

SERIES 21-24

METEOROLOGICAL OFFICE

REFERENCE MANUAL

107

SURFACE MARINE CARD FORM 307

(373)

1952 - 1953 - 1954

REFERENCE MANUAL FOR SURFACE MARINE CARD FORM 6407

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
1	Temperature Indicator	1	All temperatures are punched in °C and tenths		
		2	All temperatures are punched in °F and tenths		
		3	All temperatures are punched in whole °C		
		4	All temperatures are punched in whole °F		
		5	All temperatures are punched in half °C		
		6	All temperatures are punched in half °F		
		7	All temperatures are punched in °F and tenths, except Dew point which is punched in whole °F		
2-3	Year	62-99	1962 to 1999		
4-5	Month	01-12	January to December		
6-7	Day	01-31	Day of month		
8	Octant	0	0° to 90°W	North latitude	Left blank for Light Vessels (Series 22)
		1	90°W to 180°		
		2	180° to 90°E		
		3	90°E to 0°		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
8	Octant (continued)	5	0° to 90°W	South latitude	Left blank for Light Vessels (Series 22)
		6	90°W to 180°		
		7	180° to 90°E		
		8	90°E to 0°		
9-11	Latitude	000-900	00.0° to 90.0°		Tenths figure obtained by dividing the minutes by six and neglecting the remainder. Left blank for Light Vessels (Series 22)
12-14	Longitude	000-999	00.0° to 99.9°		Tenths figure obtained by dividing the minutes by six and neglecting the remainder. When the longitude was more than 99.9° the hundreds figure was omitted. Left blank for Light Vessels (Series 22)
15-16	Hour	00-23	0000 to 2300 GMT		
17	Total Cloud Amount	0	Clear sky	Or cannot be estimated due to darkness	
		1-8	1 eighth to 8 eighths		
		9	Sky obscured		
		BLANK	No observation		
18-19	True Wind Direction	00	Calm	Wind speed of 01-05 knots	"X" overpunch in column 18 indicates measured data for wind speed and direction
		01-36	010° to 360°		
		99	Variable		
		BLANK	No observation		
20-21	Wind Speed	00-99	0 to 99 knots	With "X" overpunch on column 20	
		00-99	100 to 199 knots		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
20-21	Wind Speed (continued)	BLANK	No observation		
22-23	Visibility	90	Less than 55 yards		If visibility was between two of the distances given, then the code figure for the lower distance was reported e.g. visibility of 600 yards would have been given code figure 93.
		91	55 yards		
		92	220 yards		
		93	550 yards		
		94	1100 yards		
		95	2200 yards		
		96	2.2 nautical miles		
		97	5.4 nautical miles		
		98	10.8 nautical miles		
		99	27 nautical miles or more		
			BLANK		
24-25	Present Weather	00-49	NO PRECIPITATION AT THE SHIP AT THE TIME OF OBSERVATION		
		00-19	No precipitation, fog, dust-storm, sand storm, or drifting snow at the time of observation or during the preceding hour except for code 09.		
		00	Cloud development not observed or not observable		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices	
24-25	Present Weather (continued)	01	Clouds generally dissolving or becoming less developed	Characteristic change of the state of the sky during the past hour		
		02	State of sky on the whole unchanged			
		03	Clouds generally forming or developing			
		04	Visibility reduced by smoke			
		05	Dry haze			
		06	Widespread dust in suspension in the air, not raised by wind at or near the ship at time of observation			
		07	Dust or sand raised by wind at or near the ship at the time of observation, but no well developed dust devil(s) and no dust-storm seen			
		08	Well developed dust-devil(s) seen at or near the ship within last hour, but no dust-storm or sand-storm seen			
		09	Dust-storm or sand-storm within sight of ship or at ship during the last hour			
		10	Mist, visibility 1,100 yards or more			
		11	Shallow fog at ship not deeper than about 10 metres (33 ft.)	In patches		
		12	(visibility less than 1,100 yards)	More or less continuous		

