SERIES 1-7

1854 - 1953

Series 1-7

METEOROLOGICAL OFFICE

REFERENCE MANUAL

for

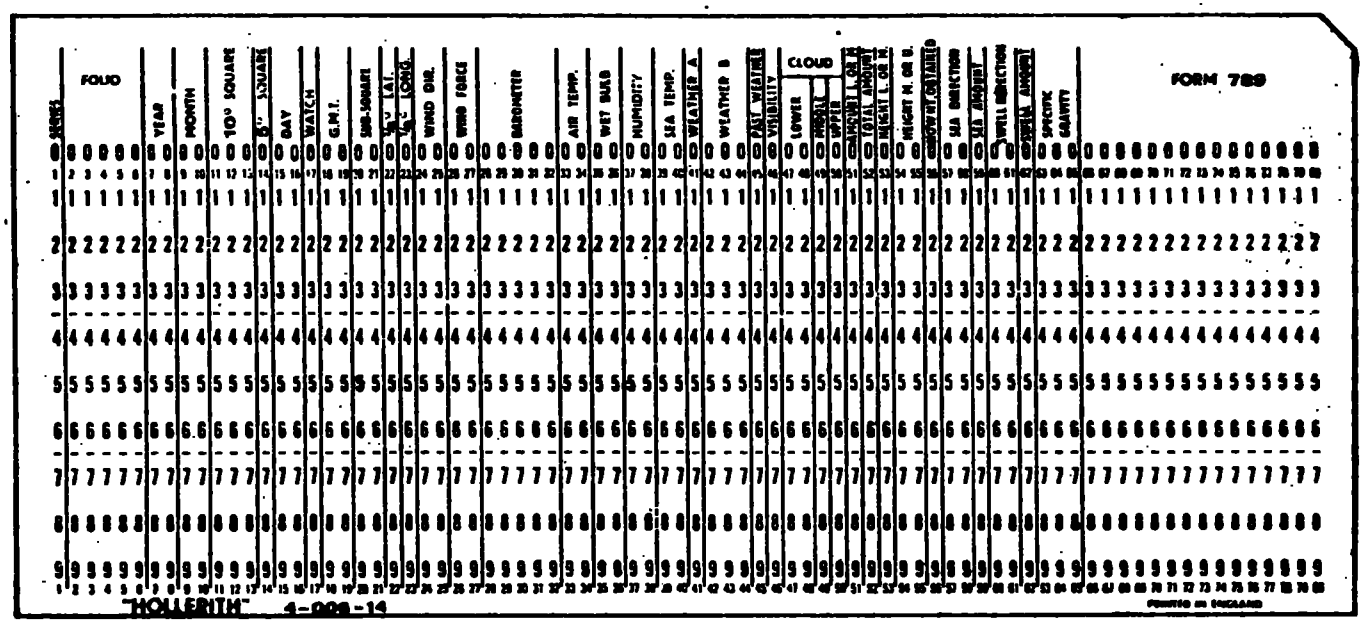
SURFACE MARINE CARD FORM 789

SERIES 1-7
(1854-1953)

REFERENCE MANUAL

for

SURFACE MARINE CARD FORM 789



Meteorological Office, M.O.18c.,
London Road,
Bracknell,
Berkshire.

