U. S. NAVY SHIPS LOG MARINE SURFACE OBSERVATIONS

This reference manual was prepared for use with punched card deck 195, produced from surface observations recorded in the meteorological section of U. S. Navy Ships Logs, source 913. Observations for the period of World War II from January 1942 through December 1945 were punched. Two different reporting forms and coding systems were in use during this period, the first from the beginning of the period until approximately the end of May, 1944, and the other commencing at about that time and continuing to the end of the period. The changeover date is only approximate, and varied from ship to ship, depending upon the time of receipt of new forms and instructions. An attempt was made to coordinate the two codes and punch the observations into a common coding system, generally described by the headings of the fields of the printed card form. The exceptions for which common practice could not be used were sea and swell descriptions. Throughout this manual, reporting and punching practices which apply to the period January, 1942, through May, 1944, are indicated by the symbol (*), and those which pertain to the June, 1944, through December 1945, period are marked with the symbol (#). These notes should be carefully studied before using the data punched, to avoid serious errors in preparing tabulations from the cards.

An attempt was made through an elaborate search to eliminate duplicate observations. A work sheet was prepared for each ship, indicating observations to be punched. These work sheets can be found on the microfilm copy of the source material, preceding the microfilmed data sheets of punched deck log pages. Observations were marked with the following codes, to indicate action to be taken by card punchers:

✓ Observations to be punched when ship was at sea

P Observations to be punched when ship was in port or immediate vicinity

N Observations not to be punched when ship was in port or immediate vicinity

X Observations not to be punched when ship was at sea

Additional notes were made on the work sheets, indicating pertinent instructions for changes in forms and punching conversions. The microfilm was made upon completion of the punching of the deck, and the documents are not in a definite order numerically or alphabetically. An index is available, in both these orders, indicating the ship number, name, period of record punched, and film roll number.

Weather Elements Punched

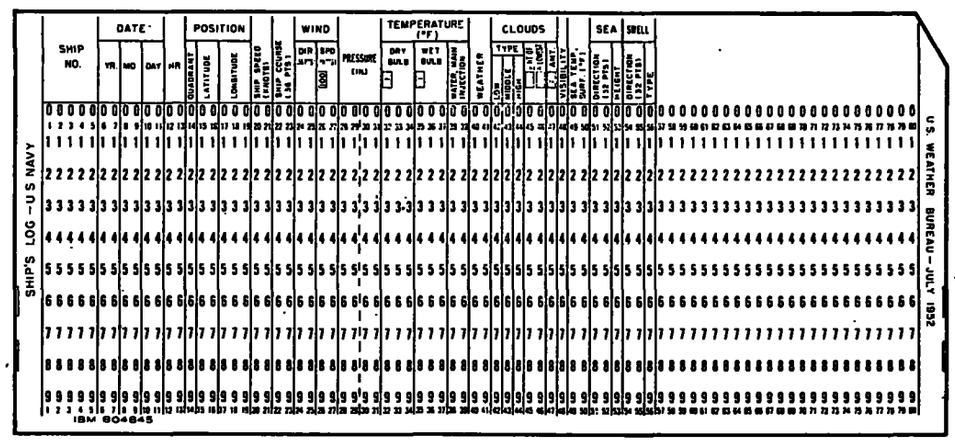
The following elements were punched, when available: wind direction and speed, sea level pressure, dry bulb temperature, wet bulb temperature, water temperature, weather and/or obstruction to vision, cloud type, height of lowest cloud, total cloud amount, visibility, sea height and direction, swell type and direction.

General Practices

Cards were punched for the observations recorded at 0800, 1200, and 2000, local standard time, which were the only observations for which ship positions were available. In cases where these hours were missing, adjacent observations were selected and punched. See remarks under columns 12-13 of this manual. Identification cards were not punched for observations that were not available.

Form of Punch Card Used

A specially printed 80-column card, containing headings for the individual elements, was used. One exception in punching practice exists: the heading on the card indicating low, middle and high cloud types should be interpreted to mean the lowest, middle, and highest cloud layers. Any type of cloud reported was punched in any of these three columns, depending upon its position in relation to other cloud layers which were present. A sample of the card form used is shown below.