Columns	Item	Code	Code Definition	Remarks		Reporting and Coding Practices		
24-25	Present Weather (continued)	13	Lightning visible, no thunder heard					
		14	Precipitation within sight, not reaching the ground or surface of the sea					
		15	Precipitation within sight, reaching the ground or surface of sea, but distant (i.e. estimated to be more than 5 km) from the ship					
		16	Precipitation within sight, reaching the ground or surface of sea, near to but not at the ship					
		17	Thunder heard, but no precipitation at the ship					
		18	Squalls within sight				At or within sight of the ship during preceding hour or at the time of observation	
		19	Funnel cloud(s). (Tornado cloud or waterspout)					
		20-29	Precipitation, fog or thunderstorm				At the ship during the preceding hour but not at the time of observation	
		20	Drizzle				Not freezing	Not falling as shower(s)
		21	Rain				Not freezing	
		22	Snow					
		23	Rain and snow					
		24	Freezing drizzle or freezing rain					
		25	Shower(s) of rain					

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
24-25	Present Weather (continued)	26	Shower(s) of snow, or of rain and snow		
		27	Shower(s) of hail, or of hail and rain		
		28	Fog, visibility less than 1,100 yards		
		29	Thunderstorm (with or without precipitation)		
		30-39	Dust-storm, sand-storm or drifting snow		
		30	Slight or moderate dust-storm or sand-storm	Has decreased during preceding hour	
		31		No appreciable change during preceding hour	
		32		Has increased during the preceding hour	
		33	Heavy dust-storm or sand-storm	Has decreased during preceding hour	
		34		No appreciable change during preceding hour	
		35		Has increased during preceding hour	
		36	Slight or moderate drifting snow	Generally low	
		37	Heavy drifting snow		
		38	Slight or moderate drifting snow	Generally high	
		39	Heavy drifting snow		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
24-25	Present weather (continued)	40-49	Fog at time of observation	41-49 visibility less than 1,100 yards	
		40	Fog at a distance but not at the ship during the past hour	Fog extending to a level above that of the observer	
		41	Fog in patches		
		42	Fog, sky discernible	Has become thinner during the preceding hour	
		43	Fog, sky not discernible		
		44	Fog, sky discernible	No appreciable change during the preceding hour	
		45	Fog, sky not discernible		
		46	Fog, sky discernible	Has begun, or has become thicker during the preceding hour	
		47	Fog, sky not discernible		
		48	Fog, depositing rime	Sky discernible	
		49		Sky not discernible	
		50-99	PRECIPITATION AT THE SHIP AT THE TIME OF OBSERVATION		
		50-59	Drizzle		
		50	Drizzle, not freezing, intermittent	Slight at time of observation	
		51	Drizzle, not freezing, continuous		
		52	Drizzle, not freezing, intermittent	Moderate at time of observation	
		53	Drizzle, not freezing, continuous		
		54	Drizzle, not freezing, intermittent	Heavy at time of observation	

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
24-25	Present weather (continued)	55	Drizzle, not freezing, continuous	Heavy at time of observation	
		56	Drizzle, freezing	Slight	
		57		Moderate or heavy	
		58	Drizzle and rain	Slight	
		59		Moderate or heavy	
		60-69	Rain		
		60	Rain, not freezing, intermittent	Slight at time of observation	
		61	Rain, not freezing, continuous		
		62	Rain, not freezing, intermittent	Moderate at time of observation	
		63	Rain, not freezing, continuous		
		64	Rain, not freezing, intermittent	Heavy at time of observation	
		65	Rain, not freezing, continuous		
		66	Rain, freezing	Slight	
		67		Moderate or heavy	
		68	Rain (or drizzle) and snow	Slight	
		69		Moderate or heavy	
		70-79	Solid precipitation not falling as showers		
		70	Intermittent fall of snow flakes	Slight at time of observation	
71	Continuous fall of snow flakes				

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
24-25	Present weather (continued)	72	Intermittent fall of snow flakes	Moderate at time of observation	
		73	Continuous fall of snow flakes		
		74	Intermittent fall of snow flakes	Heavy at time of observation	
		75	Continuous fall of snow flakes		
		76	Ice needles	With or without fog	
		77	Granular snow		
		78	Isolated star-like snow crystals		
		79	Ice pellets		
		80-90	Showery precipitation	No thunder at time of observation or in the preceding hour	
		80	Rain shower(s)	Slight	
		81		Moderate or heavy	
		82		Violent	
		83	Shower(s) of rain and snow	Slight	
		84		Moderate or heavy	
		85	Snow shower(s)	Slight	
		86		Moderate or heavy	
		87	Showers of soft or small hail with or without rain or rain and snow mixed	Slight	
		88		Moderate or heavy	

