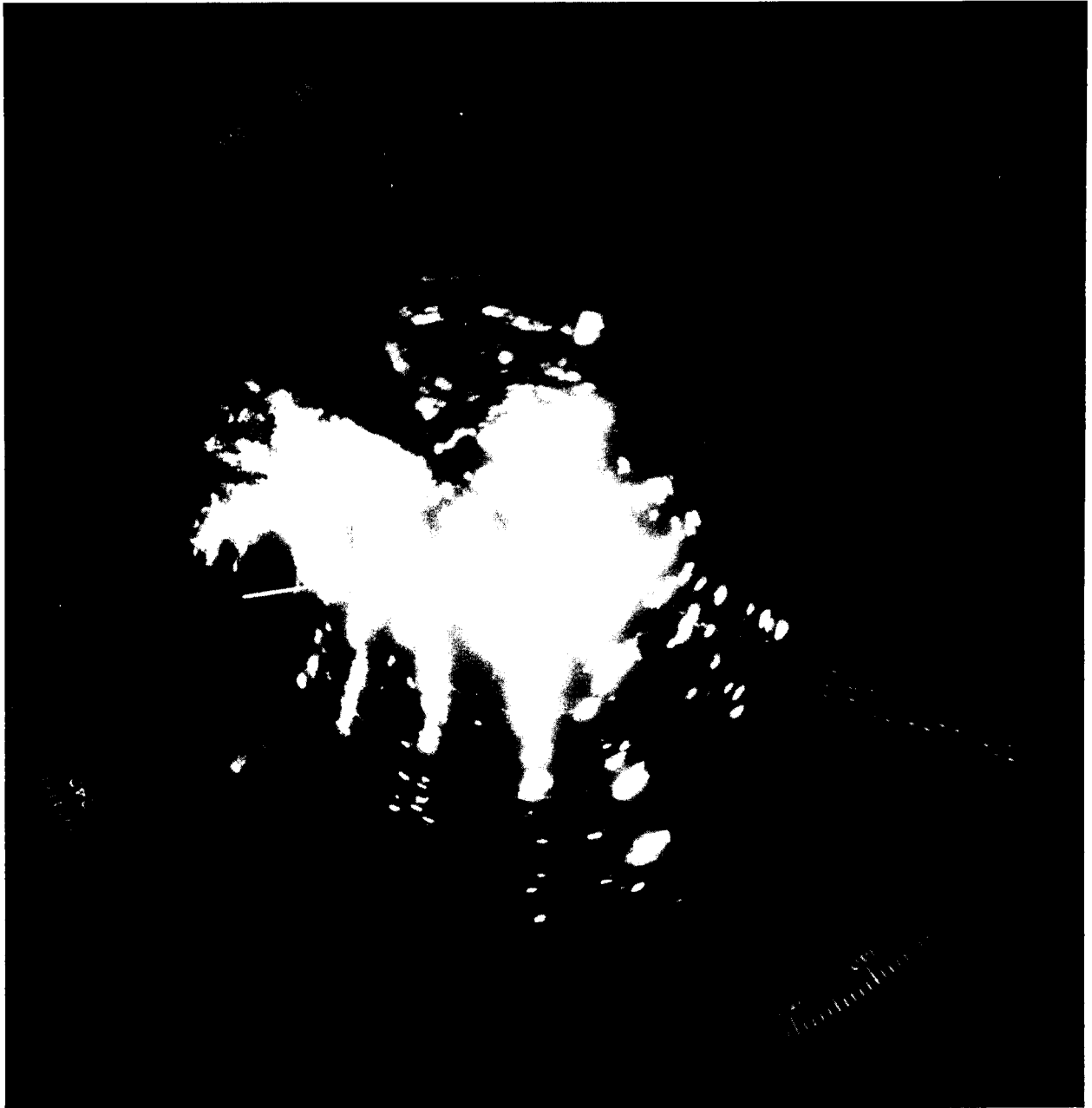


Figure 19. Photograph of Typhoon 'Pamela' taken by the Observatory's radar at 10.00 p.m. on November 8, 1972.

