

NORTHERN HEMISPHERE MARINE

This reference manual was prepared for use with punched card deck 111, produced from several classified sources of observational data, containing manuscript reports, such as ship weather observations, logs, and other original observational records for the 30-year period 1899-1928.

The great bulk of the reports has been furnished by merchant ships flying the flags of every maritime nation, and some have been supplied by the navies of the world.

Mention should be made of the scarcity of reports during the war years - 1914-1917.

It is certain, however, that ship observations have been made for which records were not available during the punching of the Northern Hemisphere Marine deck.

Data for some areas are meager, simply because few observations were made, as those areas are removed from the regular trade routes and ships rarely enter them.

WEATHER ELEMENTS PUNCHED

When reported the following weather data were coded and punched in the indicated columns:

ELEMENTS

COLUMN NUMBER

Wind direction	17-18
Wind force	19
Present weather	20-21
Atmospheric pressure	22-23
Visibility	24
Air temperature	25-26
Sea temperature	27-28
Wet bulb temperature	29-30
State of sea	31
Form of low cloud	32
Form of middle cloud	33
Form of high cloud	34
Total amount of clouds	35
Temperature difference (air and water)	36
Character of swell	37
Direction of swell	38
Past weather	39
Amount of low clouds	40
Direction of ship	41
Speed of ship	42
Characteristic of pressure change	43
Amount of pressure change	44-45
Wind force	46

GENERAL PRACTICES

Wind force Beaufort 0 - 9 was punched in column 19. Beaufort force 10, 11, or 12 was indicated by a 9 punched in column 19 and either a 1, 2, or 3, respectively, punched in column 46.

In most cases, unless otherwise designated, X's were punched in the appropriate columns of the card to indicate one or more elements of an observation was missing. Occasionally, blank spaces were used to signify missing data.

Only columns 1 - 46 were utilized for the punching of weather data.

It is not known with any degree of accuracy, when punched, what information is punched in columns 47 - 80. It is believed that information punched in these columns has served its purpose, such as a medium for plotting Northern Hemisphere map, etc., and no longer has any significance.

FORM OF PUNCH CARD USED

Due to the war, it was impossible to secure a sufficient quantity of I.B.M. punch card number 728519 to complete this project. Therefore, this card form was supplemented by I.B.M. card forms 5080 and 728013. All of these card forms were punched exactly alike.

A sample of the official punch card is shown below:

CARD CONTENT					SOURCE CONTENT	
Col- umns	Item	Code	Code Definition	Remarks	Units or Symbols	Reporting and Coding Practices
1-2	Month	01-12	January - December		Jan. - Dec.	
3-4	Day	01-31	Day of month		01-31	
5-6	Year	99-28	1899-1928		99-28	
7	Day of Week	1-7	Day of week		1 - 7	
8	Quadrant of Globe	0-1-2-3 5-6-7-8	Division of globe		Same as Code	
9-11	Latitude	000-090	Angular distance north or south of equator		Tenths of a Degree	
12-14	Longitude	000-090	Distance east or west measured by the arc between two meridians one of which passes through any given point and the other through a point chosen as standard of reference, usually Greenwich, Eng.		Tenths of a Degree	
15-16	Hour	00-23	0000-2359	Greenwich Mean Time	0000-2359	
17-18	Wind Direction	00	Calm		Letters and Direction Arrows	
		02	North-northeast			
		04	Northeast			
		06	East-northeast			
		08	East			
		10	East-southeast			
		12	Southeast			
		14	South-southeast			
		16	South			
		18	South-southwest			
		20	Southwest			
		22	West-southwest			
		24	West			
		26	West-northwest			
		28	Northwest			
30	North-northwest					
32	North					
	XX	Missing data	Both X's and blank used to indicate no data.	Blank or M		
19	Wind Force	0	Less than 1	When wind force was 10, 11, or 12, a 1, 2 or 3, respectively, was punched in column 46 and a 9 punched in column 19.	Knots or Miles per Hour	Knots and miles per hour converted to Beaufort before punching.
		1	1-3			
		2	4-7			
		3	8-12			
		4	13-18			
		5	19-24			
		6	25-31			