CARD CONTENT					SOURCE CONTENT	
Columns	Item	Code	Code Definition	Remarks	Units or Symbols	Reporting and Coding Practices
1-2	Ship Classification	00-99	Indicates type of ship	A five digit number was used to identify the ship on which the observation was recorded. Some exceptions to the general scheme exist. A complete list of ships is maintained by the USWB, and their identity is reflected in the microfilm copy of the source documents and work sheets.		
3-5	Ship Number	000-999	Official ship number			
6-7	Year	42-45	1942 - 1945	Although ships generally used the true International Date Line, which varies with latitude, to distinguish date, in punching observations the 180th meridian was used. Dates were changed, if necessary, to follow this practice.		
8-9	Month	01-12	January - December			
10-11	Day	01-31	Day of month			
12-13	Hour	08	0800 LST	If an observation scheduled to be punched was not recorded in the log, the preceding or succeeding hourly observation was punched, giving preference to the preceding hour if present. The scheduled hour (08, 12, or 20) was punched in these cases, rather than the actual hour of observation.		When two observations were recorded with identical local time, due to time zone change, the first observation was selected for punching.
		12	1200 LST			
		20	2000 LST			
14	Quadrant	0	N Latitude W Longitude		N, E, S, W	
		1	N Latitude E Longitude			
		2	S Latitude W Longitude			
		3	S Latitude E Longitude			
15-16	Latitude	00-90	0 to 90° Latitude		Degrees and minutes	Positions were recorded to degrees and minutes, but rounded to whole degrees before punching. Thirty minutes was raised to the next higher whole degree.
17-19	Longitude	000-180	0 to 180° Longitude			
20-21	Ship Speed	00	Lying-to at sea	Rounded to nearest whole knot.	Knots, to tenths	The value recorded by log (actual speed of ship) was used when available. Speed may have been determined by revolutions (speed in knots according to RPM Table for the ship).
		01-40	1 to 40 knots			
		XX	Variable			
		Blank	Anchored in port, or missing			
22-23	Ship Course	01-36	10 to 360°	Rounded to nearest ten degrees.	Degrees	Ship's true course or heading. Values 000 and 360 were used interchangeably, were punched as 36.
		XX	Variable			
		Blank	In port or missing			
24-25	Wind Direction	00	Calm		C or Calm	*Recorded to 16 or 32 points. When recorded to 32 points, the directions were punched as if recorded to 16 points, disregarding the direction after the "x" as shown below N 36 E 09 S 18 W 27 NxE 36 ExS 09 SxW 18 WxN 27 NNE 02 ESE 11 SSW 20 WNW 29 NExN 05 SExE 14 SWxS 23 NWxW 32 NE 05 SE 14 SW 23 NW 32 NExE 05 SExS 14 SwxW 23 NWxN 32 ENE 07 SSE 16 WSW 25 NNW 34 ExN 09 SxE 18 WxS 27 NxW 36 #Recorded in whole degrees (0 and 360 used interchangeably).
		01-36	10 to 360°	Rounded or converted to nearest ten degrees.		
		XX	Variable		Var.	
		Blank	Unknown	Not punched if speed unknown.		
26-27	Wind Speed	00	Calm			*Wind speeds usually reported in Beaufort Code, in values up to 17. Speeds were at times reported in knots. Variations in practice are noted on the microfilmed work sheets. Beaufort forces were converted to knots as follows: B.F. Knots B.F. Knots B.F. Knots 0 0 6 25 12 68 1 2 7 31 13 76 2 5 8 37 14 85 3 9 9 44 15 96 4 14 10 51 16 105 5 19 11 62 17 114 #Although some variations were present, speeds were usually reported in knots.
		01-99	1 to 99 knots	Column 26 not X-overpunched.		
		00-99	100 to 199 knots	Column 26 X-overpunched.		
		XX	Variable			
		Blank	Unknown			