TABLE 1

LIST OF TROPICAL CYCLONES IN THE WESTERN NORTH PACIFIC AND THE SOUTH CHINA SEA IN 1972

Name of Tropical Cyclone	Beginning of Track					First day circle	Last day circle	Ending of Track				
	Date	G.M.T.	Time	Position				Date	G.M.T.	Time	Position	
				°N	°E						°N	°E
1 Typhoon Kit	January		5 1200	9.8	135.2	6	9	January	9 1200	13.5	123.2	
2 Typhoon Lola*	May		30 0000	8.2	160.0	30	3	June	5 1200	20.0	160.0	
3 T.D. Mamie	June		2 0000	15.2	112.0	2	3	June	3 0300	16.2	107.0	
4 T.S. Nina	June		2 0000	8.7	143.7	2	4	June	4 1200	11.3	154.8	
5 Tropical Depression	June		10 0000	19.2	113.5	10	10	June	10 2100	20.7	115.3	
6 Typhoon Ora	June		23 0000	10.8	131.2	23	27	June	27 0300	21.0	110.0	
7 Typhoon Phyllis	July		6 0600	8.0	159.5	7	15	July	15 1800	37.2	137.2	
8 Typhoon Rita	July		7 0000	10.2	144.2	7	26	July	26 1800	39.5	118.0	
9 Typhoon Susan	July		7 1200	17.1	118.5	8	15	July	15 0900	27.0	120.0	
10 Typhoon Tess*	July		14 0000	12.5	159.8	14	24	July	24 0600	39.3	129.7	
11 T.S. Viola*	July		23 0000	20.5	159.5	23	24	July	24 0000	22.5	160.0	
12 T.S. Winnie	July		30 0000	18.8	131.1	30	2	August	2 0000	27.8	119.7	
13 Typhoon Alice	July		31 1500	14.0	160.0	1	9	August	9 1200	43.8	159.6	
14 Typhoon Betty	August		8 0900	11.5	150.5	9	17	August	17 1800	27.8	118.8	
15 S.T.S. Cora	August		25 0600	19.3	116.5	26	29	August	29 0300	21.3	104.9	
16 S.T.S. Elsie	August		31 0900	13.0	117.8	1	4	September	4 0600	15.2	108.2	
17 S.T.S. Flossie	September		10 2100	14.4	120.0	11	16	September	16 0300	14.5	108.0	
18 T.S. Grace	September		12 0000	15.5	126.3	12	17	September	17 1800	15.8	124.0	
19 Typhoon Helen	September		12 0000	13.0	137.2	12	17	September	17 1200	43.0	139.7	
20 Tropical Depression	September		13 0600	9.8	159.9	14	14	September	14 1800	9.0	159.0	
21 Typhoon Ida*	September		17 0000	17.9	154.5	17	25	September	25 2100	39.0	160.0	
22 T.S. Kathy	October		1 0000	16.0	155.5	1	6	October	6 1200	35.8	145.0	
23 T.S. Lorna	October		1 0000	17.2	114.5	1	3	October	3 0300	18.4	104.4	
24 Typhoon Marie*	October		7 0000	14.9	160.0	7	12	October	12 1200	41.1	151.2	
25 Typhoon Nancy*	October		18 1200	18.0	160.0	19	21	October	21 0000	24.7	160.0	
26 Typhoon Olga*	October		25 0900	13.5	160.0	26	29	October	29 1200	33.6	147.6	
27 Typhoon Pamela	November		4 0000	13.0	131.0	4	9	November	9 0000	24.2	113.3	
28 Typhoon Ruby*†	November		18 1500	15.5	160.0	19	20	November	20 1800	17.5	151.3	
29 Typhoon Sally	December		1 0000	7.2	110.7	1	6	December	6 0600	10.5	96.5	
30 Typhoon Therese	December		1 0600	6.9	137.3	2	10	December	10 0300	14.0	108.5	

* Track extends outside chart area.

† Ruby was of typhoon intensity outside chart area.

TABLE 2

TROPICAL CYCLONE WARNINGS FOR SHIPPING ISSUED IN 1972

Tropical Cyclone	No. of Warnings Issued	Date and Time of Issue of				Duration of Warnings (hours)
		First Warning		Last Warning		
Typhoon Kit	7	Jan 8	0000	Jan 9	0600	30
Tropical Depression Mamie	7	Jun 2	0600	Jun 3	0600	24
Tropical Depression*	7	Jun 10	0600	Jun 11	0000	18
Typhoon Ora*	17	Jun 24	1200	Jun 27	0300	63
Typhoon Susan*	62	Jul 7	1200	Jul 15	1200	192
Tropical Storm Winnie	5	Aug 1	0000	Aug 2	0000	24
Typhoon Betty	6	Aug 16	0600	Aug 17	1200	30
Severe Tropical Storm Cora*	27	Aug 25	0900	Aug 29	0000	87
Severe Tropical Storm Elsie	31	Aug 31	0900	Sep 4	0600	93
Severe Tropical Storm Flossie	23	Sep 12	0600	Sep 16	0000	90
Tropical Storm Grace	6	Sep 12	1800	Sep 14	0000	30
Tropical Storm Lorna	10	Oct 1	0000	Oct 2	1800	42
Typhoon Pamela*	32	Nov 5	0300	Nov 9	0000	93
Typhoon Therese	45	Dec 4	0000	Dec 10	0300	147
Total	285					963

