ROYAL OBSERVATORY, HONG KONG

TECHNICAL NOTE NO. 70

30-YEAR MEAN RAINFALL IN HONG KONG

1953 - 1982

by

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TABLES

FIGURES

1. INTRODUCTION

In the early 1950's, there were some 50 rain-gauges operating in Hong Kong. This number increased to 121 by 1 January 1983. Over the years several attempts were made to compute mean rainfall values obtained from these rainfall stations using data collected during various periods (1952-1962, 1952-1965, 1952-1972 and 1952-1976). However, no written account is available on the procedures used in computing these mean values.

As more data has become available, it is now possible to update the previous work to cover a longer period. A 30-year period is a logical choice as normal rainfall figures have been defined as "period averages computed for a uniform and relatively long period comprising at least three consecutive ten-year periods" (World Meteorological Organization 1979). This note presents the mean rainfall values computed for the 30-year period 1953-1982 together with a brief description of the procedures used in estimating missing data for some stations and in adjusting mean values obtained over different lengths of period to this common 30-year period. Because about 30 stations were set up during 1952, the choice of 1953, instead of 1952, as the first year of the period obviated the need to adjust or estimate missing data for the year 1952 for these stations.

2. DATA

(a) Rain-gauges

Daily rainfall from ordinary rain-gauges and monthly rainfall from monthly gauges were used. For stations equipped with both ordinary and autographic rain-gauges, data from the ordinary gauge were used in preference to those from autographic records because records from autographic gauges were disrupted from time to time due to mechanical faults which developed in the gauges. However, at a few stations where only autographic gauges were installed, data extracted from autographic charts were used. There are only three such stations, viz :

Aberdeen Lower Reservoir (Station 10)
Tai Lam Forest Reserve Compt. 16 (Station 73)
Tsuen Wan R.G. Filters (Station 159)

Siphoning losses inherent in autographic gauges were discussed by Cheng and Kwok (1966). These losses were not taken into account because they amounted to only 2% of the rainfall recorded for an intensity of 100 mm/h over a duration of 15 minutes and this intensity is very infrequent. The return period for this rainfall intensity is estimated to be about 2 years (Peterson and Kwong 1981).

(b) Rainfall-observing practices at outstations

Prior to 1 July 1955, daily rainfall recorded for a particular day referred to the total rainfall from 0800 Hong Kong Standard Time (time of observation in those days referred to Hong Kong Standard Time (HKST) which was 8 hours ahead of G.M.T.) on that day to 0800 HKST on the following day. Starting from 1 July 1955, the observation time was changed to 1500 HKST as it was noted that the maximum frequency of rainfall in Hong Kong occurred in the morning and the minimum in the afternoon (Bell and Chin 1968). However, from 1 July 1955 to the end of 1957, daily rainfall figures recorded at each of the stations manned by the staff of the Waterworks Office (now the Water Supplies Department) referred to the rainfall total from 1500 HKST the previous day to 1500 HKST on the day against which the figure was entered. This practice was adopted by all stations from 1958 to the present.

The following table summarizes the different practices in recording daily rainfall prior to 1958 :

Period	Type of stations	Reference duration for daily rainfall
1947 - 30.6.55	All stations	From 0800 HKST on the day concerned to 0800 HKST the following day
1.7.55 - 31.12.57	Stations maintained by the Royal Observatory	From 1500 HKST on the day concerned to 1500 HKST the following day
1.7.55 - 31.12.57	Stations manned by the Waterworks Office	From 1500 HKST the previous day to 1500 HKST on the day concerned

In order to conform to the current practice, daily rainfall recorded over the period prior to 1 July 1955 at all stations and those recorded during the period from 1 July 1955 to the end of 1957 at stations maintained by the Royal Observatory (i.e. those not manned by Waterworks staff) were shifted by one day and so archived on magnetic tapes. The following example illustrates the adjustment involved :

Station : Pokfulam Reservoir
Year : 1947
Month : June

Date	Record of daily rainfall	
	Original	Adjusted
1	Nil	
2	21.6	Nil
3	25.4	21.6
4	24.1	25.4
5		24.1

3. ANALYSIS

(a) Estimation of missing records

The reliability and accuracy of the rainfall data were discussed by Peterson (1964).

The U.S. Weather Bureau adopts a method (Paulhus and Kohler 1952) using three surrounding stations to fill in missing data for a particular station in the United States, where the network density is one station in about 782 000 square kilometres (World Meteorological Organization 1977). In Hong Kong, this method is not used for two reasons : (1) the coastal environment here renders it not always possible to find three surrounding stations and (2) the station density here is much higher -- one station in about 10 square kilometres.

To fill in missing data over a period of one or a few days, the corresponding rainfall from a nearby, topographically similar station were substituted (McKay 1970). Missing monthly data were estimated by one of the following two methods, in order of preference :

(i) inference, if possible, from the distribution map for the month, taking into account the mean distribution (for example, the 25-year mean for the period 1952-1976) ; or

(ii) substitution of monthly values from a nearby, topographically similar station or the average of two such stations, also taking into account the mean distribution and the statistical correlation between the precipitation for the station under consideration and the nearby station(s).

In the present analysis, the correlation coefficients involved were in general greater than 0.95. Full records of the estimation of missing rainfall data are available on file at the Hydrometeorology Section of the Royal Observatory, Hong Kong.

(b) Adjustment of mean values from different lengths of records to the common period of 1953 - 1982

A number of "control" stations with full and reliable records from 1953 to 1982 was selected (Fig. 1) for the adjustment of mean rainfall at stations with less than 30 years of data. The control stations were chosen based on the following considerations : the amount of missing data at these stations was minimal and the consistency in the data from these stations had been confirmed during the routine analysis of monthly distribution of rainfall during the 30-year period. The data for stations with 15 to 29 years of data were adjusted using the data from nearby control stations in topographically similar locations. The following formula was adopted (Wiesner 1970) :

$$N_{a,30} = \frac{N_{a,y}}{N_{c,y}} \cdot N_{c,30}$$

where

a stands for the station of interest,

c stands for the control station,

$N_{a,30}$ is the estimated 30-year monthly mean of the station,

$N_{c,30}$ is the 30-year monthly mean of the control station,

$N_{a,y}$ is the available y-year monthly mean at the station, and

$N_{c,y}$ is the corresponding y-year monthly mean at the control station.

The use of the above formula in the analysis was supported by a high correlation coefficient (greater than 0.95) between the observed annual precipitation for the stations considered (McKay 1970).

The computed mean monthly and annual rainfall figures at stations with 15 or more years of record are presented in Table 1. The monthly and annual spatial distributions of rainfall in Hong Kong are given in Figures 2 to 14.

Similar procedures were followed to adjust the data from the following stations which have less than 15 years of records :

(1) Cape Collinson Correctional Institute (Station 140, years of record 1969-1982)

(2) Chek Lap Kok Meteorological Station (Station 162, 1979-1982)

(3) Cheung Uk (Station 92, 1960-1973)

(4) High Island East (Station 152, 1975-1982)

(5) High Island West (Station 150, 1973-1982)

(6) Kwun Tong District Branch Office (Station 137, 1968-1979)

(7) Lamma Island (Station 133, 1967-1970, 1977-1982)

(8) Ngong Ping Tea Farm (Station 43, 1953-1958, 1965-1970)

(9) Stanley Satellite Earth Station (Station 147, 1971-1982)

(10) Tai Mei Tuk Pumping Station (Station 141, 1970-1982)

(11) Tsing Yi Development Site Office (Station 105, 1977-1982)

(12) Tuen Mun New Town Development Office (Station 153, 1976-1982)

(13) Yuk Ying Primary School, Tai Long (Station 117, 1965-1978)

The adjusted values at these stations were taken into consideration during the construction of the isohyetal maps (Figs 2-14). The estimated mean monthly and annual rainfall values are separately presented in Table 2. These mean values were derived from relatively short periods of data. Caution must be exercised in the use of these values.

REFERENCES

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2.	Cheng, S. and W.H. Kwok	1966	A Statistical Study of Heavy Rainfall in Hong Kong 1947-65, Royal Observatory Technical Note No. 24
3.	McKay, G.A.	1970	Handbook on the Principles of Hydrology, Section II, Ed. D.M. Gray, Water Information Centre
4.	Paulhus, J.L.H. and M.A. Kohler	1952	Interpretation of Missing Precipitation Records, Monthly Weather Review, Vol. 80, pp. 129-133.
5.	Peterson, P.	1964	The Rainfall of Hong Kong, Royal Observatory Technical Note No. 17 (2nd edition)
6.	Peterson, P. and H. Kwong	1981	A Design Rain Storm Profile for Hong Kong, Royal Observatory Technical Note No. 58
7.	Wiesner, C.J.	1970	"Hydrometeorology", Chapman and Hall Ltd., London
8.	World Meteorological Organization	1977	Statistical Information on Activities in Operational Hydrology, Operational Hydrology Report No. 10
9.	World Meteorological Organization	1979	Technical Regulations, WMO - No. 44.

