

*NOAA Climate Database Modernization Program (CDMP)  
Imaging Task, October 2002:*

**Document title:**  
**TDF-11 Reference Manual**  
**(Surface Marine Observations)**

**Reference information:** NCDC (National Climatic Data Center), 1968: TDF-11 Reference Manual. NCDC, Asheville, NC, 138 pp.

**Background:** In the 1960s the National Weather Records Center (NWRC), predecessor to what is currently the NOAA National Climatic Data Center (NCDC), consolidated all the major surface marine Card Deck datasets in its archive into a unified dataset on magnetic tape called Tape Data Family - 11 (TDF-11). Publication of this manual, in approximately June 1968, was stimulated by a World Meteorological Organization code change of the marine synoptic code that became effective 1 January 1968. The International Marine punched card (Deck 128), established in 1963, was used as the basic input format to Tape Data Family-11. Some modifications were made so that the previously keyed observations (earlier produced card decks) could become an integral part of the Data Family. An earlier edition of this publication is known to exist that contains at least one difference: on p. CODES-11, tape field number 029 lacks the NOTE appearing in the column labeled "Element." Note that the original document lacked a cover page, starting with page i as follows.

TAPE DECK		PAGE NO.
TDF-11	SURFACE MARINE OBSERVATIONS	i
<u>INTRODUCTION</u>		
<u>SOURCE</u>		
<p>Tape Data Family - 11 was derived from a variety of punched card decks. Observations were obtained from Ship Logs, Ship Weather Reporting Forms, published Ship Observations, Automatic Observing Bouys, Teletype Reports, and on cards purchased from several foreign Meteorological Services.</p>		
<p>The quality of instruments ranges from those found aboard a 19th century Whaling Ship to the most sophisticated electronic equipment used on today's Ocean Weather Ships. Observer qualifications vary from Deck Hand to trained Meteorologist.</p>		
<p>From this conglomeration, an effort was made to bring to the researcher of oceanic weather patterns and sea conditions, a common observational format, designed for use with modern electronic data processing equipment. The International Marine punched card (Deck 128), established in 1963, was used as the basic input format to Tape Data Family - 11. Some modifications were made so that previously recorded observations could become an integral part of this Family.</p>		
<u>QUALITY CONTROL AND CODE CONVERSIONS</u>		
<p>The starting point for programming was the individual card deck. No attempt was made to "second guess" conversion or coding procedures employed in punching each of the various decks. This did lead to instances of double conversions. ie: Elements converted from the 1929 to the 1942 codes for punching, were then converted to the current codes for inclusion in the tape.</p>		
<p>All conversion procedures used were devised or reviewed by professional meteorologists. Occasionally it was necessary to resort to subjective conversions based on observational experience as well as knowledge of instruments and observing techniques.</p>		
<p>In cases where it was felt that elements were acceptable for conversion without significant loss of resolution, the new values were placed in the common portion of the observation. Elements or meteorological phenomena which did not lend themselves to conversion were retained in the supplemental portion of the observation.</p>		
<p>During the taping, additional quality control checks were made. These checks flagged or rejected observations that did not meet specified conditions or limits. Extreme temperatures were established for each Marsden Square and individual observations were compared against these limits. Pressures were also checked against a set of extreme values. Ship positions had to be in ocean, sea, or lake areas. Wind directions, visibility, weather, sea conditions etc. had to be valid punches as defined by each card deck.</p>		
<u>USE OF THE MANUAL</u>		
<p>This manual was designed so that recourse to additional reference material should be unnecessary. Occasionally, however, the researcher may wish to obtain a copy of the original Card Deck reference manual. This may be done by writing to the Director, National Weather Records Center, Asheville, North Carolina.</p>		
<p>Care should be taken to read carefully the statements pertaining to observational quality, general tape notations, common coding practices and conversion procedures used for the individual decks.</p>		

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<p><u>THE DATA FILE</u></p> <p>Over 31 million Surface Marine observations are currently in Tape Data Family - 11. They are filed by 10<sup>0</sup> Marsden Square, Year, Month without regard to individual deck number. ie: All observations for January 1962 in Marsden Square 051 would be found together, followed by all observations for February 1962 etc. The period 1800- June,1968 is held on 293 reels of 9 channel, 800 bpi tape. It is not anticipated that future acquisitions will be merged into this group, but will be placed on tape in the TDF-11 format and retained as a separate file.</p> <p>Observations from Ocean Weather Stations were placed in the TDF-11 format but not merged into the common file mentioned above. Currently operating Weather Ships are kept, individually, by station number (See Tape Field 029), while those ships no longer actively reporting have been filed together. Observations are filed by Ocean Weather Station number, Year, Month. These reports were also taken from a variety of card decks.</p> <p>Funding for the development of TDF-11 was provided jointly by the Naval Weather Service Command, the Environmental Science Services Administration, and the Department of Defense.</p>		

<div>TAPE DECK</div> <div>TDF-11</div>	<div>SURFACE MARINE OBSERVATIONS</div>	<div>PAGE NO.</div> <div>iii</div>
<div> <div><u>SPECIAL NOTE</u></div> </div> <div> <p>Although every effort was made to assure conformity, the user is cautioned that discrepancies in original punching procedures and conversion schemes occasionally occurred. Validity checks should be applied to all elements as they are used.</p> </div> <div> <p>Reporting practices for individual decks sometimes varied during the applicable period. It must not be assumed that all elements are available for each observation. For example: A specific deck may report Present Weather for only 15 years out of a 40 year period of record. Documentation of these vagaries was not sufficient enough to allow us to include such items in this manual.</p> </div> <div> <p>Not all ships changed their reporting practices to conform to the codes effective January 1, 1968, on that date. In many cases it was impossible to determine whether the new or old codes were being reported. This situation continued for the first few months of 1968. The Wave and Swell groups, in particular, should be examined closely during this period.</p> </div>		

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## MANUAL AND TAPE NOTATIONS

### FORMAT

Each observation is 140 characters in length. Positions 001-082 and 89-93 are common to all decks. Positions 083-088 vary according to the indicator found in position 082. Positions 094-140 are reserved for Supplemental Data and may be different for each deck. Because of the wide variety of elements and coding vagaries inherent in the Supplemental Data Fields, it is expected that most users will restrict themselves to working with the common portion of the observations.

For quick reference, each element or group of similar elements is identified by a Field Number. Thus, Fields 001-032 and 037-038 are common to all decks, Fields 033-036 vary according to the indicator found in Field 032, and Fields 039-onward are reserved for Supplemental Data.

The manual consists of five basic parts:

1. General Information
2. The Standard Format with definitions of Tape Fields and Positions
3. The basic codes used for all elements in the common portion of the observations
4. Explanations of Unique Characteristics, Conversion Procedures and Supplemental Data Fields by individual deck
5. General coding practices, conversions and formulae used during the conversion from cards to tape. (Section 4).

When an element is shown as being available but no conversion procedure is noted - the codes were deemed compatible and the punched values transferred directly to the tape.

### TAPE

The following notations are used throughout the manual:

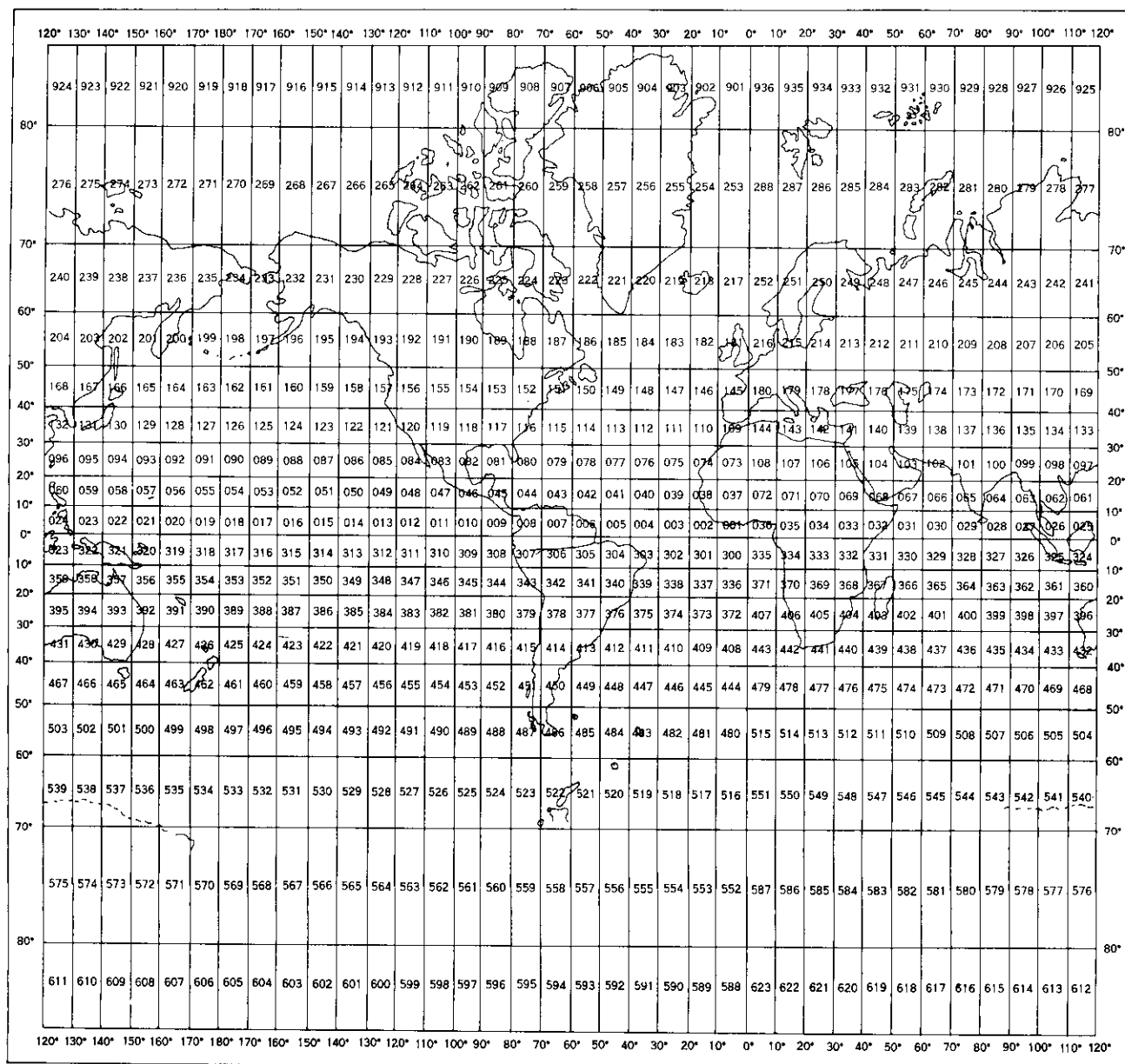
- x = any numeric digit or alpha numeric character
- i = same as x but used to show that the character is an indicator rather than part of the recorded element
- = an "11" punch in the card or the equivalent tape configuration
- + = a "12" punch in the card or the equivalent tape configuration. Both the - and + may appear by themselves or in combination with a numeric digit to indicate an overpunch or signed tape field.
- Δ = Blank - no card punch or blank configuration on tape
- Low order = Rightmost position of a field
- High order = Leftmost position of a field

When elements were not reported, not readily convertible to the common portion, or did not pass the various quality control checks, the respective tape positions in the common portion appear as blanks.

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TAPE DECK LIST			
TAPE DECK NUMBER	SOURCE CARD DECK	ORIGINAL SOURCE	GENERAL PERIOD OF RECORD
1110	110	U.S. Navy Marine Observations	1945 - 1951
1116	116	U.S. Merchant Marine	1949 - 1963
1118	118	Japanese Ship Observations No. 1	1933 - 1953
1119	119	Japanese Ship Observations No. 2	1953 - 1961
1128	128	International Marine Observations	1963 -
1181	281	U.S. Navy MAR Marine Observations	1920 - 1945
1184	184	Great Britain Marine Observations	1953 - 1956
1185	185	U.S.S.R. Marine Synoptic Observations	1957 - 1958
1187	187	Japanese Whaling Fleet Observations	1946 - 1956
1188	188	Norwegian Whaling Fleet Observations	1932 - 1939
1189	189	Netherlands Marine Observations	1939 - 1955
1192	192	Deutsche Seewarte Marine Observations	1859 - 1939
1193	193	Netherlands Marine Observations	1854 - 1938
1194	194	Great Britain Marine Observations	1856 - 1953
1195	195	U.S. Navy Ship Logs	1942 - 1945
1196	196	Deutsche Seewarte Marine Observations	1949 - 1954
1197	197	Danish Marine Observations (Arctic and Antarctic)	1860 - 1956

## SURFACE MARINE OBSERVATIONS

## MARS DEN SQUARE NUMBERING SYSTEM



90										99
80										
70										
60										
50										
40										
30										
20										
10	11	12	13	14	15	16	17	18	19	
00	01	02	03	04	05	06	07	08	09	

SQUARES ARE ALWAYS ORIENTED  
SO THAT THE LOWEST NUMBER IS  
NEAREST THE INTERSECTION OF  
THE GREENWICH MERIDIAN AND  
THE EQUATOR.

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# STANDARD FORMAT

CARD DECK	MAR SQ	SUB SQ	Q	LAT	LONG	YEAR	MO	DA	HR	WIND DIR	WIND SPD	VIS	WX	W	PRESS	T	AIR TMP	WET BLB	DEW PT	SEA TMP	A-S DIF
xxx	xxx	xx	x	xxx	xxxx	xxxx	xx	xx	xx	ixx	ixxx	ixx	xx	x	xxxxx	i	xxx	xxx	xxx	xxx	xxx

FIELD  
NUMBER

001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018 019 020 021

CLOUDS						WAVE	P	WAVE	SWL	P	SWL	OSV	C	S					A	I	ICE	A					A	D	S	a	ppp	A	SIG	SIG	SIG			I	SHIP
N	N <sub>h</sub>	C <sub>L</sub>	I	h	C <sub>M</sub>	C <sub>H</sub>	DIR	E	HGT	DIR	E	HGT	NO.	D	H	D	C	THK	C	D	I	P		D	N	T	HGT			D	x	x	xx	Δ	Δ	x	xxxx		
x	x	x	i	x	x	x	xx	x	xx	xx	x	xx	xx	x	x	1	x	xx	x	Δ	Δ	6	x	x	x	xxx	8	x	x	xx	Δ	Δ	x	xxxx					

FIELD  
NUMBER

022 023 024 025 026 027 028 029 030 031 032 033 034 035 036 032 033 034 035 036 032 033 034 035 036 037 038

## SUPPLEMENTAL DATA FIELDS


FIELD  
NUMBER

TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT
001	01-03	CARD DECK NUMBER
002	04-06	MARSDEN 10° SQUARE
003	07-08	MARSDEN 1° SUB-SQUARE
004	09	QUADRANT
005	10-12	LATITUDE
006	13-16	LONGITUDE
007	17-20	YEAR
008	21-22	MONTH
009	23-24	DAY
010	25-26	HOURL-GMT
011	27-29	WIND DIRECTION AND INDICATOR
012	30-33	WIND SPEED AND INDICATOR
013	34-36	VISIBILITY AND INDICATOR
014	37-38	PRESENT WEATHER
015	39	PAST WEATHER
016	40-44	SEA LEVEL PRESSURE
017	45-48	TEMPERATURES INDICATOR AND AIR TEMPERATURE
018	49-51	WET BULB TEMPERATURE
019	52-54	DEW POINT TEMPERATURE
020	55-57	SEA SURFACE TEMPERATURE
021	58-60	AIR-SEA TEMPERATURE DIFFERENCE



TAPE DECK		SURFACE MARINE OBSERVATIONS	PAGE NO.
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TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT
022	61	TOTAL CLOUD AMOUNT
022	62	LOWER CLOUD AMOUNT
022	63	TYPE OF LOW CLOUD
022	64	CLOUD HEIGHT INDICATOR
022	65	CLOUD HEIGHT
022	66	TYPE OF MIDDLE CLOUD
022	67	TYPE OF HIGH CLOUD
023	68-69	DIRECTION OF WAVES
024	70	PERIOD OF WAVES
025	71-72	HEIGHT OF WAVES
026	73-74	DIRECTION OF SWELL
027	75	PERIOD OF SWELL
028	76-77	HEIGHT OF SWELL
029	78-79	OCEAN WEATHER STATION NUMBER
030	80	CARD INDICATOR
031	81	OSV OR SHIP INDICATOR
032	82	ADDITIONAL DATA INDICATOR
WHEN ADDITIONAL DATA INDICATOR = Δ		
033-036	83-88	BLANK
WHEN ADDITIONAL DATA INDICATOR = 1		
033	83	TYPE OF ICE
034	84-85	THICKNESS OF ICE
035	86	RATE OF ICE ACCRETION
036	87-88	BLANK
WHEN ADDITIONAL DATA INDICATOR = 6		
033	83	SHIP DIRECTION
034	84	SHIP SPEED
035	85	BAROMETRIC TENDENCY
036	86-88	AMOUNT OF PRESSURE CHANGE
WHEN ADDITIONAL DATA INDICATOR = 8		
033	83	SIGNIFICANT CLOUD AMOUNT
034	84	SIGNIFICANT CLOUD TYPE
035	85-86	SIGNIFICANT CLOUD HEIGHT
036	87-88	BLANK
037	89	ICE INDICATOR
038	90-93	SHIP NUMBER
039 -	94-140	SUPPLEMENTAL DATA FIELDS

TAPE DECK		SURFACE MARINE OBSERVATIONS			PAGE NO.
TDF-11					CODES - 1
STANDARD FORMAT CODES					
TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT	TAPE CONFIGURATION	CODE DEFINITION AND REMARKS	
001	01-03	CARD DECK NUMBER	000-999	Number of the punched card deck from which the observation came.	
002	04-06	10° MARSDEN SQUARE	001-936	See explanation of Marsden Square system in the Introduction.	
003	07-08	1° MARSDEN SUB-SQUARE	00-99	See explanation of Marsden Square system in the Introduction.	
004	09	QUADRANT	1-4	1 = N Latitude and W Longitude 2 = N Latitude and E Longitude 3 = S Latitude and W Longitude 4 = S Latitude and E Longitude	
005	10-12	LATITUDE	000-900	00.0° - 90.0° North or South	
006	13-16	LONGITUDE	0000-1800	000.0° - 180.0° East or West	
007	17-20	YEAR	18xx-19xx	xx = Any number.	
008	21-22	MONTH	01-12	01 = January      07 = July 02 = February    08 = August 03 = March        09 = September 04 = April        10 = October 05 = May          11 = November 06 = June         12 = December	
009	23-24	DAY	01-31	Day of the month	
010	25-26	HOURL - GMT	00-23	0000 GMT - 2300 GMT	
011 i	27	WIND DIRECTION INDICATOR	A,0,1,2	A = 36 point scale 0 = 32 point scale 1 = 16 of 36 point scale 2 = 16 of 32 point scale	
011	28-29	WIND DIRECTION	00-36,99	Direction from which the wind is blowing.	
				36Pt	32Pt    16of36Pt.    16of32Pt
				00 = Calm	Calm    Calm    Calm    Calm
				01 = 005-014°	006-016°
				02 = 015-024°	017-028°    012-033°    012-034°
				03 = 025-034°	029-039°
				04 = 035-044°	040-050°    035-056°
				05 = 045-054°	051-061°    034-056°
				06 = 055-064°	062-073°    057-079°
				07 = 065-074°	074-084°    057-078°
				08 = 075-084°	085-095°    080-101°
				09 = 085-094°	096-106°    079-101°
				10 = 095-104°	107-118°    102-124°
				11 = 105-114°	119-129°    102-123°
				12 = 115-124°	130-140°    125-146°
				13 = 125-134°	141-151°
				14 = 135-144°	152-163°    124-146°    147-169°
				15 = 145-154°	164-174°
				16 = 155-164°	175-185°    147-168°    170-191°
				17 = 165-174°	186-196°
				18 = 175-184°	197-208°    169-191°    192-214°

TAPE DECK		SURFACE MARINE OBSERVATIONS				PAGE NO.	
TDF-11						CODES - 2	
TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT	TAPE CONFIGURATION	CODE DEFINITION AND REMARKS			
011	28-29	WIND DIRECTION (Cont'd)	00-36,99	36Pt	32Pt	16of36Pt	16of32Pt
				19 = 185-194°	209-219°		
				20 = 195-204°	220-230°	192-213°	215-236°
				21 = 205-214°	231-241°		
				22 = 215-224°	242-253°		237-259°
				23 = 225-234°	254-264°	214-236°	
				24 = 235-244°	265-275°		260-281°
				25 = 245-254°	276-286°	237-258°	
				26 = 255-264°	287-298°		282-304°
				27 = 265-274°	299-309°	259-281°	
				28 = 275-284°	310-320°		305-326°
				29 = 285-294°	321-331°	282-303°	
				30 = 295-304°	332-343°		327-349°
				31 = 305-314°	344-354°		
				32 = 315-324°	355-005°	304-326°	350-011°
				33 = 325-334°			
				34 = 335-344°		327-348°	
				35 = 345-354°			
				36 = 355-004°		349-011°	
				99 = Variable			
012 i	30	WIND SPEED INDICATOR	A,0	A = Not measured 0 = Measured			
012	31-33	WIND SPEED	000-199	000 = Calm 001-199 = 1 to 199 Knots			
013 i	34	VISIBILITY INDICATOR	A,0,1	A = Not measured 0 = Measured 1 = Fog present			
013	35-36	VISIBILITY	90-99	Horizontal visibility at the surface in kilometers.			
				90 = <0.05	NOTE: When Visibility		
				91 = 0.05	Indicator = 1,		
				92 = 0.2	and Visibility =		
				93 = 0.5	93, it means that		
				94 = 1	Fog was present		
				95 = 2	and visibility		
				96 = 4	was not reported.		
				97 = 10			
				98 = 20			
				99 = 50 or more			
014	37-38	PRESENT WEATHER	00-99	00 = Cloud development not observed, 01 = Clouds generally dissolving or becoming less developed. 02 = State of the sky unchanged. 03 = Clouds generally forming or developing. 04 = Visibility reduced by smoke 05 = Haze 06 = Widespread dust in suspension in the air, not raised by wind, at or near the station at the time of observation. 07 = Dust or sand raised by wind at or near the station at the time of observation, but no well developed dust whirls or sand whirls and no duststorm or sandstorm seen.			

TAPE DECK		SURFACE MARINE OBSERVATIONS		PAGE NO.
TDF-11				CODES - 3
TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT	TAPE CONFIGURATION	CODE DEFINITION AND REMARKS
014	37-38	PRESENT WEATHER	00-99	<p>08 = Well developed dust whirls or sand whirls seen at or near the station during the preceding hour or at the time of observation, but no duststorm or sandstorm.</p> <p>09 = Duststorm or sandstorm within sight at the time of observation, or at the station during the preceding hour.</p> <p>10 = Light fog (visibility 1,100 yards or more). Synonymous with European term "Mist".</p> <p>11 = Patches of shallow fog or ice fog at the station,not deeper than about 10 meters.</p> <p>12 = More or less continuous shallow fog or ice fog at the station,not deeper than about 10 meters.</p> <p>13 = Lightning visible, no thunder heard.</p> <p>14 = Precipitation within sight, not reaching the surface of the sea.</p> <p>15 = Precipitation within sight, reaching the surface of the sea, but more than 5 km. from the ship.</p> <p>16 = Precipitation within sight, reaching the surface of the sea, near to, but not at the ship.</p> <p>17 = Thunderstorm, but no precipitation at the time of observation.</p> <p>18 = Squalls at or within sight of the ship during the preceding hour or at the time of observation.</p> <p>19 = Funnel cloud or Waterspout at or within sight of the ship during the preceding hour or at the time of observation.</p> <p>The following phenomena occurred at the ship during the preceding hour but not at the time of observation.</p> <p>20 = Drizzle (not freezing) or snow grains</p> <p>21 = Rain (not freezing)</p> <p>22 = Snow</p> <p>23 = Rain and snow or ice pellets, type(a).</p> <p>24 = Freezing drizzle or freezing rain.</p> <p>25 = Shower(s) of rain.</p> <p>26 = Shower(s) of snow or of rain and snow.</p> <p>27 = Shower(s) of hail (ice pellets, type (b), snow pellets), or of rain and hail (ice pellets, type (b), snow pellets).</p> <p>28 = Fog or ice fog.</p> <p>29 = Thunderstorm (with or without precipitation).</p> <p>Present weather codes 30-99 refer to phenomena occurring at the ship at time of observation.</p> <p>30 = Slight or moderate duststorm or sandstorm has decreased during the preceding hour.</p>

TAPE DECK		SURFACE MARINE OBSERVATIONS			PAGE NO.
TDF-11					CODES - 4
TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT	TAPE CONFIGURATION	CODE DEFINITION AND REMARKS	
014	37-38	PRESENT WEATHER	00-99	31 = Slight or moderate duststorm or sandstorm no appreciable change during the preceding hour. 32 = Slight or moderate duststorm or sandstorm has begun or has increased during the preceding hour. 33 = Severe duststorm or sandstorm has decreased during the preceding hour. 34 = Severe duststorm or sandstorm no appreciable change during the preceding hour. 35 = Severe duststorm or sandstorm has begun or has increased during the preceding hour. 36 = Slight or moderate drifting snow generally low (below eye level) less than 6 feet. 37 = Heavy drifting snow generally low (below eye level) less than 6 feet. 38 = Slight or moderate blowing snow generally high (above eye level) 6 feet or more. 39 = Heavy blowing snow generally high (above eye level) 6 feet or more.  40 = Fog or ice fog at a distance at the time of observation, but not at the ship during the preceding hour, the fog or ice fog extending to a level above that of the observer. 41 = Fog or ice fog in patches. 42 = Fog or ice fog, sky visible has become thinner during the preceding hour. 43 = Fog or ice fog, sky invisible has become thinner during the preceding hour. 44 = Fog or ice fog, sky visible no appreciable change during the preceding hour. 45 = Fog or ice fog, sky invisible no appreciable change during the preceding hour. 46 = Fog or ice fog, sky visible has begun or has become thicker during the preceding hour. 47 = Fog or ice fog, sky invisible has begun or has become thicker during the preceding hour. 48 = Fog, depositing rime, sky visible. 49 = Fog, depositing rime, sky invisible.  50 = Drizzle, not freezing, intermittent slight at time of observation. 51 = Drizzle, not freezing, continuous slight at time of observation. 52 = Drizzle, not freezing, intermittent moderate at time of observation. 53 = Drizzle, not freezing, continuous moderate at time of observation. 54 = Drizzle, not freezing, intermittent heavy (dense) at time of observation. 55 = Drizzle, not freezing, continuous heavy (dense) at time of observation. 56 = Drizzle, freezing, slight. 57 = Drizzle, freezing, moderate or heavy (dense).	

TAPE DECK		SURFACE MARINE OBSERVATIONS		PAGE NO.
TAPE FIELD NUMBER	TAPE POSITIONS			CODES - 5
014	37-38	PRESENT WEATHER	00-99	<p>58 = Drizzle and rain, slight. 59 = Drizzle and rain, moderate or heavy.</p> <p>60 = Rain, not freezing, intermittent, slight at time of observation. 61 = Rain, not freezing, continuous, slight at time of observation. 62 = Rain, not freezing, intermittent, moderate at time of observation. 63 = Rain, not freezing, continuous, moderate at time of observation. 64 = Rain, not freezing, intermittent, heavy at time of observation. 65 = Rain, not freezing, continuous, heavy at time of observation. 66 = Rain, freezing, slight. 67 = Rain, freezing, moderate or heavy. 68 = Rain or drizzle and snow, slight. 69 = Rain or drizzle and snow, moderate or heavy.</p> <p>70 = Intermittent fall of snowflakes, slight at time of observation. 71 = Continuous fall of snowflakes slight at time of observation. 72 = Intermittent fall of snowflakes moderate at time of observation. 73 = Continuous fall of snowflakes moderate at time of observation. 74 = Intermittent fall of snowflakes heavy at time of observation. 75 = Continuous fall of snowflakes heavy at time of observation. 76 = Ice prisms (with or without fog). 77 = Snow grains ( with or without fog). 78 = Isolated starlike snow crystals (with or without fog). 79 = Ice pellets, type (a) (sleet, U.S. definition).</p> <p>80 = Rain shower(s), slight. 81 = Rain shower(s), moderate or heavy. 82 = Rain shower (s), violent. 83 = Shower (s) of rain and snow mixed, slight. 84 = Shower (s) of rain and snow mixed, moderate or heavy. 85 = Snow shower (s), slight. 86 = Snow shower (s), moderate or heavy. 87 = Slight showers of snow pellets or ice pellets, type (b), with or without rain or rain and snow mixed. 88 = Moderate or heavy showers of snow pellets or ice pellets (b), with or without rain or rain and snow mixed. 89 = Slight showers of hail with or without rain or rain and snow mixed, not associated with thunder.</p>

TAPE DECK		SURFACE MARINE OBSERVATIONS			PAGE NO.
TDF-11					CODES - 6
TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT	TAPE CONFIGURATION	CODE DEFINITION AND REMARKS	
014	37-38	PRESENT WEATHER	00-99	90 = Moderate or heavy showers of hail, with or without rain or rain and snow, slight mixed, not associated with thunder. 91 = Slight rain at time of observation, thunderstorm during preceding hour but not at observation. 92 = Moderate or heavy rain at time of observation, thunderstorm during preceding hour but not at observation 93 = Slight snow, or rain and snow mixed or hail, at time of observation with thunderstorm during the preceding hour but not at time of observation. 94 = Moderate or heavy snow, or rain and snow mixed, or hail, at time of observation with thunderstorm during the preceding hour but not at time of observation. 95 = Thunderstorm, slight or moderate, without hail, but with rain and/or snow 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 duststorm or sandstorm at time of observation. 99 = Thunderstorm, heavy, with hail at time of observation.	
015	39	PAST WEATHER  (The period covered by Past Weather is 6 hours for observations at 0000, 0600, 1200, and 1800 GMT and 3 hours for observations at 0300, 0900, 1500, and 2100 GMT).	0-9	0 = Cloud covering 1/2 or less of the sky throughout the appropriate period. 1 = Cloud covering more than 1/2 of the sky during part of the appropriate period and covering 1/2 or less during part of the period. 2 = Cloud covering more than 1/2 of the sky throughout the appropriate period. 3 = Sandstorm, duststorm or blowing snow. 4 = Fog or ice fog or thick haze (U.S. includes thick smoke). 5 = Drizzle 6 = Rain 7 = Snow, or rain and snow mixed. 8 = Shower 9 = Thunderstorm with or without precipitation.	
016	40-44	SEA LEVEL PRESSURE	08900-10700	890.0-1070.0 millibars	
017 i	45	TEMPERATURES INDICATOR	1, 3, 5	1 = Degrees Celsius and tenths 3 = Whole degrees Celsius 5 = Half degrees Celsius	
017	46-48	AIR TEMPERATURE			
018	49-51	WET BULB TEMPERATURE	000-999	00.0-99.9 °C positive temperature	
019	52-54	DEW POINT TEMPERATURE	000-999		
020	55-57	SEA SURFACE TEMPERATURE	001-999	-00.1--99.9°C negative temperature	

TAPE DECK		SURFACE MARINE OBSERVATIONS			PAGE NO.
TDF-11					CODES - 7
TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT	TAPE CONFIGURATION	CODE DEFINITION AND REMARKS	
021	58-60	AIR-SEA TEMPERATURE DIFFERENCE	000-999 or 000-999	00.0-99.9 °C Air warmer than sea  00.0-99.9 °C Sea warmer than air	
022	61	TOTAL CLOUD AMOUNT (N)	0-9	Fraction of celestial dome covered by all clouds.	
022	62	LOWER CLOUD AMOUNT (N <sub>h</sub> )		Fraction of celestial dome covered by all the C <sub>L</sub> clouds and, if no C <sub>L</sub> cloud is present, that fraction covered by all the C <sub>M</sub> clouds present.  0 = Clear 1 = 1 Okta or less, but not zero. 2-8 = 2-8 Oktas 9 = Sky obscured or cloud amount cannot be estimated.	
022	63	LOW CLOUD TYPE (C <sub>L</sub> )	0-9, -	0 = No Stratocumulus, Stratus, Cumulus or Cumulonimbus. 1 = Cumulus with little vertical extent and seemingly flattened, or ragged Cumulus other than of bad weather, or both. 2 = Cumulus of moderate or strong vertical extent, generally with protuberances in the form of domes or towers, either accompanied or not by other Cumulus or by Stratocumulus, all having their base at the same level. 3 = Cumulonimbus the summits of which, at least partially, lack sharp outlines but are neither clearly fibrous (cirriform) nor in the form of an anvil; Cumulus, Stratocumulus or Stratus may also be present. 4 = Stratocumulus formed by the spreading out of Cumulus; Cumulus may also be present. 5 = Stratocumulus not resulting 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 (generally existing during precipitation and a short time before and after) or Cumulus fractus of bad weather, or both (pannus), usually below Altostratus or Nimbostratus. 8 = Cumulus and Stratocumulus other than that formed from the spreading out of Cumulus; the base of the Cumulus is 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 Cumulonimbus without anvil or fibrous upper part by Cumulus, Stratocumulus, Stratus or pannus.  - = Stratocumulus, Stratus, Cumulus and Cumulonimbus invisible owing to darkness, fog, blowing dust or sand, or other similar phenomena.	