* 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 1972

SUMMARY

Signal	No. of Occasions	Total Duration
1	8	157 h 25 min
3	6	116 55
5	Nil	— —
6	Nil	— —
7	1	6 45
8	1	7 15
9	Nil	— —
10	Nil	— —

DETAILS

Tropical Cyclone	No. of Warning Bulletins Issued	Signal	Hoisted		Lowered	
			Date	Time	Date	Time
Tropical Depression	8	1	Jun 10	1330	Jun 11	0840
Typhoon Ora	15	1	Jun 26	0515	Jun 26	0845
		3	Jun 26	0845	Jun 27	0825
Typhoon Susan	64	1	Jul 8	1015	Jul 9	2115
		3	Jul 9	2115	Jul 11	0930
		1	Jul 11	0930	Jul 11	2035
		3	Jul 11	2035	Jul 12	0540
		1	Jul 13	0420	Jul 13	0610
		3	Jul 13	0610	Jul 14	0910
		1	Jul 14	0910	Jul 15	0520
Severe Tropical Storm Cora	27	1	Aug 25	2200	Aug 28	1230
Typhoon Pamela	24	1	Nov 7	1600	Nov 7	2010
		3	Nov 7	2010	Nov 8	1515
		7	Nov 8	1515	Nov 8	2200
		8	Nov 8	2200	Nov 9	0515
		3	Nov 9	0515	Nov 9	0705

TABLE 4

FREQUENCY OF HOISTING AND TOTAL DURATION OF DISPLAY
OF TROPICAL CYCLONE WARNING SIGNALS:

1946 - 1972

Signal		1	3*	5	6	7	8	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	9	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
1956 to 1972	Total	105	105	6	14	24	14	8	8	284	4430
	Mean	6.2	6.2	0.4	0.8	1.4	0.8	0.5	0.5	16.7	260.6

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

TABLE 5

NUMBER OF TROPICAL CYCLONES IN HONG KONG'S AREA OF RESPONSIBILITY AND
THAT NECESSITATED THE DISPLAY OF TROPICAL CYCLONE WARNING SIGNALS
IN HONG KONG: 1946 - 1972

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
Mean	16	6

TABLE 6

DURATION OF DISPLAY OF TROPICAL CYCLONE WARNING SIGNALS IN HONG KONG: 1946 - 1972

Signal	Duration							
	Mean		Maximum		Minimum		Mean per year	
1	17h	04min	102h	10min	1h	20min	89h	46min
3*	19	57	71	45	1	00	123	15
5	7	41	13	00	3	00	2	51
6	5	41	11	10	3	00	3	22
7	11	31	35	35	2	15	16	39
8	7	19	17	20	0	20	7	19
5-8	8	51	35	35	0	20	30	11
9	3	30	6	15	1	10	1	57
10	6	26	9	10	2	30	2	09

* 1956 - 1972.

TABLE 7

CASUALTIES AND DAMAGE CAUSED BY TROPICAL CYCLONES IN HONG KONG: 1937 - 1972

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 Tropical Depression (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

N.B. Information compiled from Hong Kong newspapers since 1937.