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CARD CONTENT					SOURCE CONTENT	
Columns	Item	Code	Code Definition	Remarks	Units or Symbols	Reporting and Coding Practices
28-31	Sea Level Pressure	0000-9999	0.00 to 99.99 in.		Inches Hg. to hundredths	Values found to be unreliable by checking with Northern Hemisphere analyzed weather maps were not punched. It was also discovered, shortly after beginning the project of punching this source, that pressure values from submarines were unreliable; they were therefore omitted.
		Blank	Unknown			
32-34	Dry Bulb Temperature	000-199	0 to 199°F		Degrees, Fahr.	
		X00-X99	-0 to -99°F			
		Blank	Unknown			
35-37	Wet Bulb Temperature	000-199	0 to 199°F		Degrees, Fahr.	
		X00-X99	-0 to -99°F			
		Blank	Unknown			
38-39	Water Temperature	00-99	0 to 99°F	Sea surface temperature, to have been punched in col 49-50, was generally found to be identical with water injection temperature, of col 38-39. Where this was discovered, col 49-50 were not punched, and all sea water temperatures were punched in col 38-39, which should be used for water tabulations.	Degrees, Fahr.	Value shown is water injection temperature.
		Blank	Unknown			
40-41	Present Weather*	00	Cloudless	Less than 1/10 total cloud amount.	b	*Weather entries were recorded in Beaufort weather code, but were converted to numeric values shown, which conform to 1942 International Synoptic Code, except code 04.
		01	Partly cloudy	1/10 to 5/10 total cloud amount.	bc	
		02	Cloudy	6/10 to 9/10 total cloud amount.	c	
		03	Overcast	Over 9/10 total cloud amount.	o	
		04	Haze	NOTE: THIS CODE IS EXCEPTION TO INTERNATIONAL	z	
		07	Distant lightning		l	
		13	Ugly sky		u or q	
		14	Squally weather		Q	
		16	Waterspouts			
		19	Tropical storm or hurricane			
		40	Fog		f	
		49	Fog in patches			
		50	Drizzle		d or m	
		57	Drizzle and fog		d, f	
		60	Rain		r	
		67	Rain and fog		rf	
		69	Rain and snow, mixed		rs	
		70	Snow		s	
		77	Snow and fog		sf	
		81	Rain showers		p	
		83	Snow showers		ps	
		88	Hail, or rain and hail showers		h	
		90	Thunderstorm		t	
		97	Heavy thunderstorm with rain or snow		T	
		Blank	Unknown			
	Present Weather#	00	Cloudless		00-99	#Weather entries were in accordance with the 1942 International Synoptic Code, and were so punched, EXCEPT THAT ALL OBSERVATIONS REPORTING CODE 05 (HAZE) WERE CHANGED TO CODE 04.
		01	Partly cloudy	1/10 to 5/10 total cloud amount		
		02	Cloudy	6/10 to 9/10 total cloud amount		
		03	Overcast	10/10 total cloud amount		
		04	Haze	NOTE: THIS CODE IS EXCEPTION TO INTERNATIONAL		
		06	Dust devils			
		07	Distant lightning			
		08	Light fog			
		09	Fog at distance	Not at station		
		10	Precipitation	Within sight but not at station		
		11	Thunder	Without precipitation at station		

*Jan 1942 - May 1944
#Jun 1944 - Dec 1945

CARD CONTENT					SOURCE CONTENT	
Columns	Item	Code	Code Definition	Remarks	Units or Symbols	Reporting and Coding Practices
40-41	Present Weather# (Continued)	12	Duststorm	Within sight but not at station		
		13	Ugly sky			
		14	Squally weather			
		15	Heavy squalls	In last three hours		
		16	Waterspouts	In last three hours		
		17	Smoky	Visibility reduced		
		18	Blowing dust			
		19	Tropical storm or hurricane			
		20	Precip. in any form			
		21	Drizzle			
		22	Rain	Continuous or intermittent	In last hour but not at time of observation	
		23	Snow	Continuous or intermittent		
		24	Rain and snow, mixed	Continuous or intermittent		
		25	Rain showers			
		26	Snow showers			
		27	Hail, or rain and hail showers			
		28	Thunderstorm	Light or moderate	With precip. in last hour but none at time of observation	
		29	Heavy Thunderstorm			
		30	Duststorm or sandstorm			
		31	Duststorm or sandstorm	Decreased by observation time		
		32	Duststorm or sandstorm	No appreciable change by observation time		
		33	Duststorm or sandstorm	Increased by observation time		
		34	Line of duststorms			
		35	Storm of drifting snow			
		36	Storm of drifting snow	Light or moderate, generally low		
		37	Storm of drifting snow	Heavy, generally low		
		38	Storm of drifting snow	Light or moderate, generally high		
		39	Storm of drifting snow	Heavy, generally high		
		40	Fog			
		41	Moderate fog	In last hour but not at time of observation		
		42	Thick or dense fog	In last hour but not at time of observation		
		43	Fog, sky discernible	Has become thinner during last hour		
		44	Fog, sky not discernible	Has become thinner during last hour		
		45	Fog, sky discernible	No appreciable change during last hour		
		46	Fog, sky not discernible	No appreciable change during last hour		
		47	Fog, sky discernible	Has become thicker during last hour		
		48	Fog, sky not discernible	Has become thicker during last hour		
		49	Fog in patches			
		50	Drizzle			
		51	Light drizzle	Intermittent		
		52	Light drizzle	Continuous		
		53	Moderate drizzle	Intermittent		
		54	Moderate drizzle	Continuous		
		55	Heavy drizzle	Intermittent		
		56	Heavy drizzle	Continuous		
		57	Drizzle and fog			
		58	Drizzle and rain	Light or moderate		
		59	Heavy drizzle and light rain			
		60	Rain			
		61	Light rain	Intermittent		
		62	Light rain	Continuous		