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
1	Series number	1	Data for years 1854-1920	Contains only reports of wind, air and sea temperatures, cloud amount and weather.	Coded in 1930 code.
		2	Data for years 1921-29		Coded in 1921 code.
		3	Data for years 1930-39		Coded in 1930 code.
		4	Data from Admiralty logs for years 1930-48.		Coded in 1930 code.
		5	Data from Marid ships and Scottish Fishery Cruisers up to 30.6.56.	MARID reports contain only sea temperature data. Scottish Fishery Cruiser reports contain only wind, sea temperature and weather data.	Coded in 1930 code.
		6	Data from British Ocean Weather Ships for years 1947-48.		Coded in 1930 code.
		6	Data from British Ocean Weather Ships for years 1949-52.		Coded in 1949 code.
		7	Data for years 1945-48		Coded in 1930 code.
		7	Data for years 1949-53 including data from Admiralty logs.		Coded in 1949 code.
		X	Data from Dutch Ocean Weather Ships on Station "J" for years 1950-52.		This series was reproduced from Series 10 cards. For more detailed explanation see Appendix I. Generally referred to as Series 6X.
2-6	Folio number	00000-99999	The number of the log in which the observations are recorded.		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
2-6	Folio number (continued)	Blank			For Series 5 these columns were not punched. The name of the ship making the observation was written on the back of the card. For data from Admiralty logs, both Series 4 and those included in Series 7, these columns were not punched, the log number being written on the back of the card.
7-8	Year	54-99	1854 to 1899	Series 1 only.	
		00-53	1900 to 1953		
		54-56	1954 to 1956	Series 5 only.	
9-10	Month	1-9	January to September	Punched in column 10, column 9 being left blank.	Both methods of recording and punching month have been used. However, as cards are reproduced, any punched in single figure code are being converted to double figure code.
		O	October		
		X	November		
		Y	December		
		01-12	January to December		
11-13	10° Marsden square number	001-288	10° square		The globe is divided into ten degree squares according to the Marsden chart and the position of the ship at time of observation is given by the Marsden square number from the chart. See chart at Appendix II.
		300-623			
		800-835			
14	5° square	1	Square A		Each 10° Marsden square is divided into four 5° squares and given identifying letters. Square A is defined as the 5° square within a 10° square nearest both to the equator and the Greenwich Meridian. See chart at Appendix III.
		2	Square B		
		3	Square C		
		4	Square D		
15-16	Day	01-31	Day of month		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
17	Watch	1	4 a.m.		The hour A.T.S. (Actual time on ship) at which observation was made. Hour A.T.S. is the time shown on the ships' clock.
		2	8 a.m.		
		3	Noon		
		4	4 p.m.		
		5	8 p.m.		
		6	Midnight		
18-19	Hour	00-23	0000 to 2300 GMT	If these columns are blank, hour GMT can be found by conversion of Watch in Column 17.	
20-21	Marsden sub-square number	00-99	1° sub-square		Each Marsden 10° square is sub-divided into 100 one degree squares. The number of these sub-squares is obtained by taking the unit figure of the whole number of degrees of the latitude and the unit figure of the whole number of degrees of the longitude. See chart at Appendix III. Example: An observation made at 27° 55'N, 31° 28'W would be given 10° Marsden square number 076 (punched in columns 11-13) and Marsden sub-square number 71 (punched in columns 20-21).
22	¼ Degree of Latitude	Blank			1921 code only.
		0	00' to 09'		1930 and 1949 codes only. Code figure obtained by dividing minutes of latitude by ten and neglecting the remainder.
		1	10' to 19'		
		2	20' to 29'		
		3	30' to 39'		
		4	40' to 49'		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
22	1/6 Degree of Latitude (continued)	5	50′ to 59′		
		9	Minutes of latitude not reported.		
23	Sub sub-square	0	Ship under way.		1921 code only. Each 1° sub-square is divided into nine sub sub-squares as follows:- 9 8 7 (60′N) 6 5 4 (40′N) 3 2 1 (20′N) 0′ 60′W 40′W 20′W Similarly for south latitudes and east longitudes. Sub sub-square 1 is defined as the sub sub-square nearest to both the equator and the Greenwich Meridian.
		1	Ship stationary	Ship in sub sub-square 1	
		2		" " " " 2	
		3		" " " " 3	
		4		" " " " 4	
		5		" " " " 5	
		6		" " " " 6	
		7		" " " " 7	
		8		" " " " 8	
		9		" " " " 9	
23	1/6 Degree of Longitude	0	00′ to 09′		1930 and 1949 codes only. Code figure obtained by dividing minutes of longitude by ten and neglecting the remainder.
		1	10′ to 19′		
		2	20′ to 29′		
		3	30′ to 39′		
		4	40′ to 49′		
		5	50′ to 59′		
		9	Minutes of longitude not reported.		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
24-25	Wind direction	00	No observation		1930 and 1949 codes only.
		00	Calm or light variable airs		1921 code only.
		01	North by east		
		02	North northeast		
		03	Northeast by north		
		04	Northeast		
		05	Northeast by east		
		06	East northeast		
		07	East by north		
		08	East		
		09	East by south		
		10	East southeast		
		11	Southeast by east		
		12	Southeast		
		13	Southeast by south		
		14	South southeast		
		15	South by east		
		16	South		
		17	South by west		
		18	South southwest		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
24-25	Wind direction (continued)	19	Southwest by south		
		20	Southwest		
		21	Southwest by west		
		22	West southwest		
		23	West by south		
		24	West		
		25	West by north		
		26	West northwest		
		27	Northwest by west		
		28	Northwest		
		29	Northwest by north		
		30	North northwest		
		31	North by west		
		32	North		
		99	Calm or light variable airs		1930 and 1949 codes only.
		XX	No observation		1921 code only.
26-27	Wind force	00	No observation		1930 and 1949 codes only.
		00	Less than 1 knot		In 1930 and 1949 codes, in order to distinguish between "no observation" and "less than 1 knot", it is necessary to refer to direction columns 24-25, i.e. "no observation" will be coded as 0000 and "calm" will be coded as 9900.
		01	1 to 3 knots		
		02	4 to 6 knots		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
26-27	Wind force (continued)	03	7 to 10 knots		
		04	11 to 16 knots		
		05	17 to 21 knots		
		06	22 to 27 knots		
		07	28 to 33 knots		
		08	34 to 40 knots		
		09	41 to 47 knots		
		10	48 to 55 knots		
		11	56 to 63 knots		
		12	64 knots or more		
		XX	No observation		1921 code only.
28-32	Barometer	00000	No observation		1930 and 1949 codes only.
		09000-10999	900·0 to 1099·9 mb.		Corrected for temperature and gravity and reduced to mean sea level.
		XXXXX	No observation		1921 code only.
33-34	Air temperature	00	No observation		1930 and 1949 codes only.
		00-99	0°F to 99°F		
		XX	No observation		1921 code only.
35-36	Wet bulb	00	No observation		1930 and 1949 codes only.
		00-99	0°F to 99°F		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
35-36	Wet bulb (continued)	XX	No observation		1921 code only
37-38	Humidity	Blank			1921 and 1949 codes only.
		00	No observation		1930 code only.
		01-08	1% to 8%		For years 1933 to 1939 only and for shaded areas shown on chart at Appendix II only, wet bulb temperature was replaced by relative humidity. Otherwise relative humidity was never reported.
		09	9% to 10%		
		10	100%		
		11-99	11% to 99%		
39-40	Sea temperature	00	No observation		1930 and 1949 codes only.
		00-99	0°F to 99°F		
		XX	No observation		1921 code only.
41	Weather A (Visibility)	0	No observation		1930 code only.
		0	Ordinary visibility		1921 code only.
		1	Exceptional visibility	Beaufort notation v	1921 and 1930 codes only.
		2	Haze	Beaufort notation z	
		3	Mist	Beaufort notation m	
		4	Fog	Beaufort notation f or F	
		9	Ordinary visibility		1930 code only.
		X	No observation		1921 code only.
		0	No observation		1949 code only.