TAPE DECK		SURFACE MARINE OBSERVATIONS			PAGE NO.
TDF-11					CODES - 8
TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT	TAPE CONFIGURATION	CODE DEFINITION AND REMARKS	
022 i	64	CLOUD HEIGHT INDICATOR	A, 0	Δ = Height not measured 0 = Height measured	
022	65	CLOUD HEIGHT (h)	0-9	Height above sea surface of the base of the lowest cloud or fragment thereof.	
				Approximate Height in Feet	Height in Meters
				0 = 0-149	0-49
				1 = 150-299	50-99
				2 = 300-599	100-199
				3 = 600-999	200-299
				4 = 1000-1999	300-599
				5 = 2000-3499	600-999
				6 = 3500-4999	1000-1499
				7 = 5000-6499	1500-1999
				8 = 6500-7999	2000-2499
				9 = > 8000 or no clouds	> 2500 or no clouds
022	66	MIDDLE CLOUD TYPE (C <sub>M</sub> )	0-9, -	0 = No altocumulus, Altostratus or Nimbostratus. 1 = Altostratus, the greater part of which is semi-transparent; through this part the sun or moon may be weakly visible, as through ground glass. 2 = Altostratus, the greater part of which is sufficiently dense to hide the sun or moon, or Nimbostratus. 3 = Altocumulus, the greater part of which is semi-transparent; the various elements of the cloud change only slowly and are all at a single level. 4 = Patches (often in the form of almonds or fishes) of Altocumulus, the greater part of which is semi-transparent; the clouds occur at one or more levels and the elements are continually changing in appearance. 5 = Semi-transparent Altocumulus in bands, or Altocumulus in one or more fairly continuous layers (semi-transparent or opaque), progressively invading the sky; these Altocumulus clouds generally thicken as a whole. 6 = Altocumulus resulting from the spread- ing out of Cumulus (or Cumulonimbus). 7 = Altocumulus in two or more layers, usually opaque in places, and not progressively invading the sky; or opaque layer of Altocumulus, not progressively invading the sky; or Altocumulus together with Altostratus or Nimbostratus. 8 = Altocumulus with sproutings in the form of small towers or battlements; or Altocumulus having the appearance of cumuliform tufts. 9 = Altocumulus of a chaotic sky, general- ly at several levels. - = Altocumulus, Altostratus and Nimbostratus invisible owing to dark- ness, fog, blowing dust or sand or other similar phenomena, or more often because of the presence of a continuous layer of lower clouds.	

TAPE DECK		SURFACE MARINE OBSERVATIONS			PAGE NO.
TDF-11					CODES - 9
TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT	TAPE CONFIGURATION	CODE DEFINITION AND REMARKS	
022	67	HIGH CLOUD TYPE (C <sub>H</sub> )	0-9, -	<p>0 = No Cirrus, Cirrocumulus or Cirrostratus</p> <p>1 = Cirrus in the form of filaments, strands or hooks, not progressively invading the sky.</p> <p>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 a Cumulonimbus; or Cirrus with sproutings in the form of small turrets or battlements, or Cirrus having the appearance of cumuliform tufts.</p> <p>3 = Dense Cirrus, often in the form of an anvil, being the remains of the upper parts of Cumulonimbus.</p> <p>4 = Cirrus in the form of hooks or of filaments, or both, progressively invading the sky; they generally become denser as a whole.</p> <p>5 = Cirrus (often in bands converging towards one point or two opposite points of the horizon) and Cirrostratus, or Cirrostratus alone; 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.</p> <p>6 = Cirrus (often in bands converging towards one point or two opposite points of the horizon) and Cirrostratus, or Cirrostratus alone; in either case, they are progressively invading the sky, and generally growing denser as a whole; the continuous veil extends more than 45 degrees above the horizon, without the sky being totally covered.</p> <p>7 = Veil of Cirrostratus covering the celestial dome.</p> <p>8 = Cirrostratus not progressively invading the sky and not completely covering the celestial dome.</p> <p>9 = Cirrocumulus alone, or Cirrocumulus accompanied by Cirrus or Cirrostratus, or both, but Cirrocumulus is predominant.</p> <p>- = Cirrus, Cirrocumulus and Cirrostratus invisible owing to darkness, fog, blowing dust or sand or other similar phenomena, or more often because of the presence of a continuous layer of lower clouds.</p>	

TAPE DECK		SURFACE MARINE OBSERVATIONS			PAGE NO.
TDF-11					CODES - 10
TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT	TAPE CONFIGURATION	CODE DEFINITION AND REMARKS	
023	68-69	DIRECTION OF WAVES	00-36, 49,99	Direction from which waves come, in tens of degrees  00 = Calm 01 = 005-014° 02 = 015-024° 03 = 025-034° 04 = 035-044° 05 = 045-054° 06 = 055-064° 07 = 065-074° 08 = 075-084° 09 = 085-094° 10 = 095-104° 11 = 105-114° 12 = 115-124° 13 = 125-134° 14 = 135-144° 15 = 145-154° 16 = 155-164° 17 = 165-174° 18 = 175-184°  19 = 185-194° 20 = 195-204° 21 = 205-214° 22 = 215-224° 23 = 225-234° 24 = 235-244° 25 = 245-254° 26 = 255-264° 27 = 265-274° 28 = 275-284° 29 = 285-294° 30 = 295-304° 31 = 305-314° 32 = 315-324° 33 = 325-334° 34 = 335-344° 35 = 345-354° 36 = 355-004°  49 = Waves confused, direction indeter- minate (waves equal to or less than 4 3/4 meters).  99 = Waves confused, direction indeter- minate (waves greater than 4 3/4 meters).	
024	70	PERIOD OF WAVES	0-9, -	2 = 5 seconds or less 3 = 6-7 seconds 4 = 8-9 seconds 5 = 10-11 seconds 6 = 12-13 seconds 7 = 14-15 seconds 8 = 16-17 seconds 9 = 18-19 seconds 0 = 20-21 seconds 1 = over 21 seconds - = calm or period not determined	
025	71-72	HEIGHT OF WAVES	00-99	Height in 1/2 meter increments  00 = < 1/4 meter 01-99 = 1/2 - 49 1/2 meters	
026	73-74	DIRECTION OF SWELL	00-36, 49,99	Same as Direction of Waves	
027	75	PERIOD OF SWELL	0-9, -	Same as Period of Waves prior to 1968  Beginning January 1, 1968, the code for Period of Swell is  0 = 10 seconds 1 = 11 seconds 2 = 12 seconds 3 = 13 seconds 4 = 14 seconds or more 5 = 5 seconds or less 6 = 6 seconds 7 = 7 seconds 8 = 8 seconds 9 = 9 seconds - = calm or period not determined	
028	76-77	HEIGHT OF SWELL	00-99	Same as Height of Waves	

TAPE DECK		SURFACE MARINE OBSERVATIONS				PAGE NO.	
TDF-11						CODES - 11	
TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT	TAPE CONFIGURATION	CODE DEFINITION AND REMARKS			
029	78-79	OCEAN WEATHER STATION NUMBER (Used when Field 031 = 2 or 2̄)	ΔΔ, 01-26	Station	No.	Station	No.
		NOTE: Other configurations may appear in this Field. These were used for control and edit procedures and have no valid meaning to the user.		A =	01	N =	14
				B =	02	O =	15
				C =	03	P =	16
				D =	04	Q =	17
				E =	05	R =	18
				F =	06	S =	19
				G =	07	T =	20
				H =	08	U =	21
				I =	09	V =	22
				J =	10	W =	23
				K =	11	X =	24
				L =	12	Y =	25
				M =	13	Z =	26
030	80	CARD INDICATOR	Δ, 0-5, 0̄	Δ =	All card decks except 128		
				0-5 =	Card deck 128. Codes are World Meteorological Organization codes effective at time of obser- vation.		
				0̄ =	Card deck 128. Observations punched by U.S.		
031	81	OSV OR SHIP INDICATOR	Δ, 0, 2, 2̄, 4	Δ =	Navy and Deck Log Observations		
				0 =	Merchant ships		
				2 =	OSV - off station		
				2̄ =	OSV - on station		
				4 =	Lightship		
032	82	ADDITIONAL DATA INDICATOR	Δ, 1, 6, 8	Δ =	No additional data		
				1 =	Ice information follows		
				6 =	Ship direction and speed and 3 hour pressure change follows		
				8 =	Significant cloud information follows		
<u>WHEN ADDITIONAL DATA INDICATOR = 1</u>							
033	83	TYPE OF ICE	1-5	1 =	Icing from ocean spray		
				2 =	Icing from fog		
				3 =	Icing from spray and fog		
				4 =	Icing from rain		
				5 =	Icing from spray and rain		
034	84-85	ICE THICKNESS	00-99	Ice thickness in centimeters			
035	86	RATE OF ICE ACCRETION	0-4	0 =	Ice not building up		
				1 =	Ice building up slowly		
				2 =	Ice building up rapidly		
				3 =	Ice melting or breaking up slowly		
036	87-88	BLANK		4 =	Ice melting or breaking up rapidly		
<u>WHEN ADDITIONAL DATA INDICATOR = 6</u>							
033	83	SHIP DIRECTION	0-9	Ship's course (true) made good during the 3 hours preceding the time of ob- servation.			
				0 =	Ship hove to	5 =	SW
				1 =	NE	6 =	W
				2 =	E	7 =	NW
				3 =	SE	8 =	N
				4 =	S	9 =	Unknown

TAPE DECK		SURFACE MARINE OBSERVATIONS			PAGE NO.
TDF-11					CODES-12
TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT	TAPE CONFIGURATION	CODE DEFINITION AND REMARKS	
034	84	SHIP SPEED	0-9	Ship's average speed made good during the three hours preceding the time of observation.  Prior to 1968: 0 = 0 knots      5 = 13-15 knots 1 = 1- 3 knots      6 = 16-18 knots 2 = 4- 6 knots      7 = 19-21 knots 3 = 7- 9 knots      8 = 22-24 knots 4 = 10-12 knots      9 = >24 knots  Beginning January 1, 1968: 0 = 0 knots      5 = 21-25 knots 1 = 1- 5 knots      6 = 26-30 knots 2 = 6-10 knots      7 = 31-35 knots 3 = 11-15 knots      8 = 36-40 knots 4 = 16-20 knots      9 = >40 knots	
035	85	BAROMETRIC TENDENCY	0-8	0 = Increasing, then decreasing; atmospheric pressure same or higher than 3 hours ago. 1 = Increasing, then steady; or increasing then increasing more slowly; atmospheric pressure now higher than 3 hours ago. 2 = Increasing (steadily or unsteadily) atmospheric pressure now higher than 3 hours ago. 3 = Decreasing or steady, then increasing; or increasing then increasing more rapidly; atmospheric pressure now higher than 3 hours ago. 4 = Steady; atmospheric pressure same as 3 hours ago. 5 = Decreasing, then increasing; atmospheric pressure the same or lower than 3 hours ago. 6 = Decreasing, then steady, or decreasing then decreasing more slowly; atmospheric pressure now lower than 3 hours ago. 7 = Decreasing (steadily or unsteadily) atmospheric pressure now lower than 3 hours ago. 8 = Steady or increasing, then decreasing; or decreasing then decreasing more rapidly; atmospheric pressure now lower than 3 hours ago.	
036	86-88	AMOUNT OF PRESSURE CHANGE	000-299	Amount of pressure change from 3 hours ago. (Tenths of millibars).  00.0- 29.9 millibars.	
<u>WHEN ADDITIONAL DATA INDICATOR = 8</u>					
033	83	SIGNIFICANT CLOUD AMOUNT	0-9	Amount of individual cloud layer or mass.  0 = Clear 1 = 1 Okta or less, but not zero 2-8 = 2-8 Oktas 9 = Sky obscured or cloud amount cannot be estimated.	

TAPE DECK		SURFACE MARINE OBSERVATIONS			PAGE NO.
TDF-11					CODES - 13
TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT	TAPE CONFIGURATION	CODE DEFINITION AND REMARKS	
034	84	SIGNIFICANT CLOUD TYPE	0-9, -	Cloud Genus 0 = Cirrus 1 = Cirrocumulus 2 = Cirrostratus 3 = Altcumulus 4 = Altostratus 5 = Nimbostratus 6 = Stratocumulus 7 = Stratus 8 = Cumulus 9 = Cumulonimbus - = Cloud not visible owing to darkness, fog, duststorms, sandstorm, or other analogous phenomena.	
035	85-86	SIGNIFICANT CLOUD HEIGHT	00-50 56-99	Height of the base of the cloud layer or mass whose genus was reported in Field 034. 00 = <30 meters 01-50 = 30-1500 meters in increments of 30 meters 56-80 = 1800-9000 meters in increments of 300 meters 81-88 = 10,500-21,000 meters in increments of 1500 meters 89 = >21,000 meters 90 = <50 meters 91 = 50-100 meters 92 = 100-200 meters 93 = 200-300 meters 94 = 300-600 meters 95 = 600-1000 meters 96 = 1000-1500 meters 97 = 1500-2000 meters 98 = 2000-2500 meters 99 = >2500 meters or no clouds	
036	87-88	BLANK			
037	89	ICE INDICATOR	+	Indicates that the sea ice group (C <sub>2</sub> KD <sub>1</sub> re) was entered on the original reporting form. This indicator used only for Card Deck 128.	
038	90-93	SHIP NUMBER	0001-9999 -001--999 1000-3000	Identifying number of individual ships.	
039-	94-140	SUPPLEMENTAL DATA FIELDS			

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TDF-11	SURFACE MARINE OBSERVATIONS	SECTION 4.1

SECTION 4

CONVERSION SCALES

SCALE 1      Conversion of Octant to Quadrant (Tape Field 004).

Octant = 0 (00-90°N, 00-90°W)	Quadrant = 1
Octant = 1 (00-90°N, 90-180°W)	Quadrant = 1
Octant = 2 (00-90°N, 90-180°E)	Quadrant = 2
Octant = 3 (00-90°N, 00-90°E)	Quadrant = 2
Octant = 5 (00-90°S, 00-90°W)	Quadrant = 3
Octant = 6 (00-90°S, 90-180°W)	Quadrant = 3
Octant = 7 (00-90°S, 90-180°E)	Quadrant = 4
Octant = 8 (00-90°S, 00-90°E)	Quadrant = 4

SCALE 2      Conversion of Local Standard Time to GMT (Tape Field 010).

Starting at 008°W and working westward in 15° increments, one hour was added to the LST for each 15° of Longitude through 180°.

For example: 1 hour was added for longitudes 008°-022°W  
2 hours were added for longitudes 023°-037°W  
etc.

Starting at 008°E and working eastward in 15° increments, one hour was subtracted from the LST for each 15° of Longitude through 180°.

For example: 1 hour was subtracted for longitudes 008°-022°E  
2 hours were subtracted for longitudes 023°-037°E  
etc.

SCALE 3      Conversion of 1942 present weather code to 1960 present weather code (Tape Field 014)

<u>1960 Code (Taped)</u>	<u>1942 Code</u>	<u>1942 Code Definition</u>
ΔΔ	00-03	State of the sky (not converted to tape)
04	17	Visibility reduced by smoke
05	05	Haze (Visibility 1000 meters or more)
08	06	Dust devils seen
09	12	Duststorm within sight but not at ship
10	08	Light fog (Visibility 1000-2000 meters)
12	40	Fog
13	07	Distant lightning
16	10	Precipitation within sight
17	11	Thunder, without precipitation at the ship
18	14	Squally weather
18	15	Heavy squalls in last three hours
19	16	Waterspouts seen in last three hours
20	20	Precipitation      Within past hour but not at observation
20	21	Drizzle      "
21	22	Rain      "
22	23	Snow      "
23	24	Rain and snow mixed      "
25	25	Rain shower      "
26	26	Snow shower      "
27	27	Hail or rain and hail showers      "
28	41	Moderate fog      "
29	28	Slight thunderstorm      "
29	29	Heavy thunderstorm      "

TAPE DECK		PAGE NO.	
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SURFACE MARINE OBSERVATIONS			
SECTION 4			
CONVERSION SCALES			
SCALE 3 (Cont'd)			
1960 Code (Taped)	1942 Code	1942 Code Definition	
30	31	Dust or sandstorm has decreased	
31	30	Dust or sandstorm	
31	32	Dust or sandstorm, no appreciable change	
32	33	Dust or sandstorm has increased	
34	34	Line of duststorms	
36	35	Storm of drifting snow	
36	36	Slight storm of drifting snow, generally low	
37	37	Heavy storm of drifting snow, generally low	
38	38	Slight storm of drifting snow, generally high	
39	39	Heavy storm of drifting snow, generally high	
40	09	Fog at a distance but not at ship	
41	49	Fog in patches	
42	43	Fog, sky discernible, has become thinner last hour	
43	44	Fog, sky not discernible, has become thinner last hour	
44	45	Fog, sky discernible, no appreciable change last hour	
45	42	Thick fog in last hour	
45	46	Fog, sky not discernible, no appreciable change last hour	
46	47	Fog, sky discernible, has begun or become thicker during last hour	
47	48	Fog, sky not discernible, has begun or become thicker during last hour	
50	50	Drizzle	
50	51	Slight intermittent Drizzle	
50	57	Drizzle and fog (A 4 was placed in field 015)	
51	52	Continuous slight drizzle	
52	53	Intermittent moderate drizzle	
53	54	Continuous moderate drizzle	
54	55	Intermittent thick drizzle	
55	56	Continuous thick drizzle	
58	58	Slight or moderate drizzle and rain	
59	59	Thick drizzle and rain	
60	60	Rain	
60	61	Intermittent slight rain	
60	67	Rain and fog (A 4 was placed in field 015)	
61	62	Continuous slight rain	
62	63	Intermittent moderate rain	
63	64	Continuous moderate rain	
64	65	Intermittent heavy rain	
65	66	Continuous heavy rain	
68	68	Slight or moderate rain and snow mixed	
69	69	Heavy rain and snow mixed	
70	70	Snow or snow and rain mixed	
70	71	Intermittent slight snow in flakes	
70	77	Snow and fog (A 4 was placed in field 015)	
71	72	Continuous slight snow in flakes	
72	73	Intermittent moderate snow in flakes	
73	74	Continuous moderate snow in flakes	
74	75	Intermittent heavy snow in flakes	
75	76	Continuous heavy snow in flakes	
77	78	Grains of snow	
79	79	Ice crystals or frozen raindrops (U.S. Sleet)	



TAPE DECK		PAGE NO.	
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SURFACE MARINE OBSERVATIONS			
SECTION 4			
CONVERSION SCALES			
SCALE 3 (Cont'd)			
1960 Code (Taped)		1942 Code	1942 Code Definition
80	80		Showers
80	81		Slight or moderate rain showers
81	82		Heavy rain showers
83	85		Slight or moderate rain and snow showers
84	86		Heavy rain and snow showers
85	83		Slight or moderate snow showers
86	84		Heavy snow showers
87	87		Showers of snow pellets
89	88		Slight hail or rain and hail showers
90	89		Heavy hail or rain and hail showers
91	91		Rain, thunderstorm during last hour but not at observation
93	92		Snow or rain and snow mixed, thunderstorm during last hour but not at observation
95	90		Thunderstorm
95	93		Thunderstorm, slight, without hail but with rain or snow
95	95		Thunderstorm, moderate, without hail but with rain or snow
96	94		Thunderstorm, slight, with hail
96	96		Thunderstorm, moderate, with hail
97	97		Thunderstorm, heavy, without hail but with rain or snow
98	98		Thunderstorm combined with duststorm
99	99		Thunderstorm, heavy, with hail
NOTE:			
1942 Codes:00 Cloudless			
01 Partly cloudy			
02 Cloudy			
03 Overcast			
13 Ugly, threatening sky			
19 Signs of tropical storm			
Do not have comparable definitions in the 1960 code and were not converted to tape.			
1960 Codes:00		35	92
01		48	94
02		49	
03		56	
06		57	
07		66	
11		67	
14		76	
15		78	
24		82	
33		88	
Did not have comparable definitions and will not appear on tape when Field 014 was derived by Scale 3.			

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#### SECTION 4

#### CONVERSION SCALES

##### SCALE 4

Computation of Wet Bulb Temperature (Tape Field 018).  
(Air Temperature 0°F and above)

$$T_{wb} = T - (.034N - .00072N \{N-1\}) (T + T_{dp} - 2P + 108)$$

Where:  $T_{wb}$  = Wet Bulb Temperature in °F  
 $T$  = Dry Bulb Temperature in °F  
 $T_{dp}$  = Dew Point Temperature in °F

$$N = \frac{T - T_{dp}}{10}$$

$$P = 29.90 \text{ inches of mercury}$$

Where necessary, Celsius temperatures were converted to Fahrenheit temperatures before the computation was made.

Because of conversion procedures, computed wet bulb temperatures occasionally exceeded the dry bulb temperature. When the computed wet bulb temperature exceeded the dry bulb temperature by one degree Celsius or less, the temperatures were considered equal and Tape Field 018 entered to equal Tape Field 017. Wet bulb temperatures exceeding the dry bulb temperature by more than one degree Celsius were considered invalid and Tape Field 018 is blank.

##### SCALE 5

Conversion of Beaufort Wind Force to Knots (Tape Field 012).

<u>Tape Entry</u>	<u>Beaufort Wind Force</u>	<u>Beaufort Limits in Knots</u>
000	0	Calm
002	1	1 - 3
005	2	4 - 6
009	3	7 -10
013	4	11-16
018	5	17-21
024	6	22-27
030	7	28-33
037	8	34-40
044	9	41-47
052	10	48-55
062	11	56-63
068	12	64 or greater

##### SCALE 6

Computation of Fahrenheit temperatures to Celsius Temperatures (Tape Fields 017,018,019,020)

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) (.55555)$$

The resultant Celsius temperature was rounded to the nearest tenth before placing in the appropriate tape field.

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SECTION 4

CONVERSION SCALES

SCALE 7      Conversion of Cloud Amounts from tenths of sky covered to eighths of sky covered  
(Tape Field 022 (N), (N<sub>h</sub>)).

<u>Tape Entry (Oktas)</u>	<u>Tenths</u>
0	0
1	1
2	2 or 3
3	4
4	5
5	6
6	7 or 8
7	9
8	10
9	Obscured

SCALE 8      Computation of Dew Point Temperature (Tape Field 019).

When RH = 40% or more:

$$T - T_{dp} = (14.55 + .114T)x + ((2.5 + .007T)x)^3$$

When RH = Less than 40%:

$$T - T_{dp} = (14.55 + .114T)x + ((2.5 + .007T)x)^3 + (15.9 + .117T)x^{14}$$

Where:    T<sub>dp</sub> = Dew Point Temperature in °C  
             T    = Dry Bulb Temperature in °C  
             x    = 1.0 - RH

TAPE DECK		PAGE NO.
1110	SURFACE MARINE OBSERVATIONS	1-1110.1

# STANDARD FORMAT

CARD DECK	MAR SQ	SUB SQ	Q	LAT	LONG	YEAR	MO	DA	HR	WIND DIR	WIND SPD	VIS	WX	W	PRESS	T I	AIR TMP	WET BLB	DEW PT	SEA TMP	A-S DIF
xxx	xxx	xx	x	xxx	xxxx	xxxx	xx	xx	xx	ixx	ixxx	ixx	xx	x	xxxxx	i	xxx	xxx	xxx	xxx	xxx
FIELD NUMBER	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021

CLOUDS							WAVE	P	WAVE	SWL	P	SWL	OSV	C	S	A I ICE A				A D S a ppp				A SIG SIG SIG				I	SHIP		
N <sub>h</sub>	C <sub>L</sub>	I <sub>h</sub>	C <sub>M</sub>	C <sub>H</sub>	DIR	E	HGT	DIR	E	HGT	NO.	D	H	P	D	C	THK	C	C	D	I	P	a	ppp	D	N	T	HGT	C	NO.	
x	x	x	i	x	x	xx	x	xx	xx	x	xx	xx	x	x	1	x	xx	x	ΔΔ	6	x	x	x	xxx	8	x	x	xx	ΔΔ	x	xxxx
FIELD NUMBER					022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	032	033	034	035	036	032	033	034	035	036	037	038

# SUPPLEMENTAL DATA FIELDS

RH	CL	SKY COND	VIS	WEATHER	AIR TMP	WND DIR	A M	T Y	CL HGT	A M	T Y	T P	CH HGT	N	WET BLB	SEA TMP	S D	SWL E I	D HGT	SWL R	PER	
xxx	xx	xxxx	xxx	ABCDEFGHIJ	xx	xx	x	x	xx	x	x	x	xx	x	xx	xx	x	x	xx	x	xx	
FIELD NUMBER	039	040	041	042	043	044	045	046	047	048	049	050	051	052	053	054	055	056	057	058	059	060

# UNIQUE CHARACTERISTICS

TAPE FIELD NUMBER	ELEMENT	TAPE NOTATION
001	CARD DECK NUMBER	110
011 i	WIND DIRECTION INDICATOR	1
012 i	WIND SPEED INDICATOR	BLANK
013 i	VISIBILITY INDICATOR	BLANK
015	PAST WEATHER	BLANK
017 i	TEMPERATURES INDICATOR	1
022 i	CLOUD INDICATOR	BLANK
023-031		BLANK
032	ADDITIONAL DATA INDICATOR	6
037-038		BLANK

# SUPPLEMENTAL DATA FIELDS

039	RELATIVE HUMIDITY
040	CEILING HEIGHT
041	SKY CONDITION

# TAPE POSITIONS

94-96
97-98
99-102

TAPE DECK		SURFACE MARINE OBSERVATIONS	PAGE NO.
1110			1-1110.2

<u>TAPE</u> <u>FIELD NUMBER</u>	<u>ELEMENT</u>	<u>TAPE POSITIONS</u>
042	VISIBILITY	103-105
043	PRESENT WEATHER	106-115
044	AIR TEMPERATURE	116-117
045	WIND DIRECTION	118-119
046	AMOUNT OF LOW CLOUD	120
047	TYPE OF LOW CLOUD	121
048	HEIGHT OF LOW CLOUD	122-123
049	AMOUNT OF MIDDLE CLOUD	124
050	TYPE OF MIDDLE CLOUD	125
051	TYPE OF HIGH CLOUD	126
052	HEIGHT OF HIGH CLOUD	127-128
053	TOTAL CLOUD AMOUNT	129
054	WET BULB TEMPERATURE	130-131
055	SEA TEMPERATURE	132-133
056	STATE OF THE SEA	134
057	DIRECTION OF SEA	135
058	HEIGHT OF SWELL	136-137
059	DIRECTION OF SWELL	138
060	PERIOD OF SWELL	139-140

TAPE DECK				PAGE NO.
1110		SURFACE MARINE OBSERVATIONS		2-1110.1
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION		
004	QUADRANT	CARD COLUMN 1 - Octant - See Scale 1, Section 4		
005	LATITUDE	CARD COLUMNS 2-3 00-90 - whole degrees A Ø was placed in the low order position of Field 005		
006	LONGITUDE	CARD COLUMNS 1 and 4-5 00-99 - whole degrees A Ø was placed in the low order position of Field 006		
		0000-0990	=	0-8 in column 4 and 0,3,5 or 8 in column 1 or a 9 punched in column 4
		1000-1800	=	0-8 in column 4 and 1, 2, 6 or 7 in column 1
007	YEAR	CARD COLUMNS 6-7 45-51 1900 was added to columns 6-7 General period of record is January 1945-May 1951		
010	HOURL-GMT	CARD COLUMNS 12-13 00-23 LST - See Section 4, Scale 2		
011	WIND DIRECTION	TAPE FIELD 045		
		00	=	00
		02	=	12
		05	=	22
		07	=	32
		09	=	33
		11	=	34
		14	=	44
		16	=	54
		18	=	55
		20	=	56
		23	=	66
		25	=	76
		27	=	77
		29	=	78
		32	=	88
		34	=	18
		36	=	11
013	VISIBILITY	TAPE FIELD 042		
		90	=	000-001
		92	=	002-003
		93	=	004-005
		94	=	006-008
		95	=	009-014
		96	=	015-042
		97	=	043-089
		98	=	090-190
		99	=	> 190