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CARD CONTENT					SOURCE CONTENT	
Columns	Item	Code	Code Definition	Remarks	Units or Symbols	Reporting and Coding Practices
40-41	Present Weather # (Continued)	63	Moderate rain	Intermittent		
		64	Moderate rain	Continuous		
		65	Heavy rain	Intermittent		
		66	Heavy rain	Continuous		
		67	Rain and fog			
		68	Rain and snow, mixed	Light or moderate		
		69	Rain and snow, mixed	Heavy		
		70	Snow			
		71	Light snow in flakes	Intermittent		
		72	Light snow in flakes	Continuous		
		73	Moderate snow in flakes	Intermittent		
		74	Moderate snow in flakes	Continuous		
		75	Heavy snow in flakes	Intermittent		
		76	Heavy snow in flakes	Continuous		
		77	Snow and fog			
		78	Snow grains			
		79	Ice crystals or sleet			
		80	Showers			
		81	Rain showers	Light or moderate		
		82	Rain showers	Heavy		
		83	Snow showers	Light or moderate		
		84	Snow showers	Heavy		
		85	Rain and snow showers	Light or moderate		
		86	Rain and snow showers	Heavy		
		87	Showers of snow pellets			
		88	Hail, or rain and hail showers	Light or moderate		
		89	Hail, or rain and hail showers	Heavy		
		90	Thunderstorm	With precipitation falling at time of observation		
		91	Rain	Rain and thunder in last hour		
		92	Snow, rain & snow mixed	Precipitation and thunder during last hour		
		93	Light thunderstorm with rain or snow	Without hail		
		94	Light thunderstorm with small hail			
		95	Moderate thunderstorm with rain or snow	Without hail		
		96	Moderate thunderstorm with hail	Small hail		
		97	Heavy thunderstorm with rain or snow	Without hail		
		98	Thunderstorm with duststorm			
		99	Heavy thunderstorm with hail			
		Blank	Unknown			
42	Lowest Cloud Layer	0	Clear, no clouds	The printed headings on the card should be interpreted to mean lowest, middle, and high layers, and not type.	*Bl,-,0 Cu, FrCu	#Bl,-,0 Cu,Fc
		1	Cumulus or fracto-cumulus			
		2	Stratocumulus	The total cloud amount determined whether higher layers were punched 0 or left blank; when the amount was 10/10 or obscured the higher layers were left blank; when 9/10 or less, zeros were punched.	St Cu	Sc
		3	Stratus or fracto-stratus		ST FrSt	S Fs
		4	Cumulonimbus		CuNb	Cb

*The cloud entries in the logs appeared to be of the predominating cloud rather than a complete cloud description. These were punched directly, except when cloud type did not agree with present weather.