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices	
41	Weather A (Visibility) (continued)	1	Exceptional visibility	With 1949 International visibility code 99		
		3	Mist or haze	With 1949 International visibility code 94		
		4	Fog	With 1949 International visibility code 90-93		
		9	Ordinary visibility	With 1949 International visibility code 95-99		
42-44	Weather B	0	None of the active weather elements reported.		1921 code only.	
		000	No observation		1930 and 1949 codes only.	If more than one type of precipitation is reported the following procedure was adopted:- rd = d = 5 pr = p = 4 pd = d = 5 ps = s = 1 sr = s + r = 13 sh = s + h = 17 rh = h = 7 ph = h = 7 Examples:- 1921 code Snow, squalls = 120 Rain = 300 Thunder, hail, lightning = 677 1930 and 1949 codes. Snow, squalls = 129 Rain = 399 Thunder, hail, lightning = 678
		1	Snow	Beaufort rotation s		
		2	Squalls	Beaufort rotation q		
		3	Rain	Beaufort rotation r		
		4	Showers	Beaufort rotation p		
		5	Drizzle	Beaufort rotation d		
		6	Thunder	Beaufort rotation t		
		7	Hail	Beaufort rotation h		
		8	Dew	Beaufort rotation w	1921 code only.	
		8	Lightning	Beaufort rotation l	1930 and 1949 codes only.	
		9	Wet air	Beaufort rotation e	1921 code only.	
		9	None of the active weather elements reported		1930 and 1949 codes only.	