TABLE 1. 30-YEAR MEAN MONTHLY AND ANNUAL RAINFALL AT STATIONS IN HONG KONG 1953-1982

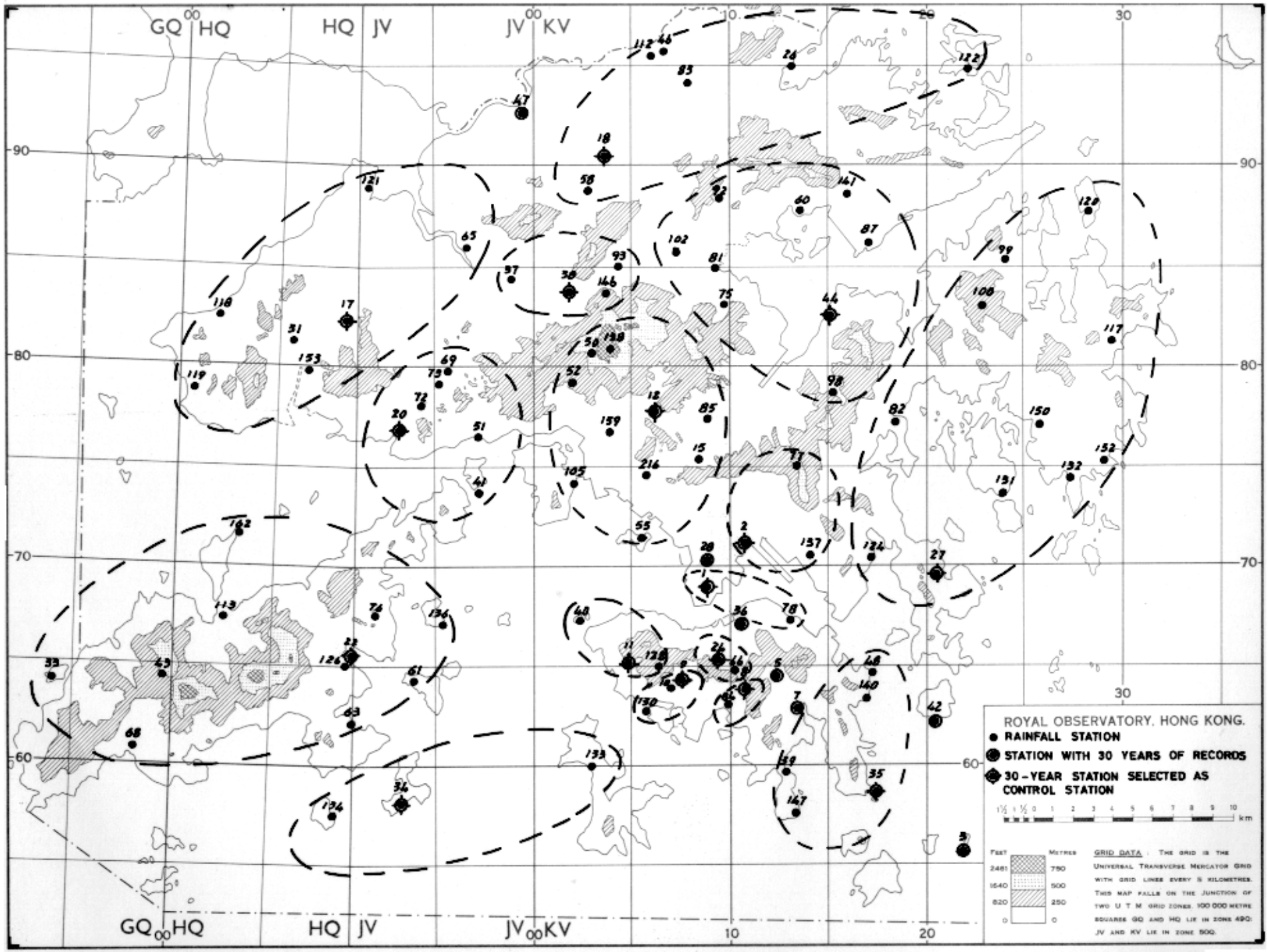
Station Number	Location	Ref. on Universal Transverse Mercator Grid	Height above Mean Sea Level	Length of record available for calculating mean values	January	February	March	April	May	June	July	August	September	October	November	December	Year
			m	years	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
10	Aberdeen Lower Reservoir (autographic records)	KV 072638	85	30	18.6	34.9	47.6	123.4	275.9	367.6	303.1	377.6	297.4	113.2	35.1	18.0	2012.4
9	Aberdeen Upper Reservoir	KV 075641	120	30	19.6	36.3	48.6	124.3	285.2	380.8	318.7	402.2	318.3	124.3	38.4	20.0	2116.7
2	Airport Meteorological Office	KV 108718	5	30	22.6	35.8	51.1	137.8	315.7	415.8	331.5	425.6	329.1	124.6	34.4	19.2	2243.2
130	Ap Lei Chau Power Station	KV 055629	5	16	13.7	29.7	42.9	112.1	258.6	321.3	256.8	324.6	272.5	98.2	29.7	16.8	1776.9
65	Au Tau Pond Fish Fare	JV 963858	5	22	20.8	36.6	51.0	122.9	252.7	324.4	291.1	330.6	236.5	85.4	31.5	21.6	1805.1
15	Beacon Hill	KV 086753	150	25	24.9	42.5	58.7	152.0	372.7	490.2	360.2	504.0	311.9	151.0	32.3	27.2	2527.6
48	Cape Collinson Meteorological Station	KV 171646	50	19	19.2	31.7	77.5	125.2	307.8	340.9	242.2	285.5	236.9	92.0	31.3	15.4	1772.1
35	Cape D'Aguilar Wireless Station	KV 169588	50	30	13.6	22.7	44.3	120.3	265.4	323.3	281.1	318.4	247.0	89.3	37.2	25.0	1793.5
31	Castle Peak Farm	HQ 057805	10	30	27.1	39.9	50.1	130.0	253.2	296.1	301.6	304.3	235.4	93.6	37.2	20.5	1756.8
34	Cheung Chau Meteorological Station	JV 932583	70	30	20.9	33.4	49.0	120.6	265.3	317.8	262.6	320.8	224.0	86.8	35.1	20.5	1756.8
100	Cheung Sheung	KV 228831	300	23	36.1	44.0	70.2	167.2	393.8	455.6	373.4	430.3	310.8	141.8	46.5	25.1	2494.8
119	Chi Hang School, Lung Kwu Tan	HQ 004792	5	18	19.0	27.0	53.8	122.8	240.8	297.8	232.8	233.8	178.0	97.4	30.8	20.3	1554.3
63	Chi Ma Wan Forestry Outpost	HQ 090619	45	22	21.9	33.6	45.6	119.5	285.3	353.1	291.0	322.4	257.6	106.1	42.1	19.8	1898.0
52	Chuen Lung Country Park Management Centre	KV 023791	330	28	21.9	42.9	59.4	133.8	321.8	473.6	377.0	424.5	308.4	120.9	37.8	25.3	2347.3
94	Deep Water Bay Royal Hong Kong Golf Club	KV 098630	5	22	11.9	31.2	48.9	112.2	256.8	338.1	323.8	402.8	339.0	131.9	29.7	17.1	2043.4
76	Diana Farm, Hung Shui	JV 916676	225	23	30.7	53.8	67.3	151.0	314.1	391.6	354.2	357.8	263.4	113.2	51.0	27.5	2175.6
18	Fanling Army Depot	KV 037910	20	30	25.9	42.3	59.6	143.2	296.3	379.8	377.6	388.0	317.7	128.0	40.5	22.6	2221.5
40	Green Island Lighthouse	KV 023674	75	29	21.4	37.1	44.9	121.0	256.4	336.3	263.3	303.2	205.8	94.3	28.4	19.1	1730.2
24	Happy Valley Race Course	KV 092659	35	30	22.6	39.6	51.5	133.0	311.0	405.0	329.5	404.2	352.6	140.7	44.6	21.8	2256.1
124	Haven of Hope Hospital, Junk Bay	KV 172705	25	18	30.6	39.6	62.0	158.7	379.3	402.6	336.5	417.8	313.0	136.2	43.7	21.6	2346.6
61	Hei Ling Chau Addiction Treatment Centre	JV 940643	10	26	25.0	36.7	54.6	129.6	289.5	350.6	285.7	321.5	225.8	100.1	46.0	21.3	1936.4
12	Jubilee Reservoir	KV 061779	200	30	26.0	43.7	60.9	142.2	343.0	477.2	390.0	457.4	327.4	146.4	42.2	25.3	2481.7
146	Kadoorie Experimental & Extension Farm	KV 034838	305	15	25.9	42.9	57.9	139.8	329.7	428.8	444.2	403.9	333.6	131.9	42.2	30.1	2415.5
122	Kat O Fisheries Research Sub-station	KV 228949	10	18	15.6	32.0	56.0	134.5	291.0	362.8	295.5	295.1	201.7	97.3	22.7	11.9	1306.1
131	Kau Sai Fishermen's Children School	KV 239734	10	16	37.1	34.4	59.3	145.5	333.9	385.4	282.7	368.4	236.7	104.3	37.0	19.8	2044.5
120	King Lam School, Tap Mun	KV 231876	10	18	14.4	34.9	47.9	134.3	250.4	347.3	286.5	246.0	206.2	80.3	30.6	13.2	1692.0
23	King's Park Meteorological Station	KV 085703	65	30	25.4	42.4	56.2	140.9	307.9	403.2	325.7	422.9	319.3	132.2	39.3	24.7	2240.1
132	Leung Shuen Wan Public School	KV 271744	10	16	29.1	37.3	58.1	135.3	329.7	410.3	279.0	373.0	248.1	102.3	32.0	22.4	2057.2
112	Ling Ying Public School, Ta Kwu Ling	KV 057953	10	19	19.8	31.9	46.8	119.1	240.3	305.0	291.1	348.9	291.2	94.6	30.9	19.6	1839.2
47	Lok Ma Chau Police Station	JV 993925	50	30	21.5	34.4	43.7	102.6	221.5	251.5	250.5	275.5	223.3	88.0	27.9	15.8	1556.2
44	Ma On Shan St. Joseph's Primary School	KV 148820	20	30	29.6	40.0	64.3	148.3	359.9	450.4	386.8	439.1	314.6	145.7	54.5	30.4	2463.6
66	Maryknoll Sisters' School	KV 102649	95	24	23.5	39.9	54.0	124.9	287.8	410.6	311.5	427.1	367.0	151.6	45.6	26.6	2270.1
60	Ming Tak School, Ting Kok	KV 135879	30	15	25.0	41.6	59.5	150.8	312.9	389.2	392.6	368.9	247.8	153.3	46.1	29.2	2216.9
98	Mui Tsz Lam	HQ 088652	50	30	33.6	45.4	61.7	139.2	313.3	400.7	342.7	351.6	264.6	102.2	49.4	26.4	2130.8
22	Mui Wo Extension Office	HQ 019827	5	18	18.2	27.9	39.9	127.1	236.3	305.8	266.7	271.3	184.8	83.5	22.7	23.8	1608.0
118	Nim Wan Public Primary School	KV 243856	60	23	35.6	46.2	71.9	175.2	393.0	488.1	380.4	433.6	299.4	133.9	46.1	27.3	2530.7
99	Pak Sha O	KV 065650	400	17	28.0	39.9	54.6	128.8	285.9	381.2	310.8	383.7	321.1	122.3	40.7	23.8	2120.8
128	Peak Police Station	JV 952672	5	16	28.1	41.4	59.6	126.8	286.5	336.6	287.2	312.6	223.7	87.7	43.8	22.5	1861.5
136	Peng Chau Pumping Station	KV 046652	175	30	20.3	35.2	45.4	115.2	276.2	350.7	301.4	361.8	286.0	110.6	31.2	17.7	1951.8
11	Pokfulam Reservoir	KV 103668	15	30	23.1	40.4	47.6	135.0	317.8	391.6	315.7	383.9	344.9	141.6	38.8	24.7	2205.1
36	Queen's College																