TAPE DECK 1110	SURFACE MARINE OBSERVATIONS	PAGE NO. 2-1110.2
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION
014	PRESENT WEATHER	TAPE FIELD 043
		04 = Pos. H = 1, 2 or 3 05 = Pos. H = 5, 7, 8 or 9 06 = Pos. I = 1 07 = Pos. I = 2 08 = Pos. I = 3 10 = Pos. G = 1 11 = Pos. G = 7 12 = Pos. G = 8 or 9 17 = Pos. A = 1 or 2 19 = Pos. A = 3 or 4 31 = Pos. J = 1, 2, 4 or 5 34 = Pos. J = 3 or 6 36 = Pos. I = 4 or 7 38 = Pos. I = 5 or 8 39 = Pos. I = 6 or 9 41 = Pos. G = 4 and temperature < 32°F 44 = Pos. G = 2 or Pos. G = 5 and temperature < 32°F 45 = Pos. G = 3 or Pos. G = 6 and temperature < 32°F 53 = Pos. C = 5 55 = Pos. C = 6 56 = Pos. C = 7 57 = Pos. C = 8 or 9 58 = Pos. A = 0, Pos. B = 1 or 4 and Pos. C = 4 59 = Pos. A = 0, Pos. B = 2 or 3 and Pos. C = 5 or 6 61 = Pos. B = 1 63 = Pos. B = 2 65 = Pos. B = 3 66 = Pos. B = 7 67 = Pos. B = 8 or 9 68 = Pos. A = 0, Pos. B = 1 or 4 and Pos. D = 1 69 = Pos. A = 0, Pos. B = 2, 3, 5 or 6 and Pos. D = 2 or 3 71 = Pos. D = 1 73 = Pos. D = 2 75 = Pos. D = 3 79 = Pos. F = 1, 2 or 3 80 = Pos. B = 4 or Pos. C = 1 81 = Pos. B = 5 or Pos. C = 2 82 = Pos. B = 6 or Pos. C = 3 83 = Pos. A = 0, Pos. B = 4 and Pos. E = 1 84 = Pos. A = 0, Pos. B = 5 or 6 and Pos. E = 2 or 3 85 = Pos. E = 1 or 4 86 = Pos. E = 2, 3, 5 or 6 87 = Pos. D = 4 or Pos. F = 7 88 = Pos. F = 5, 6, 8 or 9 89 = Pos. F = 4 95 = Pos. A = 1, 2, 3 or 4; Pos. D = 1 or 2; or Pos. E = 1, 2, 4 or 5; or Pos. F = 1 or 2; or Pos. B = 1, 2, 4, 5, 7 or 8; or Pos. C = 1, 2, 4, 5, 6, 7, 8 or 9 96 = Pos. A = 1, 2, 3 or 4; Pos. D = 4 or 5; or Pos. F = 4, 5, 7 or 8 97 = Pos. A = 1, 2, 3 or 4; Pos. B = 3, 6 or 9; or Pos. C = 3; or Pos. E = 3 or 6; or Pos. F = 3 99 = Pos. A = 1, 2, 3 or 4; Pos. D = 6; or Pos. F = 6 or 9

TAPE DECK		SURFACE MARINE OBSERVATIONS	PAGE NO.
1110			2-1110.3
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION	
017	AIR TEMPERATURE	TAPE FIELD 044 See Scale 6, Section 4 00-99 °F Signed in low order position indicates temperature > 100 °F Signed in high order position indicates temperature < 0 °F	
018	WET BULB TEMPERATURE	Computed from Tape Field 044 and dew point as punched in Card Column 41-42. See Scale 4, Section 4	
019	DEW POINT TEMPERATURE	CARD COLUMN 41-42 00-99 °F - See Scale 6, Section 4 - overpunch in column 41 indicated negative value	
020	SEA TEMPERATURE	TAPE FIELD 055 00-99 °F - See Scale 6, Section 4	
021	AIR-SEA TEMP. DIFFERENCE	Computed from Tape Fields 017 and 020 (Air minus Sea Temp.)	
022	TOTAL CLOUD AMOUNT (N)	TAPE FIELD 053	
022	LOWER CLOUD AMOUNT (N <sub>L</sub> )	TAPE FIELD 046 See Scale 7, Section 4	
022	TYPE OF LOW CLOUD (C <sub>L</sub> )	TAPE FIELD 047 0 = 0 1 = 3 5 = 2 6 = 1 or 6 9 = 4	
022	TYPE OF LOW CLOUD	TAPE FIELD 050 1 = 3 9 = 4	
022	CLOUD HEIGHT (h)	TAPE FIELD 048 0 = 00-01 1 = 02 2 = 03-05 3 = 06-09 4 = 10-19 5 = 20-34 6 = 35-49 7 = 50-64 8 = 65-79 9 = > 79	
022	TYPE OF MIDDLE CLOUD (C <sub>M</sub> )	TAPE FIELD 050 1 = 1 2 = 5 4 = 2	
022	TYPE OF MIDDLE CLOUD	TAPE FIELD 047 2 = 5	



TAPE DECK		SURFACE MARINE OBSERVATIONS		PAGE NO.
1110				2-1110.4
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION		
022	TYPE OF HIGH CLOUD ( $C_H$ )	TAPE FIELD 051		
		1	=	2
		8	=	1
		9	=	3
033	SHIP DIRECTION	CARD COLUMNS 14-15		
		1	=	03-06
		2	=	07-11
		3	=	12-15
		4	=	16-20
		5	=	21-24
		6	=	25-29
		7	=	30-33
		8	=	34-36, 01-02
034	SHIP SPEED	CARD COLUMN 16		
		0-9	=	0-9
035	BAROMETRIC TENDENCY	CARD COLUMNS 47 and 48-99		
		0	=	0
		1	=	1
		2	=	2 or 3
		3	=	4
		5	=	5
		6	=	6
		7	=	7 or 8
		8	=	9
		4	=	when column 47 punched 1-4 and columns 48-49 = 00

TAPE DECK		PAGE NO.
1110	SURFACE MARINE OBSERVATIONS	3-1110.1
<u>SUPPLEMENTAL DATA FIELDS</u>		
<u>TAPE FIELD NUMBER</u>	<u>ELEMENT</u>	<u>EXPLANATION</u>
039	RELATIVE HUMIDITY	000-100 Computed: $RH = \frac{e}{e_s}$
040	CEILING HEIGHT	00-95 = Hundreds of Feet, -- = unlimited
041	SKY CONDITION	<p>Less than 6 tenths of sky covered, nn = height of clouds in hundreds of feet:</p> <p>0--0 = Clear</p> <p>1--Δ = High thin clouds</p> <p>2--Δ = High clouds</p> <p>3--Δ = High thick clouds</p> <p>0nn1 = Low thin clouds</p> <p>0nn2 = Low clouds</p> <p>0nn3 = Low thick clouds</p> <p>At least 6 tenths but less than 10 tenths of sky covered:</p> <p>4--Δ = High thin clouds</p> <p>5--Δ = High clouds</p> <p>6--Δ = High thick clouds</p> <p>4--Δ = Low thin clouds</p> <p>5--Δ = Low clouds</p> <p>6--Δ = Low thick clouds</p> <p>10 tenths of sky covered:</p> <p>7--Δ = High thin clouds</p> <p>8--Δ = High clouds</p> <p>9--Δ = High thick clouds</p> <p>7--Δ = Low thin clouds</p> <p>8--Δ = Low clouds</p> <p>9--Δ = Low thick clouds</p> <p>8--5 = 10 tenths high clouds, 6-9 tenths lower clouds</p> <p>8nn2 = 10 tenths high clouds, less than 6 tenths lower clouds at height nn.</p> <p>5--5 = 6-9 tenths high clouds, 6-9 tenths lower clouds</p> <p>5nn2 = 6-9 tenths high clouds, less than 6 tenths lower clouds at height nn.</p> <p>2nn2 = Less than 6 tenths high clouds, less than 6 tenths lower clouds at height nn.</p> <p>8--5 = 10 tenths clouds over 6-9 tenths lower clouds</p> <p>8nn2 = 10 tenths clouds over less than 6 tenths clouds at height nn.</p> <p>5--5 = 6-9 tenths clouds over 6-9 tenths lower clouds</p>

TAPE DECK		PAGE NO.	
1110		3-1110.2	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
041	SKY CONDITION (Con'd)	5nn2 = 6-9 tenths clouds over less than 6 tenths clouds at height nn 2nn2 = less than 6 tenths clouds over less than 6 tenths clouds at height nn 0--- = No clouds visible due to obscuring phenonema	
042	VISIBILITY	001 = 1/16 miles 002 = 1/8 miles 003 = 3/16 miles 004 = 1/4 miles 005 = 5/16 miles 006 = 3/8 miles 007 = 1/2 miles 008 = 5/8 miles 009 = 3/4 miles 010 = 1 miles 014 = 1 1/4 miles 017 = 1 1/2 miles 019 = 1 3/4 miles 020 = 2 miles 024 = 2 1/4 miles 027 = 2 1/2 miles 029 = 2 3/4 miles 030 = 3 miles  040-150 = 4 - 15 miles in one mile increments 200-950 = 20 - 95 miles in five mile increments	
043	PRESENT WEATHER	0000000000 = No weather or obstructions to vision.  FIELD 043 A: 1 = Thunder 2 = Heavy thunder 3 = Tornado 4 = Waterspout  FIELD 043 B: 1 = Light rain 2 = Moderate rain 3 = Heavy rain 4 = Light rain showers 5 = Moderate rain showers 6 = Heavy rain showers 7 = Light freezing rain 8 = Moderate freezing rain 9 = Heavy freezing rain  FIELD 043 C: 1 = Light rain squalls 2 = Moderate rain squalls 3 = Heavy rain squalls 4 = Light drizzle 5 = Moderate drizzle 6 = Heavy drizzle 7 = Light freezing drizzle 8 = Moderate freezing drizzle 9 = Heavy freezing drizzle	

TAPE DECK		PAGE NO.
1110	SURFACE MARINE OBSERVATIONS	3-1110.3
TAPE FIELD NUMBER	ELEMENT	EXPLANATION
043	PRESENT WEATHER (Con't)	<p>FIELD 043 D:</p> <p>1 = Light snow  2 = Moderate snow  3 = Heavy snow  4 = Light snow pellets  5 = Moderate snow pellets  6 = Heavy snow pellets</p> <p>FIELD 043 E:</p> <p>1 = Light snow showers  2 = Moderate snow showers  3 = Heavy snow showers  4 = Light snow squalls  5 = Moderate snow squalls  6 = Heavy snow squalls</p> <p>FIELD 043 F:</p> <p>1 = Light sleet  2 = Moderate sleet  3 = Heavy sleet  4 = Light hail  5 = Moderate hail  6 = Heavy hail  7 = Light small hail  8 = Moderate small hail  9 = Heavy small hail</p> <p>FIELD 043 G:</p> <p>1 = Light fog  2 = Moderate fog  3 = Dense fog  4 = Light ice fog  5 = Moderate ice fog  6 = Dense ice fog  7 = Light ground fog  8 = Moderate ground fog  9 = Dense ground fog</p> <p>FIELD 043 H:</p> <p>1 = Light smoke  2 = Moderate smoke  3 = Dense smoke  5 = Haze  7 = Light smoke and haze  8 = Moderate smoke and haze  9 = Dense smoke and haze</p> <p>FIELD 043 I:</p> <p>1 = Light dust  2 = Moderate dust  3 = Heavy dust  4 = Light blowing snow  5 = Moderate blowing snow  6 = Heavy blowing snow  7 = Light drifting snow  8 = Moderate drifting snow  9 = Heavy drifting snow</p>

TAPE DECK		PAGE NO.	
1110		3-1110.4	
SURFACE MARINE OBSERVATIONS			
TAPE		EXPLANATION	
FIELD NUMBER	ELEMENT		
043	PRESENT WEATHER (Con't)	FIELD 043 J 1 = Light blowing dust 2 = Moderate blowing dust 3 = Heavy blowing dust 4 = Light blowing sand 5 = Moderate blowing sand 6 = Heavy blowing sand 7 = Spray	
044	AIR TEMPERATURE	00-99 in whole °F:	
054	WET BULB TEMPERATURE	- overpunch in high order position indicates negative temperature - over punch in low order position indicates temperature > 100° F	
045	WIND DIRECTION	00 = Calm 12 = NNE 22 = NE 32 = ENE 33 = E 34 = ESE 44 = SE 54 = SSE 55 = S 56 = SSW 66 = SW 76 = WSW 77 = W 78 = WNW 88 = NW 18 = NNW 11 = N	
046	LOW CLOUD AMOUNT	0-10 tenths of the sky covered	
049	MIDDLE CLOUD AMOUNT	10 tenths punched as -	
053	TOTAL CLOUD AMOUNT		
047	LOW CLOUD TYPE	0 = None 1 = Stratus 2 = Stratocumulus 3 = Cumulus 4 = Cumulonimbus 5 = Nimbus 6 = Fog	
048	LOW CLOUD HEIGHT	00-95 in hundreds of feet. -- indicates no	
052	HIGH CLOUD HEIGHT	low clouds	
050	MIDDLE CLOUD TYPE	0 = None 1 = Altostratus 2 = Altocumulus 3 = High Cumulus 4 = High Cumulonimbus 5 = Nimbostratus	
051	HIGH CLOUD TYPE	0 = None 1 = Cirrostratus 2 = Cirrus 3 = Cirocumulus	

TAPE DECK		PAGE NO.	
1110		3-1110.5	
SURFACE MARINE OBSERVATIONS			
<u>TAPE</u> <u>FIELD NUMBER</u>	<u>ELEMENT</u>	<u>EXPLANATION</u>	
055	SEA TEMPERATURE	00-99 in whole ° F	
056	STATE OF THE SEA		Wave Height
		0 = Flat, oily	0 feet
		1 = Calm, rippled	0 feet
		2 = Smooth (wavelets)	<1 foot
		3 = Slight	1-3 feet
		4 = Moderate	3-5 feet
		5 = Rough	5-8 feet
		6 = Very rough	8-12 feet
		7 = High	12-20 feet
		8 = Very high	20-40 feet
		9 = Mountainous	>40 feet
057	DIRECTION OF SEA	0 = Calm	
059	DIRECTION OF SWELL	1 = N	
		2 = NE	
		3 = E	
		4 = SE	
		5 = S	
		6 = SW	
		7 = W	
		8 = NW	
		- = Unknown	
058	SWELL HEIGHT	00-99 in whole feet	
060	PERIOD OF SWELL	00-39 in whole seconds	

TAPE DECK		PAGE NO.
1116	SURFACE MARINE OBSERVATIONS	1-1116.1

# STANDARD FORMAT

CARD DECK	MAR SQ	SUB SQ	Q	LAT	LONG	YEAR	MO	DA	HR	WIND DIR	WIND SPD	VIS	WX	W	PRESS	T I	AIR TMP	WET BLB	DEW PT	SEA TMP	A-S DIF
xxx	xxx	xx	x	xxx	xxxx	xxxx	xx	xx	xx	ixx	ixxx	ixx	xx	x	xxxxx	i	xxx	xxx	xxx	xxx	xxx
FIELD NUMBER	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021

CLOUDS										WAVE	P	WAVE	SWL	P	SWL	OSV	C	S																I	SHIP
N	N <sub>h</sub>	C <sub>L</sub>	I	h	C <sub>M</sub>	C <sub>H</sub>	DIR	E	HGT	DIR	E	HGT	NO.	D	H	P	A	I	ICE	A	A	D	S	a	ppp	A	SIG	SIG	SIG		I	SHIP			
x	x	x	i	x	x	x	xx	x	xx	xx	x	xx	xx	x	x		1	x	xx	x	Δ	Δ	6	x	x	xxx	8	x	x	xx	Δ	Δ	x	xxxx	
FIELD							022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	032	033	034	035	036	032	033	034	035	036	037	038		
NUMBER																																			

# SUPPLEMENTAL DATA FIELDS

RH	N	h	N <sub>h</sub>	AMT SIG	A M	T Y	HGT SIG	ICE RPT	B A	WND DIR	VIS	WX	20 BLANK CHARACTERS															
xxx	xx	xx	xx	xx	x	x	xx	xxxxx	x	xx	xx	xx																

FIELD NUMBER	039	040	041	042	043	044	045	046	047	048	049	050	051
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# UNIQUE CHARACTERISTICS

TAPE FIELD NUMBER	ELEMENT	TAPE NOTATION
001	CARD DECK NUMBER	116
011 i	WIND DIRECTION INDICATOR	BLANK or 1
012 i	WIND SPEED INDICATOR	BLANK
013 i	VISIBILITY INDICATOR	BLANK
017 i	TEMPERATURES INDICATOR	1
022 i	CLOUDS INDICATOR	BLANK
026-028		BLANK
029	OCEAN WEATHER STATION NUMBER	01-26 or BLANK
030	CARD INDICATOR	BLANK
031	OSV OR SHIP INDICATOR	BLANK OR 2
032	ADDITIONAL DATA INDICATOR	6 OR BLANK
037	ICE INDICATOR	BLANK

TAPE DECK		PAGE NO.	
1116		1-1116.2	
SURFACE MARINE OBSERVATIONS			
<u>SUPPLEMENTAL DATA FIELDS</u>			
<u>TAPE FIELD NUMBER</u>	<u>ELEMENT</u>	<u>TAPE POSITIONS</u>	
039	RELATIVE HUMIDITY	94-96	
040	TOTAL CLOUD AMOUNT	97-98	
041	HEIGHT OF LOW CLOUD	99-100	
042	AMOUNT OF LOWER CLOUDS	101-102	
043	SIGNIFICANT CLOUD AMOUNT (TENTHS)	103-104	
044	SIGNIFICANT CLOUD AMOUNT (EIGHTS)	105	
045	TYPE OF SIGNIFICANT CLOUD	106	
046	HEIGHT OF SIGNIFICANT CLOUD	107-108	
047	ICE REPORT	109-113	
048	BAROMETER COMPARISON STATION OR DATA SOURCE	114	
049	WIND DIRECTION	115-116	
050	VISIBILITY	117-118	
051	PRESENT WEATHER	119-120	



TAPE DECK		SURFACE MARINE OBSERVATIONS		PAGE NO.
1116				2-1116.1
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION		
004	QUADRANT	CARD COLUMN 12 - Octant See Scale 1, Section 4		
006	LONGITUDE	CARD COLUMNS 12 and 16-18 000-999 Degrees and tenths with 1 implied when longitude is 100-180°. 100.0° was added to Field 006 when Column 12 = 1,2,6 or 7; and Column 16 = 0-8		
007	YEAR	CARD COLUMNS 5-6 1900 was added to columns 5-6. General period of record is January 1945 - June 1963		
011	WIND DIRECTION	TAPE FIELD 049 Field 049 transferred directly to Field 011. OSV's and Navy ships generally have an indicator of 1 (Reporting only 16 of 36 points)		
012	WIND SPEED	CARD COLUMNS 25-26 - in knots 00-99 When column 25 contained a - overpunch, 100 was added to the indicated speed, otherwise a 0 was placed in the high order position of Field 012		
012	WIND SPEED	CARD COLUMN 27 - wind speed in Beaufort force 0-9 and 0, 1, 2 When columns 25-26 were missing, column 27 was used according to Scale 5, Section 4		
013	VISIBILITY	TAPE FIELD 050 For observations prior to 1955:		
		90-99	=	90-99 or
		90	=	-0--2
		91	=	-3--9 or 00
		92	=	01
		93	=	02, 03
		94	=	04-08
		95	=	09-17
		96	=	18-45
		97	=	46-80
		98	=	81
		99	=	82-89
		For observations 1955 and later:		
		90	=	00
		91	=	01
		92	=	02-04
		93	=	05-08
		94	=	09-17
		95	=	18-36
		96	=	37-58
		97	=	59-68
		98	=	69-82
		99	=	83-89

TAPE DECK		PAGE NO.
1116	SURFACE MARINE OBSERVATIONS	2-1116.2
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION
014	PRESENT WEATHER	TAPE FIELD 051 00-99 For observations prior to 1949 see Scale 3, Section 4 Observations 1949 and later transferred directly to tape
015	PAST WEATHER	CARD COLUMN 32 0-9 Transferred directly to tape when reported For observations prior to 1949, if column 32 not punched and Tape Field 051 = 57, 67 or 77, a 4 was placed in Field 015
023	WAVE DIRECTION	CARD COLUMNS 70-71 00-36, 49 50-86, 99  When values = 50-86, 99, 50 was subtracted and the results placed in Field 023, and 10 was added to Field 025.
029	OCEAN WEATHER STATION NUMBER	01-26, ΔΔ  See Common Code portion
031	OSV OR SHIP INDICATOR	Δ or $\bar{2}$ $\bar{2}$ = OSV on station Δ = all other ships
035	BAROMETRIC TENDENCY	CARD COLUMNS 49 AND 50-51  For period 1945-1954: <div style="margin-left: 40px;"> 0 = 0  1 = 1  2 = 2 or 3  3 = 4  5 = 5  6 = 6  7 = 7 or 8  8 = 9  4 = when column 49 punched 1-4 and columns 50-51 = 00 </div> For period 1955 onward: Accepted as punched
036	PRESSURE CHANGE	CARD COLUMNS 50-51 00-99 when column 50 contained a - overpunch a 1 was placed in the high order position of Field 036; otherwise, a Ø was placed in this position  OSV's 1945-1948: 00-99 in fifths of millibars. Punched values were multiplied by 2 for placing on tape
038	SHIP NUMBER	0001-9999 = Merchant Marine and Great Lakes ships Δ001-Δ999 = Navy ships 0101-9999 = OSV Ship and Station Number

TAPE DECK		PAGE NO.	
1116		3-1116.1	
SURFACE MARINE OBSERVATIONS			
<u>SUPPLEMENTAL DATA FIELDS</u>			
<u>TAPE</u> <u>FIELD NUMBER</u>	<u>ELEMENT</u>	<u>EXPLANATION</u>	
039	RELATIVE HUMIDITY	000-100 computed: $RH = \frac{e}{e_s T}$	
040	TOTAL CLOUD AMOUNT	CARD COLUMN 21	
042	LOW CLOUD AMOUNT	CARD COLUMN 41	
043	SIGNIFICANT CLOUD AMOUNT	CARD COLUMN 52	
		00 = 0	
		01 = 1	
		02 = 2	
		03 = 3	
		04 = 4	
		05 = 5	
		06 = 6	
		07 = 7	
		08 = 8	
		09 = 9	
		10 = 10	
		Tenths of sky covered	
		by clouds	
041	LOW CLOUD HEIGHT	-- = No clouds below 8000 feet	
		00 = Height less than 100 feet	
		01-80 = 100-8000 feet (in hundreds of feet)	
		BLANK = Sky obscured or height unknown	
044	SIGNIFICANT CLOUD AMOUNT	0-8 = Eighths of sky covered	
		9 = Sky obscured or unable to estimate amount	
045	SIGNIFICANT CLOUD TYPE - 1945-1954	1 = Cirrus	
		2 = Cirrostratus	
		3 = Cirrocumulus	
		4 = Altocumulus	
		5 = Altostratus	
		6 = Stratocumulus	
		7 = Nimbostratus	
		8 = Cumulus of Fracto Cumulus	
		9 = Cumulonimbus	
		0 = Stratus or Fracto Stratus	
		- = Cloud not visible due to obscuration or darkness	
	1955-1963	0 = Cirrus	
		1 = Cirrocumulus	
		2 = Cirrostratus	
		3 = Altocumulus	
		4 = Altostratus	
		5 = Nimbostratus	
		6 = Stratocumulus	
		7 = Stratus	
		8 = Cumulus	
		9 = Cumulonimbus	
		- = Cloud not visible due to obscuration or darkness	
046	SIGNIFICANT CLOUD HEIGHT	00 = Less than 100 feet	
	Entire period;	01-50 = 100-5000 (in hundreds of feet)	
	1945-1954;	51-80 = 5100-8000 (in hundreds of feet)	
		81 = 9000 feet	
		82 = Not used	
		83 = 10,000 feet	
		84 = 13,000 feet	
		85 = 16,000 feet	

TAPE DECK				PAGE NO.	
1116		SURFACE MARINE OBSERVATIONS		3-1116.2	
TAPE FIELD NUMBER	ELEMENT	EXPLANATION			
046	SIGNIFICANT CLOUD HEIGHT (Con't)				
	1945-1954:	86 =	20,000 feet		
		87 =	23,000 feet		
		88 =	26,000 feet		
		89 =	30,000 feet or higher		
	1955-1963:	51-55 =	Not used		
		56-80 =	6,000-30,000 (in thousands of feet)		
	For entire period:	90 =	Less than 50 meters		
		91 =	50-99 meters		
		92 =	100-199 meters		
		93 =	200-299 meters		
		94 =	300-599 meters		
		95 =	600-999 meters		
		96 =	1,000-1499 meters		
		97 =	1,500-1999 meters		
		98 =	2,000-2,499 meters		
		99 =	2,500 or more meters or no clouds		
047 A	ICE REPORT (KIND OF ICE)	0 =	No ice		
		1 =	New ice		
		2 =	Fast ice		
		3 =	Drift ice		
		4 =	Packed slush or strips of hummocked ice		
		5 =	Open lead near shore		
		6 =	Heavy fast ice		
		7 =	Heavy drift ice		
		8 =	Hummocked ice		
		9 =	Ice jamming		
	NOTE (1) Code figure 0 is used to report ice blink which requires that a direction be reported.				
	(2) Ice jamming means that the ice is being squeezed or crowded into a compact mass.				
047 B	EFFECT OF ICE ON NAVIGATION	0 =	Unobstructed		
		1 =	Obstructed for steamers, difficult for sailing ships		
		2 =	Difficult for low powered steamers, closed to sailing ships		
		3 =	Possible only for powerful steamers		
		4 =	Possible only for steamers constructed to withstand ice pressures		
		5 =	Possible with assistance of Ice Breakers		
		6 =	Channel open in solid ice		
		7 =	Temporarily closed		
		8 =	Closed		
		9 =	Conditions unknown		
047 C	BEARING OF ICE EDGE	0 =	No edge can be stated		
		1 =	Toward NE		
		2 =	Toward E		
		3 =	Toward SE		
		4 =	Toward S		
		5 =	Toward SW		
		6 =	Toward W		
		7 =	Toward NW		
		8 =	Toward N		
		9 =	Edge in several directions		

TAPE DECK		SURFACE MARINE OBSERVATIONS		PAGE NO.
1116				3-1116.3
TAPE FIELD NUMBER	ELEMENT	EXPLANATION		
047 D	DISTANCE TO ICE EDGE FROM REPORTING SHIP	0 = One mile or less 1 = > 1-2 miles 2 = > 2-4 miles 3 = > 4-6 miles 4 = > 6-8 miles 5 = > 8-12 miles 6 = > 12-16 miles 7 = > 16-20 miles 9 = Unspecified or no observation		
047 E	ORIENTATION OF ICE EDGE	0 = Impossible to estimate-ship outside ice 1 = NE to SW with ice to NW 2 = E to W with ice to N 3 = SE to NW with ice to NE 4 = S to N with ice to E 5 = SW to NE with ice to SE 6 = W to E with ice to S 7 = NW to SE with ice to SW 8 = N to S with ice to W 9 = Impossible to estimate-ship inside ice		
048	BAROMETER COMPARISON STATION OR DATA SOURCE	Code	Barometer Number Issued By	
		1 =	New York	
		2 =	New Orleans	
		3 =	San Francisco	
		4 =	OSV of any country	
		5 =	U.S. Navy ships	
		6 =	Military sea transport ships	
		9 =	Great Lakes ships	
		9 =	Canadian Great Lakes ships	
049	WIND DIRECTION	See Note in Section 1		
050	VISIBILITY	For period 1945-1954		
		00 =	Less than 200 meters	
		01-80 =	200-16,000 meters (in increments of 200 M)	
		81-85 =	20-100 KM (in increments of 20 KM)	
		86 =	150 KM	
		87 =	200 KM	
		88 =	300 KM	
		89 =	500 KM or more	
		90 =	Less than 50 meters	
		91 =	50-199 meters	
		92 =	200-499 meters	
		93 =	500-999 meters	
		94 =	1000-1999 meters	
		95 =	2000-3999 meters	
		96 =	4000-9999 meters	
		97 =	10,000-19,999 meters	
		98 =	20,000-49999 meters	
		99 =	50,000 or more meters	
		For period 1955- See Common Codes		
051	PRESENT WEATHER	For period 1945-1948 - See Scale 3, Section 4 For period 1949-1963 - See Common Codes		

TAPE DECK		PAGE NO.
1118	SURFACE MARINE OBSERVATIONS	1-1118.1

# STANDARD FORMAT

CARD DECK	MAR SQ	SUB SQ	Q	LAT	LONG	YEAR	MO	DA	HR	WIND DIR	WIND SPD	VIS	WX	W	PRESS	T I	AIR TMP	WET BLB	DEW PT	SEA TMP	A-S DIF
xxx	xxx	xx	x	xxx	xxxx	xxxx	xx	xx	xx	ixx	ixxx	ixx	xx	x	xxxxx	i	xxx	xxx	xxx	xxx	xxx
FIELD NUMBER	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021

CLOUDS										WAVE	P	WAVE	SWL	P	SWL	OSV	C	S																		
N	N <sub>h</sub>	C <sub>L</sub>	I	h	C <sub>M</sub>	C <sub>H</sub>	DIR	E	HGT	DIR	E	HGT	DIR	E	HGT	NO.	D	H	P	A	D	I	C	a	ppp	A	SIG	SIG	SIG	I	SHIP					
x	x	x	i	x	x	x	xx	x	xx	xx	x	xx	xx	x	xx	xx	x	x	P	l	x	xx	x	ΔΔ	6	x	x	x	xxx	8	x	x	xx	ΔΔ	x	xxxx
						022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	032	033	034	035	036	032	033	034	035	036	037	038				

## SUPPLEMENTAL DATA FIELDS

WAVES	SHIP CLASS NO.	S K Y	P C Y	P H N	O B S E	DIR CUR	SPD CUR	SPEC PHEN	22 BLANK CHARACTERS																						
xxxxxx	xxxxxx	x	x	x	x	x	xx	xx	xxxx																						

## UNIQUE CHARACTERISTICS

TAPE FIELD NUMBER	ELEMENT	TAPE NOTATION
001	CARD DECK NUMBER	118
011 i	WIND DIRECTION INDICATOR	0
012 i	WIND SPEED INDICATOR	BLANK
013 i	VISIBILITY INDICATOR	BLANK OR 1
015	PAST WEATHER	BLANK
017 i	TEMPERATURES INDICATOR	3
018	WET BULB TEMPERATURE	BLANK
019	DEW POINT TEMPERATURE	BLANK
022 i	CLOUDS INDICATOR	BLANK
022	CLOUDS (N <sub>h</sub> ), (h)	BLANK
023-038		BLANK

## SUPPLEMENTAL DATA FIELDS

		TAPE POSITIONS
039	DIRECTION OF SEA WAVES	94-95
040	HEIGHT OF SEA WAVES	96
041	DIRECTION OF SWELL	97-98

TAPE DECK		PAGE NO.	
1118		1-1118.2	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER		ELEMENT	TAPE POSITIONS
042		HEIGHT OF SWELL	99
043		SHIP CLASS	100
044		SHIP NUMBER	101-105
045		SKY CONDITION	106
046		TYPE OF PRECIPITATION	107
047		OTHER PHENOMENA	108
048		OBSTRUCTIONS TO VISION	109
049		KIND OF ICE	110
050		DIRECTION OF CURRENT	111-112
051		SPEED OF CURRENT	113-114
052		OPTICAL PHENOMENA	115
053		SEA WATER PHENOMENA OR LITHOMETERS	116
054		DISASTROUS PHENOMENA	117
055		SEA QUAKE	118