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
42-44	Weather B (continued)	XXX	No observation		1921 code only.
		Y	Lightning	Beaufort notation l	1921 code only.
45	Past Weather	Blank			1921 code only.
		0	Fair	Clear sky or slightly clouded.	1930 and 1949 codes only.
		1	Variable sky		
		2	Mainly overcast		
		3	Duststorm	Visibility less than 5 cables.	1 cable = 120 fathoms = 240 yards.
		4	Fog or thick dust haze	Visibility less than 5 cables.	
		5	Drizzle		
		6	Rain		
		7	Snow or sleet	Also showers of snow or sleet.	
		8	Showers	Rain or hail.	
		9	Thunderstorm	With or without precipitation.	
		X	No observation		
46	Visibility	0	No observation		1930 code only.
		0	Dense fog	Objects not visible at 50 yards.	1921 code only.
		1	Thick fog	Objects not visible at 1 cable.	
		1	Dense fog	Objects not visible at 50 yards.	1930 code only.
			Thick fog	Objects not visible at 1 cable.	

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
46	Visibility (continued)	2	Fog	Objects not visible at 2 cables	1921 and 1930 codes only.
		3	Moderate fog	Objects not visible at ½ nautical mile	
		4	Mist, haze or very poor visibility	Objects not visible at 1 nautical mile	
		5	Poor visibility	Objects not visible at 2 nautical miles	
		6	Moderate visibility	Objects not visible at 5 nautical miles	
		7	Good visibility	Objects not visible at 10 miles	
		8	Very good visibility	Objects not visible at 30 miles	
		9	Excellent visibility	Objects visible at more than 30 miles	
		X	No observation		1921 and 1949 codes only
		0	Less than 50 yards		1949 code only
		1	50 to 200 yards		
		2	200 to 500 yards		
		3	500 to 1000 yards		
		4	1000 yards to 1 nautical mile		
		5	1 to 2 nautical miles		
		6	2 to 5 nautical miles		
		7	5 to 10 nautical miles		
		8	10 to 25 nautical miles		
		9	25 nautical miles or more		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
47-48	Low cloud type	0	Stratus		1921 code only. If only one type of low cloud was reported this was punched in column 47 and column 48 was punched Y.
		6	Stratocumulus		
		7	Nimbus		
		8	Cumulus		
		9	Cumulonimbus		
		XX	No observation		
		YY	No low cloud		
		00	No observation		1930 and 1949 codes only. If only one type of low cloud was reported this was punched in column 47 and column 48 was punched 9.
		1	Stratocumulus		
		2	Nimbus	Not used in 1949 code	
		3	Cumulus		
		4	Cumulonimbus		
		5	Stratus		
		6	Scud cloud		
		7	Nimbostratus		
		88	Overcast		
		99	No low cloud		
49	Middle cloud type	4	Altocumulus		1921 code only.
		5	Altostratus		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
49	Middle cloud type (continued)	X	No observation		1921 code only.
		Y	No middle cloud		
		0	No observation		1930 and 1949 codes only.
		1	Altocumulus		
		2	Altostratus		
		3	Altocumulus and Altostratus		
		9	No middle cloud		
50	Upper cloud type	1	Cirrus		1921 code only.
		2	Cirrostratus		
		3	Cirrocumulus		
		X	No observation		
		Y	No upper cloud		
		0	No observation		1930 and 1949 codes only.
		1	Cirrus		
		2	Cirrostratus		
		3	Cirrocumulus		
		4	Cirrus and Cirrostratus		
		5	Cirrus and Cirrocumulus		
		6	Cirrostratus and Cirrocumulus		
		9	No upper cloud		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
51	Amount of low or middle cloud	Blank			1921 code only.
		0	No observation		1930 code only.
		1	0 or 1 tenth		
		2	2 tenths		
		3	3 tenths		
		4	4 tenths		
		5	5 tenths		
		6	6 tenths		
		7	7 tenths		
		8	8 tenths		
		9	9 or 10 tenths		
	Amount of low cloud	0	No low cloud		1949 code only.
		1-8	1 eighth to 8 eighths		
		9	Sky obscured	Also includes occasions when amount cannot be estimated due to darkness.	
		X	No observation		
52	Total cloud amount	0	Clear sky		1921 code only.
		1-9	1 tenth to 9 tenths		
		X	No observation		
		Y	Overcast		
		0-9	Same as 1930 code for column 51		1930 code only.

