

**HONG KONG OBSERVATORY**

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Evolution of the Tropical Cyclone Warning Systems  
in Hong Kong since 1884

by

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## 摘要

香港天文台\*於 1883 年成立的其中一項首要任務是建立一個熱帶氣旋警告系統。這個系統大致包括非本地及本地的風暴信號。

非本地風暴信號是向航海人士及船長提供熱帶氣旋的位置、移動方向和速度的資料。非本地風暴信號的演變緊隨着當時在中國沿海港口所使用的風暴信號。二次大戰後，隨著天文台透過無線電方式向船舶發出非本地風暴警報，以目視為基礎的非本地信號已於 1961 年 6 月底停止使用。

本地風暴信號主要是向市民提供熱帶氣旋所帶來的風力威脅之警告。天文台在 1884 年開始採用風炮示警，其後於 1907 至 1937 年間以燃點炸藥取代風炮。1917 年，天文台開始採用以數字為基礎的本地颱風警報系統，是目前香港熱帶氣旋警告系統的基礎。為了滿足社會發展的需求，本地風暴信號系統經歷過去百年逐步演變，成為現今熱帶氣旋警告系統的 1-3-8-9-10 方案。

香港的風暴信號系統在過去一百三十多年的演變分別記載於不同的報告和政府公報中。這份技術報告回顧及整理了有關的資料，並總結了自 1884 年至今香港的非本地和本地風暴信號系統的發展過程，方便讀者參考。

\*1912 年 7 月至 1997 年 6 月期間稱為「皇家香港天文台」。

## **Abstract**

Soon after the establishment of the Hong Kong Observatory\* in 1883, a tropical cyclone warning system was implemented as one of the main tasks of the Observatory. The signal system consisted of the non-local storm signals and the local storm signals.

The non-local storm signals provided the mariners and shipmasters with the position of tropical cyclone and its direction and speed of movement. The evolution of the non-local storm signals followed closely with those used in the coastal ports of China at the time. After the Second World War, with non-local warnings for shipping being disseminated through radio, the provision of non-local signals by visual means ceased at the end of June 1961.

Local storm signals are to provide warning of the threat of winds associated with tropical cyclones to the public. It started with the firing of a typhoon gun in 1884. Later on, explosive bombs were used to replace the typhoon gun between 1907 and 1937. The first set of numbered tropical cyclone signals for the local warning system was implemented in 1917, forming the basis of the current local tropical cyclone warning system. To meet the needs of the development of the society, the local storm signal system has evolved in phases over the past 100 years, leading to the current 1-3-8-9-10 scheme of tropical cyclone warning system.

As information on the changes of storm signal systems in Hong Kong over more than 130 years is scattered among various reports and government gazettes, this technical report is compiled to collate and summarize relevant information with a view to providing a comprehensive summary of the development of the non-local and local storm signal systems in Hong Kong since 1884 for users' easy reference.

\*Known as the Royal Observatory, Hong Kong between July 1912 and June 1997.

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# **Evolution of the tropical cyclone warning systems in Hong Kong since 1884**

## **1. Introduction**

1.1 Tropical cyclone is one of the most destructive weather systems on Earth. The western North Pacific, including the South China Sea, is the most active tropical cyclone basin in the world. On average, there are about 30 tropical cyclones occurring in this basin each year and about six of them may come within 500 km of Hong Kong (Figure 1) (Lee and Cheng, 2012). The marine community and the cities along the coast of Guangdong (including Hong Kong in the Pearl River Delta region) are prone to the impacts of tropical cyclones, including high winds, torrential rain, rough seas and storm surge. As such, tropical cyclone warning is one of the earliest weather warnings in this region.

1.2 In Hong Kong, as early as 1877, a black drum was hoisted by the Harbour Department at the Harbour Office Flagstaff to warn local boat people and marine community of the inclement weather. A similar signal was also hoisted and a gun fired from the Police Hulk (Hong Kong Government, 1877 and Figure 2). In 1884, one year after the establishment of the Hong Kong Observatory, the non-local and local storm signal systems were first introduced in Hong Kong. The non-local storm signal system, in operation from 1884 to 1961, aimed at providing information of the position of tropical cyclone and its direction and speed of movement to the mariners and shipmasters. For the local storm signal system, it provided local people with information and warnings of high winds in Hong Kong due to the approaching tropical cyclone. From 1884 to 1906, a typhoon gun was used to warn imminent gale force winds in Hong Kong brought about by tropical cyclones. Later on, explosive bombs replaced the typhoon gun between 1907 and 1937 as they made louder sounds and were considered an improvement over the firing of a gun. The first numbered local storm signal system geared to the warning of wind conditions in Hong Kong was introduced in 1917. To meet the changing needs of the society, the local storm signal system has evolved in phases over the past 100 years, leading to the current 1-3-8-9-10 scheme of the

tropical cyclone warning system in Hong Kong.

1.3 Over the years, the non-local and local signal systems in Hong Kong have undergone a number of changes, in particular the signal symbols and their meanings, signal hoisting locations and warning communication methods. These changes in different eras were documented in various reports and government gazettes (e.g. Royal Observatory (RO), 1938; Starbuck, 1951). Previous studies by researchers focused on different aspects in the development of tropical cyclone warning in Hong Kong. In his book discussing the role of Hong Kong in the early development of China coast meteorology during the late 19<sup>th</sup> century, MacKeown (2010) covered the history of the development of storm warning system in the region during the period. Wai (2004, 2005 and 2006) reviewed respectively the historical background and the development of the storm signals in three different periods, namely 1841-1899, 1900-1919, and 1920-1939. In reviewing the history of the Hong Kong Observatory, Dyson (1983) and Ho (2004) documented some of the major changes of the storm signal systems in Hong Kong. Ho (2004) also made an attempt to condense a whole range of information and summarize the major changes in a table for readers' reference. Despite the effort, gaps still remained and a full picture of the development history of tropical cyclone warning systems in Hong Kong was still lacking.

1.4 With a view to providing a more comprehensive summary of the development of the non-local and local storm signal systems in Hong Kong since 1884, we have summarized in Sections 2 and 3 respectively the key changes and milestones of non-local and local storm signal systems in Hong Kong from various reports, annual publications and government gazettes in this technical note for readers' easy reference. Moreover, some historical maps and photos related to the development of the signal systems are also presented.

## **2. Development of non-local tropical cyclone warning signals in Hong Kong**

2.1 The major changes of the non-local storm signals in Hong Kong from 1884 to 1961 are summarized in Table A. A summary of the principal locations for the hoisting of the non-local storm signals in Hong Kong is shown in Table B. Some of the key changes are further elaborated in the following paragraphs.

2.2 The Hong Kong Observatory, soon after its establishment, implemented its storm warning service on 25 May 1884 by announcing that notice would be given to the Harbour Office, the telegraph companies and newspapers whenever there were indications of strong wind and provide guidance of the signs of dangerous atmospheric depression which is known as tropical cyclone nowadays (Hong Kong Government, 1884a). This was followed soon by the establishment of the first non-local storm warning signal system in Hong Kong (Figure 3). On 11 August 1884, Dr. William Doberck, the first Director of the Observatory, announced the use of visual signals in the form of a red drum, cone and ball to indicate the existence of a tropical cyclone somewhere around Hong Kong and the approximate direction of where the tropical cyclone was located relative to Hong Kong (Hong Kong Government, 1884b). The signals were hoisted on a mast erected in front of the Police Barracks in Tsim Sha Tsui (also known as the Water Police Station), adjacent to Victoria Harbour (Figures 4 and 5). The signals aimed to enable masters of vessels to foresee the weather likely to be encountered at different localities and to plan their courses. They did not imply the approach of a tropical cyclone to Hong Kong, or the anticipation of extreme wind conditions or bad weather locally (Hong Kong Government, 1886).

2.3 Initially, the signals were rather light and were made of perforated canvas framed in leaden pipes. They were blown down and damaged during storms as the cord that supported them was far too weak. A new set of signals made of rattan were made at the suggestion of the Surveyor General and was only 4 feet (1.2 m) in diameter, while the original signals were 6 feet (1.8 m) in diameter (Hong Kong Government, 1885).

2.4 The drum was first hoisted on 8 September 1884 when a tropical cyclone was located somewhere to the southeast of Hong Kong. Two days later, the same tropical cyclone necessitated the firing of the typhoon gun to warn the local public about the expected strong to gale force winds in the territory (see Section 3).

2.5 In 1890, the non-local signals were duplicated with a set of black signals in addition to the original set in red (Hong Kong Government 1890; Chan, 1894). The red signals indicated that the centre of a tropical cyclone was judged to be more than 300 miles away from Hong Kong while the black signals less than 300 miles (Figure 6). In 1904, the signals were further enhanced with the direction of the tropical cyclone given in eight-point compass directions as compared with the four-point previously (Hong Kong Observatory, 1904; the Chinese Mail 香港華字日報, 1904). The set of non-local signals were used until 30 June 1917. Meanwhile, the non-local signals were repeated at other stations such as the Harbour Office, H.M.S. Tamar and Hong Kong and Kowloon Wharf and Godown Company (Hong Kong Government, 1904b). Starting from around 1907, supplementary signals in the form of a cone also began to be displayed at stations offshore such as Gap Rock, Waglan Island, Stanley, Cape Collinson, Aberdeen, Sai Kung and Tai Po (Hong Kong Government, 1907a).

2.6 The Zikawei Observatory (present-day Xujiahui Observatory) in Shanghai had been using flag signals as provision of weather information and typhoon warnings for Shanghai and the estuary of Yangtze River since 1884 (Wen, 2004). The flags were based on a code that distinguished typhoon and continental depression signals from gale signals. The typhoon and continental depression signals were signalled by a two-digit number indicating the storm location, and a further two-digit number indicating the probable storm movement (MacKeown, 2010). In 1896, the flag signal method was extended to other parts along the China coast. On 1 January 1904, the Observatory adopted the Shanghai flags system of communicating meteorological information using a newly erected mast at Signal Hill (also known as Blackhead Hill at that time) in Kowloon at the request of the Hongkong General Chamber

of Commerce (Hong Kong Government, 1904a) which considered the current system not sufficient and wanted a far more elaborate system (MacKeown, 2010). A deficiency of the flag system was that the shape and colour of the flags were difficult to be identified during periods of calm wind. The system was standardized in 1905 using the China Coast Code (Figure 7), which was a re-working of the existing flag code using symbols, rather than flags (MacKeown, 2010). From 1 January 1906, the China Coast Code came into effect at Zikawei Observatory in Shanghai, the coastal ports in China and also in Hong Kong (Hong Kong Government, 1905). The signals were displayed at the yard-arms of the storm signal mast at Signal Hill (Figures 8 and 9) and consisted of the Typhoon and Continental Depression signals, and Gale signals. Details are shown in Appendix 1. In 1908, Canton (Guangzhou in the present day) adopted the Hong Kong code of signals.

2.7 Starting from 8 September 1911, the non-local signal codes were transferred from the Tsim Sha Tsui Police Barracks to the mast head of the storm signal mast on Signal Hill (Hong Kong Government, 1911). During the period from 8 September 1911 to 30 June 1917, both the non-local signals and the China Coast Code were hoisted at Signal Hill.

2.8 New local and non-local storm signals were introduced in Hong Kong on 1 July 1917 (Figure 10) (Hong Kong Government, 1917b, 1918; The Hong Kong Telegraph, 1919). The same set of code was also used in the coastal ports of China such as Zikawei Observatory. The new non-local code superseded the China Coast Code and the Hong Kong Telegraphic Code, which had been used to disseminate storm warnings to ports in the Far East since the early 1910s. While the new local signals were hoisted on the mast head, the new non-local code consisting of 10 symbols representing the ten numerals were displayed at the yard-arms of the storm signal mast at Signal Hill and provided information on the position and movement of tropical cyclones and the occurrence of monsoon gales. Details are given in Appendix 2.

2.9 Back in 1913, the Zikawei Observatory adopted the China Seas Storm Signal Code (Figure 11) for tropical cyclone warnings (Appendix 3). In 1918, this system was announced for use by other East Asian coastal ports. At the request of the Chamber of Commerce, the Hong Kong



Observatory adopted this set of codes in Hong Kong on 1 June 1920 (Hong Kong Government, 1920b, 1921) in parallel with the local tropical cyclone warning signals. The China Seas Storm Signal Code replaced the non-local signal code in Hong Kong which had been used since 1 July 1917. This set of code was similar to the previous set of non-local signal code except that the China Seas Storm Signal Code included a time signal at the mast head in Signal Hill which previously was reserved for the display of local signals (Figure 12). This triggered the need to transfer the local signals to the signal mast at the Hong Kong Observatory Headquarters in 1920s (see paragraph 3.7). For some years since 1927, the China Seas Storm Signal Code was also displayed on the roof of No. 49 Godown of the Hong Kong and Kowloon Wharf and Godown Company in addition to Signal Hill (Hong Kong Government, 1927). Figure 13 shows a panoramic view with both the non-local and local signals being hoisted in Victoria Harbour.

2.10 An adaption of the China Seas Storm Signal Code was implemented on 1 March 1931 (Appendix 4) following the recommendations of the Conference of Directors of Far Eastern Weather Services held in Hong Kong from 28 April to 2 May 1930 (Figure 14) (RO, 1930; Hong Kong Government, 1930c, 1931; Non-local Storm Signal Code, 1932). One of the objectives of the conference was to attain uniformity in Far East in the codes used for local and non-local visual storm warnings. Apart from Hong Kong, the conference was also attended by directors or their representatives from the then weather services in the Philippines, Zikawei, Nanking, Tsingtao and Pratas in China as well as those in Indo-China. The symbols remained unchanged while the detailed meanings of the symbols were revised from the previous code (Appendix 3). For example, in 1920, the time symbol showed the time at which the warning was issued. This was revised in 1931 to show the time at which the storm centre was in the position indicated (see Appendix 4).

2.11 Further revision to the China Seas Storm Signal Code was implemented in 1950 following a conference on Storm Warning Procedures held in Manila in May 1949 (RO, 1949). The conference was convened under the International Meteorological Organization (predecessor of the World Meteorological Organization nowadays), and

was attended by representatives of all weather services in the Far East. Recommendations were made with the intention of bringing storm warning procedures in the countries concerned as closely as possible into line with international practice, while addressing local needs at the same time. The agreed modifications in the storm warning bulletins issued by the Observatory, and in the local and non-local storm signal codes used in Hong Kong were put into effect (RO, 1950). Details of the revised code are given in Appendix 5.

2.12 As early as 1926, warnings of tropical cyclones were sent by radio to ships at sea, other ports and weather centres (Figures 15(a) and (b)). The warnings were broadcast by Cape D'Aguilar Wireless Station and by the Hong Kong Broadcasting Station whenever a tropical cyclone was located within the area bounded by latitudes 10° and 30°N, longitudes 105° and 125°E (RO, 1948). At the end of June 1961, the non-local visual signals on Signal Hill were removed as it was considered that they were no longer necessary (RO, 1962). In 1961-62, the Marine Department Signal Station at Signal Hill started displaying local signals.

### **3. Development of local tropical cyclone warning signals in Hong Kong**

3.1 The evolution of the local storm signals in Hong Kong for three different periods, namely 1884 to mid-1917, mid-1917 to 1955, 1956 to present, are summarized respectively in Tables C, D and E. A summary of the principal locations for the hoisting of the local storm signals in Hong Kong is shown in Table F. Some of the key changes are highlighted in the following paragraphs.

3.2 While the non-local signals provided the mariners with information on the position and movement of tropical cyclones, local people in Hong Kong were warned of the hazardous wind conditions associated with tropical cyclones by means of a typhoon gun as early as August 1884 (Hong Kong Government, 1884b). At the time, the typhoon gun was placed at the foot of the mast in front of the Police Barracks at Tsim Sha Tsui facing Victoria Harbour (Figure 16). It was fired once whenever a strong gale of wind was expected. It was fired twice whenever the wind was expected to blow with typhoon force and fired again if possible when the wind was likely to suddenly shift around. The first typhoon gun was fired on 21 August 1884 although no gale force wind was recorded at the Observatory or Gap Rock, an island about 40 km to the southwest of Hong Kong. However, it was noted that the typhoon gun also performed its double duty as the mail gun in announcing the arrival of postal services from London at the time, causing local vessels and people to seek shelter from a non-existent typhoon.

3.3 Night signals using lanterns were introduced in late 1890 (Hong Kong Government, 1890) and they were hoisted on the mast beside the time-ball in Tsim Sha Tsui Police Barracks<sup>1</sup> (the time-ball was used to provide the time service since January 1885). The night signals provided indications that bad weather would be expected and the veering or backing of the winds (Table C). Thus, warnings on local weather and wind conditions were provided by the firing of typhoon gun and the night signals while the non-local signals provided information on the tropical cyclone positions around the time (Figure 17). Starting

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<sup>1</sup> Also known as the Water Police Station and subsequently the Marine Police Headquarters.

from around 1898, the signals (including the non-local and night signals) were repeated at the Godown Company in Kowloon in addition to that in Tsim Sha Tsui Barracks and also, by day only, at the Harbour Office (located in Sheung Wan, Hong Kong Island) and on H.M.'s Receiving Ship. By then, only one round of the typhoon gun was fired to warn of strong gale of winds (Hong Kong Government, 1898b) as it was considered that the advance warning was adequate.

3.4 In February 1897, the storm signals invented by Admiral FitzRoy in 1861 were introduced in Hong Kong with a minor modification (Hong Kong Government, 1898a), and the typhoon gun was fired when the drum was hoisted. The modified FitzRoy's storm warning system consisted of storm signals in the form of a cone or drum and night signals. A cone pointing upward (North Cone) was hoisted for warning of gales from the north or east while a cone pointing downwards (South Cone) warned of gales from the south or west<sup>2</sup>. A drum<sup>3</sup> was added to the cone when a strong gale which might reach hurricane force was expected (Hong Kong Government, 1897). The night signal consisted of three lanterns with white or any colour but all alike, hung on a triangular frame, pointing upwards or downwards as the case might be. No lanterns were hoisted to represent the drum. In January 1898, at the suggestions of the Committee of the Chamber of Commerce, it was reverted to the system which had been in use in Hong Kong from 1884 to 1896 as the original system was considered to be better understood and interpreted by the boat and seafaring community.

3.5 After the disastrous storm that battered Hong Kong in September 1906 and resulted in over 10,000 deaths (Ho, 2004), a small committee consisting of the harbour master, a nominee of the commodore and a nominee of the Chamber of Commerce was set up to review the need to improve storm warning system for the local public (MacKeown, 2010). Based on the suggestions by the committee, the typhoon gun, which had been used to warn of a strong gale of wind since

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<sup>2</sup> These signals were considered justified if followed, at any place within 50 miles of where they were hoisted, by winds of Force 6 or upwards to Force 12 within 48 hours, and too late if it blows a gale of force 9 before they were hoisted.

<sup>3</sup> It was considered justified if followed, at any place within 50 miles of where it was hoisted, by a gale of Force 8 and upwards to Force 12 with 48 hours, and too late if it blows a gale of Force 9 before it was hoisted.

1884, was abolished in 1907 (Hong Kong Government, 1907a and 1907b). Its place was taken up by the urgent signal of firing three explosive bombs at the Water Police Station in Tsim Sha Tsui, at intervals of ten seconds when the winds were expected to increase to full hurricane force. This was repeated at the Harbour Office. A Black Cross was also hoisted at the same time, superior to other shapes (that is above all the non-local signals), to indicate winds of hurricane force. Moreover, the night signals were re-organized with three vertical lights in green and red. The new night signals, mounted on the roof of the Water Police Station at Tsim Sha Tsui, were repeated at the Harbour Office and on board H.M.S. Tamar and thus was visible in all parts of the harbour. In addition, Supplementary Warnings in the form of a cone would be hoisted at nine outlying stations such as Waglan Island, Gap Rock and Aberdeen to inform passers-by that storm signals were hoisted in the harbour. The night signals were transferred from the Water Police Station to the Kowloon Railway Station in 1916 (Hong Kong Government, 1916 and 1917a).

3.6 A major revision to the storm signal system took place in 1917 when the new local and non-local storm signal codes (Figure 10, see also paragraph 2.8) were introduced on 1 July (Hong Kong Government, 1917b). The new local code was the first numbered tropical cyclone signal system in Hong Kong, consisting of seven signals providing a standby signal, gale signals in four directions, an increasing gale signal and a hurricane signal. The hurricane signal was accompanied by three explosive bombs fired at the Water Police Station and repeated at the Harbour Office. Initially, the local day signals were displayed at the mast head of the storm signal mast in Signal Hill (Figure 8) and other locations in the harbour. Night signals were displayed at the tower of the Railway Station, H.M.S. Tamar and on the Harbour Office flagstaff. Supplementary signals in the form of a cone were also displayed at outstations such as Gap Rock, Waglan Island and Tai Po whenever local signals were displayed in the harbour.

3.7 As discussed in paragraph 2.9, since the China Seas Storm Signal Code started to include a time signal code at the mast head which formerly was reserved for local signals, it became necessary to select a new site for hoisting the local signals (Hong Kong Government, 1921).

At the suggestion of the Director of the Observatory, hoisting of local signals was moved to the Observatory wireless mast (Figures 13 and 18). As the Observatory was further away from the harbour than Signal Hill, the height of the signals was extended to 8 feet (2.4 m) and other dimensions of the signals were increased in proportion (Hong Kong Government, 1921). The night and day signals of the local storm signals started to be displayed on the Observatory wireless mast on 3 October 1919 (Hong Kong Government, 1919) and 1 June 1920 (Hong Kong Government 1920a, 1920c) respectively. In 1933, the wireless mast was removed from its original position to make way for the Director's Quarters (Lee, 2016). The new wireless mast was set up a little to the northeast of the Main (1883) Building (Figures 19, 20 and 21).

3.8 A change to the symbol for Signal No. 1 was effected in 1927 (Hong Kong Government, 1926; Table D). Towards the close of 1929, the rattan symbols of the Local Signal Code were replaced by symbols of expanded metal on steel frames, which, though of different design, had the same appearance as the old symbols, at a distance (Hong Kong Government 1930a).