#When the cloud type was inconsistent with the height, the method of punching was determined by the preceding and subsequent observations. The general practice was as follows:

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CARD CONTENT					SOURCE CONTENT			
Columns	Item	Code	Code Definition	Remarks	Units or Symbols			Reporting and Coding Practices
42	Lowest Cloud Layer (Continued)	5	Nimbostratus	For observations which indicated the presence of clouds but none entered, the first layer was left blank. When cloud amount was less than 10/10 the other layers were punched 0; if 10/10 amount was reported, all layers were left blank.	*Nb	#Ns		1. In cases where a cirrus type cloud was reported and (a) the height was entered as less than 7000 feet, the cloud type was changed to a similar low cloud type, (b) the height was entered as 7000 to 10000 feet, the cloud type was changed to a similar middle cloud type. 2. Similar practice was followed for other combinations of conditions. 3. Where differences could not be reconciled, the height was omitted.
		6	Altocumulus		Al Cu	Ac		
		7	Altostratus		Al St	As		
		8	Cirrus		Ci	Ci		
		9	Cirrostratus		Ci St	Cs		
		X	Cirrocumulus	For observations which indicated weather clear, but reported cloud types, the types were punched, and the amount was punched 0, representing less than 1/10.	Ci Cu	Cc		
		Blank	Unknown or obscured					
43	Middle Cloud Layer		Same as column 42					
44	Highest Cloud Layer		Same as column 42					
45-46	Height of Lowest Clouds	00-95	0 to 9500 feet	Reported and punched in 100 feet intervals up to 5000 feet, in 500 feet intervals from 5000 to 9500 ft.	Feet in hundreds			*Cloud height was not reported for this period. The columns were left blank. #See note marked # in "Reporting and Coding Practices" for col 42-44. #Frequently unlimited was indicated in the source by a blank space. For logs normally reporting heights, such an observation was punched as unlimited, otherwise, the columns were left blank.
		XX	Unlimited (10,000 feet or higher, or no clouds)		99, Unlim.			
		Blank	Unknown		*Missing			
47	Total Sky Cover	0	Cloudless or < 1/10	Agreement between weather and total cloud amount was attempted. When weather and cloud amount differed by 1/10 amount, the change was made to indicate the more unfavorable condition. For larger differences, the weather was changed to agree with cloud amount, as shown in codes 00-03, col 40-41.	0-10			
		1-9	1/10 to 9/10					
		X	> 9/10 or 10/10					
		Blank	Unknown					
48	Visibility	0	Less than 50 yards		* 0	#0		*Reported in thousands of yards, generally. #Reported in code, generally. Practice in reporting visibility varied considerably. Entries were in thousands of feet, yards, or in miles or code, depending upon individual ship or observer's practice. These differences were noted on the work sheets, and all entries were converted to code for punching. Reported visibilities do not conform to limitations usually stated for present weather, mainly due to reduced visibility reported in darkness.
		1	50 but < 200 yards		.1	1		
		2	200 but < 400 yards		.2- .3	2		
		3	400 but < 1000 yards		.4- .9	3		
		4	1000 but < 1 naut. mi.		1- 1.9	4		
		5	1 but < 2 naut. mi.		2- 3.9	5		
		6	2 but < 5 naut. mi.		4- 9.9	6		
		7	5 but < 10 naut. mi.		10-19.9	7		
		8	10 but < 30 naut. mi.		20-59.9	8		
		9	Over 30 naut. mi.		60 or over	9		
		Blank	Unknown					
49-50	Sea Surface Temperature	00-99	0 to 99°F		Degrees, Fahr.			
		Blank	Unknown, or not punched	Punching of these columns was discontinued soon after punching of the deck was started, when it was ascertained that the data were almost invariably identical with water injection temperature, punched in col 38-39, which was reported more regularly. See "Remarks", col 38-39.				
51-52	*Swell Direction #Sea Direction	00	Calm	*Swell direction punched from a combination of sea and swell data given in the source. For this period column 54 was punched X and column 55 left blank. #Swell direction punched in col 54-55. Codes 00 and 32 are used interchangeably. The ascertaining difference from Calm in this condition will be a swell condition description other than "0".	*Calm or 0	#Calm or 0	Calm	*Swell direction was generally reported to 16 points, if reported to 32 points, alphabetically, it was punched to 16 points, disregarding the direction after the "x". #Sea direction was generally reported to 32 numeric points, and was so punched. In a few instances the values were reported in degrees. These were converted to 16 points as indicated in the table.
		01	NxE		NxE	1		
		02	NNE		NNE	2	11-33°	
		03	NExN		NExN	3		
		04	NE		NE	4	34-56°	
		05	NExE		NExE	5		
		06	ENE		ENE	6	57-78°	
		07	ExN		ExN	7		
		08	E		E	8	79-101°	
		09	ExS		ExS	9		
		10	ESE		ESE	10	102-123°	
		11	SExE		SExE	11		