CARD CONTENT					SOURCE CONTENT	
Col- umns	item	Code	Code Definition	Remarks	Units or Symbols	Reporting and Coding Practices
19	Wind Force	7	32-38		Knots or Miles per Hour.	
		8	39-46			
		9	47-54			
		9*	55-63*			
		9*	64-75*			
		9*	Above 75*			
			*Code as "9" and add Gale, Storm or Hur- ricane, as appro- priate.			
	X Blank	Missing data	Both X and blank used to indicate no data.	Blank or M		
20-21	Present Weather	00	Cloudless (from no clouds up to but not including 1/10)		Different Symbols	
		01	Partly cloudy (from exactly 1/10 to ex- actly 5/10)			
		02	Cloudy (over 5/10 up to and including exactly 9/10)			
		03	Overcast (over 9/10)			
		04	Low fog, whether on ground or at sea			
		05	Haze (but visibility 1,000 meters, 1,100 yards or more)			
		06	Dust devils seen			
		07	Distant lightning			
		08	Light fog (visibil- ity 1,000 meters, 1,100 yards or more)			
		09	Fog at a distance, but not at station (or ship)			
		10	Precipitation with- in sight			
		11	Thunder; without precipitation at station (or ship)			
		12	Duststorm within sight, but not at station (or ship)			
		13	Ugly, threatening sky			
		14	Squally weather			
15	Heavy squalls in last three hours					
16	Waterspouts seen in last three hours					
17	Visibility reduced by smoke					

CARD CONTENT					SOURCE CONTENT		
Col- umns	item	Code	Code Definition	Remarks	Units or Symbols	Reporting and Coding Practices	
20-21	Present Weather	18	Blowing dust (visi- bility 1,000 meters, 1,100 yards or more)		Different Symbols		
		19	Signs of tropical storm or hurricane				
		20	Precipitation in any form				
		21	Drizzle				
		22	Continuous or inter- mittent rain				
		23	Continuous or inter- mittent snow				} <u>In last hour, but not at time of observation.</u>
		24	Continuous or inter- mittent rain and snow, mixed				
		25	Rain showers				
		26	Snow showers				
		27	Hail, or rain and hail, showers				
		28	Light or moderate thunderstorm				} <u>With precipitation in last hour, but no precipitation at time of observation.</u>
		29	Heavy thunderstorm				
		30	Duststorm or sand- storm				
		31	Duststorm or sand- storm, has decreased				
		32	Duststorm or sand- storm, no appreciable change				
		33	Duststorm or sand- storm, has increased				
		34	Line of duststorms				
		35	Storm of drifting snow				
		36	Light or moderate storm of drifting snow				} <u>Generally low.</u>
		37	Heavy storm of drift- ing snow				
		38	Light or moderate storm of drifting snow				} <u>Generally high.</u>
		39	Heavy storm of drift- ing snow				
		40	Fog				
		41	Moderate fog in last hour				} <u>But not at time of observation.</u>
		42	Thick or dense fog in last hour				
		43	Fog, sky discernible				} <u>Has become thinner during last hour.</u>
44	Fog, sky not discern- ible						
45	Fog, sky discernible	} <u>No appreciable change during last hour.</u>					
46	Fog, sky not discern- ible						

CARD CONTENT					SOURCE CONTENT		
Col- umns	item	Code	Code Definition	Remarks	Units or Symbols	Reporting and Coding Practices	
20-21	Present Weather	47	Fog, sky discernible	} <u>Has begun or become thicker during last hour.</u>	Different Symbols		
		48	Fog, sky not discernible				
		49	Fog in patches	} <u>Light drizzle.</u>			
		50	Drizzle				
		51	Intermittent				
		52	Continuous	} <u>Moderate drizzle.</u>			
		53	Intermittent				
		54	Continuous				
		55	Intermittent	} <u>Heavy drizzle.</u>			
		56	Continuous				
		57	Drizzle and fog	} <u>Light rain.</u>			
		58	Light or moderate drizzle and rain				
		59	Heavy drizzle and light rain				
		60	Rain				
		61	Intermittent				
		62	Continuous				
		63	Intermittent				} <u>Moderate rain.</u>
		64	Continuous				
		65	Intermittent				} <u>Heavy rain.</u>
		66	Continuous				
		67	Rain and fog	} <u>Rain and snow, mixed.</u>			
		68	Light or moderate				
		69	Heavy				
		70	Snow	} <u>Light snow in flakes.</u>			
		71	Intermittent				
		72	Continuous				
		73	Intermittent				} <u>Moderate snow in flakes.</u>
		74	Continuous				
		75	Intermittent	} <u>Heavy snow in flakes.</u>			
76	Continuous						
77	Snow and fog	} <u>Rain.</u>					
78	Snow grains						
79	Ice Crystals; or sleet (U.S. definition)						
80	Showers						
81	Showers of light or moderate						
82	Showers of heavy		} <u>Snow.</u>				
83	Showers of light or moderate						
84	Showers of heavy		} <u>Rain and snow.</u>				
85	Showers of light or moderate						
86	Showers of heavy						
87	Showers of snow pellets						
88	Showers of light or moderate	} <u>Hail, or rain and hail.</u>					
89	Showers of heavy						