TAPE DECK		SURFACE MARINE OBSERVATIONS		PAGE NO.
1118				2-1118.1
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION		
004	QUADRANT	CARD COLUMN 16		
		0-3		
		1	= 0	
		2	= 1	
		3	= 2	
005	LATITUDE	CARD COLUMNS 17-20		
		Latitude in degrees and minutes		
		4	= 3	
006	LONGITUDE	CARD COLUMNS 21-25		
		Longitude in degrees and minutes		
		(Minutes converted to tenths of degrees)		
		.0	= 00-03 minutes (degrees remain the same)	
		.1	= 04-09 minutes	
		.2	= 10-15 minutes	
		.3	= 16-21 minutes	
		.4	= 22-27 minutes	
		.5	= 28-33 minutes	
		.6	= 34-39 minutes	
		.7	= 40-45 minutes	
		.8	= 46-51 minutes	
		.9	= 52-57 minutes	
		.0	= 58-60 ( one added to degrees)	
		007	YEAR	CARD COLUMNS 8-9
37-53 1900 was added to columns 8-9. General period of record is 1937-1953				
010	HOOR - GMT	CARD COLUMNS 14-15 - time of observation - LMT		
		CARD COLUMNS 51-54 - Time difference between ship time and Japanese standard time		
		Times were first converted to JST using columns 51-54		
		00-21 in columns 51-52 indicated number of hours ship time was slow from JST.		
		-0--3 or 30-33 in columns 51-52 indicated number of hours (0-3) ship time was fast from JST.		
		Columns 53-54 contained minutes.		
		Nine hours was subtracted from this converted value to obtain GMT.		
012	WIND SPEED	CARD COLUMN 28 - Beaufort wind force		
		0-9, 0, 1, 2 - See Scale 5, Section 4		
013 i	VISIBILITY INDICATOR	CARD COLUMNS 43-44		
		Δ	= Column 44 = 0-9 and column 43 not equal to 3	
		1	= Column 44 = Blank or 0-9 and column 43 = 3	
013	VISIBILITY	When column 44 = 0-9, 90 was added and the resulting value placed in Field 013		



TAPE DECK		PAGE NO.	
1118		2-1118.2	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION	
014	PRESENT WEATHER	CARD COLUMNS 38, 41, 42, 43	
		The highest converted value was placed into Field 014	
		00 =	43 = 0 Unusual visibility
		05 =	43 = 1 Haze
		10 =	43 = 2 Mist
		12 =	43 = 3 Fog
		13 =	42 = 6 Lightning
		14 =	42 = 3 Wet without rain, atmosphere feels wet or moist
		16 =	42 = 2 Gloomy weather, sky covered by low clouds. Rain seems to be falling, but showers or storm are absent.
		17 =	42 = 7 Thunder
		18 =	42 = 4 Ugly weather, tendency to storm-sky covered
			42 = 5 by fast moving clouds and rain or strong winds are expected momentarily, or squalls
		45 =	38 = 9 Fog
		48 =	42 = 1 Hoarfrost
		51 =	41 = 0 Drizzle
		58 =	41 = 2 Drizzle and passing showers
		59 =	41 = 1 Drizzle and rain
		61 =	41 = 4 Rain
		62 =	41 = 5 Rain and passing showers
		68 =	41 = 3 Drizzle and snow
		69 =	41 = 6 Rain and snow
		71 =	41 = 9 Snow
		79 =	41 = 0 Sleet, (ice, rain, snow together)
		81 =	41 = 7 Passing showers
		83 =	41 = 8 Passing showers and snow
		87 =	41 = 2 Hail and drizzle
		88 =	41 = 1 Hail
		89 =	41 = 4 Hail and passing showers
		89 =	41 = 5 Hail and snow
		90 =	41 = 3 Hail and rain
		91 =	42 = 8 Thunder and lightning
		95 =	42 = 9 Squall with lightning or squall with thunder
		97 =	42 = - Squall with thunder and lightning
016	PRESSURE	CARD COLUMNS 29-31	
		Pressure in millimeters converted to millibars by multiplying the punched value by 1.333	
017	AIR TEMPERATURE	CARD COLUMNS 32-33	
020	SEA TEMPERATURE	CARD COLUMNS 34-35 in whole degrees Celsius	
		00-99	Positive temperatures
		01-99	Negative temperatures
		A zero was placed in the low order position of Fields 017 and 020	
021	AIR-SEA TEMP. DIFFERENCE	Computed from Tape Field 017 and 020 (Air minus Sea Temp.)	
022	CLOUDS (N)	CARD COLUMN 39 - See Scale 7, Section 4	
022	CLOUDS (N <sub>h</sub> )	BLANK	
022	CLOUDS (C <sub>L</sub> )	CARD COLUMN 38	
		0 =	0 No low clouds
		1 =	6 Cumulus, fractocumulus
		3 =	3 Cumulonimbus
		5 =	8 Stratocumulus
		6 =	4 Stratus, fractostratus
		8 =	7 Cumulus and stratocumulus
		9 =	1 or 2 Cumulonimbus and nimbus or stratus or Cumulonimbus and stratocumulus

TAPE DECK				PAGE NO.	
1118		SURFACE MARINE OBSERVATIONS		2-1118.3	
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION			
022	CLOUDS (h)	BLANK			
022	CLOUDS (C <sub>M</sub> )	CARD COLUMN 37			
		0	=	0	No middle clouds
		2	=	1 or 5 in column 38	Altostratus
		5	=	2	Altocumulus
		7	=	3	Altocumulus and altostratus
022	CLOUDS (C <sub>H</sub> )	CARD COLUMN 36			
		0	=	0	No high clouds
		1	=	2	Cirrus
		6	=	5	Cirrus and cirrostratus
		7	=	3	Cirrostratus
		8	=	6	Cirrocumulus and cirrostratus
		9	=	1, 4 or 7	Cirrocumulus with or without cirrus and cirrostratus

TAPE DECK		PAGE NO.	
1118		3-1118.1	
SURFACE MARINE OBSERVATIONS			
SUPPLEMENTAL DATA FIELDS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
039	DIRECTION OF SEA WAVES	00-32, --	
041	DIRECTION OF SWELL	32 points of the compass -- = variable or confused (16 point scale of the 32 point compass was most frequently used).	
040	HEIGHT OF SEA WAVES	0-9, -	
		0 = 0 meters	
		1 = .3 meters	
		2 = .3-.6 meters	
		3 = .6-1.0 meters	
		4 = 1.0-1.5 meters	
		5 = 1.5-2.5 meters	
		6 = 2.5-4.0 meters	
		7 = 4.0-7.0 meters	
		8 = 7.0-13 meters	
		9 = > 13 meters	
		- = Variable or confused	
042	HEIGHT OF SWELL	0-7	
		0 = 0 meters	
		1 = .1-.4 meters	
		2 = .5-1.4 meters	
		3 = 1.5-2.4 meters	
		4 = 2.5-3.9 meters	
		5 = 4.0-5.4 meters	
		6 = 5.5-6.9 meters	
		7 = > 7 meters	
043	SHIP CLASS	0-5	
		0 = Weather	
		1 = University Scientific Expedition	
		2 = Maritime or Governmental Agency	
		3 = Naval	
		4 = Privately owned Merchant or Cargo	
		5 = Privately owned fishing boat	
044	SHIP NUMBER	00000-99999 (No further identification given)	
045	SKY CONDITION	0-5	
		0 = Blue sky, 0-.3 coverage	
		1 = Partly cloudy, .4-.7 coverage	
		2 = Cloudy, .8 coverage	
		3 = High overcast with high clouds predominating	
		4 = Low overcast	
		5 = High overcast with low overcast	
		Δ = Missing or sky obscured	
046	TYPE OF PRECIPITATION	0-9, 0̄ - 5̄, Δ	
		0 = Drizzle	
		1 = Drizzle and rain	
		2 = Drizzle and passing showers	
		3 = Drizzle and snow	
		4 = Rain	
		5 = Rain and passing showers	
		6 = Rain and snow	
		7 = Passing showers	
		8 = Passing showers and snow	
		9 = Snow	
		0̄ = Sleet	
		1̄ = Hail	
		2̄ = Hail and drizzle	
		3̄ = Hail and rain	
		4̄ = Hail and passing showers	
		5̄ = Hail and snow	
		Δ = No precipitation at time of observation	

TAPE DECK		PAGE NO.	
1118		3-1118.2	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
047	OTHER PHENOMENA	0-9, -, Δ 0 = Dew 1 = Hoarfrost 2 = Gloomy weather 3 = Wet (no rain falling) 4 = Ugly weather 5 = Squalls 6 = Lightning 7 = Thunder 8 = Thunder and lightning 9 = Squall with thunder or lightning - = Squall with thunder and lightning Δ = None of the above observed	
048	OBSTRUCTIONS TO VISION	0-3, Δ 0 = Unusual visibility-objects visible at 75 KM 1 = Haze 2 = Mist 3 = Fog Δ = None of the above	
049	KIND OF ICE	0-9, - kind of ice observed during the past 6 hours 0 = No sea ice 1 = New ice 2 = Fast ice 3 = Drift ice 4 = Ice field 5 = Packed slush or strips of hummocked ice 6 = Open lead near shore 7 = Heavy fast ice 8 = Heavy drift ice 9 = Hummocked ice - = Ice jamming	
050	DIRECTION OF CURRENT	00-36 Direction toward which ocean current is moving. Normally reported once daily at 1200 GMT 00 = Calm 01-36 = Tens of degrees	
051	SPEED OF CURRENT	Ship's drift in nautical miles in past 24 hours normally punched once daily at 1200 GMT 00 = No current 01-99 = 1-99 nautical miles 00-99 = 100-199 nautical miles	
052	OPTICAL PHENOMENA	1-8 1 = Afterglow 2 = Morningglow 3 = Halo 4 = Corona 5 = Abnormal refraction 6 = Mirage 7 = St. Elmo's Fire 8 = Aurora	

TAPE DECK		PAGE NO.
1118		3-1118.3
SURFACE MARINE OBSERVATIONS		
TAPE FIELD NUMBER	ELEMENT	EXPLANATION
053	SEA WATER PHENOMENA OR LITHOMETERS	1-9 1 = Discolored water 2 = Rip Tide 3 = Abnormal tide 4 = Rip current 5 = Dust fall 6 = Fall of volcanic ash 7 = Pumice 8 = Marine volcano 9 = Graupel (snow pellets)
054	DISASTROUS PHENOMENA	1-5 1 = High water 2 = Squall 3 = Tidal wave 4 = Eye of storm 5 = Water spout
055	SEA QUAKE	1-9, - 1 = Weak sound 2 = Felt 3 = Very slight 4 = Slight 5 = Moderate 6 = Rather strong 7 = Strong 8 = Very strong 9 = Disastrous - = Very disastrous

TAPE DECK		PAGE NO.
1119	SURFACE MARINE OBSERVATIONS	1-1119.1

# STANDARD FORMAT

CARD DECK	MAR SQ	SUB SQ	Q	LAT	LONG	YEAR	MO	DA	HR	WIND DIR	WIND SPD	VIS	WX	W	PRESS	T I	AIR TMP	WET BLB	DEW PT	SEA TMP	A-S DIF
xxx	xxx	xx	x	xxx	xxxx	xxxx	xx	xx	xx	ixx	ixxx	ixx	xx	x	xxxxx	i	xxx	xxx	xxx	xxx	xxx
FIELD NUMBER	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021

CLOUDS											WAVE	P	WAVE	SWL	P	SWL	OSV	C	S							I	SHIP								
N	N <sub>h</sub>	C <sub>L</sub>	I	h	C <sub>M</sub>	C <sub>H</sub>	DIR	E	R	HGT	DIR	E	R	HGT	NO.	D	H	P	A	I	ICE	A	A	D	S	a	ppp	A	SIG	SIG	SIG		I	SHIP	
x	x	x	i	x	x	x	xx	x	xx	xx	x	xx	xx	xx	x	x			1	x	xx	x	ΔΔ	6	x	x	x	xxx	8	x	x	xx	ΔΔ	x	xxxx
						022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	032	033	034	035	036	032	033	034	035	036	037	038			

FIELD  
NUMBER

## SUPPLEMENTAL DATA FIELDS

SHIP NO.	F O R	C L S	AIR SEA DIF	2nd WAVE GROUP	3rd WAVE GROUP	28 BLANK CHARACTERS																											
xxxxx	x	x	xx	xxxxx	xxxxx																												

FIELD NUMBER	039	040	041	042	043	044	045	046	047	048
-----------------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

## UNIQUE CHARACTERISTICS

TAPE FIELD NUMBER	ELEMENT	TAPE NOTATION
001	CARD DECK NUMBER	119
011 i	WIND DIRECTION INDICATOR	BLANK
012 i	WIND SPEED INDICATOR	BLANK
013 i	VISIBILITY INDICATOR	BLANK
017 i	TEMPERATURES INDICATOR	3
022 i	CLOUDS INDICATOR	BLANK
026-031		BLANK
032	ADDITIONAL DATA INDICATOR	6
037-038		BLANK

## SUPPLEMENTAL DATA FIELDS

039	SHIP NUMBER
040	FORMAT NUMBER
041	SHIP CLASS

TAPE POSITIONS
94-98
99
100

TAPE DECK				PAGE NO.
1119		SURFACE MARINE OBSERVATIONS		1-1119.2
TAPE FIELD NUMBER	ELEMENT		TAPE POSITIONS	
042	AIR-SEA TEMPERATURE DIFFERENCE		101-102	
043	DIRECTION OF WAVES	SECOND	103-104	
044	PERIOD OF WAVES	WAVE	105	
045	HEIGHT OF WAVES	GROUP	106-107	
046	DIRECTION OF WAVES	THIRD	108-109	
047	PERIOD OF WAVES	WAVE	110	
048	HEIGHT OF WAVES	GROUP	111-112	

TAPE DECK		SURFACE MARINE OBSERVATIONS		PAGE NO.
1119				2-1119.1
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION		
004	QUADRANT	CARD COLUMN 15 - Octant - See Section 4, Scale 1		
005	LATITUDE	CARD COLUMNS 16-18 000-900 in degrees and tenths		
006	LONGITUDE	CARD COLUMNS 19-21 000-999 in degrees and tenths with 1 implied when Longitude 100°-180° 1000 added to Field 006 when column 15 = 1,2,6 or 7 and column 19 = 0-8		
007	YEAR	CARD COLUMNS 8-9 53-60 1900 was added to columns 8-9. General period of record is 1953-1960		
011	WIND DIRECTION	CARD COLUMNS 25-26 00-36, 50-86, 49, 99 When Direction = 51-86, 50 was subtracted before placing in Field 011 and 100 was added to Field 012		
012	WIND SPEED	CARD COLUMNS 27-28 00-99 100 was added to Field 012 when card columns 25-26 were punched 51-86		
016	PRESSURE	CARD COLUMNS 34-36 000-999 in millibars and tenths with thousands and hundreds positions omitted 10000 was added to punched values 000-450 9000 was added to punched values 451-999		
017	AIR TEMPERATURE	CARD COLUMNS 37-38 whole degrees Celsius		
019	DEW POINT TEMPERATURE	CARD COLUMNS 52-53 whole degrees Celsius 00-49 = Positive values 00°-49°C 50-99 = Negative values-00°--49°C		
018	WET BULB TEMPERATURE	Computed: See Section 4, Scale 4		
020	SEA TEMPERATURE	Computed from Fields 017 and 042. The value appearing in Field 042 was decoded then added or subtracted from Field 017. Decoded values were not rounded. ( When decoded value was 02.5°, 2° was added or subtracted as appropriate, for example).		
021	AIR-SEA TEMPERATURE DIFFERENCE	Computed from Fields 017 and 020 (Air minus Sea Temperature)		
025	WAVE HEIGHT	CARD COLUMN 58 0-9, - When Wave Direction (columns 55-56) was punched 50-86, 10 was added to column 58 and the result placed in Field 025		



TAPE DECK		PAGE NO.
1119	SURFACE MARINE OBSERVATIONS	2-1119.2
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION
035	BAROMETRIC TENDENCY	<p>CARD COLUMN 46</p> <p>For observations prior to 1955:</p> <p>0 = Rising, then falling atmospheric pressure now higher than, or the same as 3 hours ago</p> <p>1 = Rising, then steady; or rising then rising more slowly atmospheric pressure now higher than, or the same as 3 hours ago</p> <p>2 = Unsteady, atmospheric pressure now higher than, or the same as 3 hours ago</p> <p>3 = Steady or rising, atmospheric pressure now higher than, or the same as 3 hours ago</p> <p>4 = Falling or steady, then rising; or rising then rising more quickly, atmospheric pressure now higher than, or the same as 3 hours ago</p> <p>5 = Falling, then rising, atmospheric pressure now lower than 3 hours ago</p> <p>6 = Falling, then steady; or falling then falling more slowly, atmospheric pressure now lower than 3 hours ago</p> <p>7 = Unsteady, atmospheric pressure now lower than 3 hours ago</p> <p>8 = Falling, atmospheric pressure now lower than 3 hours ago</p> <p>9 = Steady or rising then falling; or falling then falling more quickly, atmospheric pressure now lower than 3 hours ago</p> <p>Observations from 1955 onward use Code as explained in TDF-11 Common Codes</p>
036	AMOUNT OF PRESSURE CHANGE	<p>CARD COLUMNS 47-48 - millibars and tenths 00-99</p> <p>A zero was placed in the high order position of Field 036</p>

TAPE DECK		PAGE NO.	
1119		3-1119.1	
SURFACE MARINE OBSERVATIONS			
<u>SUPPLEMENTAL DATA FIELDS</u>			
<u>TAPE</u> <u>FIELD NUMBER</u>	<u>ELEMENT</u>	<u>EXPLANATION</u>	
039	SHIP NUMBER	53001-60999 First two digits indicate Year. Three low order digits indicate Number assigned to ship	
040	FORMAT NUMBER	2 indicates cards were punched in card format No. 2. Deck 119 was a continuation of Deck 118 which was punched in card format No. 1	
041	SHIP CLASS	0-5 Code unknown	
042	AIR-SEA TEMP. DIFFERENCE	00-49 in half degrees Celsius when Air is warmer than Sea (00-49 = 00° - 24 1/2°C) 50-99 in half degrees Celsius when Sea is warmer than Air (50-99 = 00° - 24 1/2°C)	
043	WAVE DIRECTION - 2nd GROUP	00-36, 49, or 99	
046	WAVE DIRECTION - 3rd GROUP	00 = Calm 00-36 = Direction from which waves come in tens of degrees 49 = Waves confused - direction indeterminate - height equal to or less than 4 3/4 meters 99 = Waves confused - direction indeterminate - height greater than 4 3/4 meters	
044	WAVE PERIOD - 2nd GROUP	0-9, - Same as in TDF-11 Common Codes	
047	WAVE PERIOD - 3rd GROUP		
045	WAVE HEIGHT - 2nd GROUP	00-99	
048	WAVE HEIGHT - 3rd GROUP	Height in 1/2 meter increments 00 = < 1/4 Meters 01-99 = 1/2 - 49 1/2 Meters	

TAPE DECK		PAGE NO.
1128	SURFACE MARINE OBSERVATIONS	1-1128.1

# STANDARD FORMAT

CARD DECK	MAR SQ	SUB SQ	Q	LAT	LONG	YEAR	MO	DA	HR	WIND DIR	WIND SPD	VIS	WX	W	PRESS	T I	AIR TMP	WET BLB	DEW PT	SEA TMP	A-S DIF
xxx	xxx	xx	x	xxx	xxxx	xxxx	xx	xx	xx	ixx	ixxx	ixx	xx	x	xxxxxx	i	xxx	xxx	xxx	xxx	xxx

FIELD NUMBER 001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018 019 020 021

CLOUDS						WAVE	P	WAVE	SWL	P	SWL	OSV	C	S					A	I	ICE	A					A	D	S	a	ppp	A	SIG	SIG	SIG			I	SHIP		
N	N <sub>h</sub>	C <sub>L</sub>	I	b	C <sub>M</sub>	C <sub>H</sub>	DIR	E	HGT	DIR	E	HGT	NO.	D	H					D	C	THK	C	C					D	D	I	P	D	D	N	T	HGT			C	NO.
x	x	x	i	x	x	x	xx	x	xx	xx	x	xx	xx	x	x					l	x	xx	x	ΔΔ					6	x	x	x	xxx	8	x	x	xx	Δ Δ	x	xxxx	

FIELD NUMBER 022 023 024 025 026 027 028 029 030 031 032 033 034 035 036 032 033 034 035 036 032 033 034 035 036 032 033 034 035 036 037 038

## SUPPLEMENTAL DATA FIELDS

RH	W	T	S	WAV	39 BLANK CHARACTERS																
xxx	x	x	x	xx																	

FIELD NUMBER 039 040 041 042 043

## UNIQUE CHARACTERISTICS

TAPE  
FIELD NUMBER  
001  
002-038

ELEMENT  
CARD DECK NUMBER

TAPE NOTATION  
128

THIS CARD DECK WAS USED AS THE BASIS FOR ESTABLISHING TDF-11. EXPLANATIONS OF THESE FIELDS AND CODING PRACTICES ARE CONTAINED IN THE COMMON CODES SECTION OF THIS REFERENCE MANUAL.

## SUPPLEMENTAL DATA FIELDS

039 RELATIVE HUMDIITY  
040 ICE ON WET BULB INDICATOR  
041 ORIGINAL TEMPERATURE INDICATOR  
042 SEA TEMPERATURE INDICATOR (BEGIN 1968)  
043 WAVE PERIOD (BEGIN 1968)

TAPE POSITIONS  
94-96  
97  
98  
99  
100-101

TAPE DECK		PAGE NO.																														
1128	SURFACE MARINE OBSERVATIONS	2-1128.1																														
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION																														
023	DIRECTION OF WAVES	<p>00-36, 49, 99 (Prior to 1968)  00-36 99 (1968 and later)</p> <p>Beginning January 1, 1968, Direction of Wind Waves was no longer reported. From this date on, the Wind Direction reported in Field 011 was also placed in Field 023.</p>																														
024	PERIOD OF WAVES	<p>0-9, -  Prior to 1968, values were entered as reported.  Beginning January 1, 1968, the following conversion was used: (See Tape Field 043).</p> <table> <tr><td>0</td><td>=</td><td>20-21 seconds</td></tr> <tr><td>1</td><td>=</td><td>&gt;21 seconds</td></tr> <tr><td>2</td><td>=</td><td>00-05 seconds</td></tr> <tr><td>3</td><td>=</td><td>06-07 seconds</td></tr> <tr><td>4</td><td>=</td><td>08-09 seconds</td></tr> <tr><td>5</td><td>=</td><td>10-11 seconds</td></tr> <tr><td>6</td><td>=</td><td>12-13 seconds</td></tr> <tr><td>7</td><td>=</td><td>14-15 seconds</td></tr> <tr><td>8</td><td>=</td><td>16-17 seconds</td></tr> <tr><td>9</td><td>=</td><td>18-19 seconds</td></tr> </table>	0	=	20-21 seconds	1	=	>21 seconds	2	=	00-05 seconds	3	=	06-07 seconds	4	=	08-09 seconds	5	=	10-11 seconds	6	=	12-13 seconds	7	=	14-15 seconds	8	=	16-17 seconds	9	=	18-19 seconds
0	=	20-21 seconds																														
1	=	>21 seconds																														
2	=	00-05 seconds																														
3	=	06-07 seconds																														
4	=	08-09 seconds																														
5	=	10-11 seconds																														
6	=	12-13 seconds																														
7	=	14-15 seconds																														
8	=	16-17 seconds																														
9	=	18-19 seconds																														
027	PERIOD OF SWELL	Note change in Code beginning January 1, 1968.																														
032	ADDITIONAL DATA INDICATOR	May be A, 1, 6 or 8																														
034	SHIP SPEED	Note change in Code beginning January 1, 1968.																														

TAPE DECK		PAGE NO.
1128		3-1128.1
SURFACE MARINE OBSERVATIONS		
SUPPLEMENTAL DATA FIELDS		
TAPE FIELD NUMBER	ELEMENT	EXPLANATION
039	RELATIVE HUMIDITY	000-100 Computed $RH = \frac{e}{e_s} T$
040	ICE ON WET BULB INDICATOR	A - punch in this Field indicates that the wet bulb thermometer had ice on the bulb.
041	ORIGINAL TEMPERATURE INDICATOR	Code used to determine method of conversion necessary to place temperatures into Fields 017 through 021.  1 = °C to tenths 2 = °F to tenths 3 = °C in whole degrees 4 = °F in whole degrees 5 = °C to nearest 1/2 degree 6 = °F to nearest 1/2 degree 7 = Temperature = °F to tenths, Dew Point °F in whole degrees 8 = Temperature = °C to tenths, Dew Point °C whole degrees 9 = °C to tenths (used for some OSV's)
042	SEA TEMPERATURE INDICATOR	Beginning January 1, 1968: $\frac{1}{2}$ = Sea Temperature determined by Bucket Method. Δ = Sea Temperature determined by other than Bucket Method
043	WAVE PERIOD	Beginning January 1, 1968: 00-99 00 = Calm 01-98 = Period of Wind Waves in seconds 99 = Confused sea

TAPE DECK		PAGE NO.
1181	SURFACE MARINE OBSERVATIONS	1-1181.1

# STANDARD FORMAT

	CARD DECK	MAR SQ	SUB SQ	Q	LAT	LONG	YEAR	MO	DA	HR	WIND DIR	WIND SPD	VIS	WX	W	PRESS	T I	AIR TMP	WET BLB	DEW PT	SEA TMP	A-S DIF
	xxx	xxx	xx	x	xxx	xxxx	xxxx	xx	xx	xx	ixx	ixxx	ixx	xx	x	xxxxx	i	xxx	xxx	xxx	xxx	xxx
FIELD NUMBER	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021	

CLOUDS															WAVE	P	WAVE	SWL	P	SWL	OSV	C	S																	
N	N <sub>h</sub>	C <sub>L</sub>	I	h	C <sub>M</sub>	C <sub>H</sub>	DIR	E	HGT	DIR	E	HGT	NO.	D	H	A	I	ICE	A	A	D	S	a	ppp	A	SIG	SIG	SIG		I	SHIP									
x	x	x	i	x	x	x	xx	x	xx	xx	x	xx	xx	x	x	l	x	xx	x	Δ	Δ	6	x	x	xxx	8	x	x	xx	Δ	Δ	x	xxxx							
						022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	032	033	034	035	036	032	033	034	035	036	037	038								

## SUPPLEMENTAL DATA FIELDS

	RH	S E A	S W L	WX - D	C H I D R	PRE CLD HGT	C L I D R	PCP DUR	PCPN AMT.	FOG DUR	O B C S P	P M C S L	FLY WX DUR	CEL HGT	DRY BLB	WET BLB	SEA TMP	6 BLANK CHARACTERS								
	xxx	x	x	x	xx	x	xxx	x	x	xxx	xxxx	xxx	x	x	x	xxx	xx	xxx	xxx	xx						

FIELD NUMBER	039	040	041	042	043	044	045	046	047	048	049	050	051	052	053	054	055	056	057	058	059						
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## UNIQUE CHARACTERISTICS

TAPE FIELD NUMBER	ELEMENT	TAPE NOTATION
001	CARD DECK NUMBER	281
011 i	WIND DIRECTION INDICATOR	2
012 i	WIND SPEED INDICATOR	BLANK
013 i	VISIBILITY INDICATOR	BLANK
017 i	TEMPERATURES INDICATOR	1
022 i	CLOUDS INDICATOR	BLANK
023-038		BLANK

## SUPPLEMENTAL DATA FIELDS

		TAPE POSITIONS
039	RELATIVE HUMIDITY	94-96
040	STATE OF THE SEA	97
041	DIRECTION OF SWELL	98
042	SAFETY OF LANDING CONDITIONS	99
043	PRESENT WEATHER	100-101
044	DENSITY OF UPPER CLOUDS	102
045	DIRECTION OF UPPER CLOUDS	103
046	HEIGHT OF PREDOMINATE INTERMEDIATE CLOUDS	104-106
047	DENSITY OF LOWER CLOUDS	107

TAPE DECK				PAGE NO.
1181		SURFACE MARINE OBSERVATIONS		1-1181.2
TAPE FIELD NUMBER		ELEMENT	TAPE POSITIONS	
048		DIRECTION OF LOWER CLOUDS	108	
049		DURATION OF PRECIPITATION	109-111	
050		AMOUNT OF PRECIPITATION	112-115	
051		DURATION OF FOG	116-118	
052		PAST WEATHER - OBSTRUCTIONS TO VISION	119	
053		PAST WEATHER - PRECIPITATION	120	
054		PAST WEATHER - MISCELLANEOUS WEATHER	121	
055		DURATION OF FAVORABLE FLYING WEATHER	122-124	
056		HEIGHT OF CEILING	125-126	
057		AIR TEMPERATURE	127-129	
058		WET BULB TEMPERATURE	130-132	
059		SEA TEMPERATURE	133-134	

TAPE DECK		PAGE NO.
1181		2-1181.1
SURFACE MARINE OBSERVATIONS		
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION
004	QUADRANT	CARD COLUMN 2 - Octant - See Section 4, Scale 1
005	LATITUDE	CARD COLUMNS 3-4 00-90 in whole degrees
006	LONGITUDE	CARD COLUMNS 5-6 00-99 in whole degrees with 1 implied in high order position  When Longitude $100^{\circ}$ - $180^{\circ}$ : 1000 added to Field 006 when column 2 = 1,2,6 or 7 and column 5 = 0-8
007	YEAR	CARD COLUMNS 7-8 20-45 1900 was added to columns 7-8. General period of record is January 1920-December 1945
010	HOOR - GMT	CARD COLUMNS 13-14 01-24 LST - See Section 4, Scale 2
012	WIND SPEED	CARD COLUMNS 39-40 00-99  When column 39 contained an - overpunch, 100 was added to the Wind Speed; otherwise, a zero was placed in the high order position of this Field
013		CARD COLUMN 61 0-9 90 was added to the value and the result placed in Field 013
014	PRESENT WEATHER	TAPE FIELD 043 See Section 4, Scale 3
015	PAST WEATHER	TAPE FIELDS 052, 053, 054 and 043 0-9  0 = FIELD 054 = 0 2 = FIELD 054 = 2-5 3 = FIELD 052 = 2-3 4 = FIELD 043 = 57, 67 or 77 4 = FIELD 052 = 4-9 5 = FIELD 053 = 3 6 = FIELD 053 = 1 or 5 7 = FIELD 053 = 6-7 8 = FIELD 053 = 4 or 8 8 = FIELD 054 = 9 9 = FIELD 053 = 2 or 9 9 = FIELD 054 = 6  After all Past Weather Supplementary Fields were converted, the highest figure found was selected for placement in Field 015
017	AIR TEMPERATURE	TAPE FIELD 057 in whole degrees fahrenheit 000-199 $^{\circ}$ F - See Scale 6, Section 4 -01--99 $^{\circ}$ F



TAPE DECK				PAGE NO.
1181		SURFACE MARINE OBSERVATIONS		2-1181.2
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION		
018	WET BULB TEMPERATURE	Computed from Field 057 and Card columns 28-30		
019	DEW POINT TEMPERATURE	CARD COLUMNS 28-30 Whole degrees Fahrenheit 000 - 099 Positive temperatures See Scale 6, -01 - -99 Negative temperatures Section 4		
020	SEA TEMPERATURE	TAPE FIELD 059 Whole degrees Fahrenheit 00 - 99 See Scale 6, Section 4		
021	AIR-SEA TEMPERATURE DIFFERENCE	Computed from Fields 017 and 020 (Air minus Sea Temp.)		
022	TOTAL CLOUD AMOUNT (N)	CARD COLUMNS 43-44 Tenths of sky covered		
022	LOWER CLOUD AMOUNT (N <sub>L</sub> )	CARD COLUMNS 54-55 Tenths of sky covered 00-10 See Scale 7, Section 4		
022	TYPE OF LOW CLOUD (C <sub>L</sub> )	CARD COLUMN 53		
	0 =	0 No clouds		
	1 =	2 Cumulus, Fractocumulus		
	5 =	4 Stratocumulus		
	6 =	1 Fog		
	7 =	5 Stratus, Fracostratus		
	9 =	3 Cumulonimbus		
022	HEIGHT OF LOW CLOUD (h)	CARD COLUMNS 58-60 in hundreds of feet		
	0 =	000-001		
	1 =	002		
	2 =	003-005		
	3 =	006-009		
	4 =	010-019		
	5 =	020-034		
	6 =	035-049		
	7 =	050-064		
	8 =	065-079		
	9 =	> 080		
022	TYPE OF MIDDLE CLOUD (C <sub>M</sub> )	CARD COLUMN 45		
	0 =	0 No clouds		
	1 =	5 Altostratus		
	3 =	4 Altocumulus		
	8 =	6 Altocumulus Castellatus		
	2 =	6 Nimbostratus (This taken from Col. 53)		
022	TYPE OF HIGH CLOUD (C <sub>H</sub> )	CARD COLUMN 45		
	0 =	0 No clouds		
	1 =	1 Cirrus		
	8 =	2 Cirrostratus		
	9 =	3 Cirrocumulus		