TABLE 1. (cont'd)

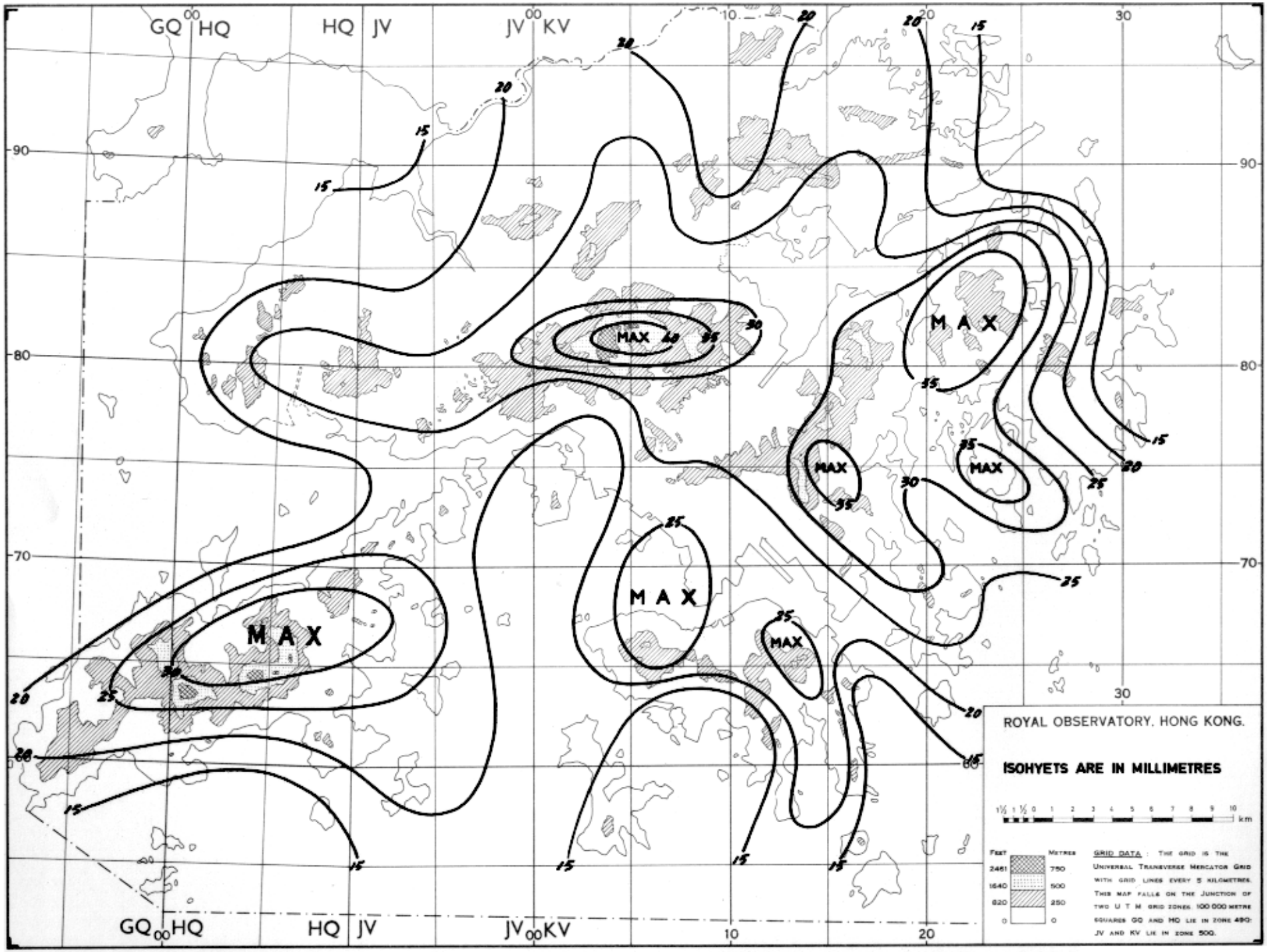
Station Number	Location	Ref. on Universal Transverse Mercator Grid	Height above Mean Sea Level	Length of record available for calculating mean values	January	February	March	April	May	June	July	August	September	October	November	December	Year
			m	years	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1	Royal Observatory	KV 086692	30	30	25.1	41.1	54.8	140.9	308.6	402.2	325.6	408.1	323.9	130.2	38.2	24.5	2223.2
82	Sai Kung Farm	KV 183773	45	23	31.8	41.5	73.3	161.1	392.8	414.8	360.0	446.6	306.3	139.0	44.5	24.5	2436.2
39	St. Stephen's College	KV 128595	30	24	14.1	28.4	59.9	124.2	273.2	321.9	286.8	348.6	283.7	95.9	38.2	15.7	1890.5
87	Sam Mun Tsai (Plover Cove)	KV 173864	35	17	25.9	41.2	56.0	120.1	265.4	383.5	322.5	322.4	228.8	91.7	41.9	26.9	1926.2
27	Sam Tuk Middle School	KV 202696	105	30	32.0	38.3	69.4	172.0	375.4	394.1	325.9	394.6	321.5	128.4	50.8	22.3	2324.7
51	San Miguel Brewery	JV 971766	5	28	22.7	39.1	49.0	135.6	315.8	394.2	346.8	357.2	259.1	91.4	38.0	22.4	2071.3
26	Sha Tau Kok Police Station	KV 129952	35	29	21.6	36.8	49.2	131.0	281.2	365.7	355.6	308.4	304.1	104.1	35.9	18.5	2012.1
95	Sha Tin Public Primary School	KV 090773	20	16	26.1	41.2	53.8	148.1	339.7	438.2	387.1	450.4	322.1	151.1	45.5	27.6	2430.9
37	Shek Kong Airfield	JV 987844	10	21	21.0	42.1	53.5	125.8	283.9	354.2	326.4	346.4	290.6	113.8	34.2	26.6	2018.5
38	Shek Kong Village	KV 022834	115	30	26.9	44.6	56.9	140.8	327.4	455.3	429.2	430.9	349.1	143.7	49.3	28.9	2483.0
134	Shek Kwu Chau Rehabilitation Centre	HQ 081576	15	16	14.8	30.6	43.2	111.4	261.6	311.0	242.7	266.5	176.3	67.7	23.4	13.2	1562.4
216	Shek Lei Pui Reservoir	KV 058745	130	18	21.6	40.0	53.4	134.4	330.0	423.2	361.6	444.4	306.6	114.2	36.3	22.7	2288.4
68	Shek Pik Reservoir	CQ 981607	5	23	19.8	37.9	50.9	122.7	286.8	334.0	303.8	335.3	279.4	114.1	38.5	24.6	1947.8
93	Shui Wo	KV 039851	90	23	28.9	50.5	60.0	140.4	313.7	439.3	422.0	433.4	341.6	149.0	49.1	27.8	2455.7
121	Shung Yee Public Primary School, Mong Tseng	JV 915892	15	18	15.1	28.6	37.5	92.6	194.3	256.2	185.0	190.2	159.4	53.7	17.7	15.5	1245.8
126	Silver Mine Bay Treatment Works	HQ 087651	60	17	28.2	43.9	54.2	125.7	284.6	368.9	310.6	338.3	237.1	95.6	42.8	24.3	1954.2
55	Stonecutters Island	KV 056713	10	20	25.4	44.8	51.9	119.8	283.8	387.6	318.7	385.2	279.7	111.6	32.3	21.6	2062.4
50	Sze Lok Yuen (Tai Mo Shan)	KV 031808	640	23	37.3	57.2	74.9	171.2	372.5	568.6	508.5	545.0	382.7	160.2	57.6	31.8	2967.5
83	Ta Kwu Ling Farm	KV 072943	15	23	19.5	42.4	55.5	133.2	240.3	344.9	350.4	363.9	317.7	115.5	37.7	20.9	2041.9
46	Ta Kwu Ling Police Station	KV 065957	5	29	18.0	33.2	42.2	119.1	225.8	303.1	276.5	320.3	241.4	75.9	33.0	16.8	1705.3
78	Taikoo Docks	KV 128674	30	18	24.7	44.4	57.0	149.8	342.3	423.4	325.3	421.9	344.2	128.8	41.9	25.3	2329.0
20	Tai Lam Chung Reservoir	JV 930773	45	30	23.6	42.3	51.3	127.2	269.4	349.8	347.9	343.8	241.6	96.6	40.4	22.9	1956.8
69	Tai Lam Forest Reserve Compt. 5	JV 955797	90	27	26.9	42.8	57.1	137.2	302.8	365.6	344.2	346.0	239.7	103.5	45.5	26.1	2037.4
73	Tai Lam Forest Reserve Compt. 16 (autographic records)	JV 952791	75	23	24.9	44.0	59.6	138.5	291.6	361.8	354.9	349.8	245.8	98.4	41.7	24.9	2035.9
72	Tai Lam Forest Reserve Compt. 18	JV 942783	110	29	29.1	45.1	60.4	150.4	309.5	406.5	378.1	398.6	275.8	105.8	46.6	28.7	2234.6
58	Tai Lung Farm	KV 032893	35	27	24.7	38.9	54.2	128.2	287.1	371.0	363.0	370.6	293.2	122.2	44.2	23.8	2121.1
138	Tai Mo Shan	KV 037814	950	15	42.0	82.1	96.4	191.2	356.4	541.3	507.5	560.8	441.2	197.2	66.9	43.4	3126.4
33	Tai O Navy Coast Watch Station	CQ 938642	90	26	20.4	33.5	41.5	124.9	215.3	274.0	238.4	248.0	214.8	92.2	35.2	24.8	1563.0
75	Tai Po Kau Country Park Management Centre	KV 096833	130	24	32.7	46.8	69.0	147.5	301.9	490.8	367.1	385.7	297.0	131.8	45.4	28.4	2344.1
102	Tai Po Tau Treatment Works	KV 063858	105	22	28.7	40.7	63.9	134.9	277.6	446.5	389.8	385.1	319.0	144.1	38.0	33.3	2300.6
5	Tai Tam Reservoir	KV 113642	155	30	22.5	41.2	59.7	147.4	338.9	413.9	345.5	444.0	367.8	148.9	45.7	26.9	2402.4
7	Tai Tam Tuk Reservoir	KV 134627	55	30	22.0	40.3	52.2	129.8	291.3	371.1	282.8	380.3	311.5	119.2	39.8	25.0	2065.3
41	Tang Lung Chau Lighthouse	JV 972736	35	18	21.5	38.3	47.1	124.0	271.0	342.1	294.5	355.5	223.4	76.9	36.3	20.2	1850.8
77	Tate's Cairn Weather Radar Station	KV 133753	575	27	33.8	53.2	82.2	168.5	403.5	471.5	370.4	465.6	346.4	163.0	55.6	33.5	2647.2
42	Tathong Point Lighthouse	KV 202619	15	30	18.0	35.6	67.4	134.1	301.0	291.2	237.9	318.6	258.7	97.7	35.5	21.8	1817.5
159	Tauen Wan W.T. Filters (autographic records)	KV 028774	20	19	19.4	37.9	49.6	118.8	296.7	397.9	341.3	386.6	272.4	109.2	33.4	21.1	2084.3
113	Tung Chung Extension Office	HQ 025674	10	19	30.0	51.7	65.3	135.3	261.9	344.7	329.4	390.7	271.8	114.5	52.4	32.3	2080.0
3	Waglan Lighthouse	KV 217557	50	30	11.4	20.7	38.1	101.9	210.9	237.4	192.3	239.5	161.2	45.6	19.2	10.0	1288.2
4	Wong Nai Chung Reservoir	KV 106621	240	30	17.0	33.2	46.5	120.8	294.4	391.2	329.0	415.5	330.7	108.2	35.1	18.8	2140.4
31	Wong Shiu Chi Middle School	KV 086852	25	23	27.2	48.6	63.4	148.5	297.4	464.6	355.3	335.2	293.9	139.0	42.3	27.3	2242.7
17	Yuen Long W.T. Filters	HQ 032925	90	30	22.9	37.2	51.2	125.0	236.6	283.7	280.4	302.9	231.5	93.6	34.9	25.4	1725.3