3.9 The local signal code was revised on 1 March 1931 (Figure 22) (Hong Kong Government, 1930b) following the recommendations at the Conference of Directors of Far Eastern Weather Services in 1930 (Hong Kong Government, 1931, RO 1930). The signal system was extended to ten signals, although Signal No. 4 was only used in the Philippines but not in Hong Kong, as the information it conveyed was covered by the non-local signals. In 1935, the signal system was further revised (Hong Kong Government, 1934; RO, 1938) as agreed between the Observatory and the Central Weather Bureau of Manila. In the revised system, Signals No. 2 to 4 were not used in Hong Kong while Signal No. 9 was not used in Manila. Explosive bombs continued to be fired when the Hurricane Signal was hoisted. The last typhoon bomb was set off in September 1937 during the passage of an intense typhoon which brought extensive casualties and damage to Hong Kong (Jeffries, 1937).

3.10 After the Second World War<sup>4</sup>, the previous tropical cyclone warning system was reinstated and a number of old signal masts in the

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<sup>4</sup> Details of the tropical cyclone warning system during the Second World War period are in Appendix 6.

New Territories and the outlying islands had to be repaired, and several new signal stations were brought into use (RO, 1947 and RO, 1948).

3.11 Following the recommendations of a conference on Storm Warning Procedures held in Manila in May 1949 (see also paragraph 2.11), the international warning signal for strong winds, in the form of a black ball, was brought into use in Hong Kong since 1 January 1950 (Figures 23 and 24) (RO, 1949, 1950 and 1951a). The purpose of this new "Local Strong Wind Signal" was to warn small craft of the onset of strong winds that were not expected to reach gale force. It covered warning of strong monsoon winds in winter, and strong winds due to less intense tropical disturbances in summer and autumn. It was not intended to be used as a preliminary signal to give warning of the approach of a tropical storm or typhoon which was expected to give winds of gale force or above in Hong Kong. According to the records, the Local Strong Wind Signal was occasionally hoisted to warn the strong winds associated with tropical cyclones between 1950 and 1956. In some cases, it was also followed by gale warnings (i.e. Signals No. 5 to 8). Moreover, the Director of the Observatory reported in the Annual Report that owing to the lack of weather information from the mainland, it was very difficult to use the signal effectively for giving warning of strong monsoon winds in winter (RO, 1951b).

3.12 With effect from 15 April 1956, the Strong Monsoon Signal (Black Ball) and the new Tropical Cyclone Strong Wind Signal No. 3 (inverted T) were introduced to delineate the use of signals for monsoon systems and tropical cyclones. The Strong Monsoon Signal was used only as a warning against strong winter and summer monsoon winds and the black ball was displayed whenever monsoon winds were forecast or known to exceed 21 knots (40 km/h) in Victoria Harbour or coastal waters (RO, 1965) (Figures 25 and 26). A new signal, No. 3 was introduced as the warning for strong winds associated with tropical cyclones (RO, 1956a, 1956b, 1959) (Figures 25 - 27). Occasionally, when Hong Kong was under the combined effect of monsoon and tropical cyclone, the Strong Monsoon Signal might be replaced by tropical cyclone signals and vice versa depending on the synoptic conditions at the time. This practice is still valid today.

3.13 Originally, Gale or Storm Signals 5, 6, 7, 8 were different only in terms of local wind direction. In 1971-1972, a review of the local storm warning system was conducted by the Observatory. Letters and questionnaires were sent to shipping companies, government departments and other organizations to find out whether the majority of people in Hong Kong wanted to change the existing storm warning signals to make them simpler in that increasing signal number would indicate increasing winds. Starting from 1 January 1973, signals numbered 5, 6, 7 and 8 were re-numbered as 8NW, 8SW, 8NE and 8SE respectively (RO, 1973, 1986) (Figures 28 and 29) to avoid giving the impression that the inter-change of Signals 5, 6, 7, 8 carried a meaning of increasing or diminishing wind strength. This system remains in use today.

3.14 The local signal stations were initially set up in the harbour and the outlying islands. As the population grew after the Second World War, signal stations gradually increased in number across the territory in addition to signal stations at the Hong Kong Observatory Headquarters (Figures 30 and 31) and outstations at Cheung Chau (Figures 32-34) and Waglan Island (Figure 35). Most of the signal stations were located at government buildings of the Hong Kong Police Force and the Marine Department (Figure 36 and 37). The number of signal stations in Hong Kong peaked at 42 in the 1960s (Figure 38). With the development of alternative communication channels, such as radio and TV, Dial-a-Weather telephone service, and Observatory website, in disseminating weather information and warnings, the signal stations were progressively closed. The wireless mast for hoisting signals at the Observatory was dismantled in 1978 for the construction of the new Centenary Building to the east of the Main (1883) Building (Lee, 2016). The last signal station in Hong Kong, on the island of Cheung Chau, was decommissioned on 1 January 2002 (Hong Kong Observatory (HKO), 2001) marking the end of the era of the hoisting of tropical cyclone warning signals (Figure 39). The signals are now preserved as historical exhibits, such as those displayed at the Observatory Headquarters (Figure 40) and Cheung Chau Meteorological Station (Figure 41).

3.15 Since the last major revision in the local signal system in 1973, some adjustments had also been made in the interim years,



including the introduction of the Pre-8 advance alert in 1987 and the setting up of a network of eight reference stations for considering the issuance of Tropical Cyclone Warning Signals No. 3 and No. 8 in 2007 (HKO, 2008). Despite such changes, the meanings of the signals remain the same for more than 40 years (Figure 42), and the local tropical cyclone warning system has become firmly established with the public showing good awareness and response in dealing with the hazardous weather conditions warned by the tropical cyclone signals. The significant reduction of the number of fatalities brought by tropical cyclones to Hong Kong clearly reflect, the effectiveness of the tropical cyclone warning system (Figure 43).

## **Acknowledgement**

The authors would like to thank various colleagues of the Hong Kong Observatory for their useful input and comments on the manuscript. We also acknowledge insightful discussion with Dr. Fiona Williamson and Professor Ma Koon-yiu on records of storm warnings and historical typhoons. Valuable photos made available by family members of Mr. G.S.P. Heywood, Shanghai Meteorological Bureau, Hong Kong Museum of History and the Information Services Department are also gratefully acknowledged.

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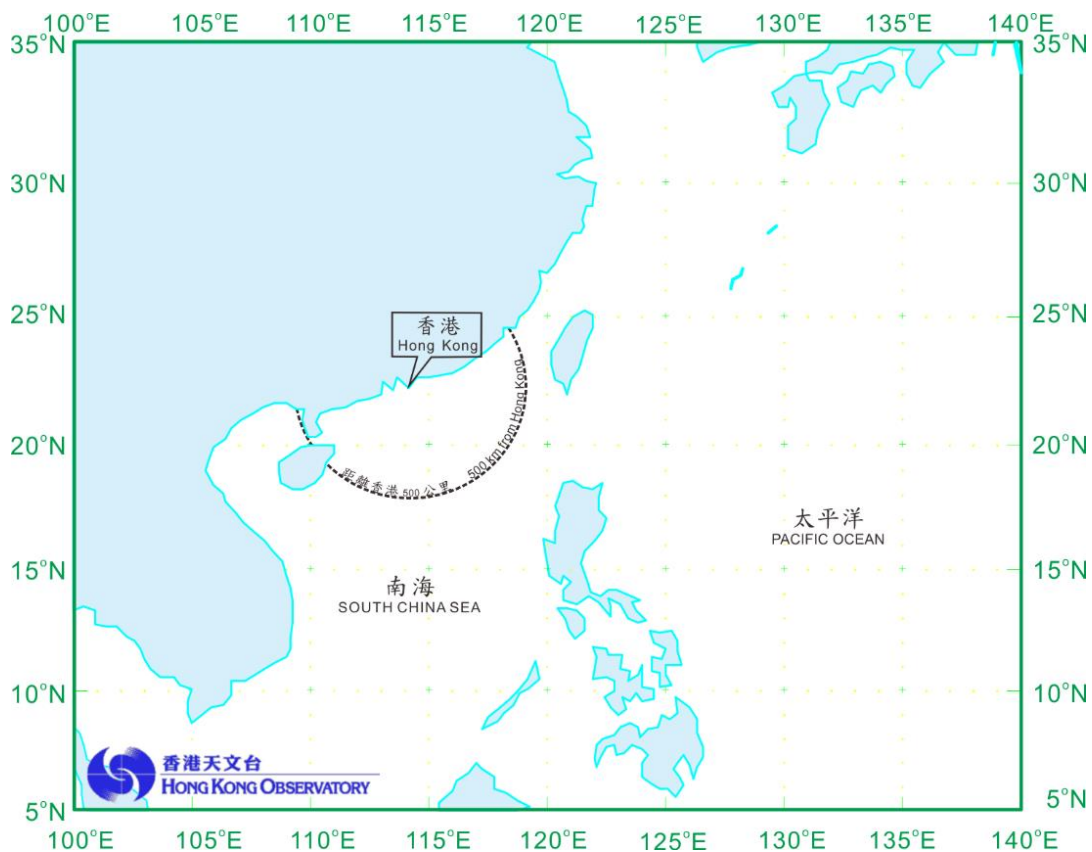


Figure 1. Map showing the location of Hong Kong and the adjacent sea areas.

NOTICE.

In the event of bad weather being apprehended by this Department, a *black drum* will be hoisted at the *Office Flagstaff*. A similar signal will be hoisted and a *gun* will be fired from the *Police Hulk*.

The usual signs of approaching bad-weather are, a falling Barometer with high Thermometer, sultriness of the atmosphere, wildness and discoloration of the clouds, and birds flying about in unusual numbers. Should these symptoms exist and the wind be any where between North-Westerly and North-Easterly, a typhoon of a severe type may be looked for.

The same indications of bad weather with the wind between South-Easterly and South-Westerly, a typhoon may be known to be in the neighbourhood, but not likely to be severely felt at Hongkong.

This signal is not to be considered as relieving Masters of ships from their proper responsibilities. The signal is intended only as calling the attention of the Mercantile Marine to any change of weather which the undersigned may of himself be expecting.

H. G. THOMSETT, R.N.,  
*Harbour Master, &c.*

Harbour Department, Hongkong, 2nd August, 1877.

Figure 2. The Hong Kong Government Gazette of 4 August 1877 on the hoisting of storm signals by the Harbour Department.

SUPPLEMENT

To the HONGKONG GOVERNMENT GAZETTE of 16th August, 1884.

GOVERNMENT NOTIFICATION.—No. 293.

The following Notice is published for general information.

By Command,

FREDERICK STEWART,  
*Acting Colonial Secretary.*

Colonial Secretary's Office, Hongkong, 16th August, 1884.

NOTICE.

*Meteorological Signals* will be hoisted on the mast in front of the Police Barracks at Tsim-sha-tsui:—

A red drum will be hoisted to indicate the existence of a typhoon somewhere to the East of the Colony.

A red cone pointing upwards will indicate, that a typhoon exists in a latitude more northern than the Colony, or, that it is progressing towards North.

A red cone pointing downwards will indicate, that a typhoon exists in a latitude more southern than the Colony, or, that it is progressing towards South.

A red ball will indicate, that a typhoon exists somewhere to the West of the Colony.

2. For the purpose of giving *Storm-warnings* to the Colony, a gun has been placed at the foot of the mast facing Victoria. It will be fired once, whenever a strong gale of wind is expected here. It will be fired twice, whenever the wind is expected to blow with typhoon force. And it will be fired again if possible, when the wind is likely to suddenly shift round,—such shifting being frequently accompanied by great disasters to the shipping.

3. In view of the fact, that typhoons—although their area of strong wind and severe weather is so limited,—determine the prevailing wind and weather a thousand miles or more away, being surrounded by a fine-weather area of so great extent,—the meteorological signals will enable masters of vessels days beforehand to foresee the weather likely to be encountered in different localities and to understand changes of weather, and their knowledge of the law of storms combined with their practical experience will enable them to shape their course so as to not only avoid the dangerous part of a typhoon, but so as to find out and benefit by favourable winds.

4. The public are supposed to be guided not solely by those signals, but to consult *The China Coast Meteorological Register* for further particulars. In fact the signals are hoisted to call attention to information contained in that register, as exhibited at the Office of the Great Northern Telegraph Company.

5. The Admirals of the British and Foreign Squadrons in China, and Masters of Vessels trading in these seas having been requested to send in their logs to this Department, whenever they encounter strong wind or bad weather, have cordially responded by forwarding a number of typhoon-logs, which will be invaluable for the future investigation of typhoons.

6. Several Captains have volunteered to keep continuous Meteorological Registers when at sea, and have been supplied with registers of the form now adopted by many of the Commissioners of Customs at the Treaty Ports. These forms may be had on application to this Department, and the typhoon-logs may be obtained from the Harbour Master, who has courteously volunteered to distribute them.

7. Instruments used in observing will be verified at the Observatory if sent there. Aneroid Barometers may be set while in the Harbour by comparison with the data given in *The China Coast Meteorological Register*.

Hongkong Observatory, 11th August, 1884.

W. DOBERCK,  
*Government Astronomer.*

Figure 3. The Hong Kong Government Gazette of 16 August 1884 announcing the establishment of the first non-local storm signal system in Hong Kong.

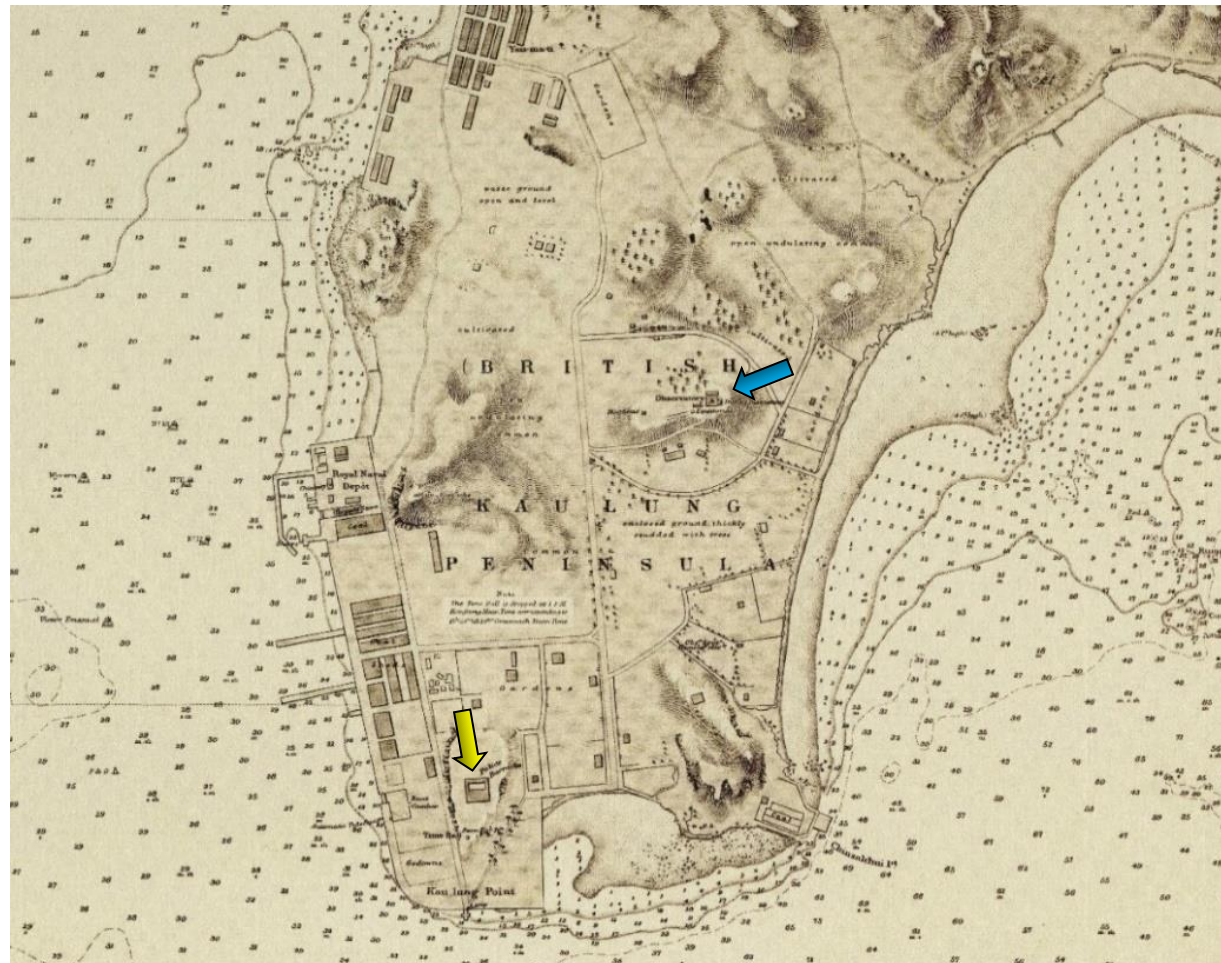


Figure 4. Map showing the locations of the Police Barracks in Tsim Sha Tsui (yellow arrow) and the Hong Kong Observatory (blue arrow) in 1886-1887 (courtesy of Mr. Shun Chi-ming).



Figure 5. The Time Ball at Tsim Sha Tsui Police Barracks (Water Police Station). Meteorological signals were hoisted on the mast beside the Time Ball during 1884 -1911 (courtesy of Mr. Shun Chi-ming).

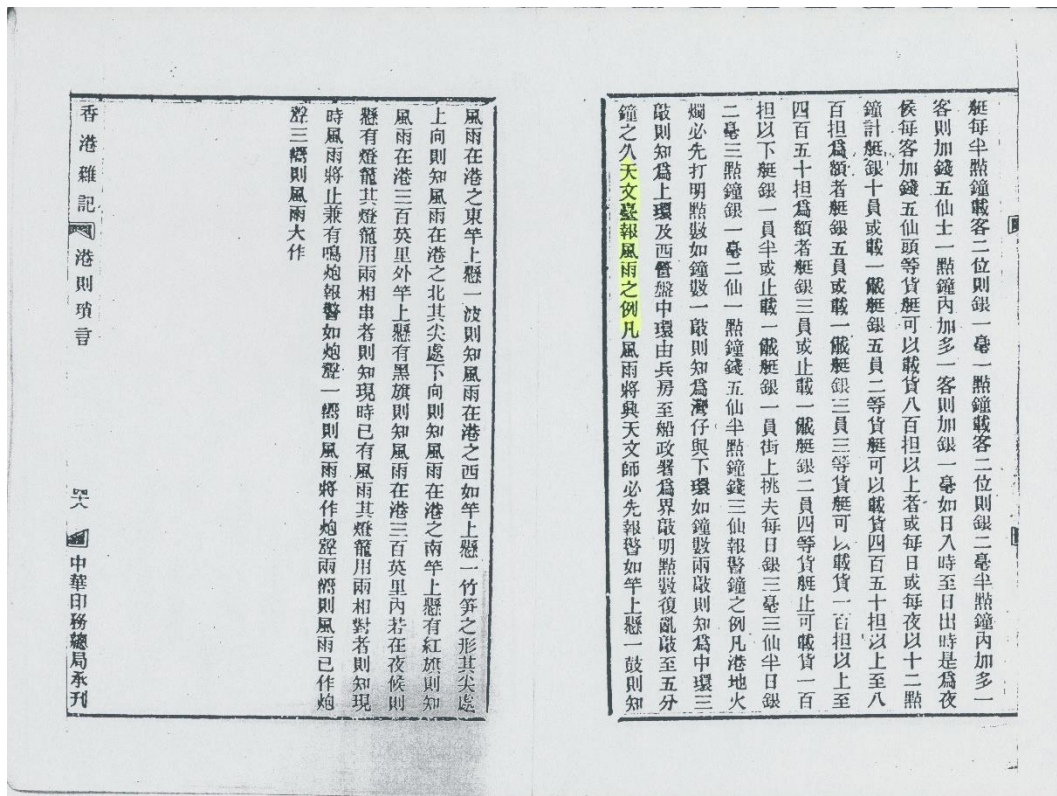
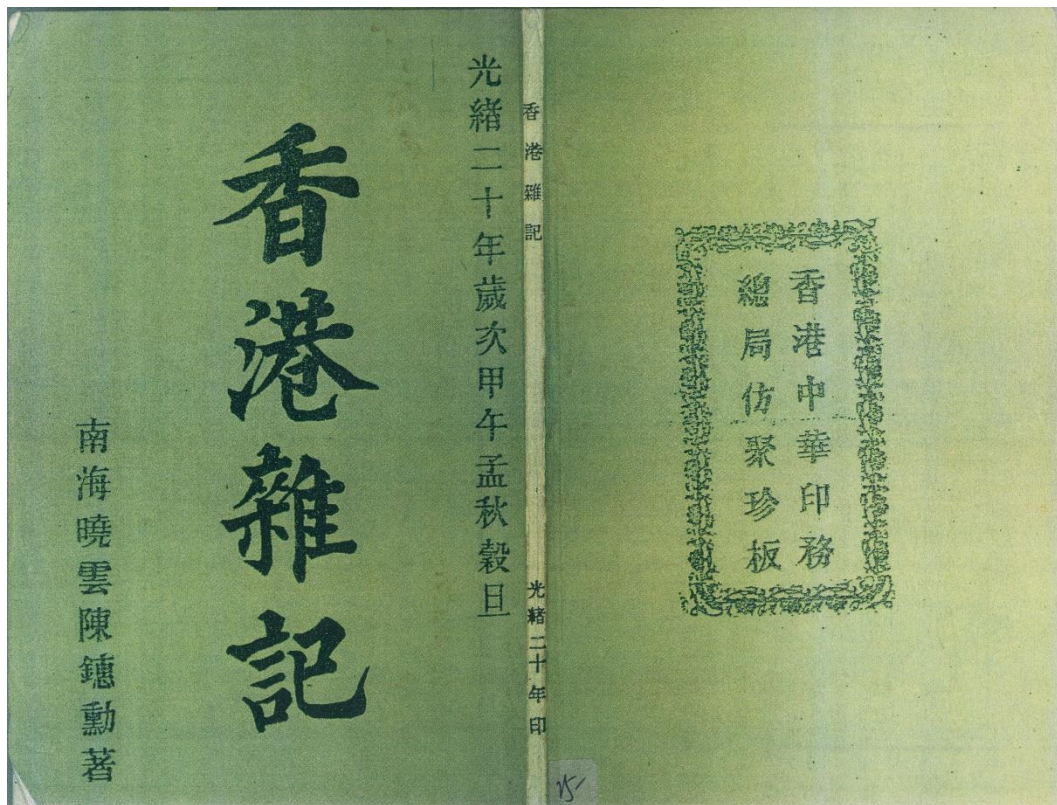


Figure 6. An extract from a historical Chinese publication "Hong Kong Collections (香港雜記)" showing details of the storm signal system in Hong Kong around the 1890s (courtesy of Mr. Cheng Po Hung).