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
24-25	Present weather (continued)	89	Showers of hail, with or without rain or rain and snow mixed, not associated with thunder	Slight	
		90		Moderate or heavy	
		91-99	Thunderstorm	At time of observation or in preceding hour	
		91	Slight rain at time of observation	Thunderstorm during the preceding hour, but not at time of observation	
		92	Moderate or heavy rain at time of observation		
		93	Slight snow, or rain and snow mixed, or hail at time of observation		
		94	Moderate or heavy snow, or rain and snow mixed, or hail at time of observation		
		95	Thunderstorm, slight or moderate, without hail, but with rain and/or snow at time of observation	Thunderstorm at time of observation	
		96	Thunderstorm, slight or moderate, with hail at time of observation		
		97	Thunderstorm, heavy, without hail, but with rain and/or snow at time of observation		
		98	Thunderstorm combined with dust-storm or sand-storm at time of observation. No precipitation (rain, snow, hail)		
		99	Thunderstorm, heavy with hail at time of observation		
		BLANK	No observation		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
26	Past weather	0	Cloud cover $\frac{1}{8}$ or less of the sky throughout the period		
		1	Cloud cover $\frac{1}{8}$ sky or less for part of the period and more than $\frac{1}{8}$ sky for part of that period		
		2	Cloud cover more than $\frac{1}{8}$ of the sky throughout the period		
		3	Dust-storm, sand-storm or drifting snow		
		4	Fog or thick haze		
		5	Drizzle		
		6	Rain		
		7	Snow or rain and snow mixed		
		8	Shower(s)		
		9	Thunderstorm(s), with or without precipitation		
		BLANK	No observation		
27-31	Barometer	09000-10999	900.0 to 1099.9 millibars		Corrected for temperature and gravity and reduced to mean sea level
		BLANK	No observation		
32-34	Air temperature	000-999	0.0°F or °C to 99.9°F or °C		(See column 1 for units of temperature.) If temperature was reported in whole degrees then column 34 was punched "0"
		001-999	-0.1°F or °C to -99.9°F or °C	With "X" overpunch in column 32	

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
32-34	Air temperature (continued)	BLANK	No observation		
35-37	Wet bulb temperature	000- 999	0-0°F or °C to 99-9°F or °C		(See column 1 for units of temperature.) If the temperature was reported in whole degrees then column 37 was punched "0". "X" overpunch in column 37 indicates ice on the wet bulb.
		001- 999	-0-1°F or °C to -99-9°F or °C	With "X" overpunch in column 35	
		BLANK	No observation		
38	Amount of lowest cloud	0-9	as Total cloud (column 17)		
		BLANK	No observation		
39	Type of low cloud	0	No cumulus, cumulonimbus, stratocumulus or stratus		
		1	Ragged cumulus other than bad weather, or cumulus with little vertical development and seemingly flattened, or both.		
		2	Cumulus of moderate or strong vertical development generally with protuberances in the form of domes or towers, either accompanied or not by other cumulus or by strato- cumulus: all having their base at the same level.		
		3	Cumulonimbus the summits of which, at least partially, lack sharp out- lines, but are neither clearly fi- brous, cirriform nor in the form of an anvil: cumulus, stratocumulus or stratus may be present.		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
39	Type of low cloud (continued)	4	Stratocumulus formed by the spreading out of cumulus: cumulus may also be present.		
		5	Stratocumulus not proceeding from the spreading out of cumulus.		
		6	Stratus in a more or less continuous sheet or layer, or in ragged shreds, or both, but no stratus fractus of bad weather.		
		7	Stratus fractus of bad weather or cumulus fractus of bad weather (pannus), or both; usually below altostratus or nimbostratus.		
		8	Cumulus and stratocumulus, other than those formed from the spreading out of cumulus; the base of the cumulus at a different level from that of the stratocumulus.		
		9	Cumulonimbus, the upper part of which is clearly fibrous (cirriform), often in the form of an anvil; either accompanied or not by cumulus, stratocumulus, stratus or pannus.		
		BLANK	No observation		
40	Height of low cloud	0	0 to 150 feet		A height exactly equal to one of the heights in the table is reported by the higher code figure e.g. a height of 2,000 feet would be reported as code figure 5.
		1	150 to 300 feet		
		2	300 to 600 feet		