TABLE 2. 30-YEAR MEAN MONTHLY AND ANNUAL RAINFALL AT STATIONS WITH LESS THAN 15 YEARS OF RECORDS

Station Number	Location	Ref. on Universal Transverse Mercator Grid	Height above Mean Sea Level	Length of record available for calculating mean values	January	February	March	April	May	June	July	August	September	October	November	December	Year
			m	years	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
140	Cape Collinson Correctional Institute	KV 167632	40	14	13.5	30.7	49.5	122.7	269.6	296.3	230.8	285.6	206.8	48.6	17.2	16.6	1587.9
162	Chek Lap Kok Meteorological Station	HQ 027712	55	4	15.2	46.2	54.3	101.3	231.0	285.9	255.2	344.1	188.4	53.9	37.9	26.4	1639.8
92	Cheung Uk	KV 098886	170	14	19.3	51.3	75.7	159.3	300.6	402.3	385.5	338.1	361.0	200.1	25.0	28.3	2346.5
152	High Island East	KV 290753	125	8	22.0	38.1	61.7	122.1	393.5	393.6	308.9	348.1	245.4	87.1	39.2	15.7	2075.4
150	High Island West	KV 257773	85	10	22.0	32.0	59.9	115.7	354.2	406.7	301.7	319.9	239.0	92.8	41.1	18.0	2003.0
137	Kwun Tong District Branch Office	KV 140704	10	12	24.8	52.9	62.2	146.4	319.9	414.6	328.7	401.3	349.8	138.6	50.6	19.1	2308.9
133	Lamma Island Police Post	KV 021609	30	10	17.1	31.7	48.0	103.5	221.3	264.4	276.9	321.6	268.2	50.4	23.4	7.3	1633.8
43	Ngong Ping Tea Farm	GQ 994644	440	12	28.6	45.7	70.4	157.7	288.8	411.7	364.1	412.6	303.7	149.7	57.9	44.7	2335.6
147	Stanley Satellite Earth Station	KV 133575	90	12	21.5	27.8	44.3	112.9	257.2	288.5	219.8	296.0	227.6	90.5	27.3	16.3	1619.7
141	Tai Mei Tuk Pumping Station	KV 157886	10	13	27.9	42.4	62.0	123.6	278.0	438.8	377.9	364.5	290.5	115.5	43.6	26.4	2191.1
105	Tsing Yi Development Site Office	KV 021743	25	6	21.3	49.3	52.2	111.8	267.6	490.8	247.0	344.2	219.7	77.0	25.6	32.9	1939.4
153	Tuen Mun New Town Development Office	HQ 060796	5	7	23.7	41.0	51.0	139.6	241.2	335.0	278.2	343.7	234.0	87.0	35.0	21.2	1830.6
117	Tuk Ying Primary School, Tai Long	KV 293815	25	14	11.2	26.8	48.5	111.8	285.0	357.1	255.4	321.2	311.0	91.7	46.6	19.9	1886.2

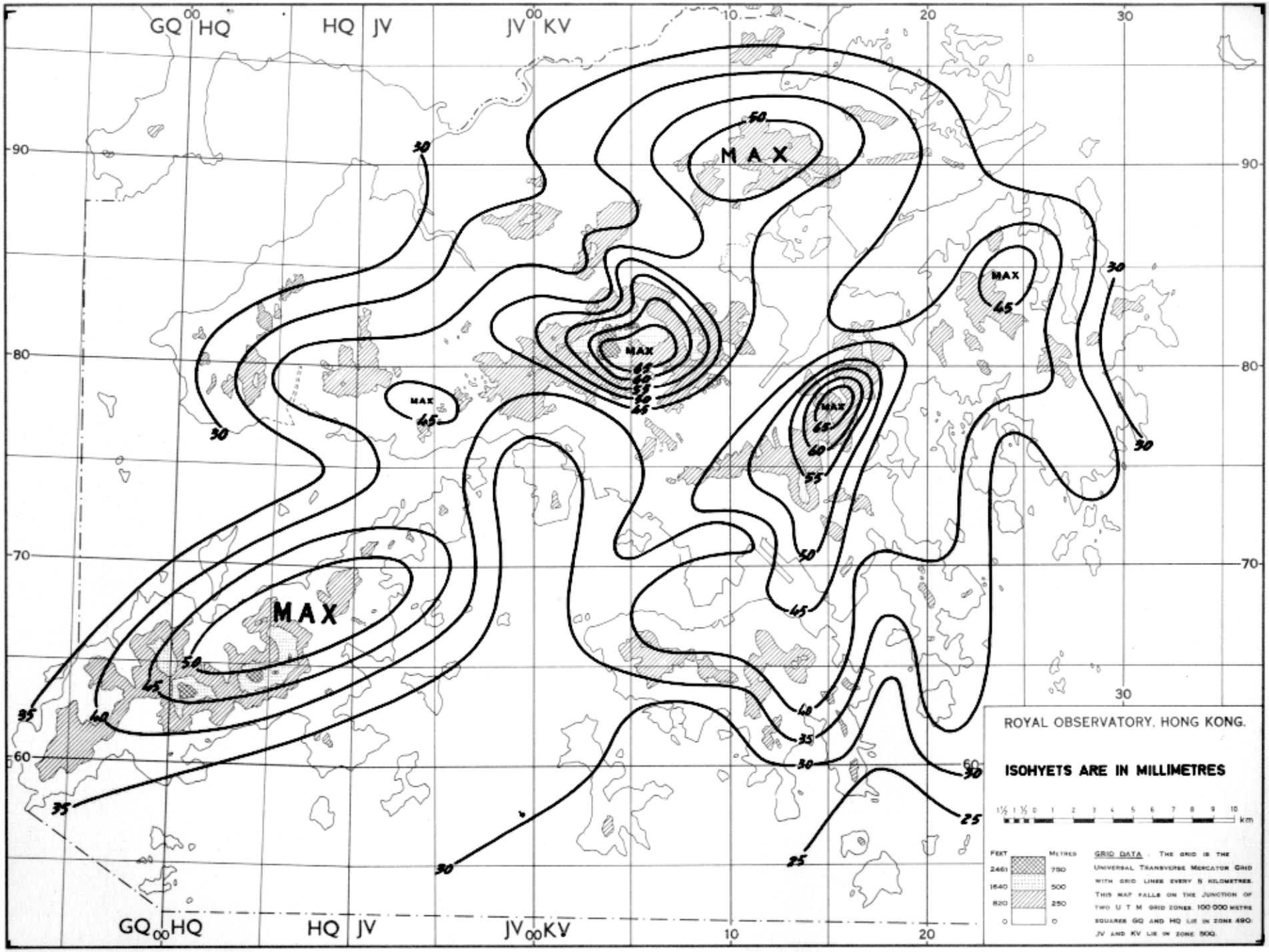


R.O. 128 **Fig. 1 Map showing rainfall stations grouped with the respective control stations.**