# OBSERVATOIRE DE ZI-KA-WEI

SÉMAPHORE MUNICIPAL DU QUAI DE FRANCE (CHANGHAÏ)

LONGITUDE:  $\left\{ \begin{array}{l} 119^{\circ} 8' 38",9 \\ 7^{\circ} 36' 29",7 \end{array} \right\}$  est de Paris | LATITUDE:  $31^{\circ} 14' 7"$  nord | LONGITUDE:  $\left\{ \begin{array}{l} 121^{\circ} 29' 16",3 \\ 8^{\circ} 5' 36",7 \end{array} \right\}$  est de Greenwich

## CODE DE SIGNAUX

### TYPHONS — DÉPRESSIONS CONTINENTALES — COUPS DE VENT

[A PARTIR DU JANVIER 1906]

Symboles du code: Symboles du code

Chiffres correspondants: 1 2 3 4 5 6 Chiffres correspondants

### I. — POSITION DU CENTRE (3 SYMBOLES)

Série 1- Région de SE	Série 2- Région de SE	Série 3- Région centrale nord	Série 4- Région centrale nord	Série 5- Région de N et de NE	Série 6- Dépressions continentales
<p><b>Nos.</b></p> <p>311 Corollaire pénins. Tchou, Tay</p> <p>312 Malacca, Penan</p> <p>313 Des Maldives aux Indes</p> <p>314 Inde à l'E des Philippines</p> <p>315 Océan de l'ouest</p> <p>316 Mer de Chine</p> <p>317 Océan de l'est</p> <p>318 Océan</p> <p>319 Océan</p> <p>320 Océan</p> <p>321 Océan</p> <p>322 Océan</p> <p>323 Océan</p> <p>324 Océan</p> <p>325 Océan</p> <p>326 Océan</p> <p>327 Océan</p> <p>328 Océan</p> <p>329 Océan</p> <p>330 Océan</p>	<p><b>Nos.</b></p> <p>311 Japon de la Sibirie</p> <p>312 Océan de la Sibirie</p> <p>313 Océan de la Sibirie</p> <p>314 Océan de la Sibirie</p> <p>315 Océan de la Sibirie</p> <p>316 Océan de la Sibirie</p> <p>317 Océan de la Sibirie</p> <p>318 Océan de la Sibirie</p> <p>319 Océan de la Sibirie</p> <p>320 Océan de la Sibirie</p> <p>321 Océan de la Sibirie</p> <p>322 Océan de la Sibirie</p> <p>323 Océan de la Sibirie</p> <p>324 Océan de la Sibirie</p> <p>325 Océan de la Sibirie</p> <p>326 Océan de la Sibirie</p> <p>327 Océan de la Sibirie</p> <p>328 Océan de la Sibirie</p> <p>329 Océan de la Sibirie</p> <p>330 Océan de la Sibirie</p>	<p><b>Nos.</b></p> <p>311 Océan de la Sibirie</p> <p>312 Océan de la Sibirie</p> <p>313 Océan de la Sibirie</p> <p>314 Océan de la Sibirie</p> <p>315 Océan de la Sibirie</p> <p>316 Océan de la Sibirie</p> <p>317 Océan de la Sibirie</p> <p>318 Océan de la Sibirie</p> <p>319 Océan de la Sibirie</p> <p>320 Océan de la Sibirie</p> <p>321 Océan de la Sibirie</p> <p>322 Océan de la Sibirie</p> <p>323 Océan de la Sibirie</p> <p>324 Océan de la Sibirie</p> <p>325 Océan de la Sibirie</p> <p>326 Océan de la Sibirie</p> <p>327 Océan de la Sibirie</p> <p>328 Océan de la Sibirie</p> <p>329 Océan de la Sibirie</p> <p>330 Océan de la Sibirie</p>	<p><b>Nos.</b></p> <p>311 Océan de la Sibirie</p> <p>312 Océan de la Sibirie</p> <p>313 Océan de la Sibirie</p> <p>314 Océan de la Sibirie</p> <p>315 Océan de la Sibirie</p> <p>316 Océan de la Sibirie</p> <p>317 Océan de la Sibirie</p> <p>318 Océan de la Sibirie</p> <p>319 Océan de la Sibirie</p> <p>320 Océan de la Sibirie</p> <p>321 Océan de la Sibirie</p> <p>322 Océan de la Sibirie</p> <p>323 Océan de la Sibirie</p> <p>324 Océan de la Sibirie</p> <p>325 Océan de la Sibirie</p> <p>326 Océan de la Sibirie</p> <p>327 Océan de la Sibirie</p> <p>328 Océan de la Sibirie</p> <p>329 Océan de la Sibirie</p> <p>330 Océan de la Sibirie</p>	<p><b>Nos.</b></p> <p>311 Océan de la Sibirie</p> <p>312 Océan de la Sibirie</p> <p>313 Océan de la Sibirie</p> <p>314 Océan de la Sibirie</p> <p>315 Océan de la Sibirie</p> <p>316 Océan de la Sibirie</p> <p>317 Océan de la Sibirie</p> <p>318 Océan de la Sibirie</p> <p>319 Océan de la Sibirie</p> <p>320 Océan de la Sibirie</p> <p>321 Océan de la Sibirie</p> <p>322 Océan de la Sibirie</p> <p>323 Océan de la Sibirie</p> <p>324 Océan de la Sibirie</p> <p>325 Océan de la Sibirie</p> <p>326 Océan de la Sibirie</p> <p>327 Océan de la Sibirie</p> <p>328 Océan de la Sibirie</p> <p>329 Océan de la Sibirie</p> <p>330 Océan de la Sibirie</p>	<p><b>Nos.</b></p> <p>311 Océan de la Sibirie</p> <p>312 Océan de la Sibirie</p> <p>313 Océan de la Sibirie</p> <p>314 Océan de la Sibirie</p> <p>315 Océan de la Sibirie</p> <p>316 Océan de la Sibirie</p> <p>317 Océan de la Sibirie</p> <p>318 Océan de la Sibirie</p> <p>319 Océan de la Sibirie</p> <p>320 Océan de la Sibirie</p> <p>321 Océan de la Sibirie</p> <p>322 Océan de la Sibirie</p> <p>323 Océan de la Sibirie</p> <p>324 Océan de la Sibirie</p> <p>325 Océan de la Sibirie</p> <p>326 Océan de la Sibirie</p> <p>327 Océan de la Sibirie</p> <p>328 Océan de la Sibirie</p> <p>329 Océan de la Sibirie</p> <p>330 Océan de la Sibirie</p>

### II. — DIRECTION PROBABLE (2 SYMBOLES)

(Typhons — point vers lequel se le centre; Coups de vent — point d'où le vent doit souffler)

SYMBOLE:	SYMBOLE:	SYMBOLE:	SYMBOLE:	SYMBOLE:	SYMBOLE:	SYMBOLE:	SYMBOLE:	SYMBOLE:	SYMBOLE:	SYMBOLE:	SYMBOLE:
SIGNIFICATION: N SE E SE S SW W NW à et nord, Sudest, de sud, N et NNE											

### III. — COUPS DE VENT (1 SYMBOLE)

RÉGIONS MENACÉES PAR UN COUP DE VENT [Plans indiqués à 6] DÉFINITION APPROXIMATIVE DE LA RÉGION

Symboles	Symboles
Côtés des Philippines; Mer de Chine, ou sud des Indes et à l'est des Indes.	Approches de Yang-tse-kiang; Sudfin; moitié sud de la Mer Jaune.
Côtés de l'Inde-Chine; Golfe du Tonkin; Mer de Chine occidentale.	Golfe de Pécheli; Liao-tong; Chou-tong; moitié nord de la Mer Jaune.
Persens, de et nord; Côte de Chine de Wou-tseï-tou à Sou-tou.	Mer et côtes de Japon; E et S de la Corée; Sur Rykkyô (Liaïki).

### IV. — SIGNAUX DE NUIT

(A) Coups de vent

(B) Typhons ou dépressions continentales

Série 1   Série 2   Série 3   Série 4   Série 5   Série 6

Chaque signal (B) indique qu'un centre est signalé dans la série correspondante de la 1<sup>re</sup> PARTIE du CODE

**REMARQUES GÉNÉRALES**

- Les SIGNAUX se font en liaison les symboles ou deux groupes aux extrémités des verges.
- Les TYPHONS ou DÉPRESSIONS sont signalés par 3 symboles: 3 à un bras [position], 3 à l'autre [direction].
- Les COUPS DE VENT sont signalés par 2 symboles: 1 à un bras [position], 2 à l'autre [direction du vent].
- Des RENSEIGNEMENTS plus amples sont fournis par le bulletin, le règlement et les cartes affichés au kiosque du Sémaphore du Quai de France.

Téléphone: Observatoire de Zi-ka-wei: No. 71; Sémaphore: No. 441.

LA FAMILLE IMPÉRIALE CHINOISE

Figure 7. The China Coast Code, 1906 (French version), adopted by the Hong Kong Observatory on 1 January 1906 (courtesy of Shanghai Meteorological Bureau).

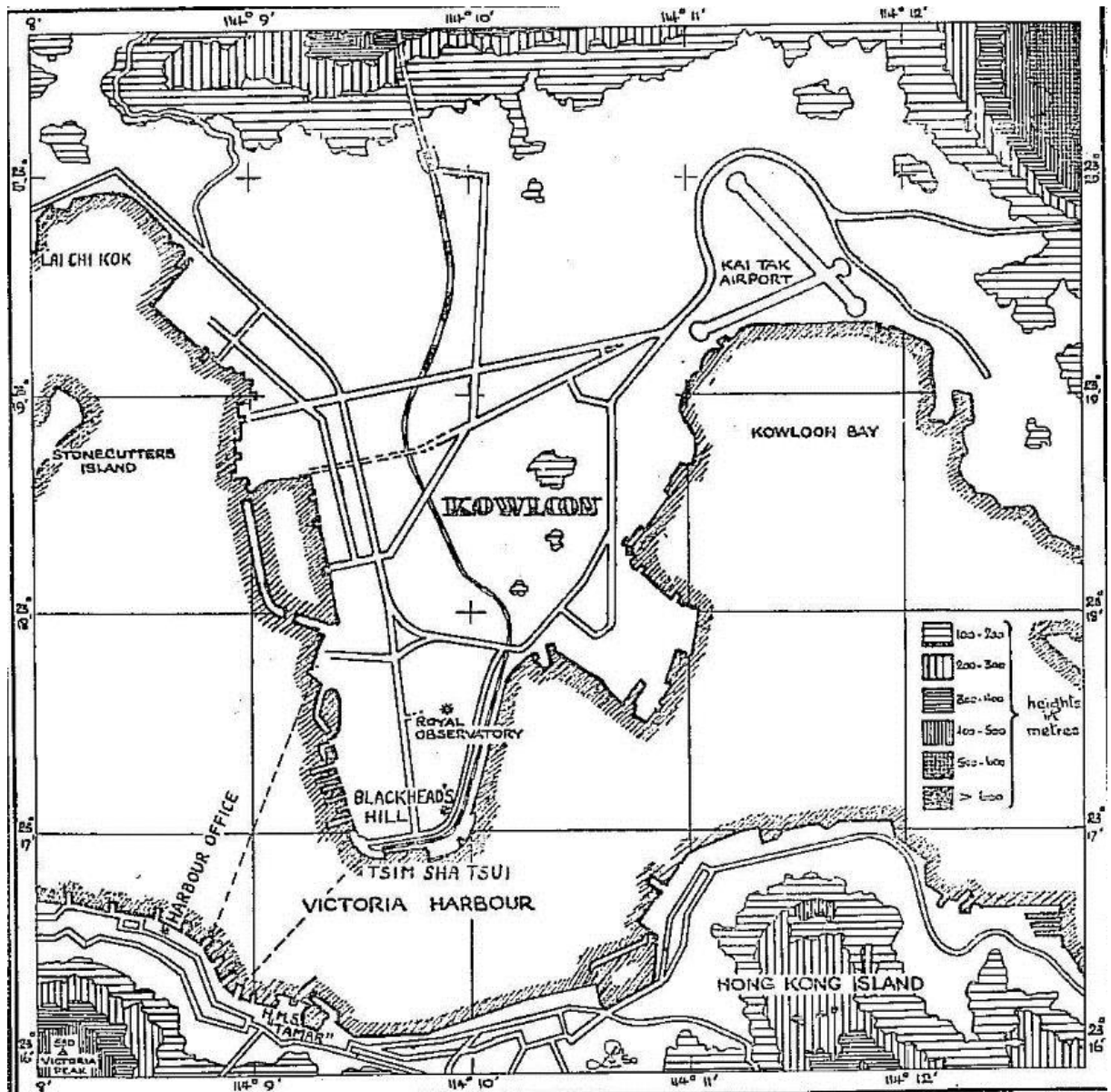


Figure 8. Map showing the locations of the Observatory and Signal Hill (Blackhead Hill) (extracted from A Brief General History of the Royal Observatory, May 1951).



Figure 9. A view of Tsim Sha Tsui around the late 1920s\* showing the Time Ball tower and the signal mast at Signal Hill (Blackhead Hill, blue arrow) on the right. Meteorological signals were hoisted on the signal mast from 8 September 1911 till 30 June 1961 (reproduced from the collection of the Hong Kong Museum of History).

\*the period was taken to be the late 1920s based on the label of "VIEW PENINSULA" on the left of the photo, suggesting that it was taken after the Peninsula Hotel was constructed in the period.



ROYAL OBSERVATORY.

**No. 283.**—It is hereby notified that new Local and Non-Local Storm Signal Codes will be introduced at Hongkong on **1st July, 1917**, in place of the old Local Code, and the China Coast Code.

The principal change in the Local Code is that the new Signals will show the direction from which the gale is expected, whereas the old signals showed the position of the typhoon. The latter will be indicated, as heretofore, by the Non-Local Signals. The new **Local Code** is given below :—

DAY SIGNALS.		
Signal.	Symbol.	Meaning.
1	▲	A typhoon exists which may possibly cause a gale at Hongkong within 24 hours.
2	▲	Gale expected from the North (N.W. to N.E.)
3	▼	" " " South (S.E. to S.W.)
4	■	" " " East (N.E. to S.E.)
5	●	" " " West (N.W. to S.W.)
6	⊗	Gale expected to increase.
7	⊕	Wind of typhoon force expected (any direction).

Signal No. 7 will be accompanied by three explosive bombs, fired at intervals of 10 seconds at the Water Police Station and repeated at the Harbour Office.

The signals will be lowered when it is considered that all danger is over.

The Day Signals will be displayed at the masthead of the storm signal mast on Blackhead Hill, the Harbour Office, H.M.S. *Tamar*, Green Island signal mast, the flagstaff on the premises of the Hongkong and Kowloon Wharf and Godown Company at Kowloon, the flagstaff on the premises of the Standard Oil Company at Lai-chi-kok, and the flagstaff near the Field Officer's Quarters at Lyemun.

NIGHT SIGNALS. (Lamps.)						
1	2	3	4	5	6	7
WHITE	WHITE	GREEN	GREEN	WHITE	GREEN	RED
WHITE	GREEN	WHITE	GREEN	WHITE	GREEN	RED
WHITE	GREEN	WHITE	WHITE	GREEN	GREEN	RED

The Night Signals will be displayed, at sunset, on the tower of the Railway Station, on H.M.S. *Tamar*, and on the Harbour Office flagstaff. They will have the same signification as the day signals.

Signal No. 7 will be accompanied by explosive bombs as above, in the event of the information conveyed by this signal being first published at night.

**SUPPLEMENTARY WARNINGS.**

When local signals are displayed in the Harbour a CONE will be exhibited at the following stations :—

Gap Rock	Sau Ki Wan
Waglan	Sai Kung
Stanley	Sha Tau Kok
Aberdeen	Tai Po

to notify the fact to native craft and passing ocean vessels.

Further details can always be given to ocean vessels, on demand, by signal from lighthouses.

The object of the code is to give at least 24 hours warning of a gale (Force 8 by Beaufort Scale, or 40-45 m.p.h., mean velocity by Dines Anemometer) and also warnings of expected changes in the direction and force of the wind. Owing however to the uncertain movements of typhoons and to insufficient telegraphic observations, it will occasionally happen that signals 2 to 5 may be displayed without a gale occurring at Hongkong, or even Gap Rock, but the reverse is not likely to happen, except in the case of typhoons forming in the vicinity and travelling rapidly towards Hongkong, or of a located typhoon increasing its rate of progression abnormally.

Signal No. 1 is intended as a warning to "Stand By" and watch for the next signal.

In the new **Non-Local Code** the approximate velocity of the Storm centre will be shown, in addition to its direction of motion, and the position of the centre will be given in degrees of latitude and longitude. The time at which the warning was issued will also be shown.

T. F. CLAXTON,  
Director.

12th June, 1917.

Figure 10. The Hong Kong Government Gazette of 15 June 1917 announcing the new local and non-local storm signal codes.





Figure 12. Display of the China Seas Storm Signal Code on Signal Hill in the 1920s. The symbol at the mast head showed the time the warning was issued. The symbols displayed under the yard-arms represented the position of the centre of the storm (left) and the direction of movement and certain characteristics of the storm (right) (courtesy of Mr. Shun Chi-ming).

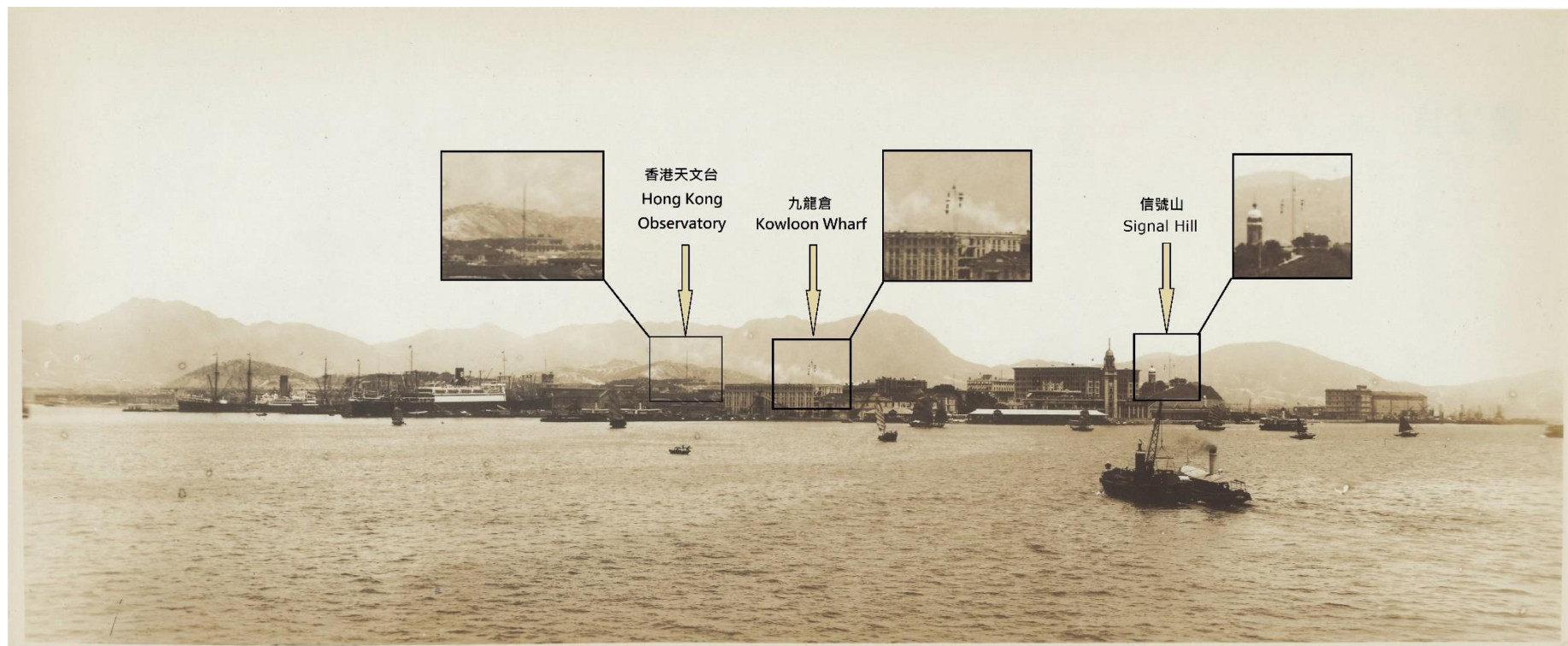


Figure 13. A panoramic view of Tsim Sha Tsui waterfront in the late-1920s to early 1930s showing three different locations where tropical cyclone warning signals were hoisted: Hong Kong Observatory (Local Signal), Kowloon Wharf (Non-Local Signal) and Signal Hill (Non-Local Signal and Time Ball) (courtesy of Mr. Shun Chi-ming).