CARD CONTENT					SOURCE CONTENT	
Col- umns	item	Code	Code Definition	Remarks	Units or Symbols	Reporting and Coding Practices
20-21	Present Weather	90	Thunderstorm with precipitation falling	At time of observation.	Different Symbols	
		91	Rain and thunder in last hour, but only rain			
		92	Precipitation and thunder during last hour, but only snow, or rain and snow mixed			
		93	Light thunderstorm, without hail, but with rain or snow			
		94	Light thunderstorm, with small hail			
		95	Moderate thunderstorm, without hail, but with rain or snow			
		96	Moderate thunderstorm, with small hail			
		97	Heavy thunderstorm, without hail, but with rain or snow			
		98	Thunderstorm, combined with dust-storm			
		99	Heavy thunderstorm, with hail			
			XX Blank	Missing data	Both X's and blank used to indicate no data.	Blank or M
22-23	Atmos- pheric Pressure	00-99	800 to 1099 millibars		Inches, Mil- limeters, Millibars	All pressures were reduced to sea level, standard gravity, and corrected for temperature.
		XX Blank	Missing data	Both X's and blank used to indicate no data.	Blank or M	
24	Visibility		Visibility in Miles		Various Units	
			Objects are visible at	Objects not visible at		
		0	-	1/32 (55 yds.)		
		1	1/32 (55 yds.)	1/8 (220 yds.)		
		2	1/8 (220 yds.)	5/16 (550 yds.)		
		3	5/16 (550 yds.)	5/8 (1,100 yds.)		
		4	5/8 (1,100 yds.)	1-1/4 (2,200 yds.)		
		5	1-1/4 (2,200 yds.)	2-1/2 miles		
		6	2-1/2 miles	6 miles		
		7	6 miles	12 miles		
		8	12 miles	30 miles		
		9	30 miles			
			X Blank	Missing data	Both X and blank used to indicate no data.	Blank or M

CARD CONTENT					SOURCE CONTENT	
Col- umns	item	Code	Code Definition	Remarks	Units or Symbols	Reporting and Coding Practices
25-26	Air Tempera- ture	00-99	0° Fahrenheit to 99° Fahrenheit		-20 to 130	
		00-99	100° Fahrenheit to 199° Fahrenheit			
		01-99	-99° Fahrenheit to 1° Fahrenheit			
		XX Blank	Missing data			
27-28	Sea Tempera- ture	00-99	0° Fahrenheit to 99° Fahrenheit		Whole De- grees F.	
		XX Blank	Missing data			
29-30	Wet Bulb Tempera- ture	00-99	0° Fahrenheit to 99° Fahrenheit	This element rarely reported.	Whole De- grees F.	
		01-99	-1° Fahrenheit to -99° Fahrenheit			
		XX Blank	Missing data			
31	State of Sea		Height of wave, crest to trough:		Same as Code	
		0	0			
		1	Less than 1 foot			
		2	1 to 3 feet			
		3	3 to 5 feet			
		4	5 to 8 feet			
		5	8 to 12 feet			
		6	12 to 20 feet			
		7	20 to 40 feet			
		8	Over 40 feet			
		9	Confused			
X Blank	Missing data	Both X and blank used to indicate no data.	Blank or M			
32	Form of Low Cloud	0	No low clouds		Same as Code	
		1	Cumulus of fine weather			
		2	Cumulus heavy and swelling, without anvil top			
		3	Cumulonimbus			
		4	Stratocumulus formed by the flattening of cumulus			
		5	Layer of stratus or stratocumulus			
		6	Low broken up clouds of bad weather			
		7	Cumulus of fine wea- ther and stratocumu- lus			