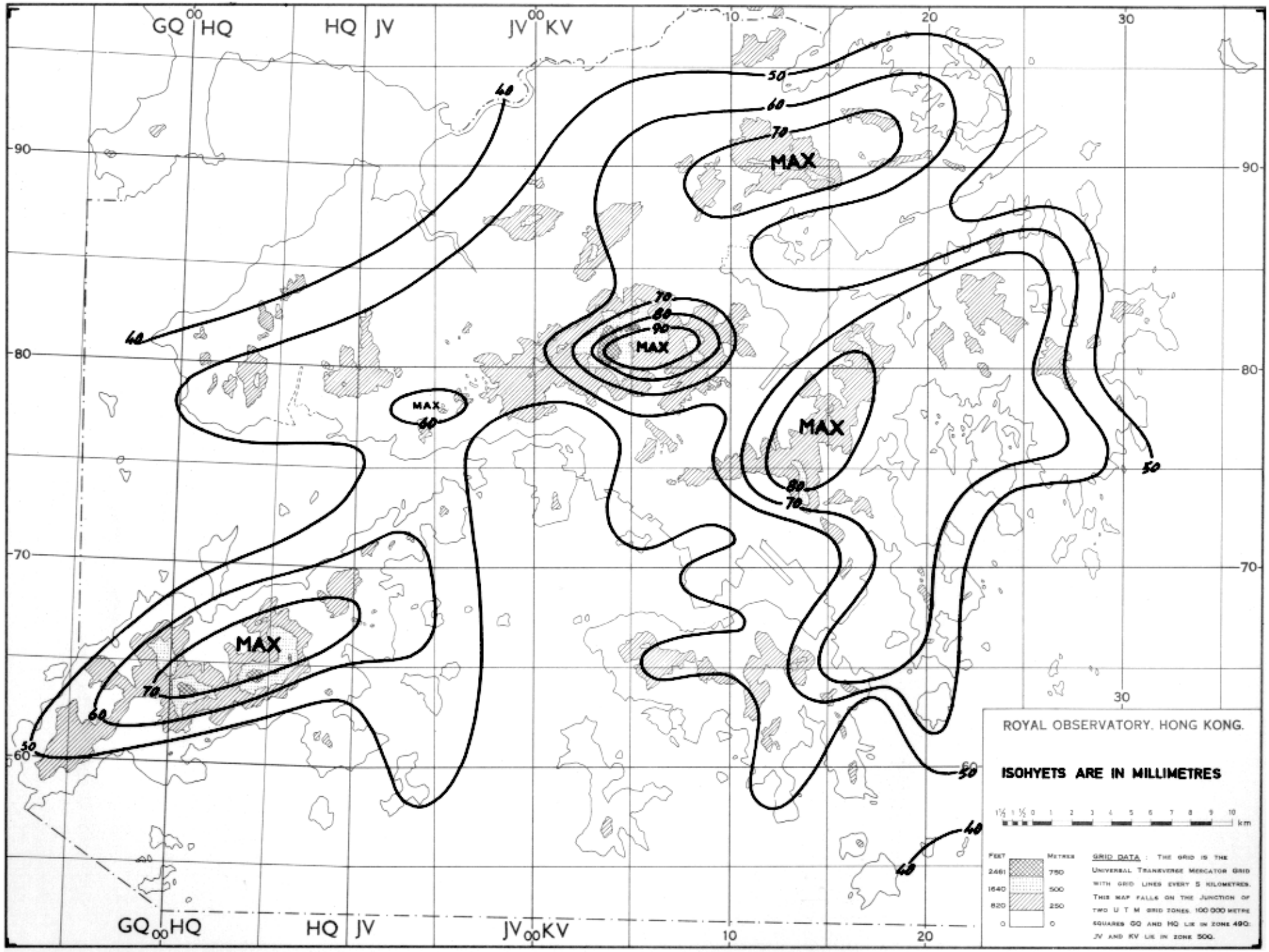
R.O. 128

Fig. 2 Mean January rainfall distribution map. (1953 – 1982)



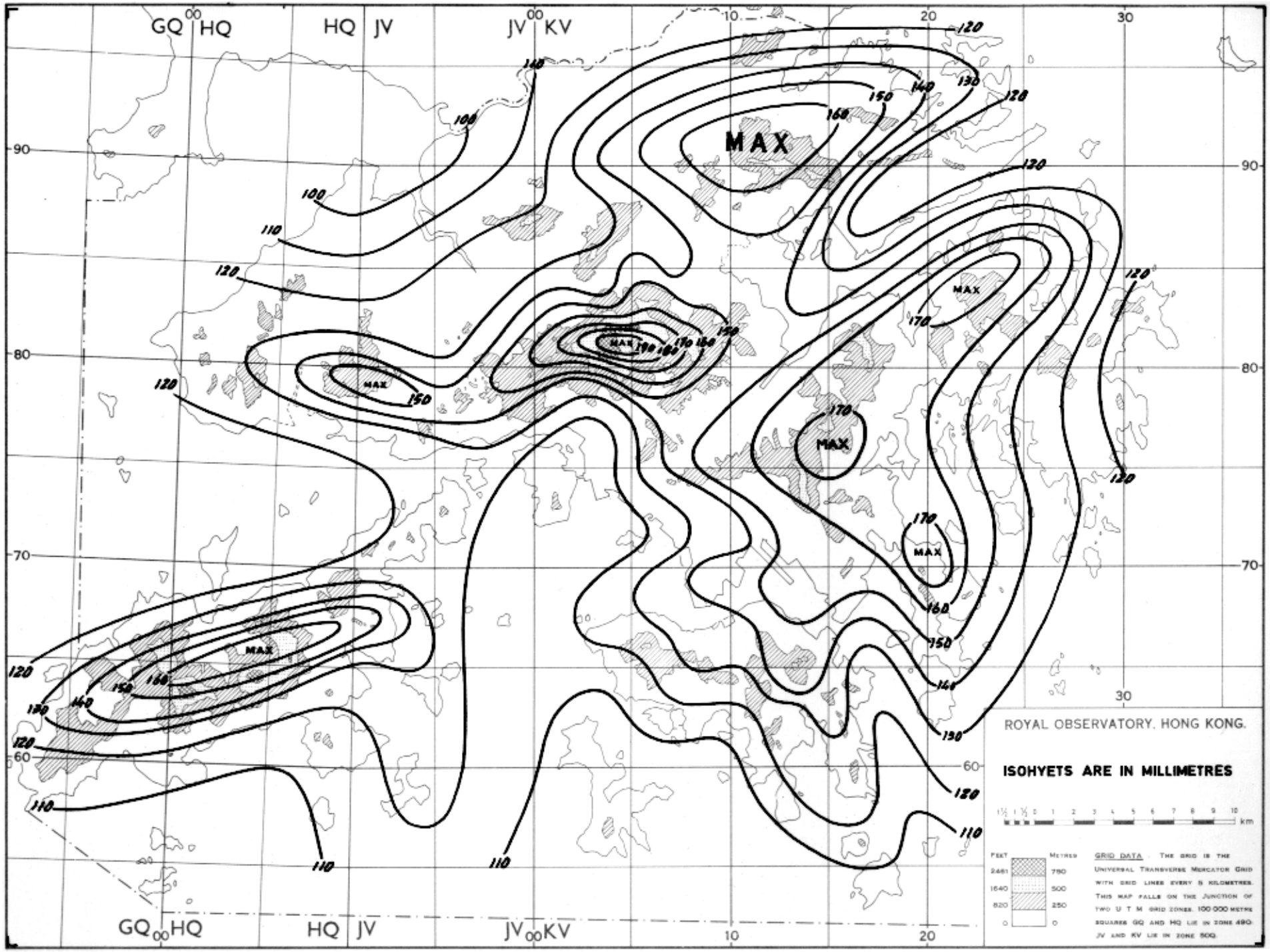
R.O. 128

Fig. 3 Mean February rainfall distribution map. (1953 – 1982)



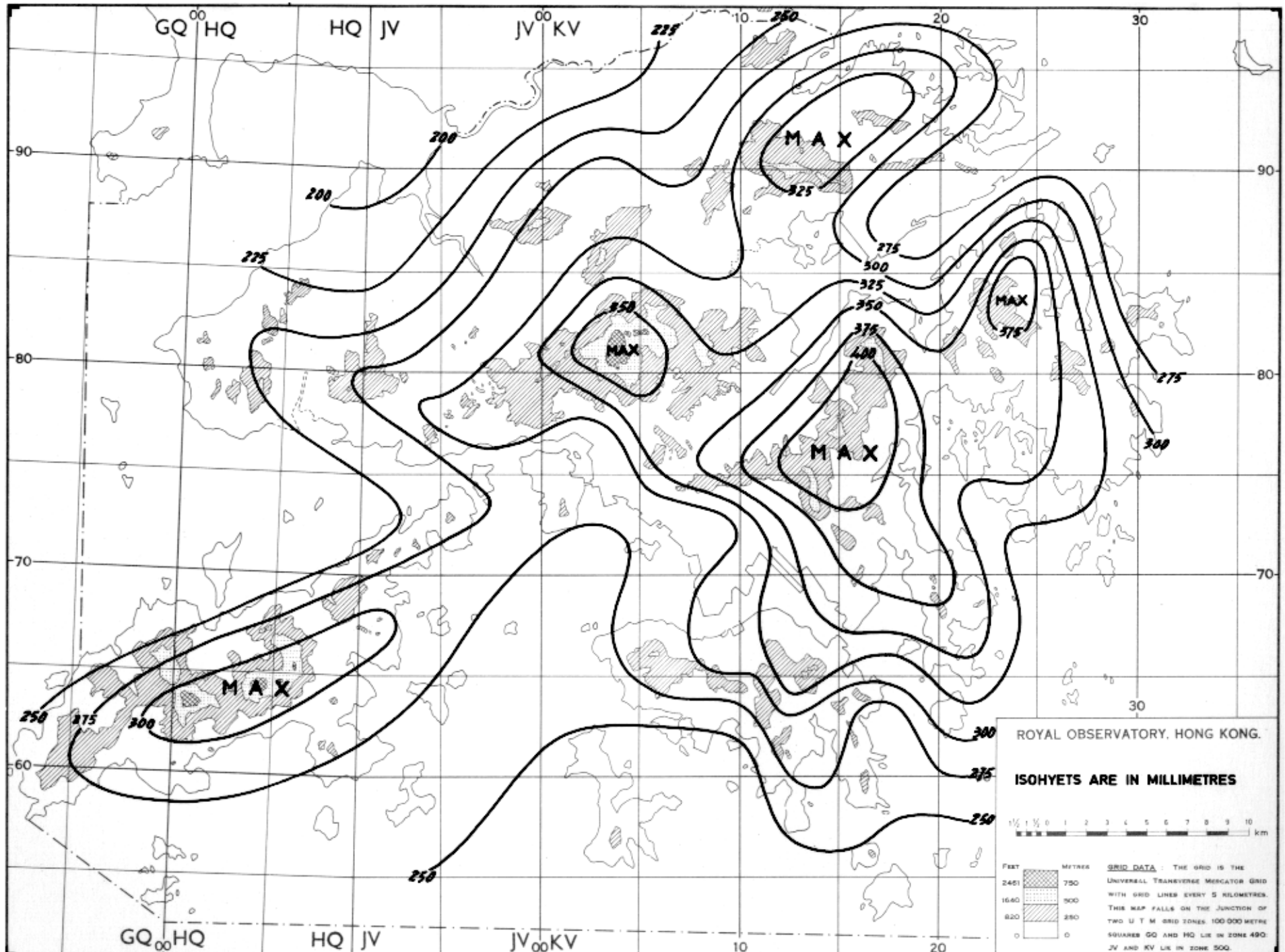
R.O. 128

Fig. 4 Mean March rainfall distribution map. (1953 – 1982)