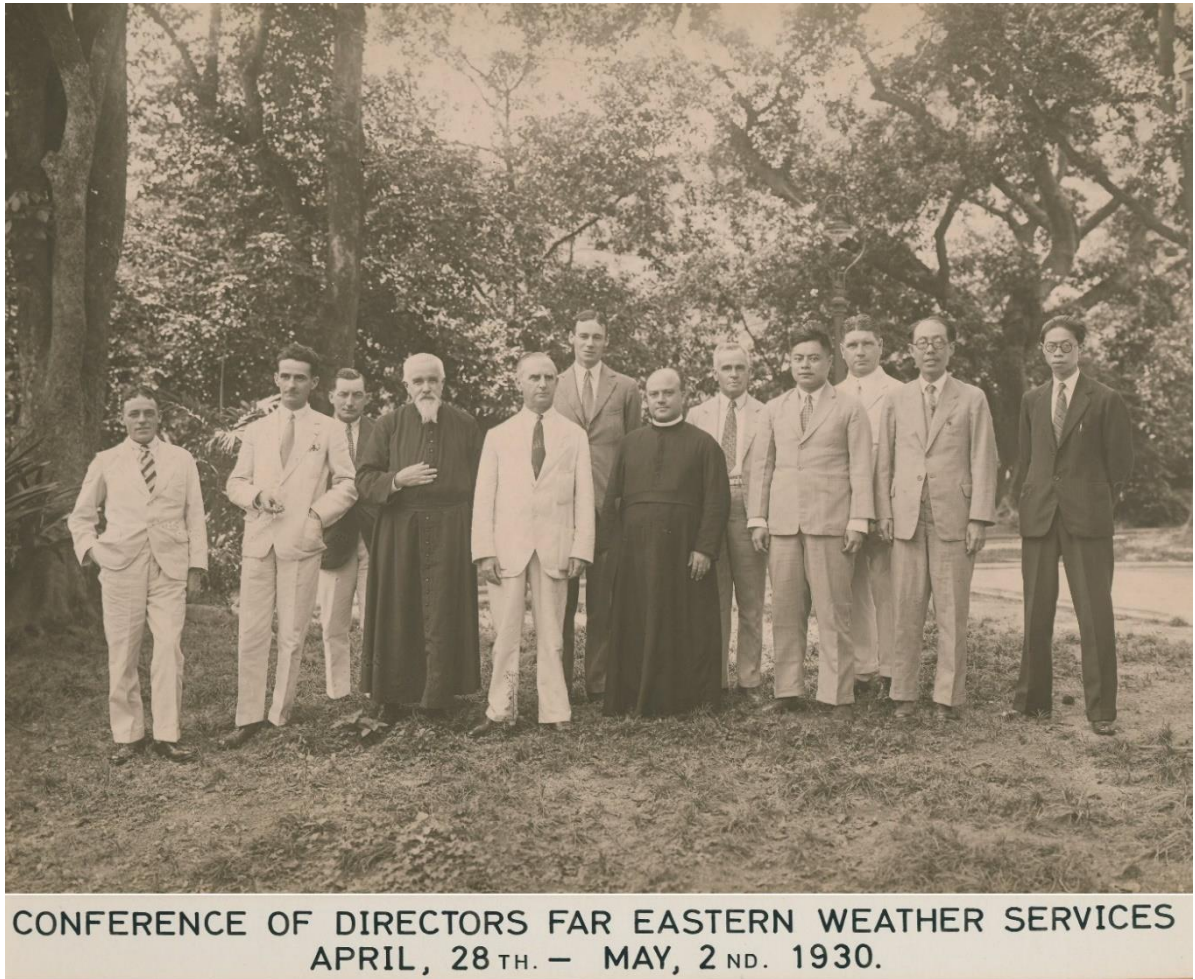


Figure 14. Participants of the Conference of Directors of Far Eastern Weather Services in 1930 held in Hong Kong (Thomas Folkes Claxton, Director, Royal Observatory Hong Kong, 5th from left; Louis Froc, Director, Zikawei Observatory, 4<sup>th</sup> from left; Miguel Selga, Director, Manila Observatory, 6<sup>th</sup> from right; Jiang Bingran, Director, Qingdao Observatory, 2<sup>nd</sup> from right; Shen Xiaohuang, Academia Sinica, representative of Cochin Chu, 4th from right; Shen Youji, Director, Dongsha Observatory (far right)).

List of Stations whose meteorological observations are broadcast by Cape D'Aguiar, Hongkong.

BROADCAST AT 0400 G. M. T.			BROADCAST AT 1200 G. M. T.		
Number.	Station.	Time of Observation (G. M. T.)	Number.	Station.	Time of Observation (G. M. T.)
1	Nagasaki .....	2100	1	Shanghai .....	0600
2	Oshima .....	2100	2	Sharp Peak .....	0600
3	Naha .....	2100	3	Amoy .....	0600
4	Ishigakijima .....	2100	4	Swatow .....	0600
5	Ichang .....	2200	5	Taihoku .....	0300
6	Hankow .....	2200	6	Koshun .....	0300
7	Changsha .....	2200	7	Pescadores .....	0300
8	Shanghai .....	2200	8	Hongkong .....	0600
9	Sharp Peak .....	2300	9	Pratas Island .....	0600
10	Amoy .....	2200	10	Phulien .....	0700
11	Swatow .....	2200	11	Tourane .....	0700
12	Taihoku .....	2100	12	Cape St. James .....	0700
13	Koshun .....	2100	13	Basco .....	0600
14	Pescadores .....	2100	14	Aparri .....	0600
15	Hongkong .....	2200	15	Manila .....	0600
16	Pratas Island .....	2200	16	Legaspi .....	0600
17	Phulien .....	2300	17	Tacloban .....	0600
18	Tourane .....	2300	18	Iloilo .....	0600
19	Cape St. James .....	2300	19	Surigao .....	0600
20	Basco .....	2200			
21	Aparri .....	2200			
22	Manila .....	2200			
23	Legaspi .....	2200			
24	Tacloban .....	2200			
25	Iloilo .....	2200			
26	Surigao .....	2200			

- Storm warnings are broadcast at about 0400 G. M. T. and repeated every two hours until 1600 G. M. T. or until the next warning is issued.
- The Hongkong Observatory will also send wireless Time Signals, via Stonecutters, in accordance with the Manila programme, between 0155 and 0200 G. M. T., and between 1255 and 1300 G. M. T. In this programme dots are sent each second, the 28th, 29th, 54th, 55th, 56th, 57th, 58th and 59th seconds being omitted for the purpose of identifying the signals.

The Time Signals are preceded by the following warning signals from Stonecutters, between 0153 and 0155 G.M.T. and between 1253 and 1254 G.M.T.

CQ DE BXY IIK TIME WAIT

Both Warning—and Time—Signals are sent out on a wave length of 2,000 metres from a 30 kw tonic train (I.C.W.). Radiotelegraphic land and ship stations within range of Stonecutters are required to keep silent between 0153 and 0200 G.M.T. and between 1253 and 1300 G.M.T. in accordance with Article 45, paragraph 3, of the Service Regulations appended to the International Radio-telegraph Convention of 1912. Operators are also required to keep themselves provided with the most accurate time available in order to know when to shut down.

T. F. CLAXTON,  
Director.

6th August, 1926.

Figure 15(a). Extract of the Hong Kong Government Gazette of 13 August 1926 with announcement of the broadcasting of storm warnings.

**HONG KONG**  
**WEATHER MESSAGES FOR SHIPPING**

2. (ii) *Denomination of broadcast: China Seas Storm Warning Service:*

Transmitting Station Call Sign	Broadcast times	Wave-lengths/frequencies Type of Waves	Power of Station
Hong Kong—VPS	0000-2400	500 kc/s (600m)	A1 (W/T) 3 KW
	1700-2200	6404 kc/s (46.8m)	
	2200-0100	8566 kc/s (35m)	
	0100-0200	13020 kc/s (23m)	
	0200-0400	8566 kc/s (35m)	
	0400-0500	13020 kc/s (23m)	
	0500-1700	8566 kc/s (35m)	

Time of Transmission	Time of Observation	Type of Message	Form of Code	Contents of message
On receipt and at HH+18 thereafter	—	Warning <sup>(1)</sup>	In clear	Storm warning.

2. (iii) *Denomination of broadcast: China Seas Weather Bulletin:*

Transmitting Station Call Sign	Broadcast times	Wave-lengths/frequencies Type of Waves	Power of Station
Hong Kong—VPS 2	0118, 0645, 1318	435 kc/s (689.7m)A1*	3 KW
ZEL 22	1318	7,658 kc/s (39.17m)A1	3 KW
ZEL 24	0118, 0645	12,325 kc/s (24.34m)A1	3 KW

Time of Transmission	Time of Observation	Type of Message	Form of Code	Contents of message
0118-0135	1800/2100 1800	Warning <sup>(1)</sup> Situation Forecast	In clear In clear In clear	Storm Warning. Forecasts for 12 hours from 0100 for:— Area A Shanghai to Foochow. " B Formosa Strait. " C H. K. & neighbourhood. " D S. China coastal waters. " E Gulf of Tonkin. " F Luzon Strait. " G China Sea N. of 10°N. " W Luzon Strait to Loochoos. " X Eastern Sea " Y South of Japan. " Z Yellow Sea.
0645-0655 1318-1335	0000 0600/0900	Analysis Warning <sup>(1)</sup> Situation Forecast	FM 46A In clear In clear In clear	Area 5°-45°N, 95°-150°E. Storm Warning. General Situation. Forecast for 12 hours from 1300 (as for 0118 broadcast).

(1) Storm warnings are issued by the Royal Observatory whenever a tropical disturbance is located within the area 10° to 30°N, 105° to 125°E. When a disturbance is located in the Western North Pacific and it is considered that it may affect shipping between Singapore and Japan, the latest available storm warning from other weather centres is re-broadcast.

\* This frequency is *not* to be used for direction finding purposes.

Figure 15(b). Schedule of Tropical Cyclone Warnings and Weather Bulletins provided by the Observatory in the 1950s (extracted from Hong Kong Weather Services For Shipping, 1956).



Figure 16. The Time Ball Tower and the mast in the Police Barracks at Tsim Sha Tsui c. 1886 (courtesy of Mr. Shun Chi-ming).

98 THE HONGKONG GOVERNMENT GAZETTE, 29<sup>TH</sup> JANUARY, 1898.

憲示第三十九號  
輔政使司駱  
曉諭事現奉  
督憲札開將九龍天文師之示開列於下俾眾週知等因奉此合出示曉  
諭為此特示  
一千八百九十八年 正月 二十九日示  
天文師示  
如見九龍之桅有紅號升起此示颶風離港甚遠如見有黑號升起此示  
颶風離港數百味爾船戶人等可照常操工毋庸驚恐惟爾等如聞九龍  
之風炮聲響或晚間見九龍之桅有燈升起此示颶風不久必至爾等須  
即尋地泊爾等之船艇如不即將爾等之船艇泊妥爾等斷難免不測之  
災特示

憲示第四十號  
輔政使司駱  
曉諭事現奉  
督憲札開定於西歷本年二月初二日即華歷正月十二日禮拜三下  
午在深水灣操演快鎗其鎗口向黃泥涌坳附近西南方開放爾各船戶  
人等凡在深水灣附近者切勿駛近鎗碼所經之處以免不虞切切特示  
英一千八百九十八年 正月 二十九日示

近有離往外埠吉信封數無人到取現由外埠回香港  
郵政總局如有此人可即到本局領取茲將原名號列左

付西貢信一封交陳金保收入	付庇冷信一封交玉昌號收入
付安南信一封交黃德輝收入	付井化信一封交廣泰號收入
付舊金山信一封交而穩記收入	付舊金山信一封交梁百連收入

Figure 17. Extract of the Hong Kong Government Gazette of 29 January 1898 on the storm warning system in Hong Kong (in Chinese).



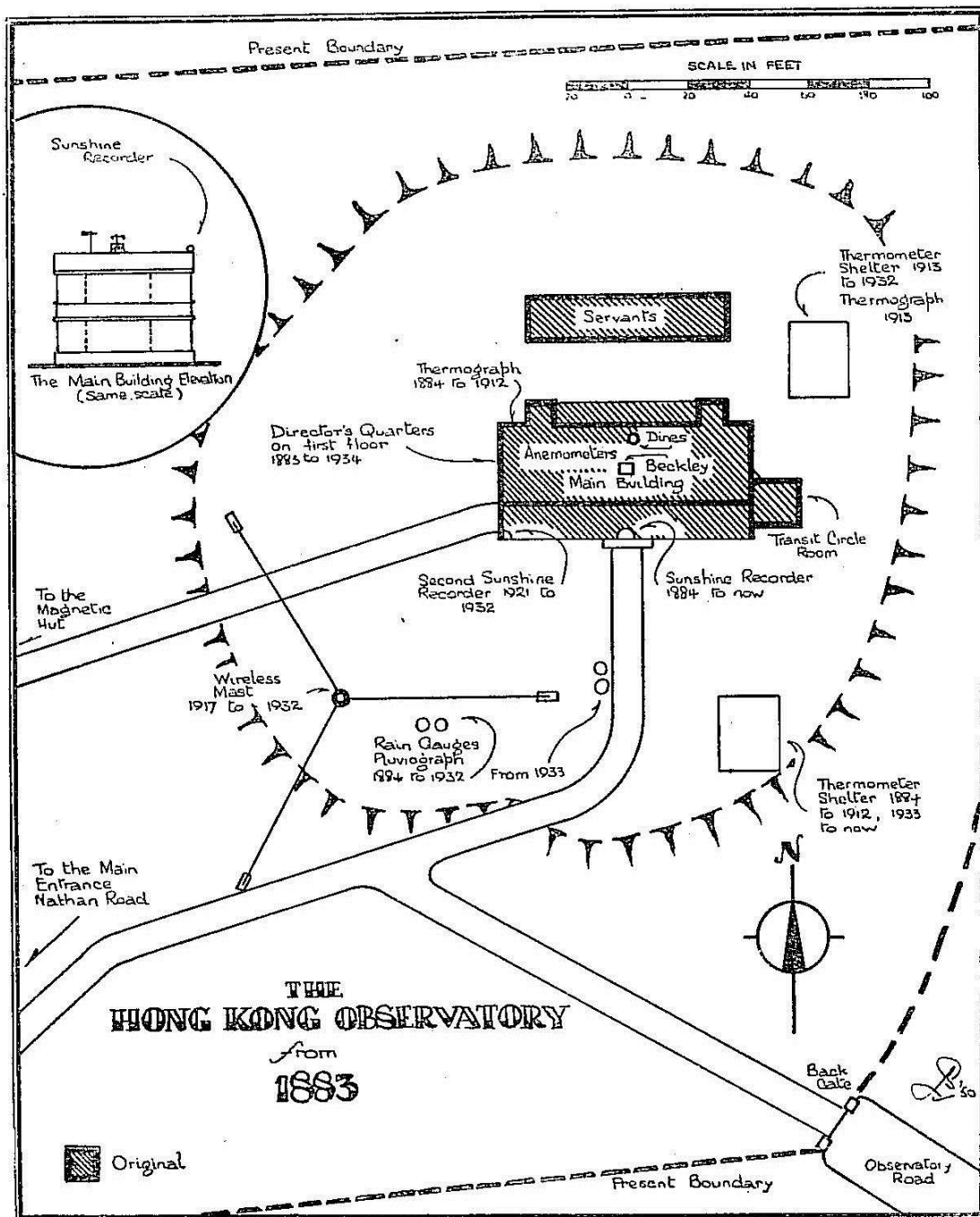


Figure 18. Sketch map of the Observatory in 1883 showing the location of the wireless mast from 1917 to 1932 (extracted from A Brief General History of the Royal Observatory, May 1951).

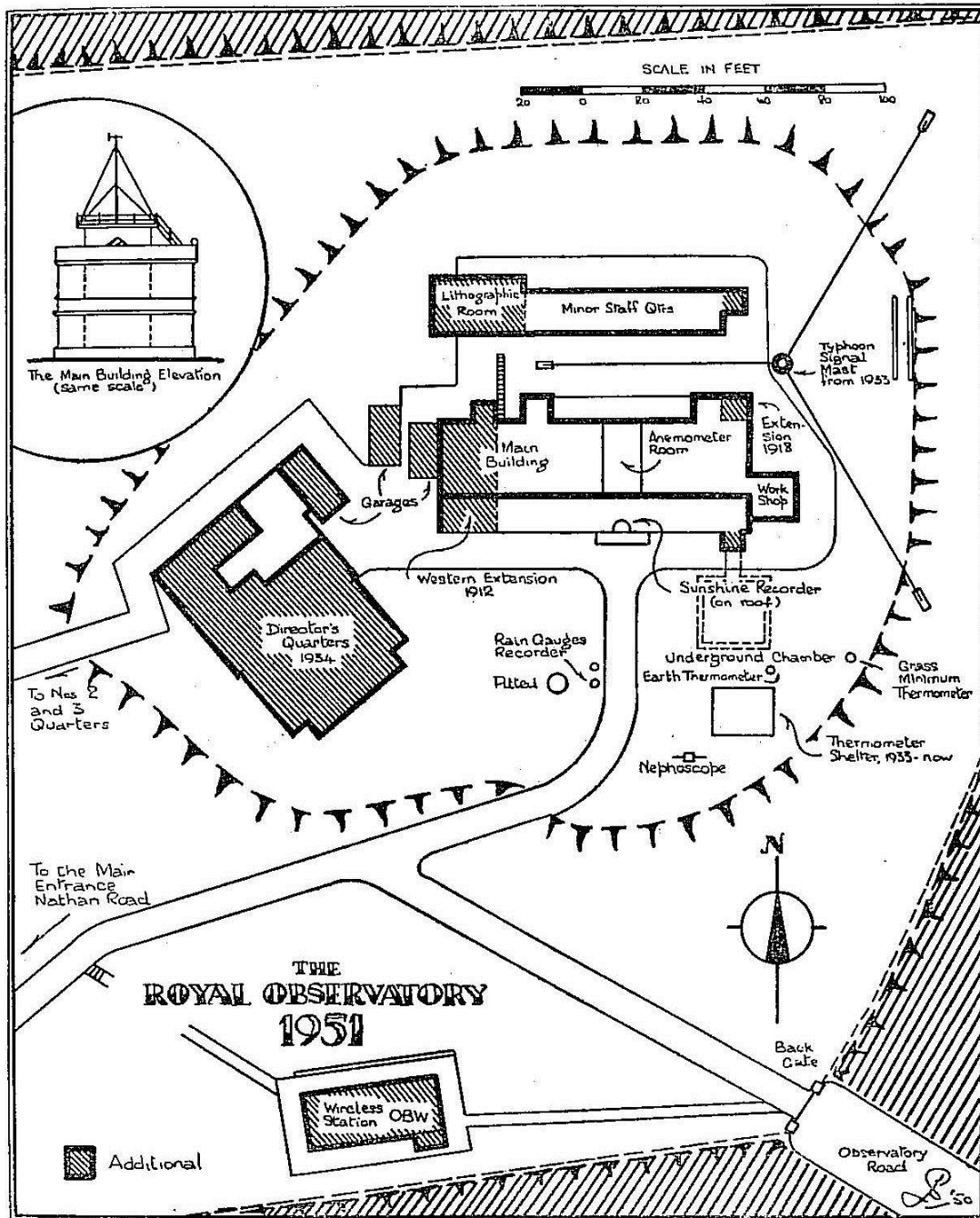


Figure 19. Sketch map of the Observatory in 1951 showing the location of the Typhoon Signal Mast from 1933 (extracted from A Brief General History of the Royal Observatory, May 1951).



Figure 20. Signal mast (blue arrow) at the Observatory Headquarters in the 1930s (courtesy of family of Mr. G.S.P. Heywood, Director of the Royal Observatory, 1946-1956).

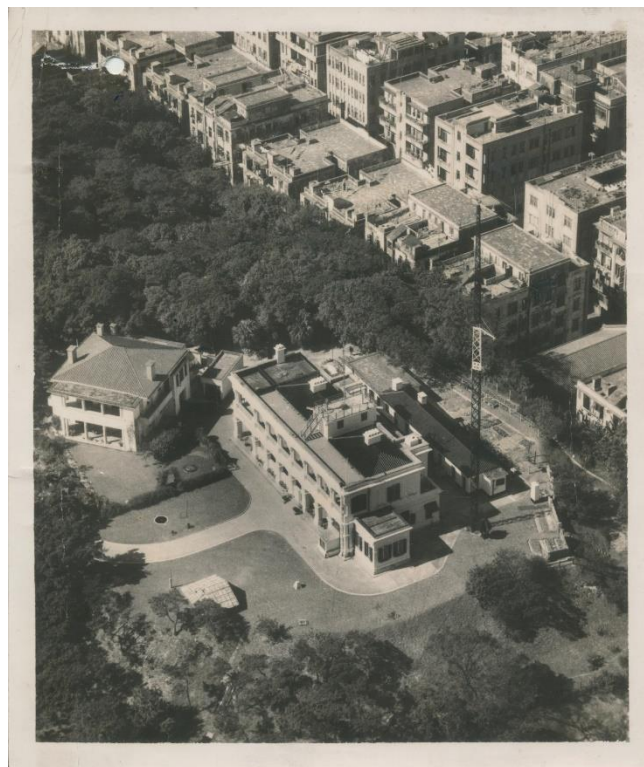






















Figure 21. Photograph of the Observatory in December 1951 showing the signal mast to the northeast of the Main (1883) Building.

## LOCAL STORM SIGNAL CODE.

RECOMMENDED FOR USE IN THE FAR EAST AT A CONFERENCE OF DIRECTORS OF FAR EASTERN WEATHER SERVICES, HELD AT HONG KONG IN THE YEAR 1930. ADOPTED AT HONG KONG FROM 1<sup>ST</sup> MARCH 1931.