* 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
IN 1971 - 1972

Year	Name of Tropical Cyclone	Name of Ship	Location of Grounding, etc	Nature of Incident	Remarks
1971	Typhoon Freda	S.S. Themis	Victoria Harbour	Slight Damage	11 other ocean-going ships suffered slight damage or went adrift
		S.S. El Jigue	Kowloon Bay	Went Adrift	
	Typhoon Lucy	S.S. Tjamar	Victoria Harbour	Collision	5 other ocean-going ships were in trouble
		S.S. Michael Jebsen	Victoria Harbour	Collision	
	Typhoon Rose	U.S.N. Regulus	Kau Yi Chau	Aground	8 other ocean-going ships went adrift or collided with other vessels
		S.S. Kim Seng	Ping Chau	Aground	
		S.S. Red Sea	N.E. Lantau	Aground	
		S.S. Huntsland	N.E. Lantau	Aground	
		S.S. Tion Hong	N.E. Lantau	Aground	
		S.S. Jade Lily	N.E. Lantau	Aground	
		S.S. Kaohsiung	N.E. Lantau	Aground	
		S.S. Winfield Trader	N.E. Lantau	Aground	
		S.S. Guimaras	N.E. Lantau	Aground	
		S.S. Fern Bank	N.E. Lantau	Aground	
		S.S. Kyoho Maru	N.E. Lantau	Aground	
		S.S. Gallantry	N.E. Lantau	Aground	
		S.S. Taikoo King	N.E. Lantau	Aground	
		S.S. Macau	Kap Shui Mun	Aground	
		S.S. Billy	Kap Shui Mun	Aground	
		S.S. Lucky Star No. 1	Castle Peak Road (Opposite Ma Wan Island)	Aground	
		S.S. Monruby	Rambler Channel	Aground	
		S.S. Jilin	E. Coast Tsing Yi	Aground	
		S.S. Sea Coral	S.E. Coast Tsing Yi	Aground	
		S.S. Lao Shan	S.E. Coast Tsing Yi	Aground	
		S.S. Man On	N. Coast Stonecutters	Aground	
		S.S. Flying Dragon	E. Coast Stonecutters	Aground	
		S.S. Watudambo	S.E. Coast Stonecutters	Aground	
	S.S. Wah Fat	S.E. Coast Stonecutters	Aground		
	S.S. Kota Sentosa	Tai Kok Tsui	Collision		
	S.S. Iron Yampi	Hung Hom	Aground		
	S.S. Fatshan	N.E. Lantau	Capsized		
	S.S. Lee Hong	E. of Tsing Yi	Sunk		
	S.S. Eastern Cape	Kau I Chau	Aground		
S.S. El Jigue	Kowloon Bay	Collision			
1972	Typhoon Pamela	S.S. Man On	Kowloon Bay	Aground	2 other ocean-going ships were in trouble.
		S.S. Van Mint	S. Coast Lei Yue Mun	Aground	

N.B. Information compiled from Hong Kong newspapers.

TABLE 9

TROPICAL CYCLONES CAUSING PERSISTENT GALES AT THE ROYAL OBSERVATORY

1884 - 1972

Name of Tropical Cyclone	Date and Time of Occurrence of Minimum Pressure		Maximum Mean Hourly Wind		Maximum Gust Peak Speed (kn)	Duration of Gales (h)	Sequence of Wind Direction	Minimum Pressure (mb)		Remarks		
			Direction	Speed (kn)				Hourly Reading	Instantaneous Minimum			
	1884	July	29	0300	E/S	34		5	ENE to ESE	v	997.5	
		September	11	0200	ENE	57		15	N/E to SSE	v	979.8	
	1885	August	17	1400	ESE	34		1	E to S/E	v	997.8	
	1887	September	17	1700	E/S	44		14	NE to SE	v	999.3	
		September	21	0400	E	36		5	ENE to SE/E	v	1000.6	
		September	25	1400	E	35		3	ENE to ESE	v	1000.4	
	1889	October	16	0400	W/N	39		4	NW/N to W	b	997.0	
	1890	October	13	0400	NE/E	34		1	NE to ENE	v	1006.4	
	1891	July	19	0500	SSW	41		5	NW/W to SSW ...	b	980.9	
		August	3	0400	ESE	39		10	NNE to SE.....	v	990.7	
	1893	September	9	0300	NW	38		3	NNW to NW/W...	b	983.2	
		September	28	1600	E/N	39		14	NE/E to E/N	v	999.3	
		October	2	1400	E	52		23	NNE to SE	v	991.8	
		October	8	0400	E/N	37		4	N/E to ESE.....	v	1000.7	
	1894	September	19	0300	E/S	43		15	NE/E to SE.....	v	995.4	
		September	25	0900	E/N	55		10	NE to SE.....	v	994.5	
		September	30	0600	E	41		17	NE/N to SE/E ...	v	999.6	
		October	5	1700	SE/S	54		27	NE/E to SW/S ...	v	987.0	
	1895	July	28	1600	NE/E	34		2	NE/N to E/S	v	995.1	
	1896	July	29	2200	E/S	69		10	NNE to S/E	v	976.6	
		August	9	1600	ENE	42		10	NE/E to SE/E.....	v	997.8	
		October	6	0400	E/N	42		17	NE/E to SE.....	v	996.4	
	1897	September	17	1500	NE/E	36		2	NE/E to ENE.....	v	1004.6	
	1898	August	5	0300	E	39		7	ENE to SE	v	987.1	
		August	17	1700	E	39		8	ENE to SE	v	995.8	
	1900	September	11	0500	E	43		12	NE/E to SE.....	v	996.6	
		November	10	0600	NNE	57		11	NE/E to SW/W ...	b	975.0	Centre recurved around Hong Kong. Highest hourly wind velocity.