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
52	Total cloud amount (continued)	0-9 X	Same as 1949 code for column 51		1949 code only.
53	Height of low or middle cloud	Blank			1921 code only although the majority of cards punched under 1930 code, except for ocean weather ship observations, were not punched in this column either.
		0	0 to 149 feet		1930 and 1949 codes only.
		1	150 to 299 feet		
		2	300 to 599 feet		
		3	600 to 999 feet		
		4	1,000 to 1,999 feet		
		5	2,000 to 2,999 feet		
		6	3,000 to 4,999 feet		
		7	5,000 to 6,499 feet		
		8	6,500 to 7,999 feet		
		9	No cloud below 8,000 feet		
		X	No height reported		
54-56	Not used	Blank			Although card is indicated as "HEIGHT M. or U" for columns 54-55 and as "HOW HT. OBTAINED" for column 56, these columns were in fact never used.
57-58	Sea direction	Blank	Not used		1949 code only.
		00	No observation		1930 code only.

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
57-58	Sea direction (continued)	00	No disturbance		1922 code only.
		01-32	Same as wind direction columns 24-25		1921 and 1930 codes only.
		50	Confused sea	No definite direction	
		51-82	Same as wind direction columns 24-25	50 added to indicate confused sea from that direction	
		99	No disturbance		1930 code only.
		XX	No observation		1921 code only.
59	Sea amount	Blank	Not used		1949 code only.
		0	No observation		1930 code only.
		0	No disturbance		1921 and 1930 codes only. In 1930 code "O" means both "no disturbance" and "no observation". It must be assumed that if columns 57-58 are punched "OO" then "O" punched in column 59 means "no observation".
		1	Smooth		
		2	Slight		
		3	Moderate		
		4	Rough		
		5	Very rough		
		6	High		
		7	Very high		
		8	Precipitous		
		9	Confused		
		X	No observation		1921 code only.

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
60-61	Swell direction		Same as Sea direction columns 57-58		
62	Swell amount	Blank	Not used		1949 code only.
		0	No swell		1921 code only.
		1	Slight		
		2			
		3	Moderate		
		4	Rather rough		
		5	Rough		
		6	Heavy		
		7			
		8	Very heavy		
		9	Abnormal		
		X	No observation		
		0	No observation		1930 code only. As "O" means both "no swell" and "no observation" it must be assumed that if columns 60-61 are punched "OO" then "O" punched in column 62 means "no observation".
		0	No swell		
		1	Low swell	Short or average length	
		2	Low swell	Long length	
		3	Moderate swell	Short length	
		4	Moderate swell	Average length	

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
62	Swell amount (continued)	5	Moderate swell	Long length	
		6	Heavy swell	Short length	
		7	Heavy swell	Average length	
		8	Heavy swell	Long length	
		9	Confused swell		
63-64	Not used	Blank			Although card is indicated "SPECIFIC GRAVITY" for columns 63-65 this element in fact was never punched.
65	Significant cloud	Blank	Not used		1921 and 1930 codes only.
		0	Stratus or fractostratus		1949 code only.
		1	Cirrus		
		2	Cirrostratus		
		3	Cirrocumulus		
		4	Altocumulus		
		5	Altostratus		
		6	Stratocumulus		
		7	Nimbostratus		
		8	Cumulus or fractocumulus		
		9	Cumulonimbus		
		X	No observation		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
66	Amount of significant cloud	Blank	Not used		1921 and 1930 codes only.
		0-8	Nil to 8 eighths		1949 code only.
		9	Sky observed	Also includes occasions when amount cannot be estimated due to darkness.	
		X	No observation		
67-68	Height of significant cloud	Blank	Not used		1921 and 1930 codes only.
		00	Below 100 feet		1949 code only.
		01-80	100 feet to 8,000 feet	Height in 100's of feet.	
		81	9,000 feet		
		83	10,000 feet		
		84	13,000 feet		
		85	16,000 feet		
		99	Above 8,000 feet		
		XX	No observation		
69-70	Wave direction	Blank	Not used		1921 and 1930 codes only.
		01-32	Same as wind direction columns 24-25		1949 code only.
		49	Confused	Wave height less than 15 feet.	
		51-82	As 01-32	50 added. See code for Wave height column 72.	
		99	Confused	Wave height over 15 feet.	