TAPE DECK		PAGE NO.	
1181		3-1181.1	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
039	RELATIVE HUMIDITY	000-100	Computed $RH = \frac{e}{e_s} \frac{T}{T_s}$
040	STATE OF THE SEA	Height of Wave from crest to trough	
		0 =	0 Feet No swell
		1 =	<1 " Moderate swell
		2 =	1- 2.9 " Heavy swell
		3 =	3- 4.9 " No swell
		4 =	5- 7.9 " Moderate swell
		5 =	8- 11.9 " Heavy swell
		6 =	12- 19.9 " High sea
		7 =	20- 40.0 " Very high sea
		8 =	> 40.0 " Precipitous sea
		9 =	Confused
041	DIRECTION OF SWELL	0 =	Calm
		1 =	NE
		2 =	E
		3 =	SE
		4 =	S
		5 =	SW
		6 =	W
		7 =	NW
		8 =	N
		- =	Unknown
042	SAFETY OF LANDING CONDITIONS	0 =	00- 9%
		1 =	10- 19%
		2 =	20- 29%
		3 =	30- 39%
		4 =	40- 49%
		5 =	50- 59%
		6 =	60- 69%
		7 =	70- 79%
		8 =	80- 89%
		9 =	90- 100%
043	PRESENT WEATHER	See definitions in Scale 3, Section 4.	
044	DENSITY OF UPPER CLOUDS	1 =	Transparent
		2 =	Semi-transparent
		3 =	Medium
		4 =	Dense
		5 =	Very Dense
		- =	No upper clouds
045	DIRECTION OF UPPER CLOUDS	0 =	Calm
048	DIRECTION OF LOWER CLOUDS	1 =	NE
		2 =	E
		3 =	SE
		4 =	S
		5 =	SW
		6 =	W
		7 =	NW
		8 =	N
		- =	No clouds
046	HEIGHT OF PREDOMINATE INTERMEDIATE CLOUDS	000-999	In hundreds of feet (Estimated)
		-	Overpunch in high order position indicates height measured by some reliable means within past hour

TAPE DECK		PAGE NO.	
1181		3-1181.2	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
047	DENSITY OF LOWER CLOUDS OR FOG	1 = Transparent 2 = Semi-transparent 3 = Medium 4 = Dense 5 = Very dense  or 1 = Very thin fog 2 = Thin fog 3 = Thin in spots - light gray 4 = Dense fog 5 = Very dense fog - = No low clouds or fog	
049	DURATION OF PRECIPITATION	000-240 = Hours to tenths (0.0-24.0)	
051	DURATION OF FOG		
055	DURATION OF FAVORABLE FLYING WEATHER		
050	AMOUNT OF PRECIPITATION	0000-9999 = Inches to hundredths (00.00 - 99.99) 000- = Trace  - overpunch in high order position indicates amount is estimated using following table:  Rate = Estimated Amount/Hour Trace = 0.01 inches Light = 0.10 inches Moderate = 0.30 inches Heavy = 0.50 inches Very heavy = 1.00 inches Extreme = 2.00 inches  Reporting Hours: 0800 LST = Precipitation amount from Midnight-0600 LST 1200 LST = Precipitation amount from 0600-1800 LST 1600 LST = Precipitation amount from 1800-Midnight LST	
052	PAST WEATHER OBSTRUCTIONS TO VISION	0 = None 1 = Exceptional visibility 2 = Drifting snow, light or moderate 3 = Drifting snow, heavy 4 = Haze 5 = Low fog 6 = Mist 7 = Light fog 8 = Fog 9 = Fog Blank = Unknown	
053	PAST WEATHER PRECIPITATION	0 = None 1 = Precipitation in sight 2 = Thunder, no precipitation 3 = Drizzle 4 = Showers 5 = Rain 6 = Snow 7 = Rain and snow 8 = Hail 9 = Thunderstorm, with precipitation Blank = Unknown	

TAPE DECK		PAGE NO.	
1181		3-1181.3	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
054	PAST WEATHER MISCELLANEOUS	0 = None 1 = Clear 2 = Partly cloudy 3 = Cloudy 4 = Overcast 5 = Ugly, threatening sky 6 = Lightning 7 = Gale 8 = Squally weather 9 = Heavy squalls Blank= Unknown	
056	HEIGHT OF CEILING	00-97 = 0-9700 in hundreds of feet 99 = Ceiling above 9700 feet or .5 or less of sky covered ΔΔ = Unknown	
057	AIR TEMPERATURE	Whole degrees Fahrenheit	
058	WET BULB TEMPERATURE	000-199 = 0° - 199° -01--99 = -1° -- 99°	
059	SEA TEMPERATURE	Whole degrees Fahrenheit 00-99 = 0° - 99°	

TAPE DECK		PAGE NO.
1184	SURFACE MARINE OBSERVATIONS	1-1184.1

# STANDARD FORMAT

CARD DECK	MAR SQ	SUB SQ	Q	LAT	LONG	YEAR	MO	DA	HR	WIND DIR	WIND SPD	VIS	WX	W	PRESS	T I	AIR TMP	WET BLB	DEW PT	SEA TMP	A-S DIF
xxx	xxx	xx	x	xxx	xxxx	xxxx	xx	xx	xx	ixx	ixxx	ixx	xx	x	xxxxx	i	xxx	xxx	xxx	xxx	xxx
FIELD NUMBER	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021

CLOUDS							WAVE	P	WAVE	SWL	P	SWL	OSV	C	S													I	SHIP							
N	N <sub>H</sub>	C <sub>L</sub>	I	h	C <sub>M</sub>	C <sub>H</sub>	DIR	E	HGT	DIR	E	HGT	NO.	C	D	H	A	I	ICE	A	A	D	S	a	ppp	A	SIG	SIG	SIG		I	SHIP				
x	x	x	i	x	x	x	xx	x	xx	xx	x	xx	xx	x	x	x	D	D	E	C	C	D	I	P	n	D	R	T	HGT		C	NO.				
x	x	x	i	x	x	x	xx	x	xx	xx	x	xx	xx	x	x	x	Δ	Δ	x	x	x	Δ	Δ	6	x	x	x	xxx	8	x	x	xx	Δ	Δ	x	xxxx
FIELD	022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047	048	049	050	051	052	053	054	055		
NUMBER																																				

## SUPPLEMENTAL DATA FIELDS

RH	O R	BEU WX	SER NO.	LOG BOOK NO.	S S	WAVES	28 BLANK CHARACTERS																					
xxx	x	xxx	xx	xxxxxx	xxxx																							
FIELD NUMBER	039	040	041	042	043	044	045	046	047	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063	064	065	066

## UNIQUE CHARACTERISTICS

TAPE FIELD NUMBER	ELEMENT	TAPE NOTATION
001	CARD DECK NUMBER	184
011 i	WIND DIRECTION INDICATOR	0 OR BLANK
012 i	WIND SPEED INDICATOR	BLANK
013 i	VISIBILITY INDICATOR	BLANK
017 i	TEMPERATURES INDICATOR	1
022 i	CLOUDS INDICATOR	BLANK
026-028		BLANK
030	CARD INDICATOR	BLANK
032	ADDITIONAL DATA INDICATOR	8
036-038		BLANK

## SUPPLEMENTAL DATA FIELDS

FIELD NUMBER	ELEMENT	TAPE POSITIONS
039	RELATIVE HUMIDITY	94-96
040	COUNTRY OF ORIGIN	97
041	BEAUFORT WEATHER	98-100

TAPE DECK		PAGE NO.
1184	SURFACE MARINE OBSERVATIONS	1-1184.2

<u>TAPE FIELD NUMBER</u>	<u>ELEMENT</u>	<u>TAPE POSITIONS</u>
042	SERIES NUMBER	101-102
043	LOG BOOK NUMBER	103-107
044	5 DEGREE SUB-SQUARE	108
045	WAVES	109-112

TAPE DECK		PAGE NO.	
1184		2-1184.1	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION	
004	QUADRANT	CARD COLUMNS 8 - 14	
005	LATITUDE	Positions were given by 10° Marsden Square,	
006	LONGITUDE	1° Marsden Square and tenths of Latitude-Longitude. These values were used to determine Quadrant, Latitude, and Longitude	
007	YEAR	CARD COLUMNS 2-3 53-56 1900 was added to columns 2-3. General period of record begins in April 1953	
012	WIND SPEED	CARD COLUMNS 20-21 - Beaufort Wind Force 00-12 - See Scale 5, Section 4	
017	AIR TEMPERATURE	CARD COLUMNS 32-34	Tenths of Degrees Fahrenheit See Scale 6, Section 4
018	WET BULB TEMPERATURE	CARD COLUMNS 35-37	
020	SEA TEMPERATURE	CARD COLUMNS 43-45	
019	DEW POINT TEMPERATURE	Computed See Scale 8, Section 4	
021	AIR-SEA TEMP. DIFFERENCE	Computed from Fields 017 and 020 (Air minus Sea Temp.)	
023	WAVE DIRECTION	CARD COLUMNS 49-50 00-36, 50-86, 49, 99 When Direction punched 50-86, 50 was subtracted before placing in Field 023	
025	WAVE HEIGHT	CARD COLUMN 52 0-9, 0 - 9 When Direction punched 00-36 or 49 and no - overpunch in column 52, 00 was added and the result (00-09) placed in Field 025  When Direction punched 50-86 or 99 and no - overpunch in column 52, 10 was added and the result (10-19) placed in Field 025  When Direction punched 50-86 or 99 and there was an - overpunch in column 52, 10 was added to the numeric value of column 52 and the result multiplied by 2 before placing in Field 025	
035	SIGNIFICANT CLOUD HEIGHT	CARD COLUMNS 77-78	
		01 = 90	0-150 feet
		02 = 91	150-300 "
		05 = 92	300-600 "
		08 = 93	600-1000 "
		15 = 94	1000-2000 "
		25 = 95	2000-3000 "
		40 = 96	3000-5000 "
		56 = 97	5000-6500 "
		58 = 98	6500-8000 "
		60 = 99	> 8000 "

TAPE DECK		PAGE NO.	
1184		3-1184.1	
SURFACE MARINE OBSERVATIONS			
SUPPLEMENTAL DATA FIELDS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
039	RELATIVE HUMIDITY	000-100	Computed $RH = \frac{e}{e_s} T$
040	COUNTRY OF ORIGIN	0-9, $\bar{0}$ - $\bar{6}$  0 = Netherlands 1 = Norway 2 = U.S.A. 3 = United Kingdom 4 = France 5 = Denmark 6 = Italy 7 = India 8 = Hong Kong 9 = New Zealand $\bar{0}$ = Ireland $\bar{1}$ = Philippines $\bar{2}$ = Egypt $\bar{3}$ = Canada $\bar{4}$ = Belgium $\bar{5}$ = South Africa $\bar{6}$ = Australia	
041	BEAUFORT WEATHER	1 = Snow 2 = Squall 3 = Rain 4 = Showers 5 = Drizzle 6 = Thunder 7 = Hail 8 = Lightning 9 = None of above reported  Space was allotted for punching up to 3 types of weather for each observation	
042	SERIES NUMBER	09 = British or Commonwealth ships	
043	LOG BOOK NUMBER	Number of the Log Book in which the observation is recorded	
044	5 DEGREE SUB-SQUARE	1-4  5° sub-square 1 is composed of Marsden 1° Squares 00-04, 10-14, 20-24, 30-34, and 40-44. Other 5° sub-squares are similarly arranged.	
045	WAVES	D D P H W W W W  Second wave group. Direction and period explained in Section 2.  Wave Height: When Direction = 00-36 0 = < 1/4 meter 1-9 = 1/2 to 4 1/2 meters in 1/2 meter increments  When Direction = 50-86 0-9 = 5 to 9 1/2 meters in 1/2 meter increments $\bar{0}$ - $\bar{9}$ = 10 to 19 meters in 1 meter increments	



		<u>TAPE POSITIONS</u>
039	WIND SPEED	94-95
040	AIR-SEA TEMPERATURE DIFFERENCE	96-97
041	DIRECTION OF WAVES	98-99
042	HEIGHT OF WAVES	100

TAPE DECK		SURFACE MARINE OBSERVATIONS	PAGE NO.
FIELD	NUMBER		2-1185.1
1185			
TAPE FIELD	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION	
004	QUADRANT	CARD COLUMN 12 See Scale 1, Section 4	
005	LATITUDE	CARD COLUMNS 13-15 500-900 = 50.0-90.0°N Placed directly into Field 005	
006	LONGITUDE	CARD COLUMNS 16-18 000-999 in degree and tenths with 1 in high order position implied when Longitude = 100°-180° 1000 added to Field 006 when column 12=1 or 2 and column 16 = 0-8	
007	YEAR	CARD COLUMNS 5-6 1900 was added to columns 5-6 General period of record is July 1957-December 1958	
012	WIND SPEED	TAPE FIELD 039 00-99 - whole meters per second Values were converted to knots by multiplying Field 039 by 1.94254 and rounding to whole number	
016	PRESSURE	CARD COLUMNS 33-36 0000-0700 Millibars and tenths with thousands 9000-9999 digit implied When punched 9000-9999 values were placed directly into Field 016 When punched 0000-0700, 10000 was added to columns 33-36	
017	AIR TEMPERATURE	CARD COLUMNS 57-59	
019	DEW POINT TEMPERATURE	CARD COLUMNS 65-67 Degrees Celsius and tenths 000-999 Positive temperature 000-999 Negative temperature	
018	WET BULB TEMPERATURE	Computed by Scale 4, Section 4	
020	SEA TEMPERATURE	Computed from Fields 017 and 040	
021	AIR-SEA TEMP. DIFFERENCE	Computed from Fields 017 and 020 (Air minus Sea Temp.)	
023	DIRECTION OF WAVES	TAPE FIELD 041 00-36, 49 50-86, 99 When values = 50-86, 50 was subtracted and the result placed in Field 023.	
025	HEIGHT OF WAVES	TAPE FIELD 042 0-9 When Field 042 = 0-9 and Field 041=00-36, 49, values were placed in Field 025 with a 0 in the high order position When Field 042 = 0-9 and Field 041=50-86, 99, values were placed in Field 025 with a 1 in the high order position.	
036	PRESSURE CHANGE	CARD COLUMNS 50-51 00-99 - millibars and tenths Values were placed in Field 036 with a 0 in the high order position.	

TAPE DECK		PAGE NO.
1185	SURFACE MARINE OBSERVATIONS	
3-1185.1		

SUPPLEMENTAL DATA FIELDS

TAPE FIELD NUMBER	ELEMENT	EXPLANATION
039	WIND SPEED	00-99 in whole meters per second
040	AIR-SEA TEMP. DIFFERENCE	00-99 in whole degrees Celsius When Sea Temperature warmer than Air, 50 was added to the difference value  Example: 05 indicates that the Air Temp. is 5° greater than the Sea Temp. 55 indicates that the Sea Temp. is 5° warmer than the Air Temp.
041	DIRECTION OF WAVES	00-36, 49, 99, 50-86 Standard Wave Direction code used when punched 50-86 indicates that wave heights are 5-9 1/2 meters.
042	HEIGHT OF WAVES	0 = Less than 1/4 m (1 foot) 1 = 1/2 m (1 1/2 feet) 2 = 1 m (3 feet) 3 = 1 1/2 m (5 feet) 4 = 2 m (6 1/2 feet) 5 = 2 1/2 m (8 feet) 6 = 3 m (9 1/2 feet) 7 = 3 1/2 m (11 feet) 8 = 4 m (13 feet) 9 = 4 1/2 m (14 feet) -- = Height not determined  If 50 is added to d d ww 0 = 5 m (16 feet) 1 = 5 1/2 m (17 1/2 feet) 2 = 6 m (19 feet) 3 = 6 1/2 m (21 feet) 4 = 7 m (22 1/2 feet) 5 = 7 1/2 m (24 feet) 6 = 8 m (25 1/2 feet) 7 = 8 1/2 m (27 feet) 8 = 9 m (29 feet) 9 = 9 1/2 m (30 1/2 feet)  Each code figure provides for reporting a range of heights. For example: 1=1/4 m (1 ft.) to 3/4 m (2 1/2 ft.); 5=2 1/4 m (7 ft.) to 2 3/4 m (9 ft.); 9=4 1/4 m (13 1/2 ft.) to 4 3/4 m (15 ft.), etc.

TAPE DECK		PAGE NO.
1187	SURFACE MARINE OBSERVATIONS	1-1187.1

# STANDARD FORMAT

CARD DECK	MAR SQ	SUB SQ	Q	LAT	LONG	YEAR	MO	DA	HR	WIND DIR	WIND SPD	VIS	WX	W	PRESS	T I	AIR TMP	WET BLB	DEW PT	SEA TMP	A-S DIF
xxx	xxx	xx	x	xxx	xxxx	xxxx	xx	xx	xx	ixx	ixxx	ixx	xx	x	xxxxx	i	xxx	xxx	xxx	xxx	xxx
FIELD NUMBER	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021

CLOUDS							WAVE	P	WAVE	SWL	P	SWL	OSV	C	S																		
N	N <sub>h</sub>	C <sub>L</sub>	I	h	C <sub>M</sub>	C <sub>H</sub>	DIR	E	R	HGT	DIR	E	HGT	NO.	D	H	A	I	ICE	A	A	D	S	a	ppp	A	SIG	SIG	SIG	I	SHIP		
																	D	C	THK	C	D	I	P		D	D	N	T	HGT	C	NO.		
																	D	E		C											E		
x	x	x	i	x	x	x	xx	x	xx	xx	x	xx	xx	xx	x	x	1	x	xx	x	ΔΔ	6	x	x	x	xxx	8	x	x	xx	Δ Δ	x	xxxx
FIELD	022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047	048	049	050	051	052	053	
NUMBER																																	

# SUPPLEMENTAL DATA FIELDS

SHP NO.	WHL SES	O C	LAT	LON	PRS	DRY BLB	SEA TMP	DEW PT.	WIND DIR	B U	MER E	L ZON	L A	21 BLANK CHARACTERS														
xx	xx	x	xxx	xxx	xxx	xx	xx	xx	xx	x	xx	x																
FIELD NUMBER	039	040	041	042	043	044	045	046	047	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063	064	065	066

# UNIQUE CHARACTERISTICS

TAPE FIELD NUMBER	ELEMENT	TAPE NOTATION
001	CARD DECK NUMBER	187
011 i	WIND DIRECTION INDICATOR	BLANK
012 i	WIND SPEED INDICATOR	BLANK
013 i	VISIBILITY INDICATOR	BLANK
017 i	TEMPERATURES INDICATOR	1
022 i	CLOUDS INDICATOR	BLANK
023-038		BLANK

# SUPPLEMENTAL DATA FIELDS

039	SHIP NUMBER
040	WHALING SEASON
041	OCTANT

TAPE POSITIONS
94-95
96-97
98

TAPE DECK

1187

SURFACE MARINE OBSERVATIONS

PAGE NO.

1-1187.2

<u>TAPE</u> <u>FIELD NUMBER</u>	<u>ELEMENT</u>	<u>TAPE POSITIONS</u>
042	LATITUDE	99-101
043	LONGITUDE	102-104
044	PRESSURE	105-107
045	AIR TEMPERATURE	108-109
046	SEA TEMPERATURE	110-111
047	DEW POINT TEMPERATURE	112-113
048	WIND DIRECTION	114-115
049	BEAUFORT WIND FORCE	116
050	MERIDIONAL ZONE	117-118
051	LATITUDE ZONE	119

TAPE DECK		SURFACE MARINE OBSERVATIONS	PAGE NO.
1187			2-1187.1
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION	
004	QUADRANT	TAPE FIELD 041 - See Section 4, Scale 1	
006	LONGITUDE	TAPE FIELD 043 000-999 to tenths of degrees 100.0° added to Longitude when column 13 = 1,2,6,7 and column 17 = 0-8	
007	YEAR	CARD COLUMNS 5-6 46-56 1900 was added to columns 5-6. General period of record is 1946-1956	
011	WIND DIRECTION	CARD COLUMNS 21-22 00-36 or 51-86 When Direction = 51-86, 50 was subtracted before placing in Field 011 and 100 was added to Field 012	
012	WIND SPEED	CARD COLUMNS 23-24 When columns 23-24 were punched wind speed was taped as entered with 100 added to the speed when columns 21-22 recorded as 51-86  When columns 23-24 were blank, wind speed was converted from Tape Field 049 using the conversion Scale 5, Section 4	
016	PRESSURE	TAPE FIELD 044 000-999 When Field 044 < 400, 10000 was added before placing in Field 016 When Field 044 > 399, 9000 was added before placing in Field 016	
017	AIR TEMPERATURE	CARD COLUMNS 40-42	
019	DEW POINT TEMPERATURE	CARD COLUMNS 48-50	
020	SEA TEMPERATURE	CARD COLUMNS 43-45 000-999 degrees Celsius and tenths If values were > 350, value was subtracted from 1000 giving negative temperature in degrees Celsius and tenths, i.e., Punched value = 625, 1000-625 = 37.5°C (37.5 in Field 017)  If values were < 351, they were placed directly in Field 017	
018	WET BULB TEMPERATURE	Computed: See Section 4, Scale 4	
021	AIR-SEA TEMPERATURE DIFFERENCE	Computed from Field 017 and 020 (Air minus Sea Temp.)	

TAPE DECK		SURFACE MARINE OBSERVATIONS		PAGE NO.
1187				3-1187.1
<u>SUPPLEMENTAL DATA FIELDS</u>				
<u>TAPE</u> <u>FIELD NUMBER</u>	<u>ELEMENT</u>	<u>EXPLANATION</u>		
039	SHIP NUMBER	01 = Kinjo-Maru	Whaling Ship	11,052 tons
		02 = Hashidate-Maru	Whaling Ship	10,798 tons
		03 = Daini-Tenyo-Maru	Refrigerator	10,611 tons
		04 = Tadotsu-Maru	Refrigerator	9,870 tons
		05 = Sttsu-Maru	Refrigerator	10,611 tons
		06 = Nisshin-Maru	Whaling Ship	11,781 tons
		06 = Nisshin-Maru (new)	Whaling Ship	16,771 tons
		07 = Tonan-Maru	Whaling Ship	19,307 tons
		08 = Matsushima-Maru	Whaling Ship	13,786 tons
		09 = Kyokuyo-Maru	Whaling Ship	13,002 tons
		61 = Asama-Maru	Cargo Boat	993 tons
		71 = Juroku-Seki-Maru	Catcher Boat	647 tons
		040	WHALING SEASON	01 = November-March
02 = November-March	1947-1948			
03 = November-March	1948-1949			
04 = November-March	1949-1950			
05 = November-March	1950-1951			
06 = November-March	1951-1952			
07 = November-March	1952-1953			
08 = November-March	1953-1954			
09 = November-March	1954-1955			
10 = November-March	1955-1956			
041	OCTANT	5 = 000-089.9	Degrees W Longitude	
		6 = 090-180.0	Degrees W Longitude	
		7 = 090-180.0	Degrees E Longitude	
		8 = 000-089.9	Degrees E Longitude	
All observations are in the Southern Hemisphere				
042	LATITUDE	00.0°-90.0°S in degrees and tenths		
043	LONGITUDE	000-999 in degrees and tenths with hundreds position omitted. Must be used in conjunction with Field 041 to determine actual longitude		
044	PRESSURE	000-999 millibars and tenths with thousands and hundreds positions omitted		
045	AIR TEMPERATURE	00-99 in whole degrees Fahrenheit		
046	SEA TEMPERATURE	Negative values were coded by adding algebraically to 100. i.e., -4°F coded and punched as 96		
047	DEW POINT TEMPERATURE			
048	WIND DIRECTION	00 = Calm		
		01 = 005-034	Degrees	
		02 = 035-064	"	
		03 = 065-094	"	
		04 = 095-124	"	
		05 = 125-154	"	
		06 = 155-184	"	
		07 = 185-214	"	
		08 = 215-244	"	
		09 = 245-274	"	
		10 = 275-304	"	
		11 = 305-334	"	
12 = 335-004	"			

TAPE DECK		PAGE NO.	
1187		3-1187.2	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
049	BEAUFORT WIND FORCE	0 = Calm 1 = 1-3 knots 2 = 4-6 knots 3 = 7-10 knots 4 = 11-16 knots 5 = 17-21 knots 6 = 22-27 knots 7 = 28-33 knots 8 = 34-40 knots 9 = 41-47 knots - = 48-55 knots + = 56-63 knots	
050	MERIDIONAL ZONE NUMBER	00 - 10 Not used 11 = 10.0 - 14.9°E 12 - 18 = 15.0 - 49.9°E (in 5° increments) 19 - 20 Not used 21 = 50.0 - 54.9°E 22 - 28 = 55.0 - 89.9°E       " 29 - 30 Not used 31 = 90.0 - 94.9°E 32 - 38 = 95.0 - 129.9°E       " 39 - 40 Not used 41 = 130.0 - 134.9°E 42 - 48 = 135.0 - 169.9°E       " 49 - 50 Not used 51 = 170.0 - 174.9°E 52 = 175.0 - 179.9°E 53 = 180.0 - 175.0°W 54 - 58 = 174.9 - 150.0°W       " 59 - 60 Not used 61 = 149.9 - 145.0°W 62 - 68 = 144.9 - 110.0°W       " 69 - 70 Not used 71 = 109.9 - 105.0°W 72 - 78 = 104.9 - 70.0°W       " 79 - 80 Not used 81 = 69.9 - 65.0°W 82 - 88 = 64.9 - 30.0°W 89 - 90 Not used 91 = 29.9 - 25.0°W 92 - 96 = 24.9 - 00.0°W 97 = 00.1 - 04.9°E 98 = 05.0 - 09.9°E	
051	LATITUDE ZONE NUMBER	1 = 60.0°S- 62.4°S 2 = 62.5 - 64.9 3 = 65.0 - 67.4 4 = 67.5 - 69.9 5 = 70.0 - 72.4 6 = 72.5 - 74.9 7 = 75.0 - 77.4 8 = 77.5 - 79.9	



TAPE DECK		PAGE NO.
1188	SURFACE MARINE OBSERVATIONS	1-1188.1

# STANDARD FORMAT

	CARD DECK	MAR SQ	SUB SQ	Q	LAT	LONG	YEAR	MO	DA	HR	WIND DIR	WIND SPD	VIS	WX	W	PRESS	T I	AIR TMP	WET BLB	DEW PT	SEA TMP	A-S DIF
	xxx	xxx	xx	x	xxx	xxxx	xxxx	xx	xx	xx	ixx	ixxx	ixx	xx	x	xxxxx	i	xxx	xxx	xxx	xxx	xxx
FIELD NUMBER	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021	

CLOUDS										WAVE	P	WAVE	SWL	P	SWL	OSV	C	S													I	SHIP					
N	N <sub>h</sub>	C <sub>L</sub>	I	h	C <sub>M</sub>	C <sub>H</sub>	DIR	E	R	HGT	DIR	E	R	HGT	NO.	D	H	P	A	I	ICE	A	A	D	S	S	a	ppp	A	SIG	SIG	SIG		C	SHIP		
x	x	x	i	x	x	x	xx	x	xx	xx	xx	x	xx	xx	xx	x	x		l	x	xx	x	Δ	Δ	6	x	x	x	xxx	8	x	x	xx	Δ	Δ	x	xxxx
							022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	037	038					039	040	041	042	043	044	045	046	047	048

## SUPPLEMENTAL DATA FIELDS

RH	S	43 BLANK CHARACTERS
xxx	x	
FIELD NUMBER	039	040

## UNIQUE CHARACTERISTICS

TAPE FIELD NUMBER	ELEMENT	TAPE NOTATION
001	CARD DECK NUMBER	188
011 i	WIND DIRECTION INDICATOR	0
012 i	WIND SPEED INDICATOR	BLANK
013 i	VISIBILITY INDICATOR	BLANK
017 i	TEMPERATURES INDICATOR	1
018-019		BLANK
022 i	CLOUDS INDICATOR	BLANK
022	CLOUDS (N <sub>h</sub> ) (C <sub>L</sub> ) (h) (C <sub>M</sub> ) (C <sub>H</sub> )	BLANK
023-038		BLANK

## SUPPLEMENTAL DATA FIELDS

FIELD NUMBER	ELEMENT	TAPE POSITIONS
039	RELATIVE HUMIDITY	94-96 (BLANK)
040	SHIP NUMBER	97

TAPE DECK				PAGE NO.	
1188		SURFACE MARINE OBSERVATIONS		2-1188.1	
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION			
004	QUADRANT	CARD COLUMNS 13 (Hemisphere) and 9-12 (Longitude)			
		Card Column 13		Card Columns 9-12	
		3	=	2	and 1800-3599
		4	=	1	and 0000-1799
005	LATITUDE	CARD COLUMNS 6-8			
		000-900 in degrees and tenths South Latitude			
006	LONGITUDE	CARD COLUMNS 9-12			
		0000-3599 in degrees and tenths			
		Longitude punched starting at 0000° Greenwich			
		and increasing in an eastward direction to 359.9°.			
		Longitudes > 179.9° were subtracted from 359.9°.			
		and assigned a "West" designation			
007	YEAR	CARD COLUMNS 2 (Season) and 5 (Month of Season)			
008	MONTH	General period of record is 1932-1939			
		Column 2		Season	
		2	=	September 1932-May 1933	
		3	=	September 1933-May 1934	
		4	=	September 1934-May 1935	
		5	=	September 1935-May 1936	
		6	=	September 1936-May 1937	
		7	=	September 1937-May 1938	
		8	=	September 1938-May 1939	
		Column 5		Month of Season	
		1	=	09	
		2	=	10	
		3	=	11	
		4	=	12	
		5	=	01	
		6	=	02	
		7	=	03	
		8	=	04	
		9	=	05	
		Column 2		Column 5	
	193209-193212	=	2	1-4	
	193301-193305	=	2	5-9	
	193309-193312	=	3	1-4	
	193401-193405	=	3	5-9	
	193409-193412	=	4	1-4	
	193501-193505	=	4	5-9	
	193509-193512	=	5	1-4	
	193601-193605	=	5	5-9	
	193609-193612	=	6	1-4	
	193701-193705	=	6	5-9	
	193709-193712	=	7	1-4	
	193801-193805	=	7	5-9	
	193809-193812	=	8	1-4	
	193901-193905	=	8	5-9	

TAPE DECK		PAGE NO.	
1188		2-1188.2	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION	
011	WIND DIRECTION	CARD COLUMNS 31-32	
		00 =	00 Calm
		01 =	13 N by E
		02 =	14 NNE
		03 =	21 NE by N
		04 =	22 NE
		05 =	23 NE by E
		06 =	24 ENE
		07 =	31 E by N
		08 =	32 E
		09 =	33 E by S
		10 =	34 ESE
		11 =	41 SE by E
		12 =	42 SE
		13 =	43 SE by S
		14 =	44 SSE
		15 =	51 S by E
		16 =	52 S
		17 =	53 S by W
		18 =	54 SSW
		19 =	61 SW by S
		20 =	62 SW
		21 =	63 SW by W
		22 =	64 WSW
		23 =	71 W by S
		24 =	72 W
		25 =	73 W by N
		26 =	74 WNW
		27 =	81 NW by W
		28 =	82 NW
		29 =	83 NW by N
		30 =	84 NNW
		31 =	11 N by W
		32 =	12 N
012	WIND SPEED	CARD COLUMNS 33-34	
		00-66 in knots	
		The observations were recorded in Beaufort Force and converted by Norway before punching according to the following:	
		<u>Beaufort Force</u>	<u>Punched As</u>
		0	00
		1	02
		2	05
		3	09
		4	14
		5	19
		6	25
		7	31
		8	37
		9	44
		10	51
		11	58
		12	66

TAPE DECK		SURFACE MARINE OBSERVATIONS	PAGE NO.
1188			2-1188.3
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION	
013	VISIBILITY	CARD COLUMN 29 0-9 90 was added to column 29 and the result placed in Field 013  0 = < 50 Yards 1 = 50 - 199 " 2 = 200 - 499 " 3 = 500 Yds - 1/4 Nautical Miles 4 = 1/2 - 3/4 " 5 = 1 - 1 3/4 " 6 = 2 - 4 3/4 " 7 = 5 - 9 3/4 " 8 = 10 - 29 3/4 " 9 = > 30 "	
014	PRESENT WEATHER	CARD COLUMNS 26-27 00-99 Converted by Scale 3, Section 4	
016	SEA LEVEL PRESSURE	CARD COLUMNS 16-18 000-999 in millibars and tenths with thousands and hundreds positions omitted  10000 was added to punched values 000-450 9000 was added to punched values 451-999	
017	AIR TEMPERATURE	CARD COLUMNS 19-22 Degrees Celsius and tenths 1001-1999 0000-0999  0 in high order position indicates negative temperature 1 in high order position indicates positive temperature	
020	SEA TEMPERATURE	CARD COLUMNS 23-25 Degrees Celsius and tenths 101-199 001-099  0 in high order position indicates negative temperature 1 in high order position indicates positive temperature	
021	AIR-SEA TEMPERATURE DIFFERENCE	Computed from Fields 017 and 020 (Air minus Sea temp.)	