TABLE 9—Contd.

Name of Tropical Cyclone	Date and Time of Occurrence of Minimum Pressure Date Time		Maximum Mean Hourly Wind		Maximum Gust Peak Speed (kn)	Duration of Gales (h)	Sequence of Wind Direction	Minimum Pressure (mb)		Remarks	
			Direction	Speed (kn)				Hourly Reading	Instantaneous Minimum		
	1902	July	18	1600	SW/S	39	2	N to SW/S	b	984.4	
		August	2	2000	SW/S	52	3	NW/W to SW/S	b	986.9	
	1904	August	10	0200	E/S	34	1	E to ESE	v	998.1	
		August	25	1700	E/N	36	6	E/N to NNE	b	986.8	
	1905	August	30	1500	ENE	41	10	N/E to E/N	v	988.2	
	1906	September	18	1000	SSW	49	2	NW to S	b	986.2	
		September	20	0400	E/S	36	3	ENE to ESE	v	1000.5	
		September	29	0900	E/N	50	15	NNE to SE	v	993.9	
	1907	September	14	0100	E/S	48	12	NE/N to SE	v	993.3	
	1908	July	28	0100	SSE	52	5	N to S/E	v	978.0	Centre passed over Cheung Chau.
		October	11	0100	E/S	34	1	NE/E to E/N	v	1003.6	
	1909	October	19	1700	ESE	48	13	NNE to SE	v	987.4	
		October	25	1700	E	35	1	NE to SE	v	1003.6	
	1911	July	4	0300	ESE	36	3	ENE to SE	v	996.9	Dines anemograph installed in 1911.
		July	27	1000	ESE	38	4	N to SSE	v	988.2	
		August	5	0900	S/E	39	12	ENE to SSE	v	991.1	
	1913	August	17	1100	ENE	55	11	NE/N to SE/E	v	991.1	
		September	18	2300	SW/W	36	1	WNW to SSW	b	992.2	
	1915	November	5	1600	E	36	2	NE/E to SE	v	1002.3	
	1916	September	7	0200	E	35	1	ENE to SE/E	v	999.1	
	1917	August	13	1100	SSW	40	2	backed from NW	b	986.6	Centre passed a few miles to N'ward.
	1918	August	15	0800	E/N	40	4	NE/E to S/E	v	987.7	
	1919	August	22	1600	E/S	38	5	E/N to SE/E	v	999.2	
	1922	September	20	1700	ENE	35	3	NE/E to E/S	v	999.8	
	1923	July	2	0500	E/S	39	8	ENE to S/E	v	990.8	
		July	22	1700	ESE	41	11	E/N to S/E	v	988.7	
		July	27	1000	S/W	38	1	SW/S to S/W	b	983.1	
		August	18	1000	NNE	67	3	N/W to ESE	v	971.7	
	1926	July	22	0900	N/E	38	5	NE/N to ESE	v	991.7	Centre passed a few miles to S'ward.
		September	27	0600	E/N	46	6	N to ESE	v	991.8	
	1927	August	20	1400	NE/E	53	10	NNE to SE	v	982.4	
	1928	July	15	0100	E	38	4	NE/E to SE/E	v	992.7	
	1929	August	22	1400	SE	57	3	NNE to S/E	v	983.2	
	1930	July	24	1800	E	42	6	NE/N to ESE	v	990.9	

TABLE 9—Contd.