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
69-70	Wave direction (continued)	XX	No observation		
71	Wave period	Blank	Not used		1921 and 1930 codes only.
		0	20 to 21 seconds		1949 code.
		1	Over 21 seconds		
		2	5 seconds or less		
		3	6 to 7 seconds		
		4	8 to 9 seconds		
		5	10 to 11 seconds		
		6	12 to 13 seconds		
		7	14 to 15 seconds		
		8	16 to 17 seconds		
		9	18 to 19 seconds		
		X	Calm or not determined		
72	Wave height	Blank	Not used		1921 and 1930 codes only.
		0	Calm or under 1 foot		1949 code only. If a wave height came between two of the heights shown in table then code figure for lower height was reported, e.g. wave height of 12 feet would have been reported as code figure 7.
		1	1½ feet		
		2	3 feet		
		3	5 feet		
		4	6½ feet		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
72	Wave height (continued)	5	8 feet		
		6	9½ feet		
		7	11 feet		
		8	13 feet		
		9	14 feet		
		0	16 feet	With 50 added to Wave direction columns 69-70	
		1	17½ feet		
		2	19 feet		
		3	21 feet		
		4	22½ feet		
		5	24 feet		
		6	25½ feet		
		7	27 feet		
		8	29 feet		
		9	30½ feet		
		X	No observation		
73-76			Same as columns 69-72		Provision is made for the punching of two wave groups if reported. If only one group was reported then it was punched in columns 69-72.

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
77-78	Air minus sea temperature difference	Blank	Not used		1921 and 1930 codes only.
		00-49	0° to 49°F	Air temperature greater than sea temperature	1949 code only.
		50-99	0° to 49°F	Sea temperature greater than air temperature	
		XX	No observation		
79-80	Dew point	Blank	Not used		1921 and 1930 codes only.
		00-99	0° to 99°F		1949 code only.
		XX	No observation		

APPENDIX I

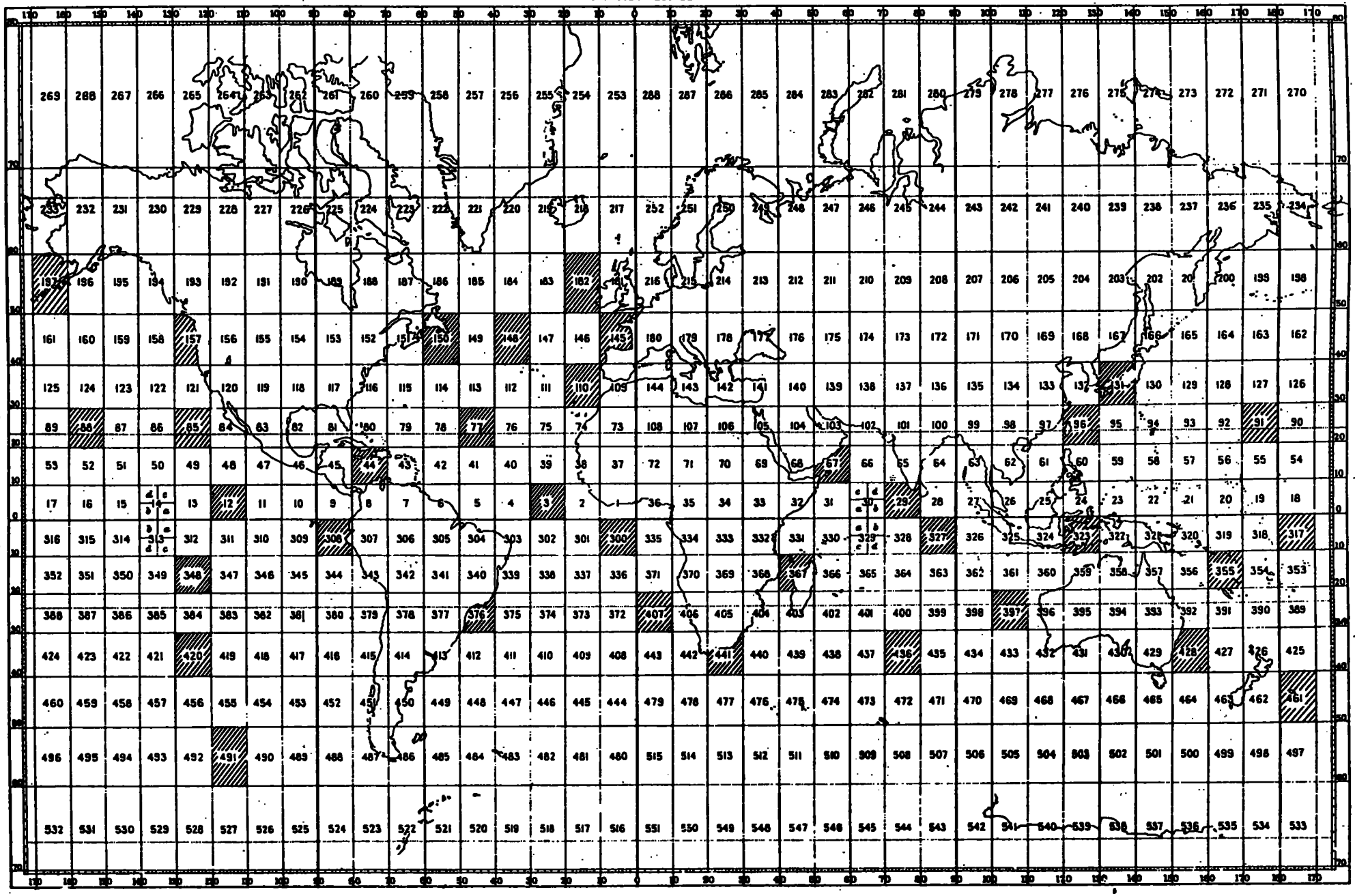
Explanation of Series 6X cards (O.W. Station "J")