DAY SIGNALS	NIGHT SIGNALS	MEANING
SIGNAL NO 1 	 WHITE WHITE WHITE	A DEPRESSION OR TYPHOON EXISTS WHICH MAY POSSIBLY AFFECT THE LOCALITY
SIGNAL NO 2 	 WHITE GREEN WHITE	STRONG WIND WITH SQUALLS MAY POSSIBLY OCCUR FROM THE S.W. (S-W)
SIGNAL NO 3 	 GREEN WHITE GREEN	STRONG WIND WITH SQUALLS MAY POSSIBLY OCCUR FROM THE S.E. (S-E)
SIGNAL NO 4 	 WHITE WHITE RED	TYPHOON DANGEROUS BUT DANGER TO LOCALITY NOT IMMINENT
SIGNAL NO 5 	 WHITE GREEN GREEN	GALE EXPECTED FROM THE N.W. (W-N)
SIGNAL NO 6 	 GREEN WHITE WHITE	GALE EXPECTED FROM THE S.W. (S-W)
SIGNAL NO 7 	 GREEN GREEN WHITE	GALE EXPECTED FROM THE N.E. (N-E)
SIGNAL NO 8 	 WHITE WHITE GREEN	GALE EXPECTED FROM THE S.E. (E-S)
SIGNAL NO 9 	 GREEN GREEN GREEN	GALE EXPECTED TO INCREASE.
SIGNAL NO 10 	 RED GREEN RED	WIND OF TYPHOON FORCE EXPECTED (ANY DIRECTION)

SIGNAL NO 4 WILL BE USED IN THE PHILIPPINES BUT NOT IN HONG KONG, THE INFORMATION IT CONVEYS BEING GIVEN BY THE NON LOCAL SIGNALS. SIGNALS 5 TO 8 ARE NOT HOISTED UNTIL IT IS TOLERABLY CERTAIN THAT A GALE (40-45 M.P.H. BY THE DINES ANEMOMETER) WILL OCCUR AT HONG HONG OR GAP ROCK, WHEN A TYPHOON IS SUFFICIENTLY NEAR TO WARRANT A DANGER SIGNAL, ALTHOUGH THE OCCURRENCE OF A GALE IS BY NO MEANS CERTAIN. IF, WITH ONE OF THE SIGNALS 5 TO 8 HOISTED, CONDITIONS INDICATE THAT THE WIND WILL NOT ONLY INCREASE BUT ATTAIN HURRICANE FORCE, SIGNAL NO 9 MAY BE DISPERSED WITH, THUS GIVING THE LONGEST POSSIBLE WARNING OF DESTRUCTIVE WINDS. SIGNAL NO 10, WILL BE ACCOMPANIED BY THREE EXPLOSIVE BOMBS, FIRED AT INTERVALS OF 10 SECONDS AT THE WATER POLICE STATION AND REPEATED AT THE HARBOUR OFFICE. WHEN THE CENTRE OF A TYPHOON PASSES OVER THE LOCALITY THE WIND DECREASES RAPIDLY TO A CALM, OR NEARLY CALM, AND BLOWS VIOLENTLY FROM THE OPPOSITE DIRECTION WHEN THE CENTRE HAS PASSED. THE SIGNAL WILL BE LOWERED WHEN IT IS CONSIDERED THAT ALL DANGER IS OVER. THE DAY SIGNALS WILL BE DISPLAYED ON THE RADIO MAST AT THE ROYAL OBSERVATORY, AT THE HARBOUR OFFICE, H.M.S. "TAMAR", GREEN ISLAND, HONG-KONG, K'OWLOON WHARF & GODOWN DR., THE STANDARD OIL CO. AT LAI-CHI-KOK, THE FLAGSTAFF NEAR THE FIELD OFFICERS QUARTERS, AT LYEMUN, GOUGH HILL POLICE STATION AT TAIPO (DISTRICT OFFICERS FLAGSTAFF)

Figure 22. The local storm signal code adopted in Hong Kong from 1931 to 1935 (courtesy of the Hong Kong Museum of History). The Observatory started including the Typhoon Signal No. 10 since 1931.

## V—STORM WARNING SERVICE.

12. *Revision of the Storm Warning Codes.* Following the recommendations of a conference on Storm Warning Procedures held in Manila in May, 1949, the local and non-local codes for visual storm warning signals were amended with effect from 1st January, 1950. The only major change in the local code was the introduction of the international warning signal for strong winds. The non-local code was completely revised. The opportunity was taken to publish a handbook under the title "Storm Warning Service" explaining the storm warning facilities available in Hong Kong, and incorporating the revised codes.

13. *Non-local Warnings.* Storm warning bulletins, giving the latitude and longitude of tropical cyclones, with their direction and speed of movement, were issued whenever a storm centre was located within the Hong Kong area of responsibility, which is bounded by latitudes  $10^{\circ}$  and  $30^{\circ}$  N, longitudes  $105^{\circ}$  and  $125^{\circ}$  E. These warnings were included in the shipping weather bulletins broadcast from Cape D'Aguilar (VPS), and in the Hong Kong Meteorological Broadcast (ZCU). They were also broadcast in English and Chinese by Radio Hong Kong (ZBW and ZEK), and were transmitted to other air terminals by point-to-point channels, and to Macau free of charge by Cable and Wireless Ltd. Visual signals giving the non-local warnings were displayed on Blackheads Hill.







14. *Local Warnings.* Storm warnings for Hong Kong and vicinity were given by means of the Local Storm Signal Code. These warnings were distributed by telephone and teleprinter from the Observatory. A list of the storm signal stations in the Colony is given in the "Local Storm Signal Code" published by the Observatory. Statements in non-technical language for Radio Hong Kong and the press were issued at frequent intervals whenever the Colony was definitely threatened by a typhoon.

Figure 23. Extract of the Hong Kong Annual Report by the Director, Royal Observatory for the fiscal year ending 31 March 1950 with information on the revision of the storm warning codes, non-local and local warnings.


**LOCAL STORM SIGNAL CODE.**

*(As approved at the Conference on Storm Warning Procedures held in Manila, May, 1949, for use in Hong Kong as from 1st January, 1950).*




**STORM SIGNALS.**

	NUMBER	DAY SIGNAL	NIGHT SIGNAL	MEANING
STANDBY	1	<b>T</b>	White White White	A depression or typhoon exists which may affect the locality.
GALE	5	+ 	White Green Green	Gale (wind speed 34 knots and upwards) expected from the NW quadrant.
	6	+ 	Green White White	Gale (wind speed 34 knots and upwards) expected from the SW quadrant.
	7	+ 	Green Green White	Gale (wind speed 34 knots and upwards) expected from the NE quadrant.
	8	+ 	White White Green	Gale (wind speed 34 knots and upwards) expected from the SE quadrant.
INCREASING GALE	9		Green Green Green	Gale expected to increase.
TYPHOON	10	+ 	Red Green Red	Hurricane or typhoon wind (speed 64 knots and upwards) any direction.

**STRONG WIND SIGNAL**

+ 	White Green White	Strong wind (speed 22-33 knots).
---------------------------------------------------------------------------------------	-------------------------	----------------------------------

**SIGNALS USED AT SUPPLEMENTARY STATIONS.**

+ 	Green Green	Strong wind (speed 22-33 knots).
Red 	Red Green	No. 1 hoisted in Hong Kong harbour.
Red 	Red Red	Nos. 5, 6, 7, 8, 9 or 10 hoisted in Hong Kong harbour.

+ International signals.

**EXPLANATORY NOTES.**

Signal No. 1 is a cautionary or "stand by" signal, and does not necessarily imply bad weather.

Signals Nos. 5 to 8 convey definite warning of expected gales from different directions. A "gale" is equivalent to a mean wind velocity of 34-40 knots, but gusts may reach 60 knots. These four signals are therefore of equal significance as regards wind velocity, but are for different wind directions.

Signal No. 9 will not necessarily be used if conditions warrant the hoisting of No. 10 as soon as it is evident that the gale will increase.

Signals will be lowered when danger is considered to be over.









The Black Ball (strong wind warning signal) is primarily intended to warn small craft of the onset of strong winds which are not expected to reach gale force. It may be hoisted to give warning of strong monsoon winds in winter, or of winds due to tropical depressions of small intensity.

G. S. P. HEYWOOD,  
*Director.*


*1st November, 1949.*

Figure 24. Details of the Local Storm Signal System adopted on 1 January 1950 as published in "Storm Warning Service" by the Observatory.




STORM SIGNALS.

	Number	Day Signal	Night Signal	Meaning
ADVISORY	1		White White White	A depression or typhoon exists (centred within 400 nautical miles of Hong Kong) which may affect the locality.
STRONG WIND	3		Green White Green	Strong wind (mean wind speed 22-33 knots) expected.
GALE	5	+ 	White Green Green	Gale (mean wind speed 34 knots and upwards) expected from the NW quadrant.
	6	+ 	Green White White	Gale (mean wind speed 34 knots and upwards) expected from the SW quadrant.
	7	+ 	Green Green White	Gale (mean wind speed 34 knots and upwards) expected from the NE quadrant.
	8	+ 	White White Green	Gale (mean wind speed 34 knots and upwards) expected from the SE quadrant.
INCREASING GALE	9		Green Green Green	Gale expected to increase.
TYPHOON	10		Red Green Red	Hurricane or typhoon wind (mean wind speed 64 knots and upwards) any direction.

STRONG MONSOON SIGNAL.

+ 	White Green White	Strong or gale monsoon wind (mean wind speed 22-35 knots) in Hong Kong area.
---------------------------------------------------------------------------------------	-------------------------	------------------------------------------------------------------------------

SIGNALS USED AT SUPPLEMENTARY STATIONS.

red 	Red Green	No. 1 hoisted in Hong Kong harbour.
red 	Red Red	Nos. 3, 5, 6, 7, 8, 9 or 10 hoisted in Hong Kong harbour.
+ 	Green Green	Strong or gale monsoon wind (mean speed 22-35 knots) in Hong Kong area.

+ International signals.

Figure 25. The Local Storm Signal Code in "Weather Service for Shipping 1956" published by the Observatory.

*Notes on the meanings of the signals and on the precautionary measures which should be taken on the hoisting of each.*

*No. 1 Signal* advises the existence of a tropical cyclone centred within 400 nautical miles of Hong Kong which may later give strong wind, gale, storm and or hurricane force winds in the Colony.

Staff required to take "typhoon precautions" should remain within call and a watch should be kept for further warnings and signals.

*No. 3 Signal* conveys a warning of the onset of strong winds (Force 6 or 7) and of gusts which may exceed gale force (Force 8 or more).

Generally, sailing craft, lighters, and ships without power, should be secured when No. 3 Signal is hoisted, and ships with power should move or be ready to move to typhoon buoys or to a typhoon anchorage, being guided by the existing circumstances.

*Signals No. 5 to 8* convey definite warnings of gale or storm force winds (Forces 8 to 11) from different directions, and of gusts which may reach hurricane force (Force 12). The signals are equally significant as to wind speed.

When one of these signals is hoisted typhoon precautions not already taken must be put in hand immediately and it should be borne in mind that, if later No. 10 signal is hoisted, a sudden and violent change in the direction of hurricane force winds must be anticipated. It would be extremely dangerous to wait for the display of Nos. 9 or 10 before taking full precautions, as these are signals of great urgency.

*No. 9 Signal* warns an expected increase in the force of the wind. It may not be used if the direction in which the storm is moving or its increased intensity warrants the hoisting of No. 10 signal.

*No. 10 Signal* gives warning of hurricane force winds (mean wind speed 64 knots or more) from any direction. It implies that the centre of the typhoon is expected to pass over or near to the Colony. When the centre passes over the Colony there will be a lull varying in duration from a few minutes to some hours, after which there will be a sudden resumption of hurricane force winds from a different direction.

### 3 (v) THE STRONG MONSOON SIGNAL

The international warning signal for strong winds, consisting of a black ball, is used to warn strong winter monsoon winds (usually from the north or east) and strong summer monsoon winds (usually from the southwest).

These winds sometimes reach gale force, and the black ball is displayed whenever monsoon winds are forecast, or known to exceed 22 knots in Hong Kong harbour or coastal waters.

This signal is displayed by all local storm signal stations and by day by police launches Nos. 1 and 2 (Empire tugs) when on patrol in the eastern approaches.

#### STRONG MONSOON SIGNAL


Day Signal	Night Signal	Meaning
	White Green White	Strong or gale monsoon wind (mean wind speed 22-35 knots) in Hong Kong area.

Figure 26 Extract from the Hong Kong Weather Services For Shipping, 5<sup>th</sup> Edition published in 1965 on the detailed meaning of the Local Storm Signal and the Strong Monsoon Signal.



# LOCAL STORM<sup>\*</sup>

## WARNING SIGNAL CARD

Keep this card in a safe place. You may need it urgently in an emergency

Signal number	Day Signals (these are black)	Night Signals by lamp	IF YOU HEAR THESE SIGNALS ANNOUNCED BY RADIO OR YOU SEE THEM SHOWN BY THE STATIONS NAMED OVERLEAF . . . . .	
			... YOU WILL KNOW THAT ...	... YOU SHOULD TAKE THESE PRECAUTIONS
1	T	○ ○ ○	A tropical cyclone is centred within 400 nautical miles of Hong Kong which later may cause strong wind, gale, storm, or hurricane force winds in the locality.	Watch for further signals and for warnings broadcast by radio. Staff required to take typhoon precautions should remain on call.
3	L	● ● ●	Winds up to 33 knots	
5	▲	○ ● ●	Gale or storm force winds (mean wind speed 34 knots and upwards) expected from the NW quadrant.	Bolt and shutter all windows and doors. Do not go out unless essential. Complete all precautions as soon as possible. It is extremely dangerous to delay precautions until the announcement of Nos. 9 and 10 as the latter are signals of great urgency
6	▼	● ○ ○	Gale or storm force winds (mean wind speed 34 knots and upwards) expected from the SW quadrant.	
7	▲	● ● ○	Gale or storm force winds (mean wind speed 34 knots and upwards) expected from the NE quadrant.	
8	▼	○ ○ ●	Gale or storm force winds (mean wind speed 34 knots and upwards) expected from the SE quadrant.	
9	⊕	● ● ●	An increase of wind force is expected.	Keep away from exposed windows. Stay where you are if reasonably protected. Even though indoors on an exposed coast or hillside bear in mind a possible line of retreat.
10	+	● ● ●	Winds—64 knots or more	
			Hurricane force winds (mean wind speed 64 knots and upwards) expected. Any direction.	BE PREPARED FOR A SUDDEN WIND CHANGE. When the centre of the typhoon passes over a locality there is a lull varying from a few minutes to some hours. This is followed by the sudden resumption of hurricane force winds from a totally different direction.

\*This word is used here as a generic term meaning Tropical Depression, Tropical Storm, Severe Tropical Storm, Typhoon. Do not confuse the above signals with the strong monsoon black ball (night signal:— white,

PLEASE READ CAREFULLY

### STORM\* AND STRONG MONSOON SIGNAL STATIONS

**HONG KONG ISLAND**  
*Urban Area and Harbour*

- Lye Yue Mun Fort
- Shau Kei Wan, Marine Licensing Office
- Port Signal Station, Ferry Pier, North Point
- H.M.S. Tamar
- Port Signal Station, Marine Department Headquarters, Connaught Road, C.
- Port Signal Station, Green Island

*South Side of Island*

- Aberdeen Police Station
- Stanley Village Police Station
- Stanley Fort (near measured mile marks)

**KOWLOON**  
*Urban Area and Harbour*

- Kwun Tong, Shell Oil Company Installation
- Kowloon Docks, big crane
- Blackhead Hill
- Kowloon Railway Station, Clock Tower
- Royal Observatory
- Kowloon Hospital, Argyle Street
- Kowloon Wharf and Godown Co. Signal Tower
- Yau Ma Tei Marine Licensing Office
- Stonecutter's Island, W/T mast

**NEW TERRITORIES**  
*Eastern Side*

- Rennie's Mill Village Police Station, Junk Bay
- Sha Tin Police Station
- Sai Kung Police Station
- Tai Po Kau, Marine Police Operations Base
- Tai Po District Office
- Tai Mei Tuk Police Post, Plover Cove
- Sha Tau Kok, Medical Department Clinic

*Western Side*

- Tsuen Wan, Caltex Oil Company Depot
- Sham Tseng, San Miguel Brewery
- Tai Lam Chung, Marine Police Operations Base
- Castle Peak Police Station
- Ping Shan Police Station
- Lau Fau Shan Police Station, Deep Bar
- Yuen Long, Divisional Police Headquarters
- Pat Heung Police Station
- Lok Ma Chau Police Station

*Outlying Islands*

- Waglan Island, Port Signal Station
- Cheung Chau Police Station
- Hei Ling Chau Police Post
- Mui Wo Police Station, Lantau Island
- Shek Pik Police Station, Lantau Island
- Tai O Police Station, Lantau Island
- Ha Mei Wan Police Post, Lantau Island

† Day signals only displayed  
‡ Night signals only displayed  
§ Station not yet established

## REMEMBER

You must decide for yourself what precautions you should take depending on the siting of your house, exposure of your anchorage, etc. Sometimes a sudden change in conditions may make all the precautions unnecessary; but there is one chance in three that signal Nos. 5-8 and gales will follow signal No. 3, while there are two chances in five that Nos. 9 or 10 and typhoon force wind will follow Nos. 5-8.

**A Tropical Depression has winds up to 33 knots.**

**A Tropical Storm has 34-47 knots.**

**A Severe Tropical Storm has 48-63 knots.**

**A Typhoon has 64 knots or more**  
(Roughly speaking, one knot equals 1½ m.p.h.)

Figure 27. Local Storm Signal System around the 1960s.

# HONG KONG'S TROPICAL CYCLONE WARNING SIGNALS

SIGNAL		DISPLAY		MEANING of the signal	What will happen and what you should do
		Symbol	Lights		
STAND BY	<b>1</b>	<b>T</b>	○ ○ ○	A TROPICAL CYCLONE IS CENTRED WITHIN ABOUT 400 NAUTICAL MILES OF HONG KONG. The Colony is placed in a state of alert because the tropical cyclone is a potential threat and may cause destructive winds later.	Listen to broadcasts for the latest developments in the weather situation and advice concerning precautions.
STRONG WIND	<b>3</b>	<b>⊥</b>	● ○ ●	STRONG WIND EXPECTED, WITH A SUSTAINED SPEED OF 22-33 KNOTS AND GUSTS WHICH MAY EXCEED 60 KNOTS. The timing of the hoisting of this signal is aimed to give about 12 hours warning of a strong wind in Victoria Harbour.	Secure hoardings, scaffolding, temporary structures and all loose objects, particularly on balconies and roof tops. Clear gutters and drains. Take full precautions for the safety of boats. Ships in port normally leave for typhoon anchorages or buoys. When the wind becomes strong it may affect some ferry services, particularly if the piers are exposed to the wind.
<b>NW</b> LY GALE OR STORM	<b>8NW</b>	<b>▲</b>	○ ● ●	GALE OR STORM EXPECTED, WITH A SUSTAINED WIND SPEED OF 34-63 KNOTS FROM THE QUARTER INDICATED AND GUSTS WHICH MAY EXCEED 100 KNOTS. The timing of the replacement of the Strong Wind Signal, No 3, by the appropriate one of these four signals is aimed to give about 12 hours warning of a gale in Victoria Harbour. Expected changes in the direction of the wind will be indicated by corresponding changes of these signals.	Full precautions must be completed as soon as possible. It is extremely dangerous to delay precautions until the hoisting of No.9 or No.10 signal as the latter are signals of great urgency. Windows and doors should be bolted and shuttered. As the winds increase, stay indoors to avoid flying debris but if you must go out keep well clear of overhead wires and hoardings. All schools and law courts close and ferries will probably stop running at short notice.
<b>SW</b> LY GALE OR STORM	<b>8SW</b>	<b>▼</b>	● ○ ○		
<b>NE</b> LY GALE OR STORM	<b>8NE</b>	<b>▲</b>	● ● ○		
<b>SE</b> LY GALE OR STORM	<b>8SE</b>	<b>▼</b>	○ ○ ●		
INCREASING GALE OR STORM	<b>9</b>	<b>⊗</b>	● ● ●	GALE OR STORM EXPECTED TO INCREASE SIGNIFICANTLY IN STRENGTH. This signal will be hoisted when the sustained wind speed is expected to increase and come within the range 48-63 knots during the next few hours.	These signals imply that the centre of a severe tropical storm or a typhoon will come close to the Colony. If the eye passes over there will be a lull lasting from a few minutes to some hours but be prepared for a sudden resumption of destructive winds from a different direction. The tide will probably be higher than normal particularly in narrow inlets. If this happens near the time of normal high tide then low-lying areas may have to be evacuated very quickly. Heavy rain may cause flooding, dangerous rockfalls and mudslides.
HURRICANE	<b>10</b>	<b>+</b>	● ● ●	HURRICANE FORCE WIND EXPECTED, WITH SUSTAINED SPEED REACHING UPWARDS FROM 64 KNOTS AND WITH GUSTS THAT MAY EXCEED 120 KNOTS. This signal is hoisted as soon as there are definite indications that the sustained wind speed anywhere near sea level in Hong Kong is likely to exceed 63 knots.	

Do not confuse the above tropical cyclone signals with the Strong Monsoon Signal. The Strong Monsoon Signal is a black ball and the lights are white, green, white. It is used whenever the winter monsoon (usually from the north or east) or more rarely the summer monsoon (usually from the southwest) is expected to exceed 21 knots near sea level anywhere in Hong Kong. These winds may sometimes reach 35 knots or even 40 knots in very exposed places.

Tropical Cyclone Warning Signals are displayed at various signal stations to give general indications of the winds expected anywhere near sea level in Hong Kong. LISTEN TO RADIO BULLETINS for all available information on the progress of the tropical cyclone and details of weather conditions. When any of the signals numbers 8 to 10 is displayed, these bulletins are broadcast at two minutes to and half past every hour. If you do not have a radio, the Information Centre at the Headquarters of the Secretariat for Home Affairs (Telephone: 5 45331) can give you the latest report. PLEASE do not telephone the Royal Observatory.

DO YOU KNOW THESE TERMS USED IN BROADCAST WARNING BULLETINS? Tropical cyclones are classified into these four categories according to the maximum sustained winds within their circulations -

A TROPICAL DEPRESSION 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 has maximum sustained winds in the range 34-47 knots. A SEVERE TROPICAL STORM has maximum sustained winds in the range 48-63 knots.