/If sky

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
40.	Height of low cloud (continued)	3	600 to 1,000 feet		If sky is not discernible due to fog or other phenomenon then code figure 0 is reported.
		4	1,000 to 2,000 feet		
		5	2,000 to 3,000 feet		
		6	3,000 to 5,000 feet		
		7	5,000 to 6,500 feet		
		8	6,500 to 8,000 feet		
		9	No cloud below 8,000 feet		
		BLANK	No observation		
41	Type of medium cloud	0	No altocumulus, altostratus or nimbostratus		
		1	Altostratus, the greatest part of which is semi-transparent: through this part the sun or moon may be weakly visible as through ground glass.		
		2	Altostratus, the greatest part of which is sufficiently dense to hide the sun or moon, or nimbostratus.		
		3	Altocumulus, the greatest part of which is semi-transparent, other than crenelated or in cumuliform tufts: the various elements of the cloud change but slowly and are all at a single level.		
		4	Patches of semi-transparent altocumulus (often in the form of almonds /or		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
41	Type of medium cloud (continued)	4	or fishes) which are at one or more levels: the elements of this cloud are continually changing in aspect.		
		5	Semi-transparent altocumulus in bands, or altocumulus in one more or less continuous layer progressively invading the sky: these altocumulus clouds generally thicken as a whole. The layer may be opaque or double with a second sheet.		
		6	Altocumulus proceeding from the spreading out of cumulus.		
		7	Any of the following: (a) Altocumulus in two or more layers, usually opaque in places and not progressively invading the sky. (b) Opaque layer of altocumulus not progressively invading the sky. (c) Altocumulus co-existing with altostratus or nimbostratus or with both.		
		8	Altocumulus with sprouts in the form of small towers or battlements, or altocumulus having the aspect of cumuliform tufts.		
		9	Altocumulus, generally at several layers in a chaotic sky: dense cirrus is usually present.		
		BLANK	No observation		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
42	Type of high cloud	0	No cirrus, cirrostratus or cirrocumulus.		
		1	Cirrus in the form of filaments, strands or hooks, not progressively invading the sky (often called "mares" tails).		
		2	Dense cirrus in patches or entangled sheaves which usually do not increase and sometimes seem to be the remains of the upper part of cumulonimbus: or cirrus with sproutings in the form of towers or battlements or having the aspect of cumuliform tufts.		
		3	Cirrus, often in the form of an anvil, either the remains of the upper parts of cumulonimbus or parts of distinct cumulonimbus, the cumuliform portions of which cannot be seen.		
		4	Cirrus in the form of hooks or of filaments, or both, progressively invading the sky: they generally become denser as a whole.		
		5	Cirrus, often in bands converging towards one or two points of the horizon and cirrostratus, or cirrostratus only: in either case they are progressively invading the sky, and generally growing denser as a whole, but the continuous veil does not reach 45 degrees above the horizon.		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
42	Type of high cloud (continued)	6	Cirrus, often in bands converging towards one or two points of the horizon and cirrostratus, or cirrostratus only: in either case they are progressively invading the sky, and generally growing denser as a whole but the continuous veil exceeds 45 degrees above the horizon without the sky being totally covered.		
		7	Veil of cirrostratus completely covering the celestial dome.		
		8	Cirrostratus not progressively invading the sky and not completely covering the celestial dome.		
		9	Cirrocumulus alone or cirrocumulus accompanied by cirrus or cirrostratus, or both, but cirrocumulus is the predominant cirriform cloud.		
		BLANK	No observation		
43-45	Sea Temperature	000 to 999	00·0°F or °C to 99·9°F or °C		(See column 1 for units of temperature) If the temperature was reported in whole degrees column 45 was punched "0".
		001 to 999	-00·1°F or °C to -99·9°F or °C	With "X" overpunch in column 43	
		BLANK	No observation		
46-48	Air minus sea temperature difference	000-999	0·0°F or °C to 99·9°F or °C	Air temperature is greater than or equal to the sea temperature	See column 1 for units of temperature
		001-999	-0·1°F or °C to -99·9°F or °C	With an "X" overpunch in column 46. Sea temperature is greater than air temperature	