For O.W. Station "J", Series 6 covers the observations made by British O.W. Ships in 1930 code up to 1948, and in 1949 code from 1949-52; Series 10 covers not only the observations made by all O.W. Ships in 1953 code from 1953 to 30.6.56, but also observations made by Dutch O.W. Ships in 1953 code from 1950-52.

As the format of these two Series is entirely different, investigations for this station over periods containing any of these years 1950-52 would require two separate machine processings, with further time needed to combine the two sets of results. It was therefore decided to reproduce as much as possible of the Series 10 punching on these 1950-52 "Dutch" cards into the Series 6 format. Of the 73 columns punched in Series 10 cards, 51 could be reproduced into the Series 6 format of 67 columns; 1 column (Series Number) was not reproduced from Series 10, but was punched "X" in the Series 6 format; the remaining 21 columns in Series 10 were not reproduced, and the remaining 15 columns normally punched in Series 6 were left blank. Details of the format of these "Series 6X" cards are as follows:

Card Column	Element	Code or Explanation
1	Series number	X = Series 6X
2-6	Form number	Number of the original coded form from which the card was punched (not the number of the logbook subsequently supplied from Holland).
7-8	Year	As 1949 code (= 1930 code)
9-10	Month	
11-13	Marsden square	
14	5° Square	
15-16	Day	
17	Watch	Not punched
18-19	GMT	As 1949 code (= 1930 code)
20-21	Subsquare number	
22	1/6° Lat.	Not punched
23	1/6° Long.	
24-25	Wind direction	As 1949 code (= 1930 code)
26-27	Wind force	
28-32	Barometer	
33-34	Air temperature	First two figures of 1953 code, which gave temperatures to 0 1°F. X overpunch, 10's col. = Temp. negative X overpunch, units col. = Temp. over 100°F.
35-36	Wet-bulb temperature	
37-38	Not used	
39-40	Sea temperature	
41	Weather (A)	Not punched
42-44	Weather (B)	As 1949 code (= 1930 code)
45	Past weather	
46	Visibility	As 1949 code
47-48	Low cloud type	Not punched
49	Middle cloud type	
50	Upper cloud type	
51	Amount of low cloud	As 1949 code
52	Total amount of cloud	
53	Height of low cloud	As 1949 code (= 1930 code)
54-64	Not used	
	Significant cloud	
65	Type	Not punched
66	Amount	As 1949 code
67-68	Height	Not punched
	Waves	
69-70	Direction	Period and Height as 1949 code. Direction is not as 1949 code, but 10's column only has been punched to show 2nd height range in 1949 code. X overpunch H't. col. = 3rd H't. range.
71	Period	
72	Height	
73-74	Direction	
75	Period	
76	Height	
77-78	Air-sea temperature	Not punched
79-80	Dew-point	As 1949 code.

APPENDIX II



Marsden Square numbers outside the area of this chart: These continue in sequence from 552 (70°–80°S., 0°–10°W.) to 623 (80°–90°S., 0°–10°E.) in the south, and from 800 (80°–90°N., 0°–10°W.) to 835 (80°–90°N., 0°–10°E.) in the north.

APPENDIX III