A TYPHOON has maximum sustained winds of 64 knots or more. The EYE at the centre of a developed tropical cyclone is a relatively calm and lightly clouded area that may be from 5 to over 50 nautical miles in diameter. The strongest winds in a tropical cyclone blow in a tight band round the outside edge of the eye in an anticlockwise direction.

One NAUTICAL MILE is 1852 metres. In weather bulletins, all distances are stated in nautical miles, but the adjective 'nautical' is sometimes omitted for the sake of brevity.

One KNOT is one nautical mile per hour and is a little over half a metre per second. Wind speed and the speed of movement of a tropical cyclone are measured in knots.

The direction from which the wind is blowing, the direction towards which a tropical cyclone is moving and the bearing of its centre from Hong Kong are each given to the nearest point of a 16-point compass bearing. Thus the actual bearing will be within 11 1/2° of the reported value. For example, a typhoon moving on any heading between 255° and 281° is said to be "moving west"; although due west is 270° from true north.

EFFECTIVE 1ST JANUARY 1973.

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Figure 28. The revised Hong Kong Tropical Cyclone Warning Signal System in 1973.

Hong Kong's tropical cyclone warning signals

香港熱帶氣旋警告信號

<p><b>1</b></p> <p>Stand by 戒備</p> <p>A tropical cyclone is centred within about 400 nautical miles of Hong Kong and may later affect Hong Kong. Hong Kong is placed in a state of alert because the tropical cyclone is a potential threat and may cause disruptive winds later.</p> <p>熱帶氣旋位於香港約400海里之內，可能影響香港。香港被置於戒備狀態，因為熱帶氣旋是一個潛在的威脅，可能會在稍後造成擾亂性風力。</p>		<p><b>3</b></p> <p>Strong wind 強風</p> <p>Strong wind expected or blowing, with a sustained speed of 23-33 knots and gusts which may exceed 40 knots.</p> <p>The height of the hoisting of this signal is raised to one about 12 hours before the start of strong wind in Victoria Harbour but the warning period may be shorter (see corresponding signal).</p> <p>預計有強風或強風吹起，持續風速為23-33節，陣風可能超過40節。</p> <p>此信號的懸掛高度在維多利亞港開始吹強風前約12小時提高，但警告期可能較短（參閱相應信號）。</p>	
<p><b>8</b></p> <p>Northwesterly Gale or storm 西北烈風或暴風</p> <p>Gale or storm expected or blowing, with a sustained wind speed of 34-43 knots from the quarter indicated and gusts which may exceed 50 knots.</p> <p>The hoisting of the appropriate one of these four signals is raised to one about 12 hours in advance warning of a gale in Victoria Harbour but the sustained wind speed may reach 54 knots within a shorter period over more exposed sections.</p> <p>Expected changes in the direction of the wind will be indicated by corresponding changes of these signals.</p>		<p><b>8</b></p> <p>Northeasterly Gale or storm 東北烈風或暴風</p> <p>Gale or storm expected or blowing, with a sustained wind speed of 34-43 knots from the quarter indicated and gusts which may exceed 50 knots.</p> <p>The hoisting of the appropriate one of these four signals is raised to one about 12 hours in advance warning of a gale in Victoria Harbour but the sustained wind speed may reach 54 knots within a shorter period over more exposed sections.</p> <p>Expected changes in the direction of the wind will be indicated by corresponding changes of these signals.</p>	
<p><b>8</b></p> <p>Southwesterly Gale or storm 西南烈風或暴風</p> <p>Gale or storm expected or blowing, with a sustained wind speed of 34-43 knots from the quarter indicated and gusts which may exceed 50 knots.</p> <p>The hoisting of the appropriate one of these four signals is raised to one about 12 hours in advance warning of a gale in Victoria Harbour but the sustained wind speed may reach 54 knots within a shorter period over more exposed sections.</p> <p>Expected changes in the direction of the wind will be indicated by corresponding changes of these signals.</p>		<p><b>8</b></p> <p>Southeasterly Gale or storm 東南烈風或暴風</p> <p>Gale or storm expected or blowing, with a sustained wind speed of 34-43 knots from the quarter indicated and gusts which may exceed 50 knots.</p> <p>The hoisting of the appropriate one of these four signals is raised to one about 12 hours in advance warning of a gale in Victoria Harbour but the sustained wind speed may reach 54 knots within a shorter period over more exposed sections.</p> <p>Expected changes in the direction of the wind will be indicated by corresponding changes of these signals.</p>	
<p><b>9</b></p> <p>Increasing Gale or storm 烈風或暴風 風力增強</p> <p>Gale or storm expected to increase significantly in strength. The signal will be hoisted when the sustained wind speed is expected to increase and come within the range of 44 knots or higher the next few hours.</p> <p>烈風或暴風預計將顯著增強。當預計持續風速將增加並進入44節或更高的範圍時，將懸掛此信號。</p>		<p><b>10</b></p> <p>Hurricane 颶風</p> <p>Hurricane force wind expected or blowing, with sustained speed reaching upwards from 64 knots and gusts that may exceed 100 knots.</p> <p>This signal is hoisted as soon as there are definite indications from the sustained wind speed area where some sea level in Hong Kong is likely to exceed 9.8 metres.</p> <p>預計有颶風級風力吹起，持續風速將達到或超過64節，陣風可能超過100節。</p> <p>當從持續風速區域有明確指示顯示香港某些海平面可能超過9.8米時，將懸掛此信號。</p>	<p>Call 5-456381 if you do not have a radio. The Information Centre at the Headquarters of the Secretariat for Home Affairs will give you the latest report.</p> <p>Listen to radio bulletins for information on warning signals and the progress of tropical cyclones.</p> <p>AVOID calling the Royal Observatory. A person can be charged with criminal offence if he/she is found to be obstructing the work of the Observatory.</p> <p>如無收音機，請電5-456381。民政事務專員辦事處總部之資訊中心將為你提供最新報告。</p> <p>聽取無線電廣播，以獲取有關警告信號及熱帶氣旋進展的資料。</p> <p>避免致電皇家天文台。如發現有人妨礙天文台的工作，該人可被控以刑事罪行。</p>

Figure 29. Extract of the Observatory Calendar for 1979 showing the Local Tropical Cyclone Signal System and photos of the signals.



Figure 30. Hoisting of the Standby Signal No. 1 at the Observatory Headquarters in the 1930s, under the supervision of Mr. G.S.P. Heywood (second right) who became the first Director after the Second World War (courtesy of family of Mr. G.S.P. Heywood).



Figure 31. Hoisting of the Standby Signal No. 1 at the Observatory Headquarters around the 1960s to 1970s (courtesy of the Information Services Department).



Figure 32. Typhoon signal mast (the middle one in black) at Cheung Chau Aeronautical Meteorological Station in April 1986.



Figure 33. A close-up of the typhoon signal mast at Cheung Chau Aeronautical Meteorological Station.

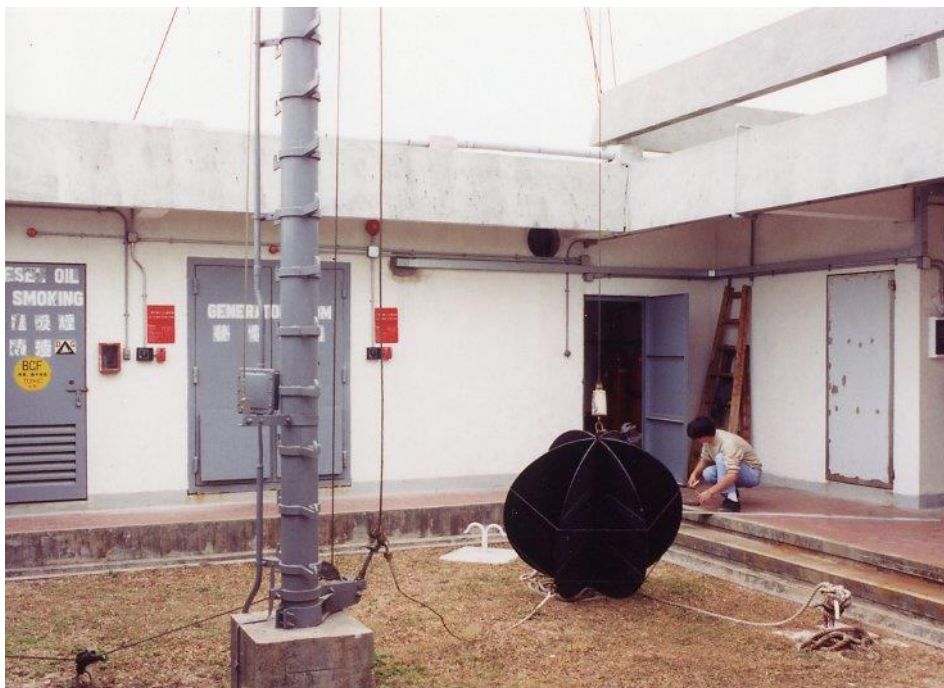
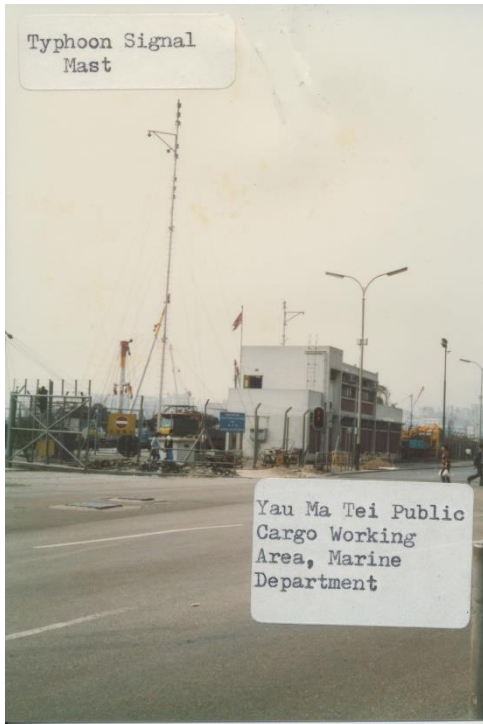


Figure 34. A view of the Strong Monsoon Signal at Cheung Chau Aeronautical Meteorological Station.



Figure 35. Typhoon signal mast at Waglan Island, an island over the southeastern part of Hong Kong, in 1971 (courtesy of Mr. Shun Chi-ming).



(a)



(b)



(c)



(d)

Figure 36. Typhoon signal masts at other locations at Hong Kong: (a) Yau Ma Tei Public Cargo Working Area of Marine Department; (b) Lau Fau Shan; (c) Sai Kung; and (d) Sha Tau Kok.



(a)



(b)



(c)



(d)

Figure 37. A testing of the hoisting of Standby Signal No. 1 ((a) and (b)) and Strong Monsoon Signal ((c) and (d)) at Aberdeen Marine Office.





Figure 38. Locations of storm signal stations in Hong Kong in the 1960s when the number of stations reached its peak at 42.



Figure 39. The closing-down ceremony of the last tropical cyclone warning signal station in Hong Kong at Cheung Chau Meteorological Station in January 2002.



(a)

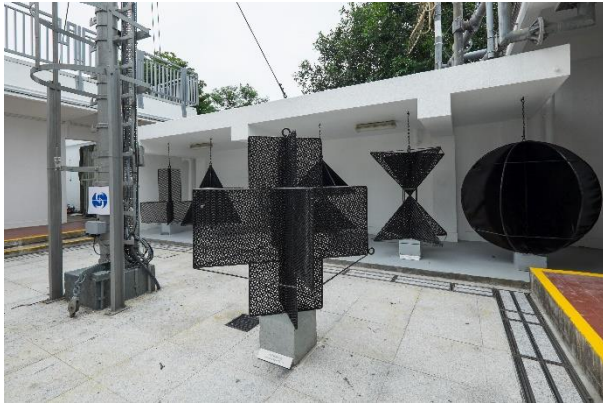


(b)



(c)

Figure 40. Current display of the tropical cyclone warning signals as historical exhibits at the Hong Kong Observatory Headquarters: (a) Strong Wind Signal No. 3 (left) and Strong Monsoon Signal (right); (b) Increasing Gale or Storm Signal No. 9 (left), Gale or Storm Signal No. 8 Northeast (middle) and Gale or Storm Signal No. 8 Northwest (right); and (c) Hurricane Signal No. 10. Each signal measures 1.2 m x 1.2 m x 1.5 m in dimension with a weight of about 25 kg.



(a)



(b)



(c)

Figure 41. Display of tropical cyclone warning signals and Strong Monsoon Signal in (a) and (b), and the night signal switch box in (c) as historical items at Cheung Chau Meteorological Station.



Figure 42. The current Hong Kong Local Tropical Cyclone Warning Signal System (left) and winds associated with the signals (right).

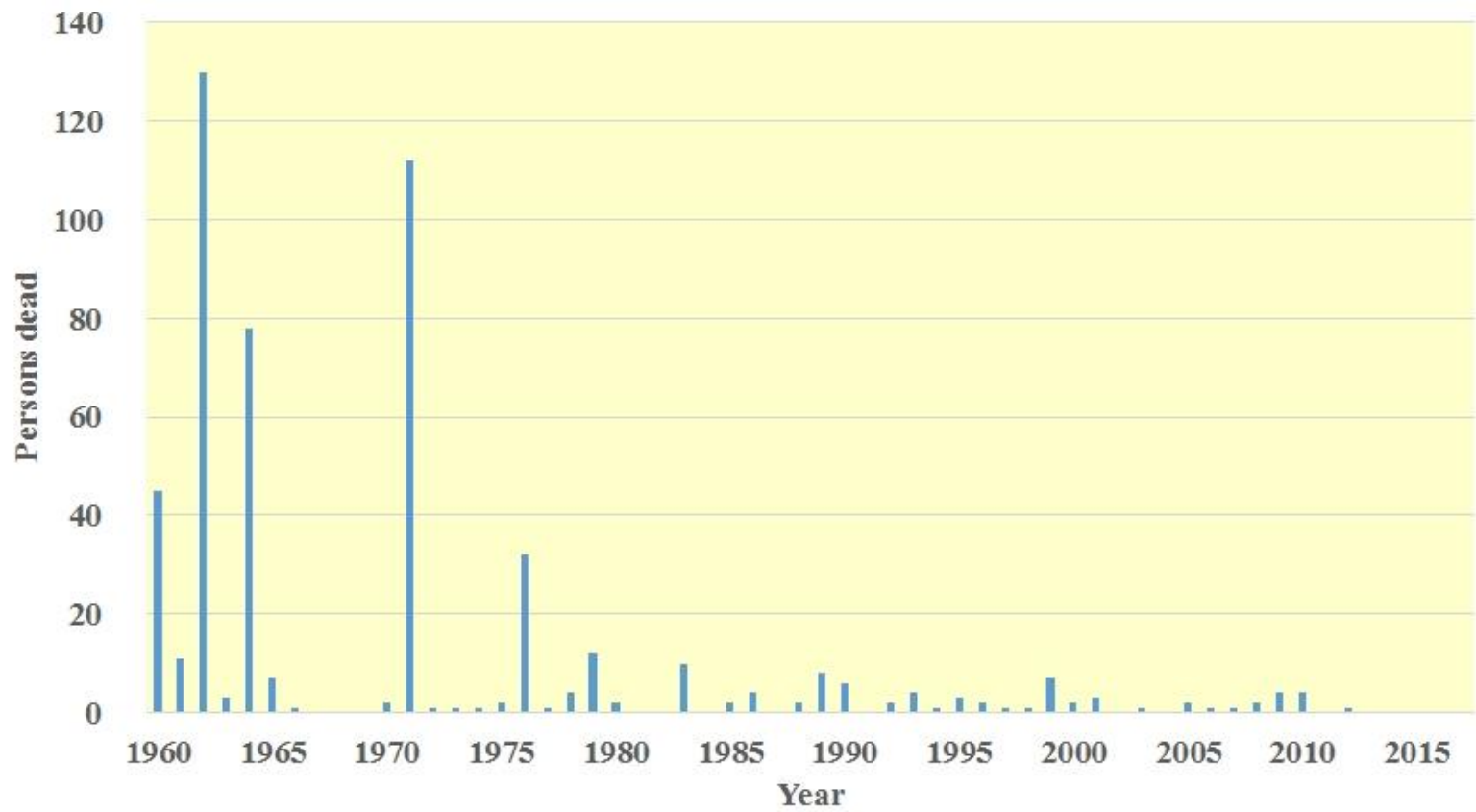


Figure 43. Number of deaths in Hong Kong caused by the passage of tropical cyclones for the years 1960-2017.

**Table A Summary of changes of non-local signals in Hong Kong from 1884 to 1961**

The non-local storm signals provided the mariners and masters of vessels leaving the port with the position of the tropical cyclone and its direction and speed of movement.

16 August 1884 - 1890		1891 - 1903		1904 - 30 June 1917			1 Jan 1906 – 30 June 1917		1 Jul 1917 – 31 May 1920		1 Jun 1920 – 30 Jun 1961		
Symbol	Location of tropical cyclone relative to Hong Kong	Symbol	Location of tropical cyclone relative to Hong Kong	Signal No.	Symbol (centre more than 300 miles away from HK)	Symbol (centre less than 300 miles away from HK)	Location of tropical cyclone relative to HK	China Coast Code		New Non-local code		China Seas Storm Signal Code	
								Code Number	Symbols of the code	Code Number	Symbols of the code	Code Number	Symbols of the Code
	Somewhere to the East of Hong Kong		To the East of Hong Kong, more than 300 miles	1			East	1		1		1	
	In a latitude more southern than Hong Kong, or moving towards South		To the South of Hong Kong, more than 300 miles	2			South	2		2		2	
	Somewhere to the West of Hong Kong		To the West of Hong Kong, more than 300 miles	3			West	3		3		3	
	In a latitude more northern than Hong Kong, or moving towards North		To the North of Hong Kong, more than 300 miles	4			North	4		4		4	
			To the East of Hong Kong, less than 300 miles	5			Southeast	5		5		5	
			To the South of Hong Kong, less than 300 miles	6			Northeast	6		6		6	
			To the West of Hong Kong, less than 300 miles	7			Southwest			7		7	
			To the North of Hong Kong, less than 300 miles	8			Northwest			8		8	
										9		9	
										0		0	
The signals provided information on the position of the tropical cyclones relative to Hong Kong. Warnings of winds locally were provided via the typhoon gun.		The signals were duplicated and a set of black signals were added to indicate that the distance of the tropical cyclone was less than 300 miles from Hong Kong.		Addition of four more signals so that the wind direction were provided in eight directions instead of four previously.			Signals according to the China Coast Code was also hoisted since 1 January 1906.		Displayed at the yard-arms of storm signal mast while local signals displayed at mast head.		Necessitated a mast head symbol in addition to those displayed in the yard-arms.		

Table B Summary of principal locations for hoisting of non-local storm signals in Hong Kong (1884 to 1961)

Period	Signal	Principal location	Examples of other locations
16 Aug 1884 – Jan 1898	Non-local	Tsim Sha Tsui Police Barracks	--
Jan 1898 – Aug 1904	Non-local	Tsim Sha Tsui Police Barracks	Godown Company in Kowloon, and also by day only, at Harbour Office and on H.M.'s Receiving Ships
Aug 1904 – 7 Sep 1911	Non-local	Tsim Sha Tsui Police Barracks	Green Island, Harbour Office, H.M.S. Tamar, Hong Kong and Kowloon Godown Company in Kowloon, Harbour Master
8 Sep 1911 – 30 Jun 1917	Non-local	Mast head of storm signal mast at Signal Hill	Green Island, Harbour Office, H.M.S. Tamar, Hong Kong and Kowloon Godown Company in Kowloon
1 Jan 1906 – 30 Jun 1917	China Coast Code	Yard-arms of storm signal mast at Signal Hill	--
1 Jul 1917 – 31 May 1920	New Non-local code	Yard-arms of storm signal mast at Signal Hill	--
1 Jun 1920 – 30 Jun 1961	China Seas Storm Signal Code	Mast head and yard-arms of storm signal mast at Signal Hill until the end of June 1961 when it was considered that they were no longer necessary.	The symbols of the China Seas Storm Signal Code were also displayed on the roof of No. 49 Godown of the Hong Kong and Kowloon Wharf and Godown Company for some years since 1927

Table C Local storm signals without numbering system in Hong Kong from 1884 to mid-1917

The local storm signals generally provides information on the forecast wind direction and speed in Hong Kong due to tropical cyclones. Starting from 1884, local communities were warned of gale / hurricane force winds by means of typhoon gun or explosive bombs, which lasted until 1937. The first numbered tropical cyclone signals for the local warning system was implemented in 1917, which forms the basis of the current local tropical cyclone warning system.




































16 August 1884 – 1890		1891 - 1906				1907 - 30 June 1917			
Method / symbol	Wind speed / direction	Symbol	Wind speed / direction	Night signal	Meaning	Symbol	Wind speed / direction	Night signal	Meaning
One round of typhoon gun fired	Strong gale of winds are expected	One round of typhoon gun fired	Strong gale of winds are expected	Two lanterns hoisted vertically	Bad weather in Hong Kong and winds are expected to veer	Three Explosive Bombs at intervals of 10 seconds	Winds are expected to increase to full typhoon (hurricane) force at any moment. A Black Cross was hoisted at the same time, superior to the other shapes.	I 	Typhoon more than 300 miles from HK
Two rounds of typhoon gun fired	Typhoon (hurricane) force winds are expected	Two rounds of typhoon gun fired	Typhoon (hurricane) force winds are expected	Two lanterns hoisted horizontally	Bad weather in Hong Kong and winds are expected to back			II 	Typhoon less than 300 miles from HK
Typhoon gun fired again	Winds are likely to shift round suddenly	Three rounds of typhoon gun fired	Winds are expected to shift suddenly during a typhoon					III 	Winds are expected to increase to full typhoon (hurricane) force at any moment. Accompanied by Explosive Bombs, in the event of the warning information was first conveyed at night.
		Night signals introduced in late 1890. In 1897, the storm signals invented by Admiral FitzRroy in 1861 were introduced in Hong Kong with a minor modification, and the typhoon gun was fired when the drum was hoisted. In 1898, it was reverted to the system which had been in use in Hong Kong from 1884 to 1896.				Abolition of the typhoon gun and the substitution of three explosive bombs in 1907. Night signals were also re-organised in 1907.			