TAPE DECK				PAGE NO.	
1188		SURFACE MARINE OBSERVATIONS		3-1188.1	
<u>SUPPLEMENTAL DATA FIELDS</u>					
<u>TAPE</u> <u>FIELD NUMBER</u>	<u>ELEMENT</u>	<u>EXPLANATION</u>			
039	RELATIVE HUMIDITY	BLANK			
040	SHIP NUMBER	0	=	Solglint	
		1	=	Vestfold	
		2	=	Skytteren	
		3	=	Kosmos II	
		4	=	Kosmos I	
		5	=	Svend Foyn	
		6	=	Hektoría	
		7	=	Thorshammer	
		8	=	Ole Wegger	
		9	=	Sir James Clark Ross	
		-	=	Thorshavet	

TAPE DECK		PAGE NO.
1189	SURFACE MARINE OBSERVATIONS	1-1189.1

# STANDARD FORMAT

CARD DECK	MAR SQ	SUB SQ	Q	LAT	LONG	YEAR	MO	DA	HR	WIND DIR	WIND SPD	VIS	WX	W	PRESS	T I	AIR TMP	WET BLB	DEW PT	SEA TMP	A-S DIF
xxx	xxx	xx	x	xxx	xxxx	xxxx	xx	xx	xx	ixx	ixxx	ixx	xx	x	xxxxx	i	xxx	xxx	xxx	xxx	xxx
FIELD NUMBER	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021

CLOUDS						WAVE	P	WAVE	SWL	P	SWL	OSV	C	S	A I ICE A				A D S a ppp				A SIG SIG SIG				I SHIP							
N	N <sub>h</sub>	C <sub>L</sub>	I <sub>h</sub>	C <sub>M</sub>	C <sub>H</sub>	DIR	E <sub>R</sub>	HGT	DIR	E <sub>R</sub>	HGT	NO.	D	H	P	D	C	THK	C	D	I	P	a	ppp	D	N	T	HGT		C	NO.			
x	x	x	i	x	x	xx	x	xx	xx	x	xx	xx	x	x		1	x	xx	x	Δ	Δ	6	x	x	x	xxx	8	x	x	xx	Δ	Δ	x	xxxx
						022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	032	033	034	035	036	032	033	034	035	036	037	038		

## SUPPLEMENTAL DATA FIELDS

RH	SPC HUM	FOG DUR	PCP DUR	B E U	SP PH	2° SQ	5° SQ	JORN NO.	CODE NO.	W A T	24 BLANK CHARACTERS											
xxx	xxx	xx	xx	x	xx	xx	x	xxxx	xx	x												
FIELD NUMBER	039	040	041	042	043	044	045	046	047	048	049											

## UNIQUE CHARACTERISTICS

TAPE FIELD NUMBER	ELEMENT	TAPE NOTATION
001	CARD DECK NUMBER	189
011 i	WIND DIRECTION INDICATOR	BLANK
012 i	WIND SPEED INDICATOR	BLANK
013 i	VISIBILITY INDICATOR	BLANK
017 i	TEMPERATURES INDICATOR	1
022 i	CLOUDS INDICATOR	BLANK
026-031		BLANK
032	ADDITIONAL DATA INDICATOR	6
037-038		BLANK

## SUPPLEMENTAL DATA FIELDS

		TAPE POSITIONS
039	RELATIVE HUMIDITY	94-96
040	SPECIFIC HUMIDITY	97-99
041	DURATION OF FOG	100-101
042	DURATION OF PRECIPITATION	102-103
043	BEAUFORT WIND FORCE	104
044	SPECIAL PHENOMENA	105-106
045	2 DEGREE SUB-SQUARE	107-108
046	5 DEGREE SUB-SQUARE	109

TAPE DECK		PAGE NO.	
1189		1-1189.2	
SURFACE MARINE OBSERVATIONS			

TAPE DECK		SURFACE MARINE OBSERVATIONS		PAGE NO.
1189				2-1189.1
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION		
004	QUADRANT	CARD COLUMN 8 See Scale 1, Section 4		
006	LONGITUDE	CARD COLUMNS 12-14 000-999 in degrees and tenths with 1 implied when longitude = 100-180 degrees. 1000 was added to Field 006 when Column 8 = 1,2,6 or 7 and Column 12 = 0-8		
007	YEAR	CARD COLUMNS 2-3 39 or 45-55  1900 was added to Field 007. General period of record is 1939 and Sept. 1945 - June 1955		
010	HOOR - GMT	CARD COLUMNS 15-16 or TAPE FIELDS 048-049  When Columns 15-16 punched, hour was transferred directly to tape. When Columns 15-16 were blank, Tape Fields 048-049 were used and LST time converted to GMT by Scale 2 Section 4		
012	WIND SPEED	CARD COLUMNS 20-21 in knots 00-99, 00-99  100 was added to Field 012 when Column 20 contained a - overpunch		
017	AIR TEMPERATURE	CARD COLUMNS 32-34	Degrees Celsius and	
018	WET BULB TEMPERATURE	CARD COLUMNS 35-37	tenths	
020	SEA TEMPERATURE	CARD COLUMNS 43-45	A - overpunch in Columns 32,35 or 43 indicated a negative temperature	
019	DEW POINT TEMPERATURE	Computed See Scale 8, Section 4		
021	AIR-SEA TEMPERATURE DIFFERENCE	Computed from Fields 017 and 020 (Air minus Sea Temp.)		
023	DIRECTION OF WAVES	CARD COLUMNS 49-50 00-36, 49,99,  When Column 50 contained a - overpunch the numeric value was accepted and Field 025 changed as described below		
024	PERIOD OF WAVES	CARD COLUMN 51 2-9, 0, 1, +  2-9 = 2-9 0 = 0 1 = 1 - = +		
025	WAVE HEIGHT	CARD COLUMN 52 0-9, 0, 9  When Wave direction punched 00-36 or 49 and no - over- punch in Column 50, 00 was added and the result (00-09) placed in Field 025  When Wave direction punched 00-36 or 99, 10 was added and the result (10-19) placed in Field 025  When Wave direction punched 00-36 or 99, and there was a - overpunch in Column 52, 10 was added to the numeric value of Column 52 and the result multiplied by 2 before placing in Field 025		



TAPE DECK		SURFACE MARINE OBSERVATIONS		PAGE NO.
1189				2-1189.2
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION		
035	BAROMETRIC TENDENCY	CARD COLUMN 59 0-9, $\bar{2}$ , $\bar{7}$		
		Observations prior to 1955:		
		0	=	0
		1	=	1
		2	=	2
		3	=	3
		3	=	4
		5	=	5
		6	=	6
		7	=	7
		7	=	8
		8	=	9
		3	=	$\bar{2}$
		7	=	$\bar{7}$
		Observations 1955 and later accepted as punched except:		
		3	=	$\bar{2}$
		7	=	$\bar{7}$
		- overpunches were used by ships without Barographs		
		$\bar{2}$ = Higher than 3 hours ago		
		$\bar{7}$ = Lower than 3 hours ago		
036	AMOUNT OF PRESSURE CHANGE	CARD COLUMNS 60-61 00-99, $\bar{00}$ - $\bar{99}$ , $\bar{00}$ - $\bar{99}$		
		000-099	=	00-99 = 0.0- 9.9 millibars
		100-199	=	$\bar{00}$ - $\bar{99}$ =10.0-19.9 millibars
		200-299	=	$\bar{00}$ - $\bar{99}$ =20.0-29.9 millibars

TAPE DECK		PAGE NO.	
1189		3-1189.1	
SURFACE MARINE OBSERVATIONS			
SUPPLEMENTAL DATA FIELDS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
039	RELATIVE HUMIDITY	000-100 Computed $RH = \frac{e}{e_s} T$	
040	SPECIFIC HUMIDITY	000-300 in tenths of Grams per Kilogram	
041	DURATION OF FOG	00-24	
042	DURATION OF PRECIPITATION	Duration of fog during past 6 hours in 1/4 hour increments ( 1=15 minutes, 12=3 hours, etc.)  + punch in high order position indicates missing data	
043	BEAUFORT WIND FORCE	0 = 0 knots 1 = 1-3 knots 2 = 4-6 knots 3 = 7-10 knots 4 = 11-16 knots 5 = 17-21 knots 6 = 22-27 knots 7 = 28-33 knots 8 = 34-40 knots 9 = 41-47 knots 0 = 48-55 knots 1 = 56-63 knots 2 = > 64 knots	
044	SPECIAL PHENOMENA	00 = No particular phenomena 01 = Tropical cyclones 02 = Gales, windforce 10 and higher, at middle and high latitude 03 = Local storms, windforce 8 and higher, as Mistral, Norther, Tornado 04 = Wind or waterspouts 07 = Arctic sea smoke 10 = Lightning with compass bearing 11 = Thunderstorm 12 = St. Elmo's Fire 13 = Ball-lightning 20 = Extra sea temperature observations 21 = Icebergs, or drift ice 22 = Wrecks, drifting buoys, etc. 23 = Current rips 24 = Abnormal enlargement of river water 25 = Color of sea water according to Forel Scale 26 = Changes of sea water temperature of 5°C or more 30 = Sunrise and sunset colors 31 = Abnormal refraction and mirage 32 = Rainbow with statement of observed colors 33 = Particular coronas with statement of observed rings 34 = Particular halos (not those of 22°) 35 = Horizon-dips observations 40 = Aurora, with or without compass disturbance 41 = Compass disturbance without aurora 42 = Meteors 43 = Seisms, earth and seaquake 50 = Particulars about birds 51 = Particulars about fishes 52 = Particulars about plankton 53 = Particulars about insects 54 = Lightning of the sea 55 = Red water	

TAPE DECK		PAGE NO.	
1189		3-1189.2	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
044	SPECIAL PHENOMENA (Con't)	60 = Sand in the air, red fog, trade-wind dust, desert-dust 65 = Dimensions of hail stones 68 = Abnormal radar reach  Specific details about the above are contained in the Log Book  - punch in column 70 means that the Log Book contains more particulars  - punch in column 71 means that the Log Book contains an extra series of surface tempera- ture observations	
045	2 DEGREE SUB-SQUARE	The 1° Squares of a 10° Square are combined into groups of 4 so that 2° Sub-square 01 is composed of Marsden 1° Squares 00, 01, 10, and 11. 2° Sub- square 02 is composed of Marsden 1° Squares 02, 03, 12 and 13, etc.	
046	5 DEGREE SUB-SQUARE	1-4 5° Sub-square 1 is composed of Marsden 1° Squares 00-04, 10-14, 20-24, 30-34 and 40-44. Other 5° Sub-squares are similarly arranged	
047	JOURNAL NUMBER	0149-9999	
048	CODE NUMBER	08 = Selected ships 14 = Auxiliary ships, columns 15-16 Blank 15 = Auxiliary ships, visibility not observed 16 = Auxiliary ships	
049	LAND OR WATCH NUMBER	0 = Netherlands 1 = 0400 LST watch 2 = 0800 LST watch 3 = 1200 LST watch 4 = 1600 LST watch 5 = 2000 LST watch 6 = 2400 LST watch	

TAPE DECK		PAGE NO.
1192	SURFACE MARINE OBSERVATIONS	1-1192.1

# STANDARD FORMAT

CARD DECK	MAR SQ	SUB SQ	Q	LAT	LONG	YEAR	MO	DA	HR	WIND DIR	WIND SPD	VIS	WX	W	PRESS	T 1	AIR TMP	WET BLB	DEW PT	SEA TMP	A-S DIF
xxx	xxx	xx	x	xxx	xxxx	xxxx	xx	xx	xx	ixx	ixxx	ixx	xx	x	xxxxx	i	xxx	xxx	xxx	xxx	xxx
FIELD NUMBER	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021

CLOUDS							WAVE	P	WAVE	SWL	P	SWL	OSV	C	S													I	SHIP					
N	N <sub>h</sub>	C <sub>L</sub>	I	h	C <sub>M</sub>	C <sub>H</sub>	DIR	E	HGT	DIR	E	HGT	NO.	D	H	P	A	I	ICE	A	A	D	S	a	ppp	A	SIG	SIG	SIG		I	SHIP		
x	x	x	i	x	x	x	xx	x	xx	xx	x	xx	xx	x	x		1	x	xx	x	Δ	Δ	6	x	x	xxx	8	x	x	xx	Δ	Δ	x	xxxx
FIELD	022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	032	033	034	035	036	032	033	034	035	036	032	033	034	035	036	037	038		
NUMBER																																		

# SUPPLEMENTAL DATA FIELDS

LOG TYP	CODE SHEET	BF WD	WX	PPP	V	C	C	C	N	N	SEA	S	SWL	T	a	pp	RH	LS	BEAU. WX.	4 BLANK CHARACTERS
I	S	L	M	H	h	DIR	T	DIR	Y	P	PRE	REMARKS								
xx	xxxxxx	xx	xx	xxx	x	x	x	x	x	x	xx	x	xx	x	x	xx	xx	xx	xxxxxx	
FIELD NUMBER	039	040	041	042	043	044	045	046	047	048	049	050	051	052	053	054	055	056	057	058

# UNIQUE CHARACTERISTICS

TAPE FIELD NUMBER	ELEMENT	TAPE NOTATION
001	CARD DECK NUMBER	192
011 i	WIND DIRECTION INDICATOR	2
012 i	WIND SPEED INDICATOR	BLANK
013 i	VISIBILITY INDICATOR	BLANK
017 i	TEMPERATURES INDICATOR	1
018	WET BULB TEMPERATURE	BLANK
019	DEW POINT TEMPERATURE	BLANK
022 i	CLOUD INDICATOR	BLANK
023-031		BLANK
032	ADDITIONAL DATA INDICATOR	6 OR BLANK
037	ICE INDICATOR	BLANK
038	SHIP NUMBER	BLANK

# SUPPLEMENTAL DATA FIELDS

		TAPE POSITIONS
039	LOG BOOK TYPE	94-95
040	CODE SHEET NUMBER	96-101
041	BEAUFORT WIND FORCE	102-103

TAPE DECK		PAGE NO.	
1192		1-1192.2	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	TAPE POSITIONS	
042	PRESENT WEATHER	104-105	
043	SEA LEVEL PRESSURE	106-108	
044	VISIBILITY	109	
045	LOW CLOUD TYPE	110	
046	MIDDLE CLOUD TYPE	111	
047	HIGH CLOUD TYPE	112	
048	TOTAL CLOUD AMOUNT	113	
049	LOW CLOUD AMOUNT	114	
050	DIRECTION OF SEA	115-116	
051	STATE OF THE SEA	117	
052	DIRECTION OF SWELL	118-119	
053	SWELL TYPE	120	
054	BAROMETRIC TENDENCY	121	
055	AMOUNT OF PRESSURE CHANGE	122-123	
056	RELATIVE HUMIDITY	124-125	
057	PRECIPITATION FROM LIGHTSHIP	126-127	
058	BEAUFORT WEATHER AND REMARKS	128-136	

TAPE DECK				PAGE NO.
1192		SURFACE MARINE OBSERVATIONS		2-1192.1

TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION	
004	QUADRANT	CARD COLUMNS 14-18 - MARSDEN SQUARES	
005	LATITUDE	Positions were given by 10° and 1° Marsden	
006	LONGITUDE	Squares. These values were used to determine Quadrant, Latitude and Longitude.	
007	YEAR	CARD COLUMNS 4-5 00-99 When columns 4-5 were punched 59-99, 1800 was added. When punched 00-39, 1900 was added. General period of record is 1859-1939.	
008	MONTH	CARD COLUMN 3 1-9, 0, $\bar{0}$ , -, $\bar{1}$ , +, $\bar{2}$  01-09 = 1-9 10 = 0 or $\bar{0}$ 11 = - or $\bar{1}$ 12 = + or $\bar{2}$	
010	HOURL-GMT	CARD COLUMNS 19-20 00-23 GMT 50-73 = 00-23 LST When columns 19-20 punched 00-23, values were placed directly into Field 010. When columns 19-20 punched 50-73, time was converted to GMT by Scale 2, Section 4.	
012	WIND SPEED	TAPE FIELD 041 A0-12 See Scale 5, Section 4	
013	VISIBILITY	TAPE FIELD 044 0-9 90 was added to the value in Field 044 and the result placed in Field 013.	
014	PRESENT WEATHER	TAPE FIELD 042 00-99 See Scale 3, Section 4	
017	AIR TEMPERATURE	CARD COLUMNS 31-34	
020	SEA TEMPERATURE	CARD COLUMNS 35-38 Degrees Celsius and tenths A000-A999 = Positive Temperature -000--999 = Negative Temperature	
021	AIR-SEA TEMP. DIFFERENCE	Computed from Fields 017 and 020 (Air minus Sea Temp.)	
022	CLOUDS (N) ( $N_h$ )	TAPE FIELDS 048-049 0-9,- See Scale 7, Section 4	
022	CLOUDS ( $C_L$ )	TAPE FIELD 045 0-9 0 = 0 1 = 1 2 = 2 3 = 3 4 = 4 or 7 5 = 5 6 = 6 7 = 7 8 = 8 9 = 9	

TAPE DECK				PAGE NO.
1192		SURFACE MARINE OBSERVATIONS		2-1192.2
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION		
035	BAROMETRIC TENDENCY	TAPE FIELD 054 0-9 0 = 0 1 = 1 2 = 2 or 3 3 = 4 5 = 5 6 = 6 7 = 7 or 8 8 = 9		
036	AMOUNT OF PRESSURE CHANGE	CARD COLUMNS 58-59 00-99, 00 - 99 When punched 00-99, value was placed directly into Field 036. When punched 00 - 99, 100 was added and the result placed in Field 036.		
036	AMOUNT OF PRESSURE CHANGE	TAPE FIELD 055 - in tenths of millimeters 00-99, 00 - 99, 00 - 99 00-99 = 10.0 - 19.9 millimeters 00-99 = 20.0 - 29.9 millimeters This Field was used if Columns 58-59 not punched. Values were first converted to millibars by multiplying by 1.33324.		

TAPE DECK		PAGE NO.
1192		3-1192.1
SURFACE MARINE OBSERVATIONS		
<u>SUPPLEMENTAL DATA FIELDS</u>		
<u>TAPE FIELD NUMBER</u>	<u>ELEMENT</u>	<u>EXPLANATION</u>
039	LOG BOOK TYPE	<u>TYPE OF LOGBOOKS</u> 00 = Small coastal sailing vessel 01 = Sailing vessel 02 = Steamer 03 = Warship 04 = Small boat weather book 05 = Fishing steamer  06 = Logbook Form 1, 7 groups Observation time according to GMT 07 = Logbook Form 2, 4 groups Observation time according to local time 08 = Logbook Form 3, 4 Groups Observation time according to GMT 09 = Denmark 10 = Norway 11 = Holland 13 = France  30 = Norway  40 = France 41 = Denmark  60 = Instrument observations only  61 = Weather information by Beaufort code       Clouds code prior to 1930 62 = Weather information word description. Clouds code prior to 1930 64 = Weather and clouds by Copenhagen code 65 = Weather by Copenhagen code       Clouds code prior to 1930
040	CODE SHEET NUMBER	NUMBER OF CODE SHEET UPON WHICH ORIGINAL OBSERVATION WAS RECORDED
041	BEAUFORT WIND FORCE	A0-12 A0 = < 1 knot A1 = 1-3 knots A2 = 4-6 knots A3 = 7-10 knots A4 = 11-16 knots A5 = 17-21 knots A6 = 22-27 knots A7 = 28-33 knots A8 = 34-40 knots A9 = 41-47 knots 10 = 48-55 knots 11 = 56-63 knots 12 = > 63 knots
042	PRESENT WEATHER	00-99 See Scale 3, Section 4
043	SEA LEVEL PRESSURE	000-999 in millimeters to tenths 000-999=600.0-699.9 millimeters 000-999=700.0-799.0 millimeters 000-999=800.0-899.0 millimeters



TAPE DECK		SURFACE MARINE OBSERVATIONS	PAGE NO.
1192			3-1192.2
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
044	VISIBILITY	0-9, - 0 = 0-49 yards 1 = 50-199 yards 2 = 200-499 yards 3 = < 1/2 nautical miles 4 = 1/2<1 nautical miles 5 = > 1< 2 nautical miles 6 = > 2< 5 nautical miles 7 = > 5<10 nautical miles 8 = > 10<30 nautical miles 9 = > 30 nautical miles - = unknown	
045	LOW CLOUD TYPE	0-9, - 0 = No low clouds 1 = Cumulus of fine weather 2 = Cumulus, heavy and swelling, without anvil top 3 = Cumulonimbus 4 = Stratocumulus formed by flattening of cumulus 5 = Layer of stratus or stratocumulus 6 = Low broken up clouds of bad weather 7 = Cumulus of fine weather and stratocumulus 8 = Heavy or swelling cumulus, or cumulonimbus, and stratocumulus 9 = Heavy or swelling cumulus (or cumulonimbus) and low ragged clouds of bad weather - = Unknown Blank= Unknown	
046	MIDDLE CLOUD TYPE	0-9, - 0 = No middle clouds 1 = Typical altostratus, thin 2 = Typical altostratus, thick (or nimbostratus) 3 = Altocumulus, or high stratocumulus, sheet at one level only 4 = Altocumulus in small isolated patches; individual clouds often show signs of evaporation and are more or less lenticular in shape 5 = Altocumulus arranged in more or less parallel bands, or an ordered layer advancing over sky 6 = Altocumulus formed by a spreading out of the tops of cumulus 7 = Altocumulus associated with altostratus or altostratus with a partially altocumulus character 8 = Altocumulus castellatus, or scattered cumuliform tufts 9 = Altocumulus in several sheets at different levels, generally associated with thick fibrous veils of cloud and a chaotic appearance of the sky - = Unknown Blank= Unknown	

TAPE DECK		PAGE NO.
1192		3-1192.3
SURFACE MARINE OBSERVATIONS		
TAPE FIELD NUMBER	ELEMENT	EXPLANATION
047	HIGH CLOUD TYPE	0-9, - 0 = No high clouds 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 - = Unknown Blank = Unknown
048	TOTAL CLOUD AMOUNT	0-9, - in tenths of sky covered
049	LOW CLOUD AMOUNT	- = 10 tenths
050	DIRECTION OF SEA	00 = Calm
052	DIRECTION OF SWELL	02 = NNE 04 = NE 06 = ENE 08 = E 10 = ESE 12 = SE 14 = SSE 16 = S 18 = SSW 20 = SW 22 = WSW 24 = W 26 = WNW 28 = NW 30 = NNW 32 = N
051	STATE OF THE SEA	0-9 in feet 0 = 0 1 = 0-1 feet 2 = 1-2 feet 3 = 2-3 feet 4 = 3-5 feet 5 = 5-8 feet 6 = 8-12 feet 7 = 12-20 feet 8 = 20-40 feet 9 = > 40
053	SWELL TYPE	0-9, - or 0̄ - 9̄ 0 = No swell 1 = Very low 2 = Low 3 = Light 4 = Moderate - average length 5 = Fairly heavy 6 = Heavy - short 7 = High 8 = Very high 9 = Very heavy - = Confused sea and swell 0̄ - 9̄ = Confused sea

TAPE DECK		PAGE NO.	
1192		3-1192.4	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
054	BAROMETRIC TENDENCY	0-9, - 0 = Rising, then falling 1 = Rising, then steady; or rising, then rising more slowly 2 = Unsteady 3 = Steady or rising 4 = Falling or steady, then rising; or rising then rising more quickly 5 = Falling, then rising 6 = Falling, then steady; or falling, then falling more slowly 7 = Unsteady 8 = Falling 9 = Steady or rising, then falling; or falling, then falling more quickly - = Unknown	
	0-4 = Barometer now higher than or same as 3 hours ago		
	5-9 = Barometer no lower than 3 hours ago		
055	AMOUNT OF PRESSURE CHANGE	00-99 in millimeters to tenths 00-99 = 0.0 - 9.9 millimeters 00-99 = 10.0 - 19.9 millimeters 00-99 = 20.0 - 29.9 millimeters	
056	RELATIVE HUMIDITY	00-99 in percent 01-99 = 1% - 99% 00 = 100%	
057	PRECIPITATION FROM LIGHTSHIP	00-99 00 = None 01 = .7-01 millimeters 02-90 = 02-90 millimeters 91-96 = .1-.6 millimeters 97 = Trace 98 = > 90.4 millimeters 99 = Indeterminate	
058	BEAUFORT WEATHER (A)	0 = Clear 1 = Less than 1/2 cloud cover 2 = Sky 1/2 covered by clouds 3 = Sky 3/4 covered by clouds 4 = Overcast 5 = No cloud reported 9 = No weather reported	
058	BEAUFORT WEATHER (B)	0 = Fog 1 = Thick fog 2 = Smoke 3 = Dense smoke 4 = Visibility clear 5 = Visibility very clear 6 = Haze 7 = Gloomy 8 = Threatening	

TAPE DECK				PAGE NO.
1192		SURFACE MARINE OBSERVATIONS		3-1192.5
TAPE FIELD NUMBER	ELEMENT		EXPLANATION	
058	BEAUFORT WEATHER	(C)	0 = Drizzle (spray) 1 = Thick drizzle 2 = Rain 3 = Heavy rain 4 = Rain showers, rain squall 5 = Heavy rain showers, heavy rain squalls 7 = Snow showers, snow squall 8 = Heavy snow showers, heavy snow squall 9 = Drizzle shower	
058	BEAUFORT WEATHER	(D)	0 = Snow 1 = Heavy snow 2 = Hail, graupel 3 = Heavy hail, heavy graupel 4 = Snow graupel 5 = Heavy snow graupel 6 = Rain and snow 7 = Heavy rain and snow mixed	
058	BEAUFORT WEATHER	(E)	0 = Intermittent lightning 1 = Continuous lightning 2 = Intermittent thunder 3 = Continuous thunder 4 = Thunderstorm 5 = Intense thunderstorm 6 = Spray with rain 7 = Heavy spray with rain 8 = Rain and hail (graupel) 9 = Heavy rain and hail (graupel)	
058	BEAUFORT WEATHER	(F)	0 = Squalls 1 = Heavy squalls 2 = Ground fog 3 = Damp fog 4 = Wet fog 5 = Coastal fog 6 = Sun ring 7 = Sun halo 8 = Moon ring 9 = Moon halo - = Water spout (wind spout)	
058	BEAUFORT WEATHER	(G)	0 = Dew 1 = Heavy dew 2 = Duststorm 3 = Frost 4 = Hoar frost 5 = Glaze 6 = Ice, floating ice, ice pack 7 = Iceberg 8 = Aurora 9 = Air mirage - = St. Elmo's fire + = Gustiness	

TAPE DECK		PAGE NO.	
1192		3-1192.6	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
058	BEAUFORT WEATHER (H)	0 = Gale during last four hours but not at time of observation 1 = 4 hours                      Gale Duration 2 = 8 hours                      " 3 = 12 hours                     " 4 = 16 hours                    " 5 = 20 hours                    " 6 = 24 hours                    " 7 = 28-36 hours                " 8 = 40-48 hours                " 9 = 52-72 hours                " - = 76-92 hours                " + = 96 hours or longer        "	
058	BEAUFORT WEATHER (J)	0 = Fog during last four hours but not at time of observation 1 = 4 hours                      Fog Duration 2 = 8 hours                      " 3 = 12 hours                     " 4 = 16 hours                    " 5 = 20 hours                    " 6 = 24 hours                    " 7 = 28-36 hours                " 8 = 40-48 hours                " 9 = 52-72 hours                " - = 76-92 hours                " + = 96 hours or longer        "	

TAPE DECK		PAGE NO.
1193	SURFACE MARINE OBSERVATIONS	1-1193.1

# STANDARD FORMAT

CARD DECK	MAR SQ	SUB SQ	Q	LAT	LONG	YEAR	MO	DA	HR	WIND DIR	WIND SPD	VIS	WX	W	PRESS	T I	AIR TMP	WET BLB	DEW PT	SEA TMP	A-S DIF
xxx	xxx	xx	x	xxx	xxxx	xxxx	xx	xx	xx	ixx	ixxx	ixx	xx	x	xxxxx	i	xxx	xxx	xxx	xxx	xxx
FIELD NUMBER	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021