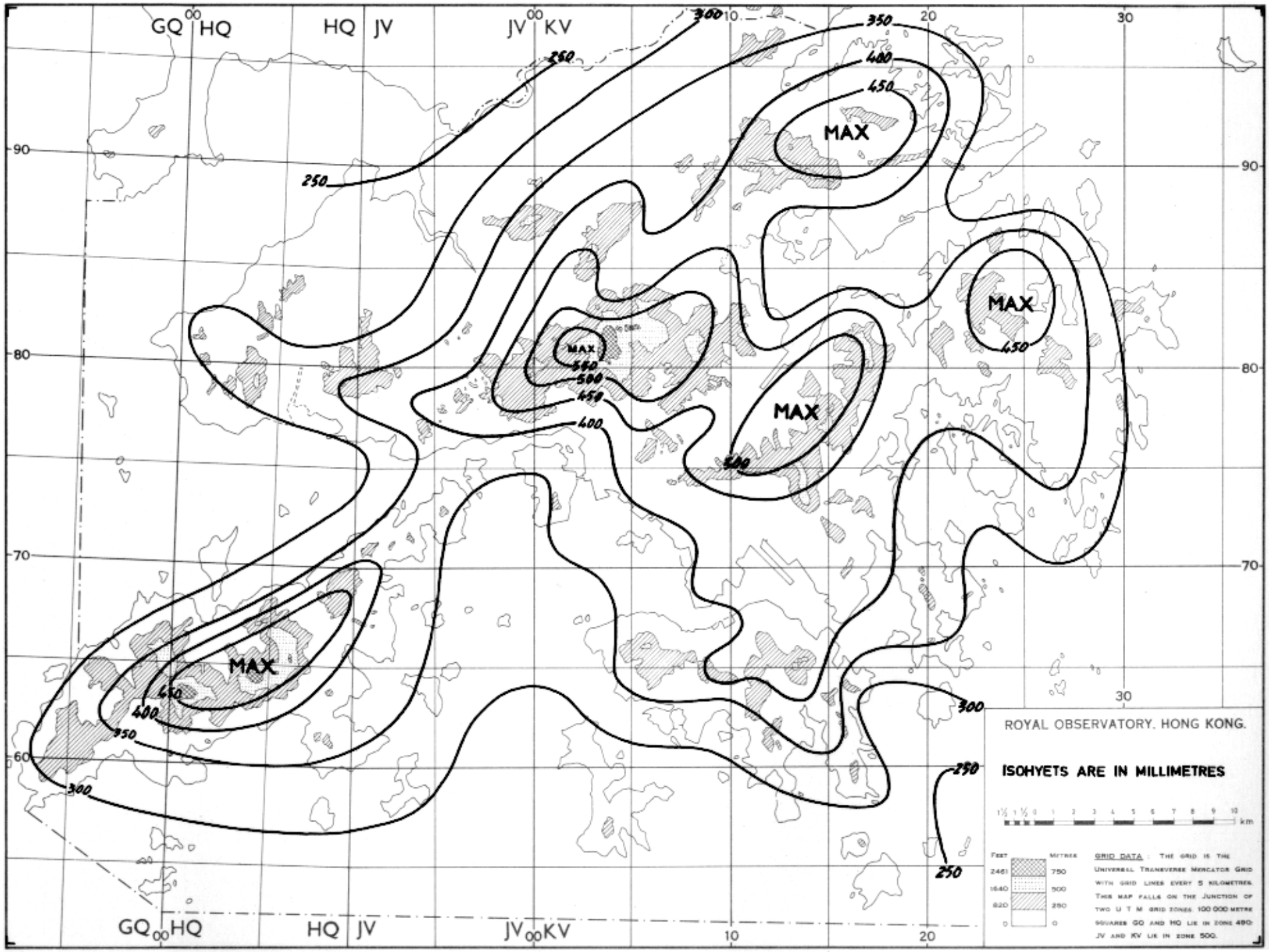
R.O. 128

Fig. 5 Mean April rainfall distribution map. (1953 – 1982)



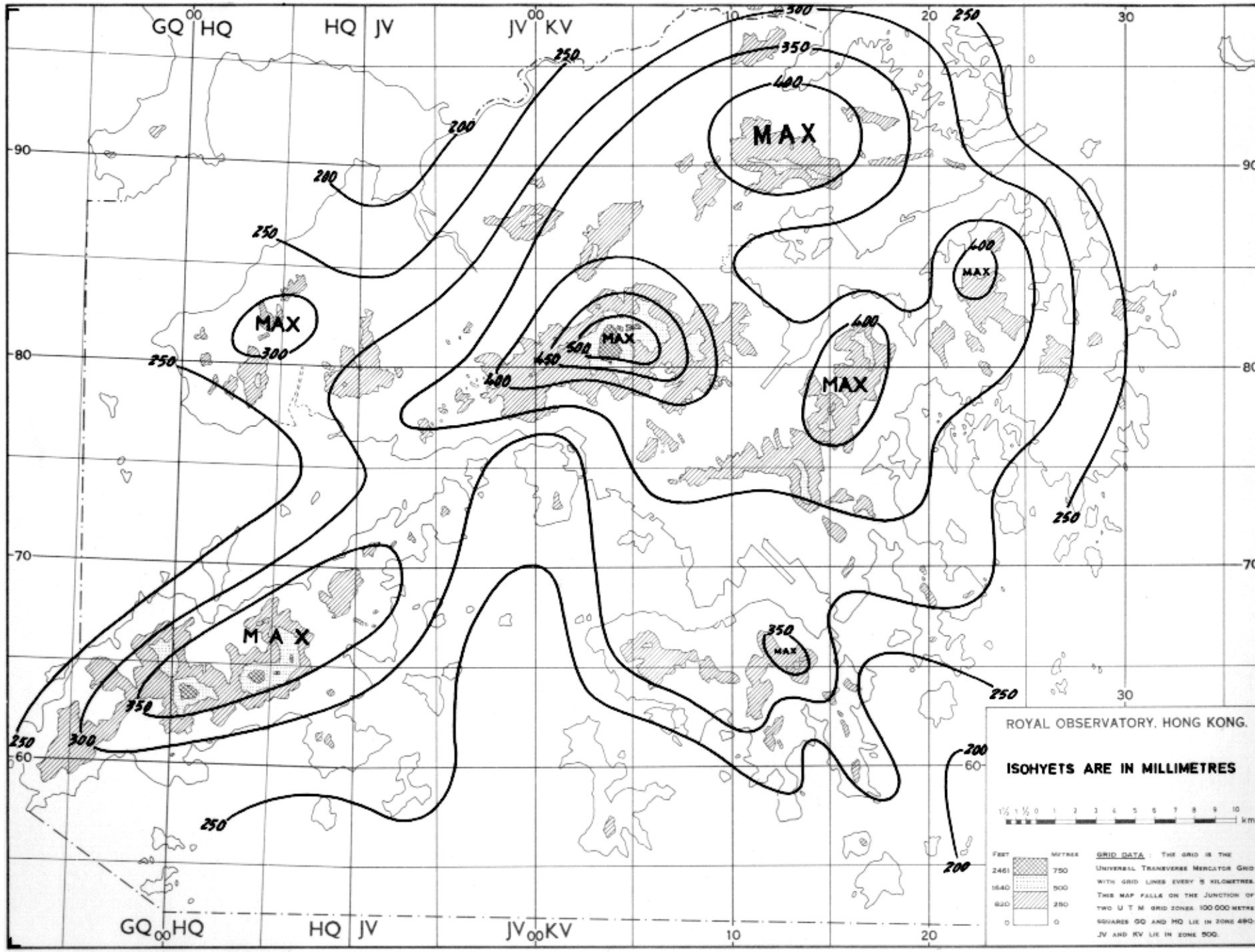
R.O. 128

Fig. 6 Mean May rainfall distribution map. (1953 – 1982)



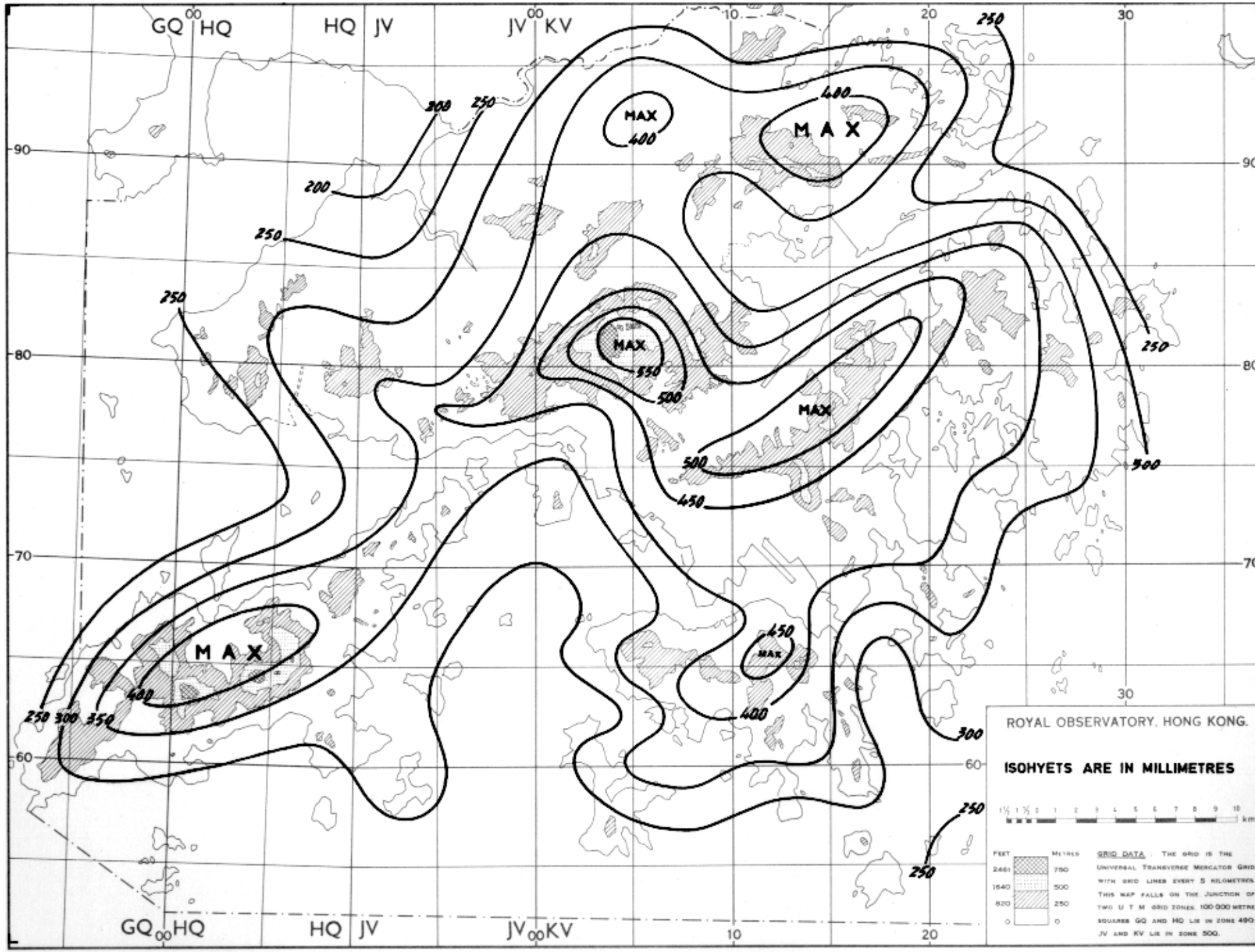
R.O. 128

Fig. 7 Mean June rainfall distribution map. (1953 – 1982)