Table D Local storm signals with numbering system in Hong Kong from mid-1917 to 1955

1 July 1917 - 1926				1927 - 1930			1931 - 1934				1935 - 1955			
Signal	Symbol	Night Signal	Wind speed and direction	Signal	Symbol	Night Signal	Signal	Symbol	Night signal	Wind speed and direction	Signal	Symbol	Night signal	Wind speed and direction
1			A typhoon may cause gales in HK within 24 hours	1			1			A depression or typhoon exists which may affect Hong Kong	1			A depression or typhoon exists which may affect Hong Kong
2			Gales expected from the North (NW to NE)	2			2			Strong winds with squalls may possibly occur from SW (S-W)	2*			Strong winds with squalls may possibly occur from SW
3			Gales expected from the South (SE to SW)	3			3			Strong winds with squalls may possibly occur from SE (E-S)	3*			Strong winds with squalls may possibly occur from SE
4			Gales expected from the East (NE to SE)	4			4*			Typhoon dangerous, but danger to locality not imminent	4*			Typhoon dangerous, but danger to locality not imminent
5			Gales expected from the West (NW to SW)	5			5			Gales are expected from NW (W-N)	5			Gales are expected from NW (W-N)
6			Gales are expected to increase	6			6			Gales are expected from SW (S-W)	6			Gales are expected from SW (S-W)
7			Winds of typhoon (hurricane) force expected (any direction)	7			7			Gales are expected from NE (N-E)	7			Gales are expected from NE (N-E)
							8			Gales are expected from SE (E-S)	8			Gales are expected from SE (E-S)
							9			Gales are expected to increase	9			Gales are expected to increase
							10			Winds of typhoon (hurricane) force are expected (any direction)	10			Winds of typhoon (hurricane) force are expected (any direction)
<p>New local signal code based on a numbered system was introduced on 1 July 1917. The new signal code showed the direction from which the gale would be expected. Explosive bombs continued to be used.</p>				<p>Meaning of signals remained the same but the symbol for the No. 1 Signal  was replaced by .</p>			<p>New local signal code adopted in Hong Kong since 1 March 1931.</p> <p>*Signal No. 4 was used in the Philippines, but not at Hong Kong, the information it conveys being given by Non-local signals.</p>				<p>New local signal code as agreed between the Hong Kong Observatory and the Central Weather Bureau of Manila, Philippines since 1 January 1935.</p> <p>*Signals No. 2 to 4 were not used in Hong Kong and Signal No. 9 was not used in Manila. "Local Strong Wind Signal" in the form of a "black ball" was introduced between 1950 and early 1956 to warn small craft of the onset of strong winds that were not expected to reach gale force. It covered warning of strong monsoon winds in winter, and strong winds due to less intense tropical disturbances in summer and autumn.</p>			

Table E Local storm signals with numbering system in Hong Kong from 1956 to present

1956 - 1972				1973 - present			
Signal	Symbol	Night signal	Wind speed and direction	Signal	Symbol	Night signal	Wind speed and direction
1			A depression or typhoon exists (centred within 400 nautical miles of Hong Kong) which may affect the locality	1			A tropical cyclone is centred within about 400 nautical miles (800 km*) of Hong Kong and may affect the territory
3			Strong winds (mean wind speed 22-33 knots) are expected	3			Strong winds are expected, with a sustained speed of 22-33 knots (41-62 km/h*) and gusts which may exceed 60 knots (110 km/h*)
5			Gale force winds (mean wind speed 34 knots and upwards) are expected from the NW quadrant	8NW			Gale or storm force winds are expected, with a sustained wind speed of 34-63 knots (63-117 km/h*) from the quarter indicated and gusts which may exceed 100 knots (180 km/h*)
6			Gale force winds (mean wind speed 34 knots and upwards) are expected from the SW quadrant	8SW			
7			Gale force winds (mean wind speed 34 knots and upwards) are expected from the NE quadrant	8NE			
8			Gale force winds (mean wind speed 34 knots and upwards) are expected from the SE quadrant	8SE			
9			Gale force winds are expected to increase	9			Gale or storm force winds are expected to increase significantly in strength
10			Hurricane or typhoon winds (mean wind speed 64 knots and upward) any direction	10			Hurricane force winds are expected, with sustained speed reaching upwards from 64 knots (118km/h*) and gusts that may exceed 120 knots (220 km/h*)
Modified local signal code adopted since 15 April 1956. A new signal, No. 3 was introduced for warning strong winds associated with tropical cyclones, while the black ball was designated for high winds due to summer and winter monsoons.				Starting from 1 January 1973, signals No. 5 to 8 were replaced by 8 NW, 8 SW, 8 NE and 8 SE respectively so as to avoid misunderstanding by the public. This system has been in use since then. *since 1986			

**STRONG MONSOON SIGNAL (since 1956)**



Signal	Day signal	Night signal	Wind speed
Strong Monsoon Signal			Strong or gale monsoon wind with mean wind speed reaching 22 knots (41 km/h*) or more in Hong Kong area.  *since 1986

Table F Summary of principal locations for hoisting of local storm signals in Hong Kong (1884 to 2001)

Period	Signal	Principal location	Examples of other locations
16 Aug 1884 - 1906	Typhoon gun	Tsim Sha Tsui Police Barracks	--
1907 - 1941	Explosive bombs	Tsim Sha Tsui Water Police Station (A Black Cross was also hoisted at the same time, superior to the other shapes (1907-1917))	Harbour Office
Late 1890 – Apr 1916	Local night signal	Tsim Sha Tsui Police Barracks / Water Police Station	Godown Company in Kowloon (since 1898). Harbour Office, H.M.S. Tamar (since 1907)
May 1916 – 2 Oct 1919	Local night signal	Kowloon Railway Station, the Harbour Office and H.M.S. Tamar	--
1 Jul 1917 – 31 May 1920	Local day signal	Masthead of storm signal mast at Signal Hill	Harbour Office, H.M.S. Tamar, Green Island, Godown Company in Kowloon
3 Oct 1919 – 31 May 1920	Local night signal	Hong Kong Observatory Headquarters	Kowloon Railway Station, H.M.S. Tamar, Harbour Office
1 Jun 1920 – 30 Jun 1978	Local day and night signals	Hong Kong Observatory Headquarters. Starting from 1 July 1978, tropical cyclone and strong monsoon signals was no longer hoisted on the Observatory signal mast, as it was scheduled to be dismantled to make way for the new Centenary Building.	Harbour Office, H.M.S. Tamar, Green Island, Godown Company in Kowloon, Cheung Chau Meteorological Station (1971-2001), Green Island Signal Station, Marine Department Port Communication Centre in Hong Kong Island, Sha Tau Kok Police Station, Yau Ma Tei Public
1 Jul 1978 – 31 December 2001	Local day and night signals	Storm signals were displayed in various parts of Hong Kong until 31 December 2001 when the last signal station at Cheung Chau was decommissioned on 1 January 2002.	Cargo Working Area

China Coast Code from 1 January 1906 to 30 June 1917

The signals were hoisted at the yard arms of the storm signal mast at Signal Hill, Kowloon and have the following characteristics:

- (a) Typhoon and Continental Depression signals – 3 symbols at one yard-arm showing the position of the storm centre: 2 symbols at the other yard-arm showing its direction of motion.
- (b) Gale signals – 2 symbols at one yard-arm showing the general direction of wind; 1 symbol at the other yard-arm showing the region threatened.

The following extracts from the Hong Kong Government Gazette (Hong Kong Government, 1905) explain the meaning of the China Coast Code:




The Code is as follows :—

Symbols of the Code						
Corresponding Number	1	2	3	4	5	6

**Position of the Centre (3 Symbols.)**

Series 1 =		Series 2 =		Series 3 =	
S.E. District.		S.W. District.		S. Central District.	
No.	Meaning.	No.	Meaning.	No.	Meaning.
111	Caroline Is. Pelew (Yap).	211	Off the coast of Cochinchina.	311	E. of Loochoo Is. (Luchu).
112	Mariana Is. (Guan).	212	S.W. of Paracels.	312	Central Loochoo Is. (Luchu).
113	Between Mariana & Bonin Is.	213	Off Touron. B. (Annam).	313	S.E. of Loochoo Is. (Luchu).
114	Far to the E. of Philippine Is.	214	Between Paracels & Hainan.	314	S. of Loochoo Is. (Luchu).
115	S.E. of Luzon.	215	Between Hainan & Annam.	315	S.E. of Meiacoo Sima group.
116	S. „ „	216	E. of Hainan Is.	316	S. of Meiacoo Sima group.
122	Sulu Sea.	222	Tongking Gulf.	322	N. of Meiacoo Sima group.
123	S.W. of Luzon.	223	Off the Delta of the Sungka.	323	W. of Loochoo Is. (Luchu).
124	E. „ „	224	Hainan Strait.	324	S.E. of Formosa.
125	Central „	225	S.E. of Hongkong beyond 200 miles.]	325	Ballintang Channel.
126	W. of „	226	S.E. „ „ within 200 miles.]	326	Bashee Channel.
133	N.E. „ „	233	S. of Hongkong.	333	S.W. of Formosa.
134	N.W. „ „	234	S.W. of „	334	E. of Formosa.
135	W. „ Palawan Is.	235	S. of Formosa Channel.	335	Central Formosa.
136	S.E. „ Macclesfield Bk.	236	Coast near Macao.	336	N.E. of Formosa.
144	S. „ „	244	Coast „ Hainan.	344	N. of Formosa.
145	S. „ Paracels.	245	N.W. of Hongkong.	345	Centre of Formosa Channel.]
146	E. „ „	246	Off Swatow.	346	N. of Formosa Channel.
155	Central „	255	Off Amoy.	355	Off Turnabout.
156	N.E. of „	256	Coast S. of 25th parallel.	356	Foochow.













Appendix 1 (cont'd)

Series 4 = 		Series 5 = 		Series 6 = 	
N. Central District.		N. District.		Continental Depression.	
No.	Meaning.	No.	Meaning.	No.	Meaning.
411	N.E. of Loochoo Is. (Luchu).	511	S.E. of Yezo Is. (Hokkaido).	611	Si-kiang Valley.
412	N.W. " " "	512	N. part of the Sea of Japan.	612	Upper Yangtze Valley.
413	S. of Kiusiu Is.	513	E. of Nippon.	613	Meau " "
414	Off Tung-Yung Lt.	514	Central " "	614	Lower " "
415	S.E. of Wenchow.	515	W. of " "	615	Upper Hoang-ho " "
416	S.E. of Hie-shan Lt.	516	S.E. of " "	616	Lower " "
422	Coast of Chi-kiang.	522	Approaches to Kii Channel.	622	N. of China.
423	S.E. of Chusan Is.	523	" Bungo "	623	W. of Lake Baikal.
424	S.E. of Gutzhoff Lt.	524	S.W. of Kiusiu.	624	S. " " (Mongolia).
425	Off the Saddle Is.	525	W. " "	625	E. " "
426	S. of Shanghai.	526	Korea Strait.	626	N. Liaotung.
433	S.W. " "	533	E. of Korea.	633	Shantung.
434	E. " "	534	S.E. of Shantung.	634	Korea.
435	W. " "	535	S.E. " Tsintau.	635	Eastern Manchuria.
436	N.E. " "	536	S. " "	636	Yellow Sea.
444	N.W. " "	544	E. " Shantung.	644	Sea of Japan.
445	N. " "	545	N.E. " "	645	Eastern Sea.
446	Between the Saddles and Quelpart Is.]	546	Pechili Strait.	646	Japan.
455	Central Yellow Sea.	555	Gulf of Pechili.	655	Yezo Is. (Hokkaido).
456	Coast of Kiangsu.	556	Liaotung Gulf.	656	E. of Nippon.

Signals of Direction (2 Symbols).







(TYPHOONS &c:—Point towards which the centre is travelling.

GALES:—Quarter from which the wind may be expected to blow).

Symbols:						
Meaning:	N.	N.E.	E.	S.E.	S.	S.W.
Symbols:						
Meaning:	W.	N.W.	Recurring.	Steady or Very Slow	Filling up.	Unknown.

Regions threatened by Gale (1 Symbol)

Description of the Section threatened.

Symbols:	
	Coast of the Philippine Islands, China Sea, South of Pratas Reefs and E. of the Paracel Islands.
	Coast of Indo-China, Gulf of Tongking, China Sea, W. of the Paracels.
	Formosa Island and Channel, Coast of China, between Swatow and Wenchow.
	Approaches to Yangtze, Saddles, Southern Yellow Sea.
	Gulf of Pechili, Coasts of Liaotung, Shantung, Northern Yellow Sea.
	Sea and Coasts of Japan, E. and S. of Korea, (Loochoo) Luchu Islands.

Non-local code from 1 July 1917 to 31 May 1920  
 (based on The Hong Kong Telegraph, 2 September 1919)

The non-local storm code superseded the “China Coast” code. The signals consisted of 10 symbols representing the ten numerals. The signals were displayed at the yard-arms of the storm signal mast at Signal Hill with the following meanings:

- (a) Position of storm centre, in degrees of latitude and longitude; by 4 symbols at one yard arm.
- (b) Direction and speed of motion, and the time; by 3 symbols at the other yard-arm.

Monsoon gales were signalled by 3 symbols at one yard-arm. The top symbol indicated the region threatened, the middle symbol the direction from which the gale was expected, and the bottom symbol the time at which gale conditions were first indicated. Details are in Tables I - IV.

Table I – Direction Signals (upper symbol of hoist)

These indicate the direction in which a typhoon or depression is travelling or the direction from which a monsoon gale is expected.











1	2	3	4	5	6	7	8	9	0
									
N	NNE	NE	E or ESE	WSW	W	WNW	NW	NNW	Unknown

Table II – Velocity and Condition Signals (middle symbol of hoist)











Velocity							Condition		
1	2	3	4	5	6	7	8	9	0
									
<1 mph	1-12 mph	13-20 mph	21-30 mph	above 30 mph	Nearly stationary	Velocity unknown	Forming	Filling up	Continental depression

Table III – Time signals (lower symbol of hoist)















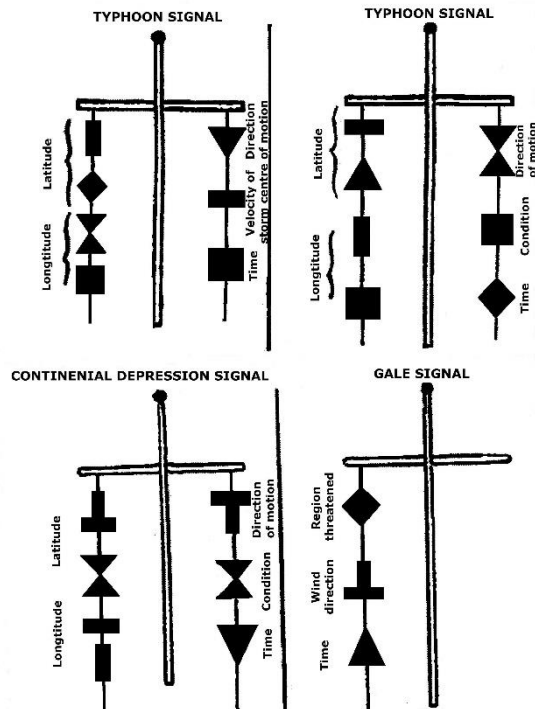
6	7	8	9
			
6 a.m. yesterday	2 p.m. yesterday	6 a. m. today	2 p.m. today

Table IV – Regions threatened by monsoon gales

1	2	3	4	5
				
South of Kiushu	East coast of Japan	North of Hokkaido	Sea of Japan	Gulf of Pechili and Yalu Gulf
6	7	8	9	0
				
Chusan to Shantung Promontory	Formosa to Chusan	Formosa Channel	Gulf of Tongking to Swatow	Annam Coast



China Seas Storm Signal Code from 1 June 1920 to 28 February 1931

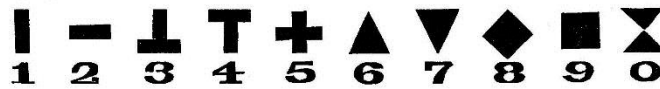
The China Seas Storm Signal Code was adopted in Hong Kong on 1 June 1920. The signals were hoisted at the yard-arms and mast head of the storm signal mast at Signal Hill, Kowloon. The following are extracted from the Hong Kong Government Gazette (Hong Kong Government, 1920b) explaining the meaning of the symbols used in the China Seas Storm Signal Code:

**China Seas Storm Signal Code.**

*(Operative in Hongkong from the 1st June, 1920.)*

**General Explanation.**

1. The Signals are made by means of certain Symbols, each corresponding, for certain purposes, to a number:—



2. The Signals are hoisted at the yard-arms and masthead of the Storm Signal Mast on Blackheads Hill, and have the following general characteristics:—

*Typhoon and Continental Depression Signals:*

- (a.) 4 symbols at one yard-arm showing the position of the centre.
- (b.) 3 symbols at the other yard-arm showing the direction of motion and/or certain characteristics (*see* Tables Nos. 1, 2, and 3).
- (c.) 1 symbol at the masthead showing the time the warning was issued by the Royal Observatory (*see* Table No. 4).

*Gale Signals:*

- (d.) 1 symbol at one yard-arm showing the region threatened (*see* Table No. 5).
- (e.) 2 symbols at the other yard-arm showing the general direction of the wind (*see* Table No. 1).
- (f.) 1 symbol at the masthead showing the time the warning was issued by the Royal Observatory (*see* Table No. 4).

The two upper symbols of group (a) indicate by their corresponding numbers the latitude, and the two lower symbols of the typhoon or depression lies. The symbols for longitude give the units and tens only; thus, 32 indicates longitude 132.

The two upper symbols of group (b) indicate the direction in which the typhoon is travelling, (*see* Table No. 1) or, alternately, certain conditions of the typhoon (*see* Table No. 2). The third and lowest symbol of group (b) indicates the radius of the circle whose centre is shown by the latitude and longitude. This symbol may also indicate degree of intensity. In the case of a continental depression it indicates that it is such, and the corresponding latitude and longitude is the centre of an indefinite area affected (*see* Table No. 3).

*Caution.*—It should be clearly understood that the position indicated by the latitude and longitude signalled does not purport to be the position of the centre of the typhoon. It indicates merely the centre of a circle of a specified radius within which the centre of the typhoon is believed to lie.

**Table No. 1.—Direction Signals.**

*Two upper Symbols of hoist.*

These indicate the direction in which a typhoon is travelling or the direction from which a gale may be expected.



*Note.*—The numbers corresponding to the symbols indicate the number of points from North.



Table No. 2.—Condition Signals.

*Two upper Symbols of hoist.*







					
Forming.	Two centres.	Direction unknown.	Stationary or very slow.	Recurving.	Filling up.

Table No. 3.—Radius and Intensity Signals.

*The lowest of three Symbols.*











Radius of position circles:										
	120'		60'		30'					
										
Intensity, etc.: Unknown.	Severe.	Unknown.	Severe.	Deepening.	Unknown.	Severe.	Exceptional velocity.	Continental depression.	Position uncertain.	

Table No. 4.—Time Signals.

*Single Symbol at masthead.*















			
Yesterday morning.	Yesterday afternoon.	This morning.	This afternoon.

Table No. 5.—Gale Signals.

*One Symbol at yard-arm.*

									
Annan Coast.	Gulf of Tongking to Swatow.	Formosa Channel.	Formosa to Yangtze.	Yangtze to Shantung Promontory.	Gulf of Pechili and Yalu Gulf.	Sea of Japan.	North of Hokkaido.	East Coast of Japan.	South of Kiushu.

It is important that seamen should realise that the position of the centre of the typhoon as signalled is the position according to the data possessed by the Royal Observatory at the time of the issue of the warning. That data may be as much as 12 hours old. Thus, if the time signal indicates that the warning was issued "This morning," it may be that the position corresponds to data concerning yesterday afternoon.

If the signal "Deepening" is made, it indicates that there is reason to believe that the barometric gradient and, consequently, the intensity of the typhoon is increasing.

If the signal "Exceptional velocity" is made, it indicates that there is reason to believe that the rate of progression is 25 per cent. or more greater than the average rate.

If the signal "Position uncertain" is made, it indicates that the data possessed is unreliable and that the position signalled is a mere probability.

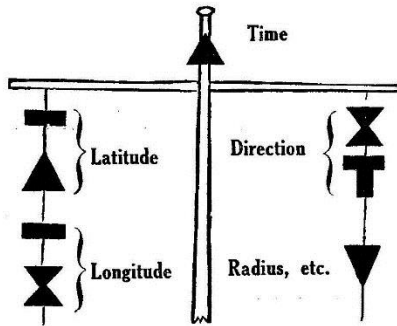
The several tracks which a typhoon may follow in the several months are very varied, and the velocity of progression is liable to be erratic. It is not safe to count on a typhoon maintaining a velocity indicated by previous positions of its centre. The velocity is liable to increase very suddenly. Seamen are recommended to study from available sources the tracks and average velocities for the month and locality concerned.

In the absence of more exact information the following table of velocities in knots for the several latitudes may be useful.