CLOUDS						WAVE	P	WAVE	SWL	P	SWL	OSV	C	S				A	I	ICE	A				A	D	S	a	ppp	A	SIG	SIG	SIG			I	SHIP
N	N <sub>h</sub>	C <sub>L</sub>	I	h	C <sub>M</sub>	C <sub>H</sub>	DIR	E	HGT	DIR	E	HGT	NO.	D	H	P	D	E	C	THK	C	D	I	P	D	D	D	N	T	HGT			C	NO.			
x	x	x	i	x	x	x	xx	x	xx	xx	x	xx	xx	x	x	x	x	x	x	Δ	Δ	6	x	x	x	xxx	8	x	x	xx	Δ	Δ	x	xxxx			
						022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	032	033	034	035	036	032	033	034	035	036	037	038					

# SUPPLEMENTAL DATA FIELDS

CUR SET	CUR DFT	W A T	BF WD	PPP	V I S	C H	CLD DIR	N S A	SWL DIR	A M T	FOG DUR	PCP DUR	24 BLANK CHARACTERS																	
xx	xx	x	xx	xxx	x	x	xx	x	x	xx	x	xx	xx																	
FIELD NUMBER	039	040	041	042	043	044	045	046	047	048	049	050	051	052																

# UNIQUE CHARACTERISTICS

TAPE FIELD NUMBER	ELEMENT	TAPE NOTATION
001	CARD DECK NUMBER	193
011 i	WIND DIRECTION INDICATOR	2
012 i	WIND SPEED INDICATOR	BLANK
013 i	VISIBILITY INDICATOR	BLANK
014	PRESENT WEATHER	BLANK
015	PAST WEATHER	BLANK
016	SEA LEVEL PRESSURE	BLANK
017 i	TEMPERATURES INDICATOR	1
018	WET BULB TEMPERATURE	BLANK
019	DEW POINT TEMPERATURE	BLANK
022	CLOUDS (N <sub>h</sub> ) (C <sub>L</sub> ) (I) (h) (C <sub>M</sub> ) (C <sub>H</sub> )	BLANK
023-038		BLANK

TAPE DECK		PAGE NO.
1193	SURFACE MARINE OBSERVATIONS	1-1193.2

SUPPLEMENTAL DATA FIELDS

<u>TAPE FIELD NUMBER</u>	<u>ELEMENT</u>	<u>TAPE POSITIONS</u>
039	CURRENT (SET)	94-95
040	CURRENT (DRIFT)	96-97
041	WATCH	98
042	BEAUFORT WIND FORCE	99-100
043	PRESSURE	101-103
044	VISIBILITY	104
045	CLOUD TYPE (HIGH)	105
046	CLOUD DIRECTION	106-107
047	TOTAL CLOUD AMOUNT	108
048	STATE OF THE SEA	109
049	DIRECTION OF SWELL	110-111
050	AMOUNT OF SWELL	112
051	DURATION OF FOG	113-114
052	DURATION OF PRECIPITATION	115-116

TAPE DECK		PAGE NO.	
1193		2-1193.1	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION	
004	QUADRANT	CARD COLUMNS 14-18 - MARSDEN SQUARES	
005	LATITUDE	Positions were given by 10° and 1° Marsden	
006	LONGITUDE	Squares. These values were used to determine Quadrant, Latitude and Longitude.	
007	YEAR	CARD COLUMNS 4-5 00-99 When columns 4-5 were punched 54-99, 1800 was added. When punched 00-38, 1900 was added. General period of record is 1854-1938.	
008	MONTH	CARD COLUMN 3 1-9, 0, 1, 2  01-09 = 1-9 10 = 0 11 = 1 12 = 2	
010	HOOR - GMT	CARD COLUMN 19 1-6 1 = 0400 LST 2 = 0800 LST 3 = 1200 LST 4 = 1600 LST 5 = 2000 LST 6 = 0000 LST The LST times were converted to GMT by Scale 2, Section 4.	
012	WIND SPEED	TAPE FIELD 042 00-12 - Scale 5, Section 4	
013	VISIBILITY	TAPE FIELD 044 0-9 Observations of visibility began in 1922. 90 was added to the value in Field 044 and the result placed in Field 013.	
017	AIR TEMPERATURE	CARD COLUMNS 32-34	
020	SEA TEMPERATURE	CARD COLUMNS 35-38 Degrees Celsius and tenths 000-499 Positive temperature 501-999 Negative temperature	
021	AIR-SEA TEMP. DIFFERENCE	Computed from Fields 017 and 020. (Air minus Sea Temp.)	
022	CLOUDS (N)	TAPE FIELD 047 0-9, + See Scale 7, Section 4	



TAPE DECK		PAGE NO.	
1193		3-1193.1	
SURFACE MARINE OBSERVATIONS			
<u>SUPPLEMENTAL DATA FIELDS</u>			
<u>TAPE</u>	<u>FIELD NUMBER</u>	<u>ELEMENT</u>	<u>EXPLANATION</u>
	039	CURRENT (SET)	00-99 Direction toward which Current is moving. 00 = No Current (1854-1930) 02 = NNE 04 = NE 06 = ENE 08 = E 10 = ESE 12 = SE 14 = SSE 16 = S 18 = SSW 20 = SW 22 = WSW 24 = W 26 = WNW 28 = NW 30 = NNW 32 = N 99 = No Current (1931-1938)
	040	CURRENT (DRIFT)	NAUTICAL MILES PER DAY 00-99, 00-98 = 0-98 nautical miles per day 99 = > 99 nautical miles per day
	041	WATCH	SEE TAPE FIELD 010
	042	BEAUFORT WIND FORCE	00-12 00 = < 1 knots 01 = 1-3 knots 02 = 4-6 knots 03 = 7-10 knots 04 = 11-16 knots 05 = 17-21 knots 06 = 22-27 knots 07 = 28-33 knots 08 = 34-40 knots 09 = 41-47 knots 10 = 48-55 knots 11 = 56-63 knots 12 = > 63 knots
	043	PRESSURE (SEA LEVEL)	000-999 in tens, units, and tenths of millimeters with high order position assumed. Corrected for temperature but not for gravity. 000-999 = 700.0 - 799.9 millimeters
	044	VISIBILITY	0-9 Observations of Visibility began in 1922. 0 = <50 meters 1 = 50-200 meters 2 = 200-500 meters 3 = 500-1000 meters 4 = 1/2-1 nautical miles 5 = 1-2 nautical miles 6 = 2-5 nautical miles 7 = 5-10 nautical miles 8 = 10-30 nautical miles 9 = > 30 nautical miles

TAPE DECK		PAGE NO.
1193	SURFACE MARINE OBSERVATIONS	3-1193.2
TAPE FIELD NUMBER	ELEMENT	EXPLANATION
045	CLOUD TYPE (HIGH)	1-5 1 = Cirrus 2 = Cirrostratus 3 = Cirrocumulus 4 = Altocumulus 5 = Altostratus
046	CLOUD DIRECTION	00-99 Direction from which cloud is moving Codes are in 16 of 32 point scale same as Field 039. 00 = Calm (1854-1930) 99 = Calm (1931-1938)
047	TOTAL CLOUD AMOUNT	0-9, + in tenths of sky cover with + = overcast.
048	STATE OF THE SEA	0-9 Height of wave (crest to trough) Observations began in 1883 0 = Calm 1 = < 1 foot 2 = 1-3 feet 3 = 3-5 feet 4 = 5-8 feet 5 = 8-12 feet 6 = 12-20 feet 7 = 20-40 feet 8 = > 40 feet 9 = Confused
049	DIRECTION OF SWELL	00-99 Direction from which Swell comes. Observations began in 1922. Codes are in 16 of 32 point scale same as Field 039 with 00 = No Swell or slight Swell the direction of which was not observed, or confused Swell.(1922-1930) 99 = No Swell.(1931-1938)
050	AMOUNT OF SWELL	0-9 (1922-1930) 0 = None or slight 1 = Moderate 2 = Heavy 3 = Long-low 4 = Confused 5 = None or slight 6 = Moderate 7 = Heavy 8 = Long-low 9 = Confused Sea smooth to moderate Sea rough
050	AMOUNT OF SWELL	0-9 (1931-1938) 0 = None 1 = Low-short or average length 2 = Low-long 3 = Moderate-short 4 = Moderate-average 5 = Moderate-long 6 = Heavy-short 7 = Heavy-average 8 = Heavy-long 9 = Confused

TAPE DECK		PAGE NO.
1193	SURFACE MARINE OBSERVATIONS	3-1193.3
TAPE FIELD NUMBER	ELEMENT	EXPLANATION
051	DURATION OF FOG	01-16 in quarter hour increments for each watch 01 = 15 minutes 02 = 30 minutes 03 = 45 minutes 04 = 1 hour etc.
052	DURATION OF PRECIPITATION	Duration in quater hour increments for each watch with + overpunch in high order position indicating a thunderstorm during the watch. + overpunch in low order position indicating hail during the watch. - overpunch in low order position indicating snow during the watch.

TAPE DECK		PAGE NO.
1194	SURFACE MARINE OBSERVATIONS	1-1194.1

# STANDARD FORMAT

CARD DECK	MAR SQ	SUB SQ	Q	LAT	LONG	YEAR	MO	DA	HR	WIND DIR	WIND SPD	VIS	WX	W	PRESS	T	AIR TMP	WET BLB	DEW PT	SEA TMP	A-S DIF
xxx	xxx	xx	x	xxx	xxxx	xxxx	xx	xx	xx	ixx	ixxx	ixx	xx	x	xxxxxx	i	xxx	xxx	xxx	xxx	xxx

FIELD  
NUMBER

001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018 019 020 021

CLOUDS							WAVE	P	WAVE	SWL	P	SWL	OSV	C	S					I	SHIP	
N	N <sub>h</sub>	C <sub>L</sub>	I	h	C <sub>M</sub>	C <sub>H</sub>	DIR	E	HGT	DIR	E	HGT	NO.	D	H	A	D	S	a	ppp	A	SIG
x	x	x	i	x	x	x	xx	x	xx	xx	x	xx	xx	x	x	l	x	xx	x	ΔΔ	6	x

FIELD  
NUMBER

022 023 024 025 026 027 028 029 030 031 032 033 034 035 036 032 033 034 035 036 032 033 034 035 036 037 038

## SUPPLEMENTAL DATA FIELDS

RH	S	LOG	W	BF	SEA	S	SWL	A	W	WXB	SER	V	20 BLANK CHARACTERS									
E	NO.	A	WD	DIR	T	A	DIR	M	X		CODE	I										
xxx	x	xxxxx	x	xx	xx	x	xx	x	x	xxx	xxxx	x										

FIELD  
NUMBER

039 040 041 042 043 044 045 046 047 048 049 050 051

## UNIQUE CHARACTERISTICS

TAPE FIELD NUMBER	ELEMENT	TAPE NOTATION
001	CARD DECK	194
011 i	WIND DIRECTION INDICATOR	0
012 i	WIND SPEED INDICATOR	BLANK
013 i	VISIBILITY INDICATOR	BLANK
017 i	TEMPERATURES INDICATOR	1
022 i	CLOUD INDICATOR	BLANK
023	DIRECTION OF SEA	BLANK PRIOR TO 1949
024	PERIOD OF WAVES	BLANK PRIOR TO 1949
025	HEIGHT OF WAVES	BLANK PRIOR TO 1949
026-031		BLANK
032	ADDITIONAL DATA INDICATOR	BLANK PRIOR TO 1949
033-035		8 1949 AND LATER WHEN AVAILABLE
036-038		BLANK PRIOR TO 1949
		BLANK

TAPE DECK		PAGE NO.	
1194		1-1194.2	
SURFACE MARINE OBSERVATIONS			
<u>SUPPLEMENTAL DATA FIELDS</u>			
<u>TAPE</u> <u>FIELD NUMBER</u>	<u>ELEMENT</u>	<u>TAPE POSITIONS</u>	
039	RELATIVE HUMIDITY	94-96	
040	SERIES	97	
041	LOG BOOK NUMBER	98-102	
042	WATCH	103	
043	BEAUFORT WIND FORCE	104-105	
044	DIRECTION OF SEA	106-107	
045	STATE OF THE SEA	108	
046	DIRECTION OF SWELL	109-110	
047	AMOUNT OF SWELL	111	
048	WEATHER A	112	
049	WEATHER B	113-115	
050	SERIES CODE	116-119	
051	VISIBILITY	120	

TAPE DECK		PAGE NO.	
1194		2-1194.1	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION	
004	QUADRANT	CARD COLUMNS 11-13 and 20-21 - MARSDEN SQUARES	
005	LATITUDE	Positions were given by 10° and 1° Marsden	
006	LONGITUDE	Squares. These values were used to determine Quadrant, Latitude and Longitude.	
007	YEAR	CARD COLUMNS 7-8 00-99 When columns 7-8 were punched 56-99, 1800 was added. When punched 00-55, 1900 was added. General period of record is 1856-1950.	
008	MONTH	CARD COLUMNS 9-10 A1-A9, A0, A-, A+, 01-12	
		01-12	= 01-12 placed directly into Field 008; otherwise,
		01-09	= A1-A9
		10	= A0
		11	= - punch
		12	= + punch
010	HOOR-GMT	CARD COLUMNS 18-19 or Tape Field 042 When columns 18-19 were punched, GMT values 00-23 were placed directly into Field 010. When columns 18-19 were blank, Tape Field 042 was used according to the following:	
		1	= 0400 LST
		2	= 0800 LST
		3	= 1200 LST
		4	= 1600 LST
		5	= 2000 LST
		6	= 0000 LST
		The LST times were converted to GMT by Scale 2, Section 4.	
012	WIND SPEED	TAPE FIELD 043 00-12 - Scale 5, Section 4	
013	VISIBILITY	TAPE FIELD 051 or 048 0-9 90 was added to the value in Field 051 and the result placed in Field 013. Exceptions: When Field 051 = 0 and Year = 1930-1948, a blank was placed in Field 013. When Field 051 = blank, Field 048 was used to determine visibility.	
		Blank	= 0 and Year = 1930-1949
		92	= 4
		94	= 3
		95	= 2
		97	= 0
		99	= 1
014	PRESENT WEATHER	TAPE FIELD 049 Three codes were used over the span of this Deck. The use of 3 digits allows almost unlimited expression of the current weather situation in terms of simultaneous phenomena but with no indication of intensity. Based on the conversion scheme outlined below, Field 014 can be used for studies of weather occurrence but should not be used in studies pertaining to amounts, rate of fall and the like.	

TAPE DECK		PAGE NO.
1194	SURFACE MARINE OBSERVATIONS	2-1194.2
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION
	PRESENT WEATHER (Con't)	
	ΔΔ =	000
	ΔΔ =	000 (1921-1929)
	ΔΔ =	999 (1856-1920 and 1930-1955)
		Throughout the period A Ø or 9 in any of the 3 positions indicates that none of the active weather elements were reported. When only 1 or 2 digits are shown; therefore, it is assumed that the other digits are Ø or 9 and may occur anywhere in the group. Other digits within the group may also appear in any order, i.e., (234, 432, 423, 342, etc. all have the same meaning).
	13 =	8
	17 =	6
	18 =	2
	53 =	5 or 25 and Temperature > 0°C
	57 =	5 or 25 and Temperature < 0°C
	59 =	35
	63 =	3 and Temperature > 0°C
	67 =	2, 23, 234, 235, 3, 34, 345 and Temperature < 0°C
	69 =	13, 135, 15
	73 =	1
	81 =	24, 245, 4 or 23, 234, 235, 34, 345 and Temperature > 0°C
	84 =	123, 125, 134, 145
	86 =	12, 124, 14
	90 =	127, 137, 147, 157, 17, 237, 247, 257, 27, 347, 357, 37, 457, 47, 57, 7
	95 =	126, 128, 136, 138, 146, 148, 156, 158, 16, 168, 18, 236, 238, 246, 248, 256, 258, 26, 268, 28, 346, 348, 356, 358, 36, 368, 38, 456, 458, 46, 468, 48, 56, 568, 58, 68
	96 =	167, 178, 267, 278, 367, 378, 467, 478, 567, 578, 67, 678, 78
		The highest converted present weather number was placed into Field 014.
015	PAST WEATHER	CARD COLUMN 45
		0-9 (1949 and later only)
		A (1856-1948)
017	AIR TEMPERATURE	CARD COLUMNS 33-34
018	WET BULB TEMPERATURE	CARD COLUMNS 35-36 In whole °F - See Scale 6,
020	SEA TEMPERATURE	CARD COLUMNS 39-40 Section 4
		01-99 = 01-99°F
		00 = 100°F
		No provisions were made for negative temperatures.
019	DEW POINT TEMPERATURE	Computed - see Scale 8, Section 4
021	AIR-SEA TEMP. DIFFERENCE	Computed from Field 017 and 020
		(Air minus Sea Temp.)

TAPE DECK		SURFACE MARINE OBSERVATIONS		PAGE NO.
1194				2-1194.3
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION		
022	CLOUDS (N) (N <sub>h</sub> )			CARD COLUMN 52 CARD COLUMN 51 See Scale 7, Section 4 (N), (N <sub>h</sub> ) 1949 and later in eights
		0-9	=	0-9
022	CLOUDS (C <sub>L</sub> )			CARD COLUMNS 47-48 For period 1856-1920 and 1930-1950 if either 47 or 48 contains
		0	=	9 No lower cloud
		1	=	3 Cumulus
		5	=	1 Stratocumulus
		6	=	5 Stratus
		7	=	6 Scud
		8	=	13 or 31 in columns 47-48
		9	=	4 Cumulonimbus
				For period 1921-1929
		1	=	8 Cumulus
022	CLOUDS (h)			CARD COLUMN 53 This column seldom punched prior to 1949
		0-9	=	0-9
022	CLOUDS (C <sub>M</sub> )			CARD COLUMN 49 and columns 47-48
		0	=	+ or 9 none
		1	=	2 or 5 Altostratus
		2	=	7 or 2 Nimbus (Columns 47-48)
		5	=	1 or 4 Altocumulus
		7	=	3 Altocumulus and Altostratus
022	CLOUDS (C <sub>H</sub> )			CARD COLUMN 50
		0	=	+ or 9 none
		2	=	1 Cirrus
		5	=	4 Cirrus and Cirrostratus (1856-1920 and 1930-1950)
		8	=	2 Cirrostratus
		9	=	5 or 6 Cirrocumulus with Cirrus or Cirrostratus (1856-1920 and 1930-1950)
023	DIRECTION OF WAVES			CARD COLUMNS 69-70 Punched only for period 1949 and later 00-36, 50-86, 49, 99 When columns 69-70 equal 50-86, 50 was subtracted, the result placed in Field 023, and 10 added to height of waves.
024	PERIOD OF WAVES			CARD COLUMN 71 Punched only for period 1949 and later
		0-9	=	0-9
025	HEIGHT OF WAVES			CARD COLUMN 72 Punched only for period 1949 and later
		00-09	=	0-9 A zero was placed in high order position of Field 025
		10-19	=	0-9 and direction punched 50-86



TAPE DECK				PAGE NO.
1194		SURFACE MARINE OBSERVATIONS		2-1194.4
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION		
032	ADDITIONAL DATA INDICATOR	Blank prior to 1949 Blank or 8 - 1949 and later		
033	SIGNIFICANT CLOUD AMOUNT	CARD COLUMN 66 0-8		
034	SIGNIFICANT CLOUD TYPE	CARD COLUMN 65 0-9		
	0	=	1	Cirrus
	1	=	3	Cirrocumulus
	2	=	2	Cirrostratus
	3	=	4	Alto cumulus
	4	=	5	Altostratus
	5	=	7	Nimbostratus
	6	=	6	Stratocumulus
	7	=	0	Stratus
	8	=	8	Cumulus
	9	=	9	Cumulonimbus
035	SIGNIFICANT CLOUD HEIGHT	CARD COLUMNS 67-68 - coded height values		
	00	=	00	Lower than 100 feet
	01-49	=	01-49	100-4900 feet
	50	=	50-54	5000-5400 feet
	56	=	55-64	5500-6400 feet
	57	=	65-74	6500-7400 feet
	58	=	75-80	7500-8000 feet
	59	=	81	9000 feet
	61	=	83	10-12000 feet
	64	=	84	13-15000 feet
	68	=	85	16-19000 feet
	71	=	86	20-22000 feet
	74	=	87	23-25000 feet
	78	=	88	26-29000 feet
	80	=	89	> 30000 feet
	90	=	90	0-150 feet
	91	=	91	150-300 feet
	92	=	92	300-600 feet
	93	=	93	600-1000 feet
	94	=	94	1000-2000 feet
	95	=	95	2000-3000 feet
	96	=	96	3000-5000 feet
	97	=	97	5000-6500 feet
	98	=	98	6500-8000 feet
	99	=	99	> 8000 feet

TAPE DECK		PAGE NO.	
1194		3-1194.1	
SURFACE MARINE OBSERVATIONS			
SUPPLEMENTAL DATA FIELDS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
039	RELATIVE HUMIDITY	000-100 Computed $RH = \frac{e}{e_s} T$	
040	SERIES	1 = Abbreviated form for period 1856-1920. Only wind, dry bulb, sea temperature, total cloud amount and weather punched. 2 = Observations for general period 1921-1929 3 = Observations for period 1930-1950 4 = Admiralty logs 6 = OSV logs 7 = Synoptic logs	
041	LOG BOOK NUMBER	00000-99999 - Number of log in which the original observations are recorded.	
042	WATCH	1-6 Time of observation 1 = 0400 LST 2 = 0800 LST 3 = 1200 LST 4 = 1600 LST 5 = 2000 LST 6 = 0000 LST	
043	BEAUFORT WIND FORCE	00 = < 1 Miles per Hour (1921-1929) 01 = 1-3 MPH 02 = 4-7 MPH 03 = 8-12 MPH 04 = 13-18 MPH 05 = 19-24 MPH 06 = 25-31 MPH 07 = 32-38 MPH 08 = 39-46 MPH 09 = 47-54 MPH 10 = 55-63 MPH 11 = 64-72 MPH 12 = > 72 -- = No observation 00 = No observation (1856-1920 and 1930-1950)	
044	DIRECTION OF SEA	00-32, 99, in standard 32 point code	
046	DIRECTION OF SWELL	00 or -- = No observation 99 = Calm	
045	STATE OF THE SEA	0-9, - 0 or - = No observation 1 = Wave height < 1 foot 2 = Wave height 1-3 feet 3 = Wave height 3-5 feet 4 = Wave height 5-8 feet 5 = Wave height 8-12 feet 6 = Wave height 12-20 feet 7 = Wave height 20-40 feet 8 = Wave height > 40 feet 9 = Confused	

TAPE DECK		PAGE NO.	
1194		3-1194.2	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
047	AMOUNT OF SWELL	<p>For period 1921-1929</p> <p>0 = None 1 or 2 = Slight 3 = Moderate 4 = Rather rough 5 = Rough 6 or 7 = Heavy 8 = Very heavy 9 = Abnormal</p> <p>For period 1856-1920 and 1930-1948</p> <p>0 = None 1 = Low - short or average length 2 = Low - long 3 = Moderate - short 4 = Moderate - average 5 = Moderate - long 6 = Heavy - short 7 = Heavy - average 8 = Heavy - long 9 = Confused</p> <p>This Field should be blank from 1949 onward</p>	
048	WEATHER (A)	<p>0-9</p> <p>For period 1921-1929</p> <p>0 = Ordinary visibility 1 = Exceptional visibility 2 = Haze 3 = Mist 4 = Fog - = No observation</p> <p>For period 1856-1920 and 1930-1948</p> <p>0 = No observation 1 = Exceptional visibility 2 = Haze 3 = Mist 4 = Fog 9 = Ordinary visibility</p> <p>For period 1949-1950</p> <p>0 = No observation 1 = Exceptional visibility 3 = Mist or haze 4 = Fog 9 = Ordinary visibility</p>	
049	WEATHER (B)	<p>000-999, ---</p> <p>0 or 9 in any position indicates no active weather reported</p> <p>000 = No observation</p> <p>The elements listed below may appear in any of the 3 positions of this Field and may occur in combination with one or two other elements.</p> <p>1 = Snow 2 = Squalls 3 = Rain 4 = Showers or passing showers 5 = Drizzle 6 = Thunder 7 = Hail 8 = Lightning</p>	

TAPE DECK		PAGE NO.	
1194		3-1194.3	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
050	SERIES CODE	This code was developed from Fields 007 and 040 to form basis of many of the conversion procedures.	
		CODE	YEARS      SERIES NUMBER
		1921	1921 - 1929      2
		1930	1856 - 1920      1
		1930	1930 - 1955      3
		1930	1856 - 1948      4,6,7
		1949	1949 - 1955      4,6,7
051	VISIBILITY	For period 1921- 1929	
		0 = < 50 yards	
		1 = > 50 yards < 1 Cable	
		2 = > 1 Cable < 2 Cables	
		3 = > 2 Cables < 1/2 nautical mile	
		4 = > 1/2 nautical mile < 1 nautical mile	
		5 = > 1 nautical mile < 2 nautical miles	
		6 = > 2 nautical miles < 5 nautical miles	
		7 = > 5 nautical miles < 10 nautical miles	
		8 = > 10 nautical miles < 30 nautical miles	
		9 = > 30 nautical miles	
		- = No observation	
		For period 1856-1920 and 1930-1948	
		0 = No observation	
		1 = < 1 Cable	
		2-9= Same as above	
		For period 1949 onward	
		0 = < 50 yards	
		1 = 50-200 yards	
		2 = 200-500 yards	
		3 = 500-1000 yards	
		4 = 1000 yards - 1 nautical mile	
		5 = 1-2 nautical miles	
		6 = 2-5 nautical miles	
		7 = 5-10 nautical miles	
		8 = 10-25 nautical miles	
		9 = > 25 nautical miles	
		One Cable = 120 Fathoms = 240 yards	

TAPE DECK		PAGE NO.
1195	SURFACE MARINE OBSERVATIONS	1-1195.1

# STANDARD FORMAT

CARD DECK	MAR SQ	SUB SQ	Q	LAT	LONG	YEAR	MO	DA	HR	WIND DIR	WIND SPD	VIS	WX	W	PRESS	T I	AIR TMP	WET BLB	DEW PT	SEA TMP	A-S DIF
xxx	xxx	xx	x	xxx	xxxx	xxxx	xx	xx	xx	ixx	ixxx	ixx	xx	x	xxxxx	i	xxx	xxx	xxx	xxx	xxx
FIELD NUMBER	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021

CLOUDS						WAVE	P	WAVE	SWL	P	SWL	OSV	C	S																									
N	N <sub>h</sub>	C <sub>L</sub>	I	h	C <sub>M</sub>	C <sub>H</sub>	DIR	E	HGT	DIR	E	HGT	NO.	D	H					A	D	S	a	ppp	A	SIG	SIG	SIG	I	SHIP									
x	x	x	i	x	x	x	xx	x	xx	xx	x	xx	xx	x	x					A	D	I	P	D	D	D	N	T	HGT	C	NO.								
x	x	x	i	x	x	x	xx	x	xx	xx	x	xx	xx	x	x					1	x	xx	x		Δ	Δ	6	x	x	x	xxx	8	x	x	xx	Δ	Δ	x	xxxx
						022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	032	033	034	035	036	032	033	034	035	036	037	038							

## SUPPLEMENTAL DATA FIELDS

RH	SHIP NO.	WX	CLD TYP	SS DIR	S C	SWL DIR	T Y	P R	27 BLANK CHARACTERS																			
xxx	xxxxxx	xx	xxx	xx	x	xx	x	x																				
FIELD NUMBER	039	040	041	042	043	044	045	046	047																			

## UNIQUE CHARACTERISTICS

TAPE FIELD NUMBER	ELEMENT	TAPE NOTATION
001	CARD DECK NUMBER	195
011 i	WIND DIRECTION INDICATOR	BLANK
012 i	WIND SPEED INDICATOR	BLANK
013 i	VISIBILITY INDICATOR	BLANK
015	PAST WEATHER	BLANK
017 i	TEMPERATURES INDICATOR	1
022	CLOUDS (N <sub>h</sub> )	BLANK
022 i	CLOUD INDICATOR	BLANK
023-031		BLANK
032	ADDITIONAL DATA INDICATOR	6 or BLANK
035-038		BLANK

## SUPPLEMENTAL DATA FIELDS

039	RELATIVE HUMIDITY
040	SHIP NUMBER
041	PRESENT WEATHER

TAPE POSITIONS
94-96
97-101
102-103

TAPE DECK		PAGE NO.	
1195		1-1195.2	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	TAPE POSITIONS	
042	CLOUD TYPE	104-106	
043	SEA/SWELL DIRECTION	107-108	
044	SEA/SWELL COMBINED	109	
045	DIRECTION OF SWELL	110-111	
046	TYPE OF SWELL	112	
047	PORT INDICATOR	113	

TAPE DECK				PAGE NO.
1195		SURFACE MARINE OBSERVATIONS		2-1195.1
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION		
004	QUADRANT	CARD COLUMN 14		
		1	=	0
		2	=	1
		3	=	2
		4	=	3
005	LATITUDE	CARD COLUMNS 15-16 00-90 - whole degrees A zero was placed in the low order position of Field 005		
006	LONGITUDE	CARD COLUMNS 17-19 000-180 - whole degrees A zero was placed in the low order position of Field 006		
007	YEAR	CARD COLUMNS 6-7 42-45 1900 was added to columns 6-7. The general period of record is 1942-1945		
010	HOURL-GMT	CARD COLUMNS 12-13 08, 12, 20 LST Times converted to GMT by Scale 2, Section 4		
012	WIND SPEED	CARD COLUMNS 26-27 00-99, 00-99 - knots When punched 00-99, a zero was placed in the high order position of Field 012. When punched 00-99, 100 was added before placing in Field 012.		
013	VISIBILITY	CARD COLUMN 48 0-9 90 was added before placing in Field 013		
014	PRESENT WEATHER	CARD COLUMNS 40-41 00-99 For period January 1942-May 1944		
		05	=	04 Haze
		10	=	57 Drizzle and fog
		11	=	49 Fog in patches
		13	=	07 Distant lightning
		18	=	13 Ugly sky
		18	=	14 Squally weather
		19	=	16 Tropical storm or hurricane
		45	=	40 Fog
		51	=	50 Drizzle
		60	=	67 Rain and fog
		61	=	60 Rain
		68	=	69 Rain and snow mixed
		70	=	77 Snow and fog
		71	=	70 Snow
		80	=	81 Rain showers
		85	=	83 Snow showers
		89	=	88 Hail or rain and hail showers
		95	=	90 Thunderstorm
		97	=	97 Heavy thunderstorm with rain or snow
		For period June 1944-December 1945 See Scale 3, Section 4		

TAPE DECK		PAGE NO.	
1195		2-1195.2	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION	
016	PRESSURE	CARD COLUMNS 28-31 0000-9999 - inches of mercury to hundredths. Punched values were multiplied by 33.8639 and the result placed in Field 016	
017	AIR TEMPERATURE	CARD COLUMNS 32-34	
018	WET BULB TEMPERATURE	CARD COLUMNS 35-37	
020	SEA TEMPERATURE	CARD COLUMNS 38-39 (water injection temperature) 000-999 Positive °F to tenths -00--99 Negative °F to tenths See Scale 6, Section 4	
019	DEW POINT TEMPERATURE	Computed: See Scale 8, Section 4	
021	AIR-SEA TEMP. DIFFERENCE	Computed from Fields 017 and 020 (Air minus Sea Temp.)	
022	CLOUDS (N)	CARD COLUMN 47 0-9, - See Scale 7, Section 4	
022	CLOUDS (C <sub>L</sub> )	TAPE FIELD 042	
		0 =	0
		1 =	1
		5 =	2
		6 =	3
		8 =	1 and 2
		9 =	4
022	CLOUDS (h)	CARD COLUMNS 45-46 - in hundreds of feet 00-95, --	
		0 =	00 or 01
		1 =	02
		2 =	03-05
		3 =	06-09
		4 =	10-19
		5 =	20-34
		6 =	35-49
		7 =	50-64
		8 =	65-79
		9 =	80-95 or --
022	CLOUDS (C <sub>M</sub> )	TAPE FIELD 042	
		0 =	0
		1 =	7
		2 =	5
		5 =	6
		7 =	6 and 7
022	CLOUDS (C <sub>H</sub> )	TAPE FIELD 042	
		0 =	0
		1 =	8
		6 =	8 and 9
		8 =	9
		9 =	-
FOR EXAMPLE: If TAPE FIELD 042 = 158, a 1 would be placed in the C <sub>L</sub> position, a 2 in the C <sub>M</sub> position and a 1 in the C <sub>H</sub> position.			