CARD CONTENT					SOURCE CONTENT	
Col- umns	item	Code	Code Definition	Remarks	Units or Symbols	Reporting and Coding Practices
32	Form of Low Cloud	8	Heavy or swelling cumulus, or cumulonimbus, and stratocumulus		Same as Code	
		9	Heavy or swelling cumulus (or cumulonimbus) and low ragged clouds of bad weather			
		X Blank	Missing data			
33	Form of Middle Cloud	0	No middle clouds		Same as Code	
		1	Typical altostratus, thin			
		2	Typical altostratus, thick (or nimbostratus)			
		3	Alto cumulus, or high stratocumulus, sheet at one level only			
		4	Alto cumulus in small isolated patches; individual clouds often show signs of evaporation and are more or less lenticular in shape			
		5	Alto cumulus arranged in more or less parallel bands, or an ordered layer advancing over sky			
		6	Alto cumulus formed by a spreading out of the tops of cumulus			
		7	Alto cumulus associated with altostratus or altostratus with a partially alto cumulus character			
		8	Alto cumulus castellatus or scattered cumuliform tufts			
		9	Alto cumulus in several sheets at different levels, generally associated with thick fibrous veils of cloud and a chaotic appearance of the sky			

CARD CONTENT					SOURCE CONTENT	
Col- umns	item	Code	Code Definition	Remarks	Units or Symbols	Reporting and Coding Practices
33	Form of Middle Cloud	X	Missing data	Both X and blank used to indicate no data.	Blank or M	
		Blank				
34	Form of High Cloud	0	No high clouds (no cirrus clouds)		Same as Code	
		1	Cirrus, delicate, not increasing, scattered and isolated masses			
		2	Cirrus, delicate, not increasing, abundant, but not forming a continuous layer			
		3	Cirrus of anvil clouds, usually dense			
		4	Cirrus, increasing, generally in the form of hooks ending in a point or in a small tuft			
		5	Cirrus (often in polar bands) or cirrostratus advancing over the sky, but not more than 45° above the horizon			
		6	Cirrus (often in polar bands) or cirrostratus advancing over the sky and more than 45° above the horizon			
		7	Veil of cirrostratus covering the whole sky			
		8	Cirrostratus, not increasing and not covering the whole sky			
		9	Cirrocumulus predominating, associated with a small quantity of cirrus			
			X			
	Blank					
35	Total Amount of Clouds	0	Absolutely no clouds		Various Units	
		1	Less than one-tenth			
		2	One-tenth			
		3	Two- or three-tenths			

CARD CONTENT					SOURCE CONTENT	
Col- umns	item	Code	Code Definition	Remarks	Units or Symbols	Reporting and Coding Practices
35	Total Amount of Clouds	4	Four-, five-, six- tenths		Various Units	
		5	Seven- or eight- tenths			
		6	Nine-tenths			
		7	More than nine- tenths, but with openings			
		8	Sky fully covered			
		9	Sky obscured by fog, duststorm, etc.			
		X Blank	Missing data			
36	Tempera- ture Difference (Air and Water)	0	More than 9° F.	} Air temperature same as or higher than sea tempera- ture. } Air temperature lower than sea temperature.	Degrees Fahrenheit	
		1	6° to 9°			
		2	3° to 6°			
		3	1° to 3°			
		4	No difference or less than 1° F. higher			
		5	Less than 1° F.			
		6	1° to 3°			
		7	3° to 6°			
		8	6° to 9°			
		9	More than 9°			
X Blank	Missing data	Both X and blank used to indicate no data.	Blank or M			
37	Character of Swell	0	No swell		Same as Code	
		1	Low swell, short or average length			
		2	Low swell, long			
		3	Moderate swell, short			
		4	Moderate swell, average length			
		5	Moderate swell, long			
		6	Heavy swell, short			
		7	Heavy swell, average length			
		8	Heavy swell, long			
		9	Confused swell			
X Blank	Missing data	Both X and blank used to indicate no data.	Blank or M			
38	Direction of Swell	0	No sea or swell		C NE ENE, E, ESE SE SSE, S, SSW SW	
		1	Northeast			
		2	East			
		3	Southeast			
		4	South			
		5	Southwest			