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
46-48	Air minus sea temperature difference (continued)	BLANK	No observation but see Remarks	For selected ships only the air minus sea temperature difference will be calculated by computer from the values of air temperature and sea temperature if they are reported to 0.1 of a degree. For Ocean Weather Ships the values reported on the form will be punched.	
49-50	Wind wave direction	00	Calm	Direction from which waves are coming.	In the case of half way values, the higher ten-degree value was coded, e.g. 125° was coded as 13.
		01-36	010° to 360°		
		49	Confused		
		BLANK	No observation		
51-52	Wind wave period	0	20 to 21 seconds	This is punched in column 51 and column 52 will be left blank.	
		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		
		BLANK	Calm, not determined, or no observation		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
53-54	Wind wave height	00-99	00-49½ metres	Punched in half metres e.g. Less than ¼ metre is punched as 00 3½ metres is punched as 07 22 metres is punched as 44	
		BLANK	No observation		
55-60	Swell wave direction, period and height		As for columns 49-54		
61-62	Country of origin	00	Netherlands		This is the country which actually recruited the ship.
		01	Norway		
		02	U.S.A.		
		03	United Kingdom		
		04	France		
		05	Denmark		
		06	Italy		
		07	India		
		08	Hong Kong		
		09	New Zealand		
		10	Ireland		
		11	Philippines		
12	United Arab Republic				

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
61-62	Country of origin (continued)	13	Canada		
		14	Belgium		
		15	South Africa		
		16	Australia		
		17	Japan		
		18	Pakistan		
		19	Argentina		
		20	Sweden		
		21	Federal Republic of Germany		
		22	Iceland		
		23	Israel		
		24	Federation of Malaya		
25	U.S.S.R.				
63	Card Indicator	0	Punched according to W.M.O. codes, effective in the year indicated in columns 2-3.		
		5	Data with deviating codes as indicated in column 1, otherwise punched according to W.M.O. codes, effective in the year indicated in columns 2-3.		
64-66	NOT USED	BLANK			

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
67-68	Series number	21	MARID reports and Scottish Fishery Cruisers from 1.1.62 onwards		
		22	Light Vessel reports from 1.1.62 onwards		
		23	Observations from British, H.M. Ships, Commonwealth and certain foreign ships from 1.1.62 onwards		
		24	British, French and Dutch Weather Ships on stations "A", "I" and "J" from 1.1.62 onwards		
69-73	NOT USED	BLANK			
74-76	Dew point	000-999	0.0°C or °F to 99.9°C or °F		See column 1 for units of temperature
		001-999	-0.1°C or °F to -99.9°C or °F	With "X" overpunch in column 74	
		BLANK	No observation but see Remarks	The Dew point will be calculated by computer for selected ships only, from the values of air temperature and wet bulb temperature if they are reported to 0.1 of a degree. For Ocean Weather Ships the figures reported on the form will be punched.	
77	Wind force	0	Less than 1 knot		Beaufort scale
		1	1 to 3 knots		
		2	4 to 6 knots		
		3	7 to 10 knots		
		4	11 to 16 knots		

Columns	Item	Code	Code Definition	Remarks	Reporting and Coding Practices
77	Wind force (continued)	5	17 to 21 knots		Beaufort scale
		6	22 to 27 knots		
		7	28 to 33 knots		
		8	34 to 40 knots		
		9	41 to 47 knots		
		0	48 to 55 knots	With "X" overpunch	
		1	56 to 63 knots		
		2	64 knots or more		
		BLANK		The Beaufort force will be calculated from the wind speed by computer for selected ships only. For Ocean Weather Ships this column will be left blank.	
78-80	Logbook No.	001-999		Last three figures of the serial number of the logbook in which the observations are recorded. The Light Vessel identification number is punched in columns 79-80 and 78 is left blank.	
		001-999		With "X" overpunch for H.M. ships.	