LATITUDE.	BEFORE RECURVING.				AFTER RECURVING.			
	Ordinary Limits.	Mean.	Exceptional Velocity as signalled.	Maximum recorded.	Ordinary Limits.	Mean.	Exceptional Velocity as signalled.	Maximum recorded.
5° to 15°	5 to 12	9	11	22	...	...	...	...
15° " 20°	5 " 14	10	12½	24	5 to 17	10	13	22
20° " 25°	7 " 16	11	13	19	14 " 23	17	21	30
25° " 30°	7 " 13	11	13	15	11 " 23	18	23	47
30° " 35°	...	...	...	10	11 " 36	20	25	42
35° " 40°	...	...	...	16	12 " 36	21	26	50
40° " 45°	...	...	...	...	17 " 36	21	26	48
45° " 50°	...	...	...	...	12 " 36	21	26	52
50° " 55°	...	...	...	...	12 " 37	21	26	49

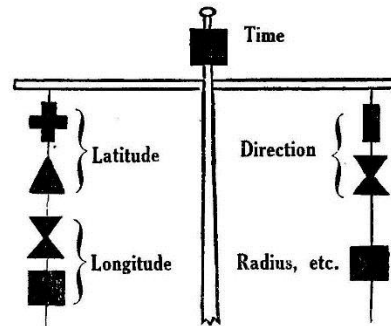
Seamen should realise that, whatever may be the *probability* of a certain velocity in a given case, there is always the *possibility* that it may be greatly exceeded. The safest guide is to make allowance for extreme velocity.

TYPHOON SIGNAL.



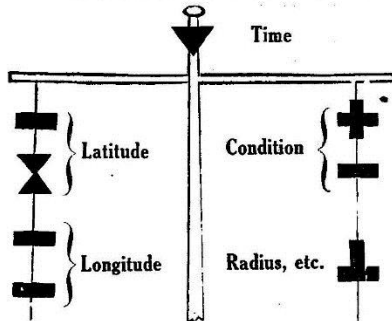
A severe typhoon within 30 miles of lat. 26° N., long. 120° E., travelling N.E. Warning issued this morning.

DEPRESSION SIGNAL.



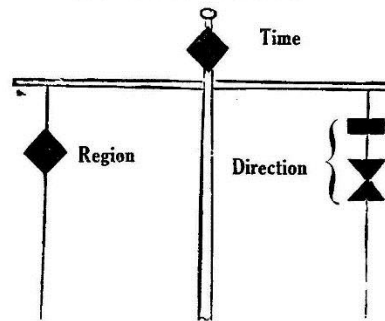
A continental depression in lat. 56° N., long. 109° E., travelling E.S.E. Warning issued yesterday morning.

TYPHOON SIGNAL.



A typhoon within 60 miles of lat. 20° N., long. 122° E., splitting in two. Warning issued this afternoon.

GALE SIGNAL.



The north coast of Hokkaido threatened by a gale from S.W. Warning issued yesterday afternoon.

China Seas Storm Signal Code from 1 March 1931 to 31 December 1949

During the period from 1 March 1931 to 31 December 1949, the China Seas Storm Signal Code used in China since 1918 was adapted for use in Hong Kong. The signals were hoisted at the yard-arms and mast head of the storm signal mast at Signal Hill, Kowloon. The following extracts from the Hong Kong Government Gazette (Hong Kong Government, 1930c) explain the meaning of the code.

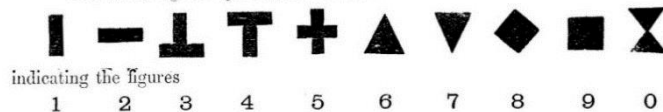
NON-LOCAL STORM SIGNAL CODE, SUITABLE UNIVERSALLY  
FOR VISUAL AND TELEGRAPHIC STORM WARNINGS, ALSO FOR  
THE "GENERAL INFERENCE" FOLLOWING SYNOPTIC WEATHER  
MESSAGES.

Recommended for use in the Far East at a Conference of Directors of Far  
Eastern Weather Services, held at Hong Kong in the year 1930.

Adopted at Hong Kong from 1931, March 1.

The Code is an adaptation of the China Seas Storm Signal Code which has been  
in use in China since 1918.

The following ten symbols are used:—



(2) The signals are hoisted at the yard-arms and at the mast head of a Storm Signal Mast and have the following significance:—

*Typhoon and depression Signals:—*

- (a) 4 symbols at one yard-arm showing the position of the centre.
- (b) 3 symbols at the other yard-arm, showing the direction of motion or, alternatively, certain conditions; also the accuracy with which the centre has been located, and the intensity. (Tables 1, 2 and 3).
- (c) 1 symbol at the mast head showing the time at which the centre was in the position indicated (Table 4).

*Gale Signals:—*

- (d) 1 symbol at one yard-arm showing the region threatened (Table 5).
- (e) 2 symbols at the other yard-arm showing the general direction from which the gale is blowing, in points: 08=East, 16=South, 24=West, 32=North.
- (f) 1 symbol at the mast head showing the time at which the gale was as stated.

(3) The two upper symbols of group (a) indicate by their corresponding numbers the latitude, and the two lower symbols the longitude, of the centre of a circle (of a radius specified by the lowest symbol of group (b)) within which the centre of the typhoon or depression lies. The symbols for longitude give the tens and units only; thus 32 indicates longitude 132°.

(4) The two upper symbols of group (b) indicate the direction in which the typhoon etc., is travelling (Table No. 1) or alternatively, certain conditions (Table 2).

(5) The third and lowest symbol of the group (b) indicates the radius of the circle whose centre is shown by the latitude and longitude, together with the degree of intensity or, alternatively, one of four conditions which can sometimes be given in addition to the direction of motion (Table 1) and in preference to the radius and intensity signal.

(6) The only velocity signals given are "stationary or very slow", which is an alternative to the direction of motion, and "exceptionally high rate of travel" which may be given in addition to direction of motion.

Appendix 4 (cont'd)

In this connection the following table, extracted from the China Seas Storm Signal Code will be useful:—

Latitude (North).	Rate of travel of typhoons in the Far East (Knots).							
	Before recurving.				After recurving.			
	Ordinary limits.	Mean.	Exceptional Velocity as signalled.	Maximum recorded.	Ordinary limits.	Mean.	Exceptional Velocity as signalled.	Maximum recorded.
° °								
5 to 15	5 to 12	9	11 or above	22	—	—	—	—
15 „ 20	5 „ 14	10	12½ „	24	5 to 17	10	13 or above	22
20 „ 25	7 „ 16	11	13 „	19	14 „ 23	17	21 „	30
25 „ 30	7 „ 13	11	13 „	15	11 „ 23	18	23 „	47
30 „ 35	—	—	—	10	11 „ 36	20	25 „	42
35 „ 40	—	—	—	16	12 „ 36	21	26 „	50
40 „ 45	—	—	—	—	17 „ 36	21	26 „	48
45 „ 50	—	—	—	—	12 „ 36	21	26 „	52
50 „ 55	—	—	—	—	12 „ 37	21	26 „	49

(7) *Caution.*—The position indicated by the latitude and longitude signals does not purport to be the position of the centre of the typhoon, but merely the centre of a circle of specified radius within which the centre of the typhoon is believed to lie.

(8) In the China Seas Code the Time Signal (Table 4) indicates the time at which the warning was issued. In the present code it shows the time at which the typhoon or depression was in the position indicated. The table has been expanded as observations are now available from certain stations at 11h and 17h. Symbol No. 9 provides for occasions when the centre has been located from observations at other than routine hours.

(9) The code can also be used for the “general inference” following a synoptic message.

Thus:—An anticyclone, central in latitude 36° N. and longitude 110° E. is strengthening and moving eastward, and the depression appears to be stationary in latitude 22° N. and longitude 104° E., but the position is only approximate,

would be:—

3610367

2204790.

The “general inference” may, if necessary, be followed by a few words *en clair*.

TABLE 1:—DIRECTION SIGNALS.

*Two upper symbols of hoist.*

Direction of motion.	Code Figures.			
	Typhoon.	(a) Typhoon or Depression.	Depression.	Anticyclone.
NNE .....	0 2	6 2	0 0	3 3
NE .....	0 4	6 4	0 1	3 4
ENE .....	0 6	6 6	0 3	3 5
E .....	0 8	6 8	0 5	3 6
ESE .....	1 0	7 0	0 7	3 7
SE .....	1 2	7 2	0 9	3 8
SSE .....	1 4	7 4	1 1	3 9
S .....	1 6	7 6	1 3	4 0
SSW .....	1 8	7 8	1 5	4 1
SW .....	2 0	8 0	1 7	4 2
WSW .....	2 2	8 2	1 9	4 3
W .....	2 4	8 4	2 1	4 4
WNW .....	2 6	8 6	2 3	4 5
NW .....	2 8	8 8	2 5	4 6
NNW .....	3 0	9 0	2 7	4 7
N .....	3 2	9 2	2 9	4 8
Unknown .....	5 3	9 3	3 1	4 9
Column .....	2	3	4	5

The table serves for typhoons, depressions and anticyclones: also for the doubtful case: typhoon or depression.

The figures in the last two columns will not be displayed on the storm signal masts. They are for the "general inference" following a synoptic message. The display of the figures in column 3 is optional.

(a) The word "typhoon" has been retained as it is in general use throughout the Far East. The word "cyclone" is in this case preferable.

TABLE 2:—CONDITION SIGNALS.

(Alternative to Table 1).

*Two upper symbols of hoist.*

Typhoon.		Depression.		Anticyclone.	
Code figures.	Condition.	Code figures.	Condition.	Code figures.	Condition.
5 1	Forming.	7 3	Forming.	8 7	Forming.
5 2	Two centres.	7 5	Filling up.	8 9	Dissipating.
5 4	Stationary or very slow.	7 7	Filled up.	9 1	Dissipated.
5 5	Curving N	7 9	Stationary or very slow.	9 4	Spreading N
5 6	„ NE	8 1	—	9 5	„ E
5 7	„ E	8 3	V-shaped depression.	9 6	„ S
5 9	„ SE	8 5	No remarks.	9 7	Northern portion has moved eastward, leaving a separate anticyclone over China.
6 1	„ S				
6 3	„ SW			9 8	Stationary or very slow.
6 5	„ W			9 9	No remarks.
6 7	„ NW				
6 9	Filling up or curving. N				
7 1	„ NE				
5 8	Filling up.				
6 0	Filled up.				
Column ..	2	3	4	5	6

The figures in columns 3 and 5 will not be displayed on the storm signal masts. They are for the “general inference” following a synoptic message.

TABLE 3:—RADIUS AND INTENSITY SIGNALS.

*The lowest of three Symbols.*

(a) Code figures.	A typhoon or a depression.		Anticyclone.	
	Radius of position circle.	Intensity etc.	Radius of position circle.	Condition.
1	120'	Unknown.	150'	Feeble.
2	120'	Severe.	150'	Moderate.
3	60'	Unknown.	150'	Strong.
4	60'	Severe.	120'	Feeble.
5	—	Deepened.	120'	Moderate.
6	30'	Unknown.	120'	Strong.
7	30'	Severe.	—	Strengthening.
8	—	Exceptionally high rate of travel.	—	A vague area of high pressure.
9	—	Continental depres- sion (b).	—	—
0	—	Position of centre uncertain.	—	Position of centre uncertain.

The word "typhoon" has been retained as it is in general use throughout the Far East. Used in conjunction with the "intensity" signal the word "cyclone" would be preferable.

(a) The figures in Table 1 will indicate whether the figures in this column refer to a typhoon, a depression, an anticyclone or the doubtful case of "typhoon or depression".

(b) As there is no column for "continental depression" in Table 1, when this signal is sent the direction of motion will be given by means of the figures in column 2 of Table 1, so as to maintain the practice of former years.

TABLE 4:—TIME SIGNALS.

*Single Symbol at Masthead.*

Day.	Today.				Yesterday.				
Code figures.	1	2	3	4	5	6	7	8	9
Time of 120th meridian, E.	6 a.m.	11 a.m.	2 p.m.	5 p.m.	6 a.m.	11 a.m.	2 p.m.	5 p.m.	Position deduced from supplementary information received since last warning.

TABLE 5:—GALE SIGNALS.

*One Symbol at yard-arm showing the locality of the gale.*

Code figures.	District.
1 ... ..	Annam Coast.
2 ... ..	Gulf of Tonkin.
3 ... ..	Formosa Channel.
4 ... ..	Formosa to Yangtze.
5 ... ..	Yangtze to Shangtung Promontory.
6 ... ..	Gulf of Pechili and Yalu Gulf.
7 ... ..	Sea of Japan.
8 ... ..	North of Hokkaido.
9 ... ..	East Coast of Japan.
0 ... ..	South of Kiushiu.



China Seas Storm Signal Code from 1 January 1950 to 30 June 1961

Following the recommendations at a conference on Storm Warning Procedures held in Manila in May 1949, the non-local code was revised on 1 January 1950. The signals were hoisted at the mast head and at the yard-arms of the storm signal mast at Signal Hill, Kowloon. The following extracts from Storm Warning Service (RO, 1949) explain the meaning of the code.

**THE CHINA SEAS NON-LOCAL STORM SIGNAL CODE FOR  
VISUAL STORM WARNINGS.**

*(As amended by agreement between the Meteorological Service of Indo China, the Central Weather Bureau of China, and the Royal Observatory, Hong Kong, and used from 1st January, 1950).*

1. The following ten symbols are used:—



indicating the figures.

1      2      3      4      5      6      7      8      9      0

2. These signals are hoisted at the mast head and at the yard-arms of a storm signal mast, and have the following significance:—

- (a) 1 symbol at the mast head showing the time at which the centre of a tropical cyclone was in the position indicated (Table I).
- (b) 4 symbols at one yard-arm showing the position of the centre. The two upper symbols give by their corresponding numbers the latitude in degrees; the two lower symbols the longitude in degrees (initial 1 omitted for longitudes of 100° or over).
- (c) 3 symbols at the other yard-arm. The two upper symbols of this group show the speed and direction of motion of the centre at the time of observation, or, alternatively, certain conditions (Table II).

The lowest symbol of this group shows the intensity of the cyclone, together with the degree of accuracy with which the centre has been located (Table III). The latter is specified as the radius of the circle whose centre is shown by the latitude and longitude. Thus the position indicated by the latitude and longitude signals does not purport to be the exact position of the storm centre, but merely the centre of a circle of specified radius within which the centre of the storm is believed to lie.

TABLE I.—SINGLE SYMBOL AT MASTHEAD.

Time of observation.

Code Figures	1	2	3	4	5	6	7	8	9
Hrs. G.M.T.	03	06	09	12	15	18	21	24 00	Position deduced from supplementary information since last warning.

TABLE II.—TWO UPPER SYMBOLS OF HOIST.

Speed and direction of motion; or conditions.

Code fig. 00		Stationary, or moving at 5 knots or less.				
Speed of motion						
Direction of motion.	10 knots	15 knots	20 knots	25 knots or more		
Code fig.						
NNE	01	17	33	49		
NE	02	18	34	50		
ENE	03	19	35	51		
E	04	20	36	52		
ESE	05	21	37	53		
SE	06	22	38	54		
SSE	07	23	39	55		
S	08	24	40	56		
SSW	09	25	41	57		
SW	10	26	42	58		
WSW	11	27	43	59		
W	12	28	44	60		
WNW	13	29	45	61		
NW	14	30	46	62		
NNW	15	31	47	63		
N	16	32	48	64		
Conditions						
Code fig.				Code fig.		
65	Curving NE			81	Forming, will probably move NE	
66	"	E		82	"	" " " " E
67	"	SE		83	"	" " " " SE
68	"	S		84	"	" " " " S
69	"	SW		85	"	" " " " SW
70	"	W		86	"	" " " " W
71	"	NW		87	"	" " " " NW
72	"	N		88	"	" " " " N
73	Moving NE and accelerating			89	Forming, movement unknown	
74	"	E	" "	90	Filling up	
75	"	SE	" "	91	Filled up, no further warnings	
76	"	S	" "	92	Passed inland, no further warnings	
77	"	SW	" "	93	Passed out of area, no further warnings	
78	"	W	" "	94-98 (Spare numbers)		
79	"	NW	" "			
80	"	N	" "	99	Movement and condition unknown	

TABLE III.—LOWEST OF THREE SYMBOLS.

Code fig.	Intensity	Radius of position circle in nautical miles (see para. 2(c)).
0	Position and intensity uncertain	—
1	Tropical Depression (winds up to 33 knots)	120
2	" " " "	60
3	" " " "	30
4	Tropical Storm (winds from 34 to 63 knots)	120
5	" " " "	60
6	" " " "	30
7	Typhoon (winds 64 knots and over)	120
8	" " " "	60
9	" " " "	30

*Note:*—If no reliable observations of wind force near the centre of the storm are available, the intensity signalled will indicate the highest wind force believed to exist in the storm.

Tropical cyclone warning system in Hong Kong during the  
Second World War period

According to Notification No. 32 issued by the Japanese military government as reported by a local Chinese newspaper (香島日報, 11 June 1942, Figure 44), a local tropical cyclone warning system similar to that adopted in 1935 continued to be used in Hong Kong initially during the Second World War period. The signals were displayed at locations including the Harbour Office, Kowloon-Canton Railway Station, Blackhead Hill, Kowloon Wharf, Lai Chi Kok, Lei Yue Mun and possibly also at the Hong Kong Observatory (referred to as 九龍測候所 in the Notification) Supplementary signals were displayed at offshore islands. On 20 October 1943, the Japanese military government issued Notification No. 66 (Wah Kiu Yat Po) to revise the tropical cyclone warning system. Basically, the system was simplified into just using the supplementary signals (Figure 45).

## 當局昨規定 颶風信號規則

### 指定船舶避泊地點

【本報特訊】當局於本港一旦遇有颶風來襲時，所發出信號之規則，經有規定，此項信號，計分三種，即警報信號，實況信號，與補助信號，當揚示信號時，晝間與夜間之形式，各有不同，其揚示信號之地點，港務局經有指定。（颶風信號表信文及中文解釋等，五月廿八日之星島日報已詳為刊載）至關於大風來襲發出警報時，所有大中小型三種船舶之避泊所，當局亦已詳列明，俾遇發生上述情事時，各種船舶得依指定之地帶避泊，以保安全，茲錄港務部公示第三十二號及第三十三號如下：

### 公 示（第三十二號）

本處颶風信號規則

(一) 本處颶風信號分為三種。一、颶風警報信號。二、颶風實況信號。三、補助信號。

(二) 颶風警報信號係照第一表中第一號信號之形式。

(三) 實況信號係照第一表中第九號至第十號信號之形式。

(四) 補助信號係照第二表中第一、二號形式。

(五) 颶風信號分為晝間與夜間兩種，俱照第一表及第二表所指示之形式。

(六) 關於依照本規程所發出警報時，一般船舶應遵事宜，另文公示之。

(七) 颶風信號在下開各地點表示之。

(一) 港務局屋上信號所。(二) 廣九鐵道停車場上信號所。(三) 九龍鳳山信號所。(四) 九龍倉庫信號所。(五) 九龍唐山信號所。(六) 荔枝角信號所。(七) 九龍灣警署信號所。(八) 鯉魚門信號所。

(八) 所有颶風信號所，皆屬於香港港務局管理之。

昭和十七年六月十日  
香港占領地總督部

### 颶 風 信 號

(昭和十七年五月二十一日) 香港港務局

晝間形象	信號番號	夜間信號 (燈通連續)	信 文
T	一	白○ 白○ 白○	颶風アリ當地方ニ 襲來ノ兆アリ
▲	五	白○● 綠●● 白○●	北西偏リノ疾強風 吹ク
▼	六	白○● 綠●● 白○●	南西偏リノ疾強風 吹ク
▲▲	七	白○●● 綠●●● 白○●●	北東偏リノ疾強風 吹ク
▼▼	八	白○●● 綠●●● 白○●●	南東偏リノ疾強風 吹ク
⊗	九	綠●●● 綠●●● 綠●●●	風力益々強烈トナル
+	十	紅●●● 紅●●● 紅●●●	颶風ノ中心近クキ 方向不定ノ風益々 強烈トナル

### 補 助 信 號

晝間形象	信號番號	夜間信號 (燈通連續)	信 文
T	一	紅●●●	颶風警報ノ兆アリ
▲	二	綠●●●	颶風警報ノ文ニ颶風ノ中心近ク ノ風力益々強烈トナル

### 公 示（第三十三號）

颶風時，在香港港內之一般船舶，應遵颶風信號及廣播，依情況從左列事件無違避泊為要。

計開

一、大型船舶（總噸數五千噸以上）之避泊地點。(一) 竹洲島(昂船洲)ノ北方水域。(二) 汶克灣，鯉魚門通過依照海軍之指示。(三) 大型船浮標，第五，七，八，九，十，十一，十二，十三，十四，十五，十六，十七，及十八號之十三個為限。(浮標信號，依水路部海圖)

Figure 44. Extract of Notification No. 32 as reported by a local Chinese newspaper (香島日報) of 11 June 1942 with information on the tropical cyclone warning system in Hong Kong at that time.

**告示第六六號**

茲定暴風警報信號規程如左

昭和十八年十月二十日

香港占領地總督部

**暴風警報信號規程**

第一條 本規程所定暴風警報信號者。指在管區內  
表示暴風警報之信號。

第二條 暴風警報信號。晝間用形象。夜間用燈  
火表示之。

信號之表示。依另表所定行之。

第三條 暴風警報信號。於左列地點揭示之。

晝夜共同揭示之地點

香港港務局屋頂信號所

九龍氣象台信號所

九龍唐山信號所

九龍魚門信號所

僅在晝間揭示之地點

九龍黑山信號所

九龍會軍岸頂信號所

僅在夜間揭示之地點

九龍粉車場屋頂信號所

第四條 有本規程所定之信號時。關於一般船舶  
避泊事項。應依照昭和十七年告示第三十三號  
關於一般船舶避泊要領。

第五條 本規程所定之信號。由香港港務局管制

暴 風 警 報 信 號		( 香 港 港 務 局 )	
晝間信號	夜間信號	表 示	解 說
丁	赤	壹	有強風(雨)襲來之兆
▲	綠	貳	強風(雨)吹到
	綠		強風(雨)在數小時內襲來 小型船須避入安全避難所 大型船應作避難準備并體察情形預早 避難 各九聯絡船或停航二小時 海上應關緊門戶須海地區須對潮水高 漲小心警戒

Figure 45. Extract of Notification No. 66 as reported by a local Chinese newspaper (Wah Kiu Yat Po 華僑日報) of 20 October 1943 on the revision of the tropical cyclone warning system.