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CARD CONTENT					SOURCE CONTENT		
Columns	Item	Code	Code Definition	Remarks	Units or Symbols		Reporting and Coding Practices
51-52	*Swell Direction #Sea Direction (Continued)	12	SE		SE	12	124-146°
		13	SExS		SExS	13	
		14	SSE		SSE	14	147-168°
		15	SxE		SxE	15	
		16	S		S	16	169-191°
		17	SxW		SxW	17	
		18	SSW		SSW	18	192-213°
		19	SWxS		SWxS	19	
		20	SW		SW	20	214-236°
		21	SWxW		SWxW	21	
		22	WSW		WSW	22	237-258°
		23	WxS		WxS	23	
		24	W		W	24	259-281°
		25	WxN		WxN	25	
		26	WNW		WNW	26	282-303°
		27	NWxW		NWxW	27	
		28	NW		NW	28	304-326°
		29	NWxN		NWxN	29	
		30	NNW		NNW	30	327-348°
		31	NxW		NxW	31	
		32	N		N	32 or 0	349-10°
		99	Direction confused or variable		Confused or Var.	Con. or 99	Confused or Var.
		Blank	Unknown, or in port				
53	*Sea and Swell Combination	0	No swell	Calm or slight sea	0 or blank		*During this period the swell direction was reported, and punched in col 51-52. The sea and swell were reported in a combined description, shown here. and punched in column 53.
		1	Moderate swell		1		
		2	Heavy swell		2		
		3	No swell	Moderate sea.	3		
		4	Moderate swell		4		
		5	Heavy swell		5		
		6	Rather rough sea		6		
		7	Rough sea		7		
		8	Very rough sea		8		
		9	Mountainous sea		9		
		Blank	Unknown, or in port				
	#Sea Height		Description Ht., ft.				#During this period the sea condition was reported, and punched in col 51-52. Sea height was punched as reported, in column 53.
		0	Calm 0		0 or blank		
		1	Smooth < 1		1-8		
		2	Slight 1 - 3				
		3	Moderate 3 - 5				
		4	Rough 5 - 8				
		5	Very rough 8 - 12				
		6	High 12 - 20				
		7	Very high 20 - 40				
		8	Mountainous 40 or over				
		9	Qualifying condition of confused sea	When sea direction was reported as "confused", but no sea height was reported, column 53 was punched 9. If sea direction was confused, and sea height was reported col 51-52 were punched 99, and column 53 was punched 5-9, according to the sea height value reported.	5-9		
		Blank	Unknown, or in port				
54-55	#Swell Direction	00-32	Same as column 51-52		00-99		#Reported and punched in numeric code.
		99	Confused or variable				
		Blank	Unknown, or in port				

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CARD CONTENT						SOURCE CONTENT	
Columns	Item	Code	Code Definition		Remarks	Units or Symbols	Reporting and Coding Practices
54-55	*No data	X-Blank			*Swell direction punched in col 51-52, cf. For this period column 54 was X-punched and column 55 was left blank.		
56	#Swell Type		Description		Approximate Height(ft) / Length(ft)	0-9	#Reported and punched in numeric code.
		0	No swell		0 / 0		
		1	Low swell	Short or Average	1-6 / 0-600		
		2		Long	1-6 / Above 600		
		3	Moderate swell	Short	6-12 / 0-300		
		4		Average	6-12 / 300-600		
		5		Long	6-12 / Above 600		
		6	High swell	Short	Greater than 12 / 0-300		
		7		Average	Greater than 12 / 300-600		
		8		Long	Greater than 12 / Above 600		
		9	Confused				
		Blank	Unknown, or in port				
	*No data	Blank					*Reported in manner described in column 53.
57	In-port Observation Indicator	X	Observation taken in port or immediate vicinity				
		Blank	Observation taken at sea				
58-80		Blank	Not used				

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