TAPE DECK		SURFACE MARINE OBSERVATIONS		PAGE NO.
1195				2-1195.3
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION		
033	DIRECTION OF SHIP	CARD COLUMNS 22-23 -tens of degrees 00-36, --		
		0	=	00
		1	=	03-06
		2	=	07-11
		3	=	12-15
		4	=	16-20
		5	=	21-24
		6	=	25-29
		7	=	30-33
		8	=	34-02
		9	=	--
034	SPEED OF SHIP	CARD COLUMNS 20-21 - knots 00-40		
		0	=	00
		1	=	01-03
		2	=	04-06
		3	=	07-09
		4	=	10-12
		5	=	13-15
		6	=	16-18
		7	=	19-21
		8	=	22-24
		9	=	> 24

TAPE DECK		SURFACE MARINE OBSERVATIONS		PAGE NO.
1195				3-1195.1
<u>SUPPLEMENTAL DATA FIELDS</u>				
<u>TAPE</u> <u>FIELD NUMBER</u>	<u>ELEMENT</u>	<u>EXPLANATION</u>		
039	RELATIVE HUMIDITY	Computed $RH = \frac{e}{e_s} T$		
040	SHIP NUMBER	00000-99999		
041	PRESENT WEATHER	00-99 For period 1942-May 1944  00 = Cloudless 01 = Partly cloudy 02 = Cloudy 03 = Overcast 04 = Haze 07 = Distant Lightning 13 = Ugly sky 14 = Squally weather 16 = Waterspouts 19 = Tropical storm or hurricane 40 = Fog 49 = Fog in patches 50 = Drizzle 57 = Drizzle and fog 60 = Rain 67 = Rain and fog 69 = Rain and snow mixed 70 = Snow 77 = Snow and fog 81 = Rain showers 83 = Snow showers 88 = Hail or rain and hail showers 90 = Thunderstorm 97 = Heavy thunderstorm with rain or snow  For period June 1944-1945  00 = Cloudless 01 = Partly cloudy 02 = Cloudy 03 = Overcast 04 = Low fog, whether on ground or over sea 05 = Haze (visibility 1,000m, 1,100 yards or more) 06 = Dust devils seen 07 = Distant lightning 08 = Light fog (visibility between 1,000 m and 2,000m, 1,100 yards and 2,200 yards) 09 = Fog at a distance, but not at station (or ship) 10 = Precipitation within 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 3 hours 16 = Waterspouts seen 17 = Visibility reduced by smoke (industrial, grass, or forest fires), or volcanic ashes 18 = Duststorm (visibility greater than 1,000m, 1,100 yards) 19 = Signs of tropical storm (hurricane)		

TAPE DECK		PAGE NO.	
1195		3-1195.2	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
	PRESENT WEATHER (Con't)		
		20-29	= Precipitation in last hour but not at time of observation
		20	= Precipitation (rain, drizzle, hail, snow or sleet
		21	= Drizzle
		22	= Rain
		23	= Snow
		24	= Rain and snow mixed
		25	= Rain shower (s)
		26	= Snow shower (s)
		27	= Hail, or rain and hail shower (s)
		28	= Slight thunderstorm
		29	= Heavy thunderstorm
		30-39	= Duststorms and storms of drifting snow (visibility less than 1,000m, 1,100 yards)
		30	= Dust or sandstorm
		31	= Dust or sandstorm has decreased
		32	= Dust or sandstorm, no appreciable change
		33	= Dust or sandstorm has increased
		34	= Line of duststorms
		35	= Storm of drifting snow
		36	= Slight storm of drifting snow
		37	= Heavy storm of drifting snow generally low
		38	= Slight storm of drifting snow generally high
		39	= Heavy storm of drifting snow
		40-49	= Fog (visibility less than 1,100m, 1,100 yards)
		40	= Fog
		41	= Moderate fog in last hour but not at time of observation
		42	= Thick fog in last hour has become
		43	= Fog, sky discernible thinner during last hour
		44	= Fog, sky not discernible
		45	= Fog, sky discernible no appreciable change during last hour
		46	= Fog, sky not discernible
		47	= Fog, sky discernible has begun, or become thicker during last hour
		48	= Fog, sky not discernible
		49	= Fog, in patches
		50-59	= Drizzle (precipitation consisting of numerous minute drops)
		50	= Drizzle
		51	= Intermittent
		52	= Continuous slight drizzle
		53	= Intermittent
		54	= Continuous moderate drizzle
		55	= Intermittent
		56	= Continuous thick drizzle
		57	= Drizzle and fog
		58	= Slight or moderate drizzle and rain
		59	= Thick

TAPE DECK		PAGE NO.	
1195		3-1195.3	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER		ELEMENT	EXPLANATION
		PRESENT WEATHER (Con't)	For period June 1944-1945
			60-69 = Rain
			60 = Rain
			61 = Intermittent
			62 = Continuous
			63 = Intermittent
			64 = Continuous
			65 = Intermittent
			66 = Continuous
			67 = Rain and fog
			68 = Slight or moderate
			69 = Heavy
			70-79 = Snow
			70 = Snow (or snow and rain mixed)
			71 = Intermittent
			72 = Continuous
			73 = Intermittent
			74 = Continuous
			75 = Intermittent
			76 = Continuous
			77 = Snow and fog
			78 = Grains of snow (frozen drizzle)
			79 = Ice crystals; or frozen raindrops (sleet - U.S. definition)
			80-89 = Shower (s)
			80 = Shower (s)
			81 = Shower (s) of slight or moderate
			82 = Shower (s) of heavy
			83 = Shower (s) of slight or moderate
			84 = Shower (s) of heavy
			85 = Shower (s) of slight or moderate
			86 = Shower (s) of heavy
			87 = Shower (s) of snow pellets
			88 = Shower (s) of slight or moderate
			89 = Shower (s) of heavy
			90-99 = Thunderstorm
			90 = Thunderstorm
			91 = Rain at time
			92 = Snow, or snow and rain
			93 = Thunderstorm, slight, without hail,
			94 = Thunderstorm, slight, with hail
			95 = Thunderstorm, moderate, with-
			96 = Thunderstorm, moderate, with hail
			97 = Thunderstorm, heavy, without hail,
			98 = Thunderstorm combined with
			99 = Thunderstorm, heavy, with hail
NOTE: In coding present weather (ww) the observer used the highest applicable number.			

TAPE DECK		PAGE NO.	
1195		3-1195.4	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
042	CLOUD TYPE	000-999, ---, ΔΔΔ - or any combination of these figures	
		0 = Clear 1 = Cumulus or Fractocumulus 2 = Stratocumulus 3 = Stratus or Fractostratus 4 = Cumulonimbus 5 = Nimbostratus 6 = Altopumulus 7 = Altostratus 8 = Cirrus 9 = Cirrostratus - = Cirrocumulus Δ = Unknown or obscured	
043	SEA/SWELL DIRECTION	Swell direction for Period 1942-May 1944	
045	SWELL DIRECTION	Sea direction for period June 1944-1945 00-32, 99 In standard 32 point wind scale  00 = Calm when sea or swell = 0 00 = North when sea or swell > 0	
044	SEA/SWELL COMBINATION	0-9, Δ For period 1942-May 1944  0 = No swell 1 = Moderate                      calm or slight sea 2 = Heavy  3 = No swell                      moderate sea 4 = Moderate 5 = Heavy  6 = Rather rough sea 7 = Rough sea 8 = Very rough sea 9 = Mountainous sea Δ = Unknown or in port  For period June 1944-1945 (sea height)  0 = Calm 1 = < 1 foot 2 = 1-3 feet 3 = 3-5 feet 4 = 5-8 feet 5 = 8-12 feet 6 = 12-20 feet 7 = 20-40 feet 8 = > 40 9 = Qualifying condition or confused sea Δ = Unknown or in port	

TAPE DECK		PAGE NO.																															
1195		3-1195.5																															
SURFACE MARINE OBSERVATIONS																																	
TAPE FIELD NUMBER	ELEMENT	EXPLANATION																															
046	TYPE OF SWELL	0-9, Δ Reported June 1944-1945 only  0 = None 1 = Low - short or average 2 = Low - long 3 = Moderate - short 4 = Moderate - average 5 = Moderate - long 6 = High - short 7 = High - average 8 = High - long 9 = Confused Δ = Unknown or in port  Approximate Values - Feet <table><tr><th></th><th>Height</th><th>Length</th></tr><tr><td>0</td><td></td><td>0</td></tr><tr><td>1</td><td>1-6</td><td>0-600</td></tr><tr><td>2</td><td>1-6</td><td>&gt; 600</td></tr><tr><td>3</td><td>6-12</td><td>0-300</td></tr><tr><td>4</td><td>6-12</td><td>300-600</td></tr><tr><td>5</td><td>6-12</td><td>&gt; 600</td></tr><tr><td>6</td><td>&gt; 12</td><td>0-300</td></tr><tr><td>7</td><td>&gt; 12</td><td>300-600</td></tr><tr><td>8</td><td>&gt; 12</td><td>&gt; 600</td></tr></table>			Height	Length	0		0	1	1-6	0-600	2	1-6	> 600	3	6-12	0-300	4	6-12	300-600	5	6-12	> 600	6	> 12	0-300	7	> 12	300-600	8	> 12	> 600
	Height	Length																															
0		0																															
1	1-6	0-600																															
2	1-6	> 600																															
3	6-12	0-300																															
4	6-12	300-600																															
5	6-12	> 600																															
6	> 12	0-300																															
7	> 12	300-600																															
8	> 12	> 600																															
047	PORT INDICATOR	-, Δ - = observation taken in port or immediate vicinity Δ = observation taken at sea																															

TAPE DECK		PAGE NO.
1196	SURFACE MARINE OBSERVATIONS	1-1196.1

STANDARD FORMAT

CARD DECK	MAR SQ	SUB SQ	Q	LAT	LONG	YEAR	MO	DA	HR	WIND DIR	WIND SPD	VIS	WX	W	PRESS	T I	AIR TMP	WET BLB	DEW PT	SEA TMP	A-S DIF
xxx	xxx	xx	x	xxx	xxxx	xxxx	xx	xx	xx	ixx	ixxx	ixx	xx	x	xxxxxx	i	xxx	xxx	xxx	xxx	xxx
FIELD NUMBER	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021

CLOUDS						WAVE	P	WAVE	SWL	P	SWL	OSV	C	S							A	I	ICE	A							A	D	S	a	ppp	A	SIG	SIG	SIG			I	SHIP		
N	N <sub>h</sub>	C <sub>L</sub>	I <sub>h</sub>	C <sub>M</sub>	C <sub>H</sub>	DIR	R	HGT	DIR	R	HGT	NO.	D	H							D	C	THK	C	C							D	D	I	P	D	D	N	T	HGT			C	NO.	
x	x	x	i	x	x	xx	x	xx	xx	x	xx	xx	x	x							1	x	xx	x	Δ	Δ							6	x	x	x	xxx	8	x	x	xx	Δ	Δ	x	xxxx
						022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	032	033	034	035	036	032	033	034	035	036	032	033	034	035	036	037	038								

SUPPLEMENTAL DATA FIELDS

RH	M O	SHP CLS	CODE SHEET	HR	SHP NO.	W D Q	SEA DIR	S T A	SWL DIR	T Y P	PCP AMT	SIG WX	S T M	F O G	B E U	14 BLANK CHARACTERS													
xxx	x	xx	xxxxxxx	xx	xxx	x	xx	x	xx	x	xxx	xxx	x	x	x														

UNIQUE CHARACTERISTICS

TAPE FIELD NUMBER	ELEMENT	TAPE NOTATION
001	CARD DECK NUMBER	196
011 i	WIND DIRECTION INDICATOR	BLANK
012 i	WIND SPEED INDICATOR	BLANK
013 i	VISIBILITY INDICATOR	BLANK
017 i	TEMPERATURES INDICATOR	1
022 i	CLOUD INDICATOR	BLANK
023-031		BLANK
032	ADDITIONAL DATA INDICATOR	6
037	ICE INDICATOR	BLANK
038	SHIP NUMBER	BLANK

SUPPLEMENTAL DATA FIELDS

TAPE POSITIONS

039	RELATIVE HUMIDITY	94-96
040	MONTH	97
041	SHIP CLASS	98-99
042	CODE SHEET NUMBER	100-105
043	HOURLY	106-107
044	SHIP NUMBER	108-110

TAPE DECK		PAGE NO.
1196	SURFACE MARINE OBSERVATIONS	1-1196.2
<u>TAPE FIELD NUMBER</u>	<u>ELEMENT</u>	<u>TAPE POSITIONS</u>
045	WIND QUADRANT	111
046	DIRECTION OF SEA	112-113
047	STATE OF THE SEA	114
048	DIRECTION OF SWELL	115-116
049	TYPE OF SWELL	117
050	AMOUNT OF PRECIPITATION	118-120
051	SIGNIFICANT WEATHER	121-123
052	STORM DURATION	124
053	FOG DURATION	125
054	BEAUFORT WIND FORCE	126



TAPE DECK				PAGE NO.
1196		SURFACE MARINE OBSERVATIONS		2-1196.1
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION		
004	QUADRANT	CARD COLUMNS 14-18 - MARSDEN SQUARES		
005	LATITUDE	Positions were given by 10° and 1° Marsden		
006	LONGITUDE	Squares. These values were used to determine Quadrant, Latitude and Longitude.		
007	YEAR	CARD COLUMNS 4-5 49-54 1900 was added to columns 4-5. General period of record is 1949-1953.		
008	MONTH	TAPE FIELD 040 1-9, 0, 1, 2		
		01-09	=	1-9
		10	=	0
		11	=	1
		12	=	2
010	HOURL-GMT	TAPE FIELD 043 00-23 GMT 50-73 = 00-23 LST When columns 19-20 punched 00-23, values were placed directly into Field 010. When columns 19-20 punched 50-73, time was converted to GMT by Scale 2, Section 4.		
012	WIND SPEED	CARD COLUMNS 26-27 - knots 00-99, 00 - 99 When punched 00-99, a zero was placed in the high order position of Field 12. When punched 00-99, 100 was added before placing in Field 012.		
017	AIR TEMPERATURE	CARD COLUMNS 39-41		
019	DEW POINT TEMPERATURE	CARD COLUMNS 48-50 Degrees Celsius and tenths		
020	SEA TEMPERATURE	CARD COLUMNS 42-44 000-999 = Positive Temperature 000-999 = Negative Temperature		
018	WET BULB TEMPERATURE	Computed by Scale 4, Section 4		
021	AIR-SEA TEMP. DIFFERENCE	Computed from Tape Fields 017 and 020 (Air minus Sea Temp.)		
035	BAROMETRIC TENDENCY	CARD COLUMN 67		
		0	=	0
		1	=	1
		2	=	2 or 3
		3	=	4
		5	=	5
		6	=	6
		7	=	7 or 8
		8	=	9
		4	=	When Card Column punched 1-4 and Tape Field 036=000.

TAPE DECK		SURFACE MARINE OBSERVATIONS	PAGE NO.
1196			3-1196.1
SUPPLEMENTAL DATA FIELDS			
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
039	RELATIVE HUMIDITY	$RH = \frac{e}{e_s T}$	
040	MONTH	1-9, $\bar{0}$ , $\bar{1}$ , $\bar{2}$ 1-9 = Jan-Sep $\bar{0}$ = Oct $\bar{1}$ = Nov $\bar{2}$ = Dec	
041	SHIP CLASS	50-55, 67, 69, 70, - may have x overpunch 50 = Commercial ships 51 = Fishing ships 52 = Commercial ships-shortened code 53 = Fishing ships 54 = Commercial ships-short code 55 = Fishing ships 67 = Research ship-with Meteorologist 69 = Research ship-no Meteorologist 70 = Light ships  An x-overpunch in the high order position indicates that wave observations were taken.	
042	CODE SHEET NUMBER	000001-999999 Number of Code Sheet page on which the original observation is recorded.	
043	HOURL	00-23 GMT 50-73 = 00-23 LST	
044	SHIP NUMBER	000-999 000-299 = Commercial ship 300-849 = Fishing ship 850-999 = Research ship	
045	WIND QUADRANT	0-5 Quadrant from which the wind is blowing. 0 = Calm 1 = 001-090 degrees 2 = 091-180 degrees 3 = 181-270 degrees 4 = 271-360 degrees 5 = Variable	
046	DIRECTION OF SEA	00-36, 49, 99	
048	DIRECTION OF SWELL	Reported in Standard Sea Direction code.	
047	STATE OF THE SEA	0-9 0 = Calm 1 = $\frac{1}{2}$ meters 2 = $\frac{1}{2}$ -1 meters 3 = 1-2 meters 4 = 2-3 meters 5 = 3-4 meters 6 = 4-6 meters 7 = 6-9 meters 8 = 9-14 meters 9 = > 14 meters	

TAPE DECK		SURFACE MARINE OBSERVATIONS	PAGE NO.
1196			3-1196.2
TAPE FIELD NUMBER	ELEMENT	EXPLANATION	
049	TYPE OF SWELL	0-9 0 = None 1 = Low - short or average length 2 = Low - long 3 = Moderate- short 4 = Moderate - average 5 = Moderate - long 6 = Heavy - short 7 = Heavy - average 8 = Heavy - long 9 = Confused	
050	AMOUNT OF PRECIPITATION	000-999, 0AA 000 = Trace 001-999 = 00.1 - 99.9 millimeters 0AA = None	
051	SIGNIFICANT WEATHER	High order position of Field 051 0 = Squalls 1 = Heavy squalls 2 = Wind gusts 3 = Water spout 4 = Drizzle or fog 5 = Fog shower or fog bank 6 = Coastal fog 7 = Unusual visibility 8 = Optical phenomena 9 = Northern Lights - = St. Elmo's Fire  Middle position of Field 051 0 = Dew 1 = Heavy dew 2 = Hoar frost 3 = Glazed frost and rime 4 = Icing, smooth ice 5 = Rainbow 6 = Corona 7 = Moon corona 8 = Sun halo 9 = Moon halo - = Sand or dust fall  Low order position of Field 051 0 = No ice or ice blink 1 = Slush or young ice 2 = Fast ice 3 = Drift ice 4 = Packed slush or strips of Hummocked ice 5 = Open lead near shore 6 = Δ 7 = Heavy drift ice 8 = Packed ice 9 = Ice jamming - = Iceberg (s)	

TAPE DECK		PAGE NO.
1196		3-1196.3
SURFACE MARINE OBSERVATIONS		
TAPE FIELD NUMBER	ELEMENT	EXPLANATION
052	STORM DURATION	0-9, -, +
053	FOG DURATION	Duration in 4-hour periods (Lightships report for 3-hour periods). 0 = Only between periods 1-6= 1-6 4-hour periods 7 = 7-9 4-hour periods 8 =10-12 4-hour periods 9 =13-18 4-hour periods - =19-23 4-hour periods + => 24 4-hour periods
		Example: A duration of 20 hours would be coded 5.
054	BEAUFORT WIND FORCE	0-9, 0̄, 1̄, 2̄ 0 = Calm 1 = 1-3 knots 2 = 4-6 knots 3 = 7-10 knots 4 =11-16 knots 5 =17-21 knots 6 =22-27 knots 7 =28-33 knots 8 =34-40 knots 9 =41-47 knots 0̄ =48-55 knots 1̄ =56-63 knots 2̄ = > 63

TAPE DECK		PAGE NO.
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# STANDARD FORMAT

CARD DECK	MAR SQ	SUB SQ	Q	LAT	LONG	YEAR	MO	DA	HR	WIND DIR	WIND SPD	VIS	WX	W	PRESS	T I	AIR TMP	WET BLB	DEW PT	SEA TMP	A-S DIF
xxx	xxx	xx	x	xxx	xxxx	xxxx	xx	xx	xx	ixx	ixxx	ixx	xx	x	xxxxx	i	xxx	xxx	xxx	xxx	xxx
FIELD NUMBER	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021

CLOUDS							WAVE	P	WAVE	SWL	P	SWL	OSV	C	S																		
N	N <sub>h</sub>	C <sub>L</sub>	I	h	C <sub>M</sub>	C <sub>H</sub>	DIR	E	HGT	DIR	E	HGT	NO.	D	H	A	I	ICE	A	A	D	S	a	ppp	A	SIG	SIG	SIG	I	SHIP			
x	x	x	i	x	x	x	xx	x	xx	xx	x	xx	xx	x	x	1	x	xx	x	Δ	Δ	6	x	x	xxx	8	x	x	xx	Δ	Δ	x	xxxx
FIELD	022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	032	033	034	035	036	032	033	034	035	036	032	033	034	035	036	037	038	
NUMBER																																	

# SUPPLEMENTAL DATA FIELDS

FIELD NUMBER	RH	DECK LOG	BF WD	N	WX	V I S	SEA DIR	S T A	SEA HGT	S C H	S D R	AIR TMP	SEA TMP	WET TMP	CODE SHEET	15 BLANK CHARACTERS														
	xxx	xxxx	xx	x	xx	x	xx	x	xx	x	x	xxx	xx	xxxx	xxx															
039																														
040																														
041																														
042																														
043																														
044																														
045																														
046																														
047																														
048																														
049																														
050																														
051																														
052																														
053																														

# UNIQUE CHARACTERISTICS

TAPE FIELD NUMBER	ELEMENT	TAPE NOTATION
001	CARD DECK	197
011 i	WIND DIRECTION INDICATOR	2
012 i	WIND SPEED INDICATOR	BLANK
013 i	VISIBILITY INDICATOR	BLANK
017 i	TEMPERATURES INDICATOR	1
022 i	CLOUD INDICATOR	BLANK
023-038		BLANK

# SUPPLEMENTAL DATA FIELDS

# TAPE POSITIONS

039	RELATIVE HUMIDITY	94-96
040	DECK LOG NUMBER	97-100
041	BEAUFORT WIND FORCE	101-102
042	TOTAL CLOUD AMOUNT	103
043	PRESENT WEATHER	104-105

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1197		1-1197.2	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	TAPE POSITIONS	
044	VISIBILITY	106	
045	DIRECTION OF SEA	107-108	
046	STATE OF THE SEA	109	
047	HEIGHT OF SEA	110-111	
048	CHARACTER OF SWELL	112	
049	DIRECTION OF SWELL	113	
050	DRY BULB TEMPERATURE	114-116	
051	SEA TEMPERATURE	117-118	
052	WET BULB TEMPERATURE	119-122	
053	CODE SHEET PAGE NUMBER AND SOURCE	123-125	

TAPE DECK		PAGE NO.	
1197		2-1197.1	
SURFACE MARINE OBSERVATIONS			
TAPE FIELD NUMBER	ELEMENT	CONVERSION PROCEDURE OR EXPLANATION	
004	QUADRANT	CARD COLUMN 13 - octant See Section 4, Scale 1	
006	LONGITUDE	CARD COLUMNS 17-19 000-999 to tenths of degrees 100° added to Longitude when column 13 = 1,2,6, or 7 and column 17 = 0-8	
007	YEAR	CARD COLUMNS 5-6 When columns 5-6 = 60-99, 1800 was added. When columns 5-6 = 00-56, 1900 was added. General period of record is 1860-1956	
012	WIND SPEED	TAPE FIELD 041 00-12 - Scale 5, Section 4	
013	VISIBILITY	TAPE FIELD 044 0-9 90 was added before placing in Field 013	
014	PRESENT WEATHER	FIELD 043 00-99 as punched with the exception that  57 was taped as 50 67 was taped as 60 77 was taped as 70 87 was taped as 80  These columns had previously been converted, where necessary, from Beaufort weather and 1929 codes	
015	PAST WEATHER	CARD COLUMN 58 0-9  0 = 0 Clear or few clouds 1 = 1 Partly cloudy or variable sky 2 = 2 Cloudy or overcast 3 = 3 Sandstorm, duststorm, or drifting or blowing snow 4 = 4 Fog, smoke or thick dust haze 5 = 5 Drizzle 6 = 6 Rain 7 = 7 Snow, rain and snow mixed, or sleet 8 = 8 Shower (s) 9 = 9 Thunderstorm with or without precipitation	
017	AIR TEMPERATURE	CARD COLUMNS 33-36 (°C), or Tape Field 050 (°F) When Tape Field 050 used, temperature was converted to °C by Scale 6, Section 4.	
018	WET BULB TEMPERATURE	FIELD 052 0000-0999 -000--999	
019	DEW POINT TEMPERATURE	Computed - See Scale 8, Section 4	
020	SEA TEMPERATURE	CARD COLUMNS 37-40 0000-0999 = 0.0°-99.9°C -001--999 = -0.1--99.9°C	
021	AIR-SEA TEMP. DIFFERENCE	Computed from Tape Fields 17 and 20 (Air minus Sea Temp.)	

TAPE DECK		PAGE NO.	
1197		2-1197.2	
SURFACE MARINE OBSERVATIONS			
<u>TAPE</u> <u>FIELD NUMBER</u>	<u>ELEMENT</u>	<u>CONVERSION PROCEDURE OR EXPLANATION</u>	
022	CLOUDS (C <sub>L</sub> ) LOW TYPE	CARD COLUMN 47 0-9 Observations prior to 1949 used the following code:	
		0 =	0 No lower clouds
		1 =	1 Cumulus of fine weather
		2 =	2 Cumulus heavy and swelling, without anvil top
		3 =	3 Cumulonimbus
		4 =	4 Stratocumulus
		5 =	5 Layer of Stratus or Stratocumulus
		7 =	6 Low broken up clouds of bad weather
		1 =	7 Cumulus of fine weather and Stratocumulus
		3 =	8 Heavy or swelling Cumulus, or Cumulonibus, and Stratocumulus
		9 =	9 Heavy or swelling Cumulus or Cumulonimbus and low ragged clouds of bad weather
		From 1949 onward, Column 47 was transferred directly to Tape Field 022 (C <sub>L</sub> ).	



TAPE DECK		SURFACE MARINE OBSERVATIONS	PAGE NO.
1197			3-1197.1
<u>SUPPLEMENTAL DATA FIELDS</u>			
<u>TAPE FIELD NUMBER</u>	<u>ELEMENT</u>	<u>EXPLANATION</u>	
039	RELATIVE HUMIDITY	CARD COLUMNS 76-77 00-99 100% RH was punched as 00 A 1 was placed in the high order position of Field 039 when this occurred. For all other values a Ø was placed in the high order position.	
040	DECK LOG NUMBER	0000-9999 - overpunch in high order position = B and C logs for period prior to 1923  - overpunch in hundreds position = 2 ships with identical log numbers.  - overpunch in low order position = selected ships.  No overpunches in any position = D and E logs. D=1923-1932, E=1933-1956.	
041	BEAUFORT WIND FORCE	00 = Calm 01 = 1-3 knots 02 = 4-6 knots 03 = 7-10 knots 04 = 11-16 knots 05 = 17-21 knots 06 = 22-27 knots 07 = 28-33 knots 08 = 34-40 knots 09 = 41-47 knots 10 = 48-55 knots 11 = 56-63 knots 12 = 64-71 knots	
042	TOTAL CLOUD AMOUNT	0-9 tenths cloud amount - = 10 tenths Δ = Obscured or unknown	
043	PRESENT WEATHER	00-99 Same as described under common portion	
044	VISIBILITY	0 = less than 50 yards 1 = 50 yards 2 = 200 yards 3 = 1/4 nautical mile 4 = 1/2 nautical mile 5 = 1 nautical mile 6 = 2 nautical miles 7 = 5 nautical miles 8 = 10 nautical miles 9 = 25 nautical miles	
045	DIRECTION OF SEA	<u>16 of 32 Point Scale</u> 02 =NNE 18=SSW 00=Calm 04 =NE 20=SW Blank=Unknown 06 =ENE 22=WSW 08 =E 24=W 10 =ESE 26=WNW 12 =SE 28=NW 14 =SSE 30=NNW 16 =S 32=N	

TAPE DECK		PAGE NO.
1197		3-1197.2
SURFACE MARINE OBSERVATIONS		
TAPE FIELD NUMBER	ELEMENT	EXPLANATION
046	STATE OF THE SEA	0 = Calm 1 = < 1 foot 2 = 1- 2 feet 3 = 2- 3 feet 4 = 3- 5 feet 5 = 5- 8 feet 6 = 8- 12 feet 7 = 12- 20 feet 8 = 20- 40 feet 9 = > 40 feet
047	HEIGHT OF SEA	00-99 = 0.0 - 9.9 meters Mean maximum height of sea in meters and tenths
048	CHARACTER OF SWELL	Approximate Height Feet 0 = 0 No swell 1 = 1-6 Low swell, short or average length 2 = 1-6 Low swell, long 3 = 6-12 Moderate swell, short 4 = 6-12 Moderate swell, average length 5 = 6-12 Moderate swell, long 6 = 12 Heavy swell, short 7 = 12 Heavy swell, average length 8 = 12 Heavy swell, long 9 = Confused swell
049	DIRECTION OF SWELL	0 = No sea or swell or ship hove to 1 = NE 2 = E 3 = SE 4 = S 5 = SW 6 = W 7 = NW 8 = N 9 = All directions or no definite direction
050	AIR TEMPERATURE	Degrees and tenths - Fahrenheit 000-999 - overpunch in high order position indicates negative temperatures.
051	SEA TEMPERATURE	Whole degrees - Fahrenheit 00-99 - overpunch in high order position indicates negative temperatures.
052	WET BULB TEMPERATURE	Degrees and tenths Celsius 0000-0999 - punch in high order position indicates negative temperatures + punch indicates wet bulb temperature in degrees and tenths- Fahrenheit

TAPE DECK		PAGE NO.
1197		3-1197.3
SURFACE MARINE OBSERVATIONS		
TAPE FIELD NUMBER	ELEMENT	EXPLANATION
053	CODE SHEET PAGE NUMBER AND SOURCE	000-499 = Danish source 500-797 = British Expedition RRS Discovery 1925-1927 and RRS Wm. Scoresby 798      = French Antarctic Expedition Pourquoi Pas 1908-1910 799      = Scottish Expedition RRS Scotia 1902-1904 800-999 = Russian Expedition F.J. Sedov 1912-1914  The initial 7,000 Danish observations did not have these columns punched.
SPECIAL NOTE: The original source data were recorded in a variety of codes. Some elements were manually converted to a common system of units before being punched, while others were punched as recorded and then converted to a common system by computer.  As indicated, additional conversion was employed so that these observations might be placed in TDF-11.  Not all elements were recorded by the various expeditions and many blank areas must be expected on tape.		