CARD CONTENT					SOURCE CONTENT	
Col- umns	item	Code	Code Definition	Remarks	Units or Symbols	Reporting and Coding Practices
38	Direction of Swell	6	West		WSW, W, WNW	
		7	Northwest		NW	
		8	North		NNW, N, NNE	
		9	All directions or no definite direction			
		X Blank	Missing data		Both X and blank used to indicate no data.	
39	Past Weather	0	Clear or scattered clouds		Letters	
		1	Broken clouds or variable sky			
		2	Overcast			
		3	Sandstorm or dust- storm, or storm of drifting snow			
		4	Fog, or thick dust haze (visibility less than 1,000 me- ters, 1,100 yards)			
		5	Drizzle			
		6	Rain			
		7	Snow or sleet			
		8	Showers			
		9	Thunderstorm			
		X Blank	Missing data			
40	Amount of Low Clouds	0	Absolutely no clouds		Various Units	
		1	Less than one-tenth			
		2	One-tenth			
		3	Two- or three-tenths			
		4	Four-, five-, six- tenths			
		5	Seven- or eight- tenths			
		6	Nine-tenths			
		7	More than nine-tenths but with openings			
		8	Sky fully covered			
		9	Sky obscured by fog, duststorm, etc.			
X Blank	Missing data	Both X and blank used to indicate no data.	Blank or M			
41	Direction of Ship	0	No sea or swell or ship hove to		Same as Code	
		1	Northeast			
		2	East			
		3	Southeast			
		4	South			
		5	Southwest			
		6	West			
		7	Northwest			

CARD CONTENT					SOURCE CONTENT	
Col- umns	item	Code	Code Definition	Remarks	Units or Symbols	Reporting and Coding Practices
41	Direction of Ship	8	North	Both X and blank used to indicate no data.	Same as Code	
		9	All directions or no definite direction			
		X Blank	Missing data		Blank or M	
42	Speed of Ship	0	Ship stopped	Both X and blank used to indicate no data.	Knots	
		1	1 to 3 knots			
		2	4 to 6 knots			
		3	7 to 9 knots			
		4	10 to 12 knots			
		5	13 to 15 knots			
		6	16 to 18 knots			
		7	19 to 21 knots			
		8	22 to 24 knots			
		9	Over 24 knots			
		X Blank	Missing data		Blank or M	
43	Character- istic of Pressure Change	0	Rising, then falling	} Barometer now higher than, or the same as 3 hours ago. } Barometer now lower than 3 hours ago.	0 - 9	When the pressure tendency was shown merely as plus or minus, it was punched as "3" or "8", respectively.
		1	Rising, then steady; or rising, then ris- ing more slowly			
		2	Rising unsteadily, or unsteady			
		3	Rising steadily, or steady			
		4	Falling or steady, then rising; or ris- ing, then rising more quickly			
		5	Falling, then rising			
		6	Falling, then steady; or falling, then falling more slowly			
		7	Falling unsteadily, or unsteady			
		8	Falling steadily			
		9	Steady or rising, then falling; or falling, then falling more quickly			
		X Blank	Missing data			
44-45	Amount of Pressure Change	00-99	0 to 99 fifths of a millibar	Both X's and blank used to indicate no data.	Fifths of a Millibar	
		XX Blank	Missing data		Blank or M	

CARD CONTENT					SOURCE CONTENT	
Col- umns	item	Code	Code Definition	Remarks	Units or Symbols	Reporting and Coding Practices
46	Wind Force	1	10 - whole gale	When wind force was 10, 11, or 12, a 1, 2, or 3, respectively, was punched in column 46, and a 9 was punched in column 19.	Description	
		2	11 - storm			
		3	12 - hurricane			
		Blank	9 or less		0 - 9	
47-49	Ship Number	000-999	Arbitrary ship number	An arbitrary ship number was punched in these columns for part of the record as a medium for plotting the Northwest Pacific maps. Having served its purpose, the information no longer has any significance.	000-999	
		Blank	Discontinued the punching of record ship number		Blank	
50-51	Hour	00-23	Source time	All source time converted to Greenwich Mean Time.	00-23	
52-80	In most cases, these columns were not used. However, if they were used the data are of no significance.					