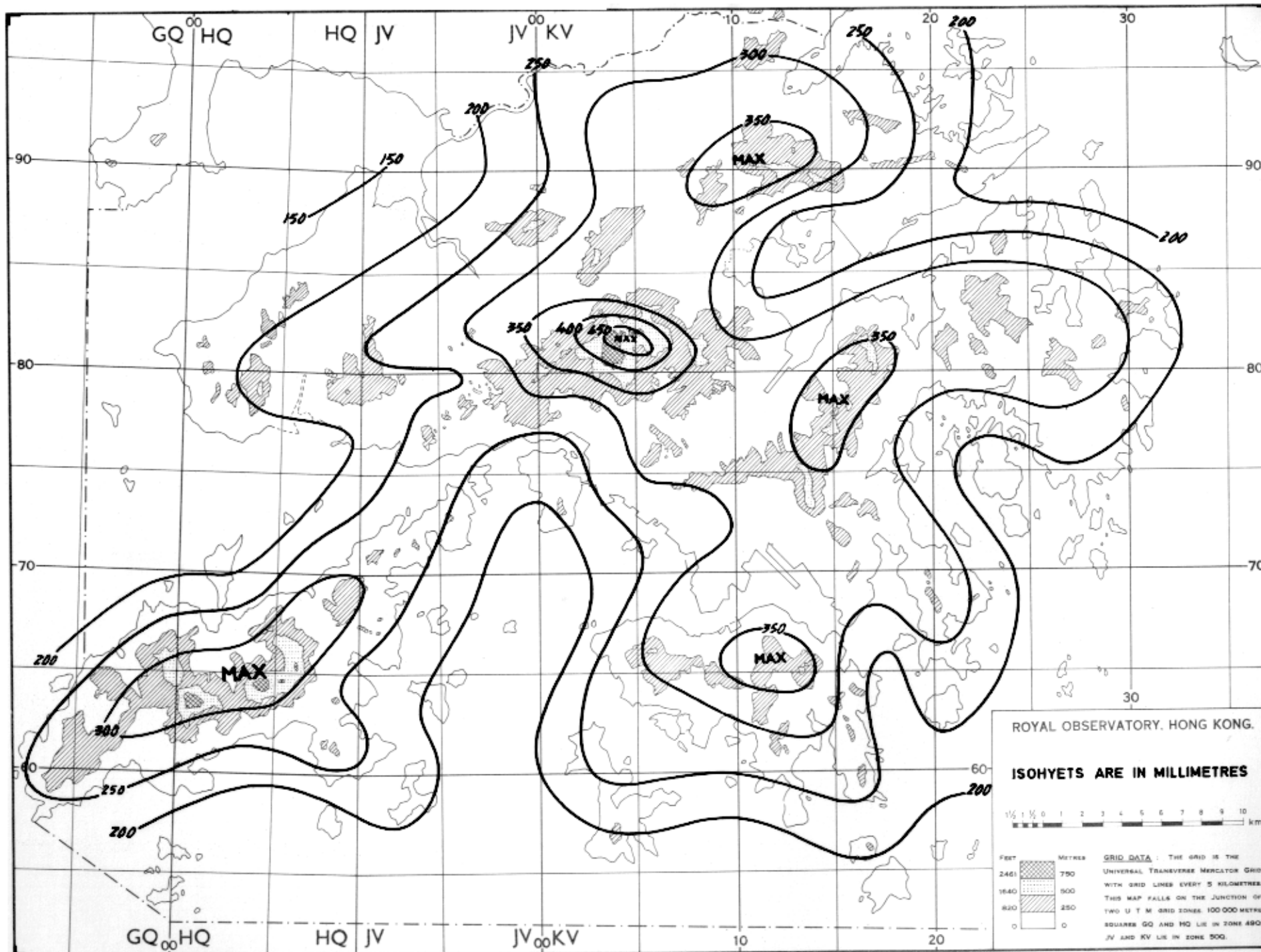
R.O. 128

Fig. 8 Mean July rainfall distribution map. (1953 - 1982)



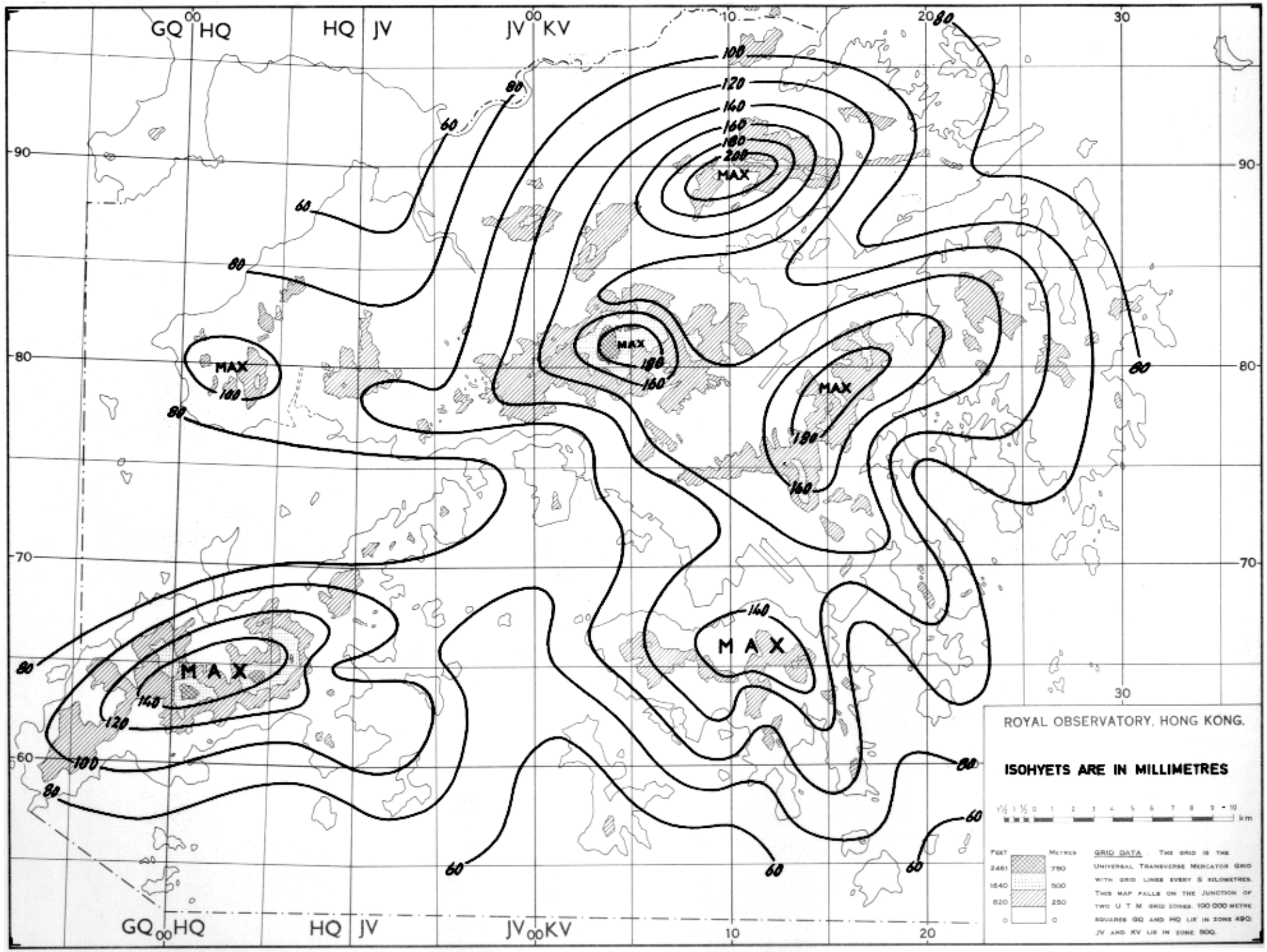
R.O. 128

Fig. 9 Mean August rainfall distribution map. (1953 - 1982)