Name of Tropical Cyclone	Date and Time of Occurrence of Minimum Pressure Date Time		Maximum Mean Hourly Wind		Maximum Gust Peak Speed (kn)	Duration of Gales (h)	Sequence of Wind Direction	Minimum Pressure (mb)		Remarks		
			Direction	Speed (kn)				Hourly Reading	Instantaneous Minimum			
	1931	August	1	1200	E/N	60	118*	5	NE/N to SE v	989.2		
		September	2	1500	S/E	41	82	3	NE/N to S/E v	988.7		
	1932	September	17	0500	NE/E	35	69	2	NE/E to ESE v	996.1		
	1936	August	17	0300	E/N	62	115*	6	NE/N to SE/S ... v	979.3		
	1937	September	2	0400	NE/E	59	130*	5	NNW to SE/S ... v	958.3		Max. gust peak speed 145 kn at North Point.
	1939	November	23	1600	E/N	35	64	1	E to NW..... v	989.5		Centre passed over Observatory.
	1940	August	21	0900	E	45	72	12	NNW to E/S v	990.2		
	1941	June	30	1600	ENE	44	83	9	NE to E v	977.8		
		September	16	1200	E/N	55	94	9	N to S/E v	983.7		
	1942 - 1945 No records due to World War II. (No very severe typhoons).											Severest typhoon during the period on July 22, 1944.
	1946	July	18	1600	N/E	—	95	7	N to S v	985.7		
	1948	June	10	1200	E	39	48	1	NE to ESE v	993.1	992.9	
		July	27	1700	SSW	45	64	8	NNE to SW b	981.1	980.1	
		September	3	0400	E	46	75	14	NE to ESE v	996.3	995.5	
	1949	September	8	0300	E	56	81	6	N to SE v	991.3	990.8	
	1950	October	5	0400	E	34	59	1	N to ENE v	997.3	997.2	
	1951	June	18	1800	E	36	63	2	ENE to ESE v	1001.7	1001.6	
		August	1	1800	ENE	44	76	19	ENE to ESE v	990.8	990.1	
		September	2	1400	ENE	36	59	4	ENE to E v	1002.9	1002.4	
Typhoon Susan	1953	September	18	1800	NE	42	75	8	N to ESE..... v	995.0	994.7	
Typhoon Ida	1954	August	29	1400	ENE	47	87	12	NNE to ESE v	992.9	992.4	
Typhoon Pamela		November	6	1100	E	47	84	5	NNE to SE..... v	997.6	997.1	
Typhoon Gloria	1957	September	22	1700	ENE	59	101	14	N to SE v	986.2	984.3	
Typhoon Mary	1960	June	9	0500	SSE	50	103	19	ENE to SW..... v	974.3	973.8	Centre passed over Cheung Chau.

TABLE 9—Contd.

Name of Tropical Cyclone	Date and Time of Occurrence of Minimum Pressure		Maximum Mean Hourly Wind		Maximum Gust Peak Speed (kn)	Duration of Gales (h)	Sequence of Wind Direction	Minimum Pressure (mb)		Remarks		
			Direction	Speed (kn)				Hourly Reading	Instantaneous Minimum			
Typhoon Alice	1961	May	19	1200	ESE	43	89	6	ENE to SW..... v	981.6	981.1	Centre passed over Observatory.
Severe Tropical Storm Olga		September ...	10	0200	W	35	64	1	NNE to SW b	986.5	986.1	
Typhoon Wanda	1962	September ...	1	1000	N	68	140	8	NNW to S v	955.1	953.2	Centre passed about 10 miles to S'ward. Max. gust peak speed at Tate's Cairn 154 kn.
Typhoon Viola	1964	May	28	0700	ESE	35	82	3	ENE to SSE v	993.0	991.9	
Typhoon Ida		August	8	2300	NE	42	112	2	NNE to SSE v	972.3	972.0	
Typhoon Ruby		September ...	5	1300	ESE	58	122	6	N to SE v	971.0	968.2	
Typhoon Sally		September ...	10	2100	WSW	35	56	1	NNW to SW b	989.9	989.1	
Typhoon Dot		October	13	0500	N	46	94	8	N to SW b	978.9	977.3	
Severe Tropical Storm Lola	1966	July	13	2000	E	35	82	1	ENE to SSE v	990.1	989.5	Centre passed about 5 miles west of Cheung Chau. Max. gust peak speed at the Observatory 121 kn.
Typhoon Shirley	1968	August	21	1800	N	37	72	4	NNE to SSW b	968.7	968.6	
Typhoon Freda	1971	June	18	0100	E	34	79	1	ENE to SE v	984.4	984.3	
Typhoon Lucy		July	22	1100	W	34	68	1	NW to S b	978.2	977.9	
Typhoon Rose		August	17	0100	ESE	53	121	6	E to S v	984.5	982.8	

Note: No corrections for air-density have been made to the wind speeds in this table.

* Estimated.

v=veering.

b=backing.