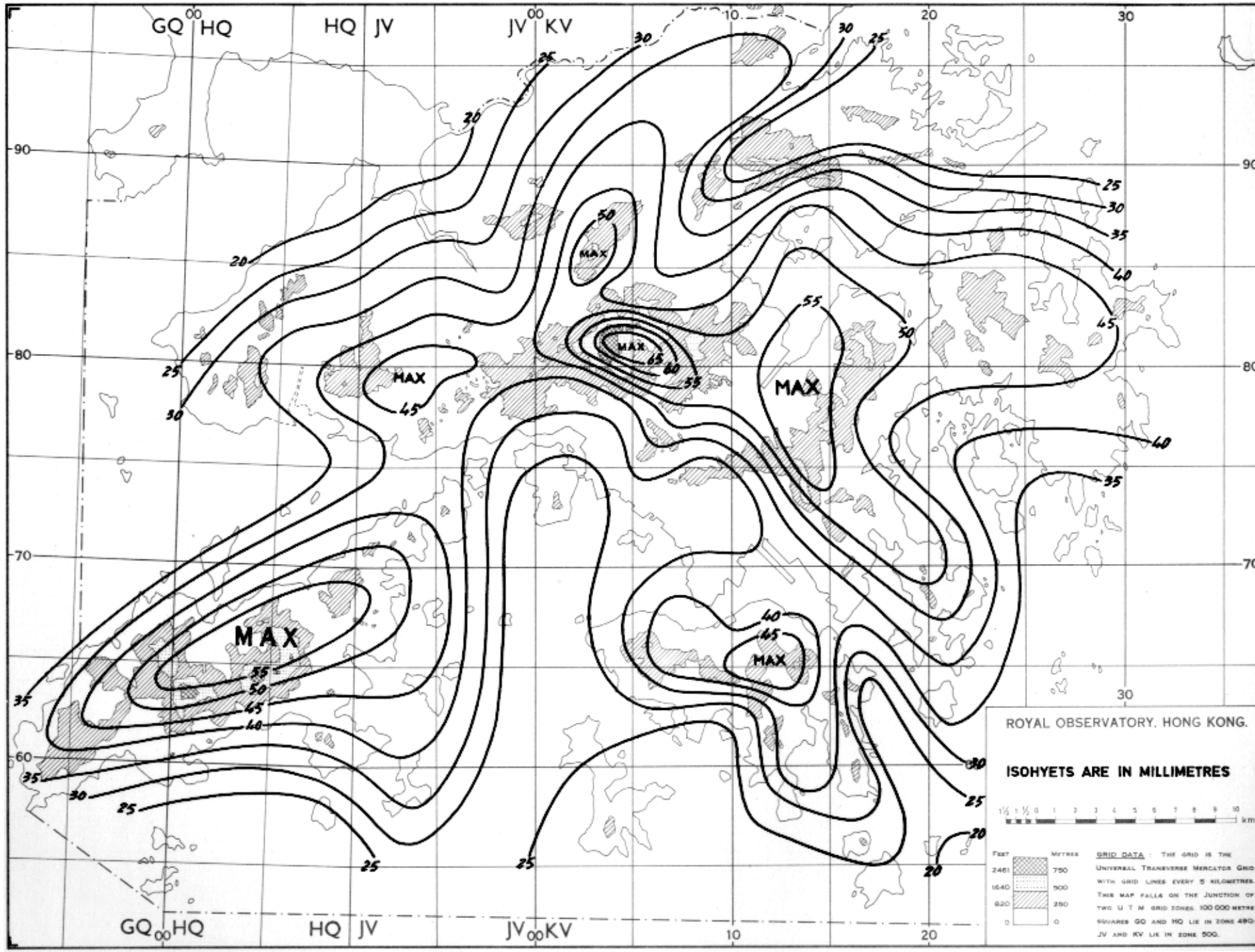
R.O. 128

Fig. 10 Mean September rainfall distribution map. (1953 – 1982)



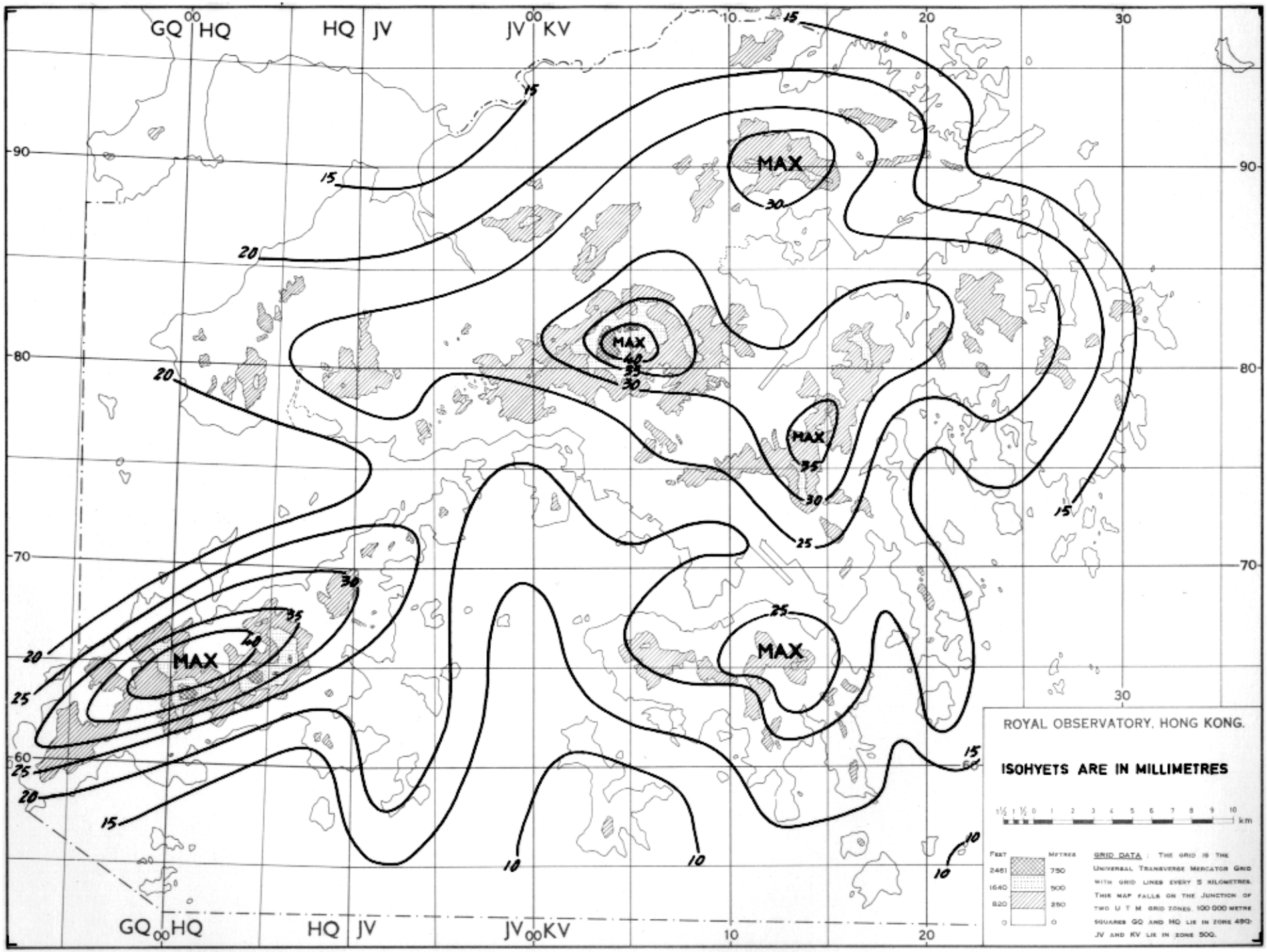
R.O. 128

Fig. 11 Mean October rainfall distribution map. (1953 – 1982)



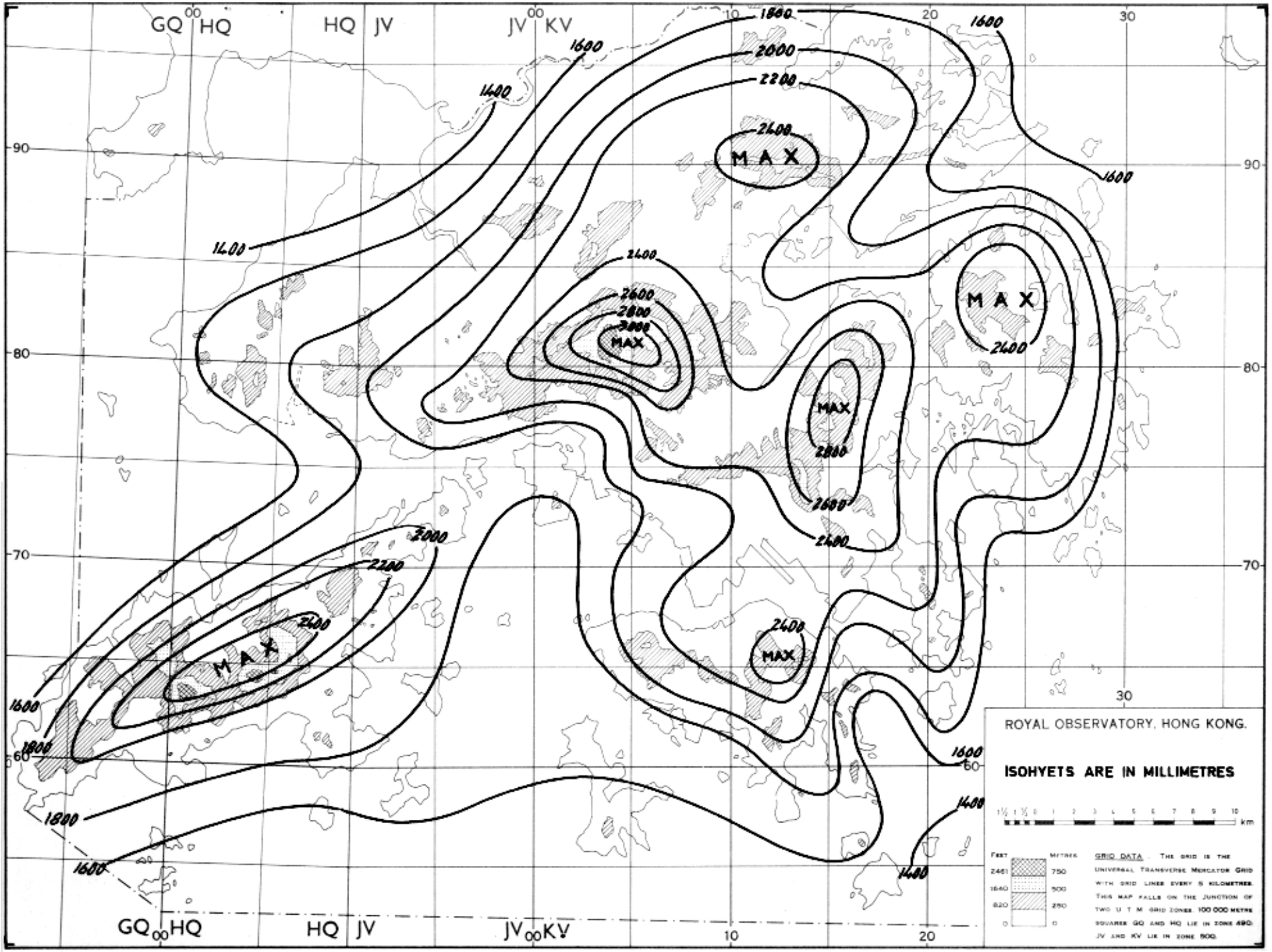
R.O. 128

Fig. 12 Mean November rainfall distribution map. (1953 – 1982)



R.O. 128

Fig. 13 Mean December rainfall distribution map. (1953 – 1982)



R.O. 128

Fig. 14 Mean annual rainfall distribution map. (1953 – 1982)