Card Deck Summary Reference Manual.

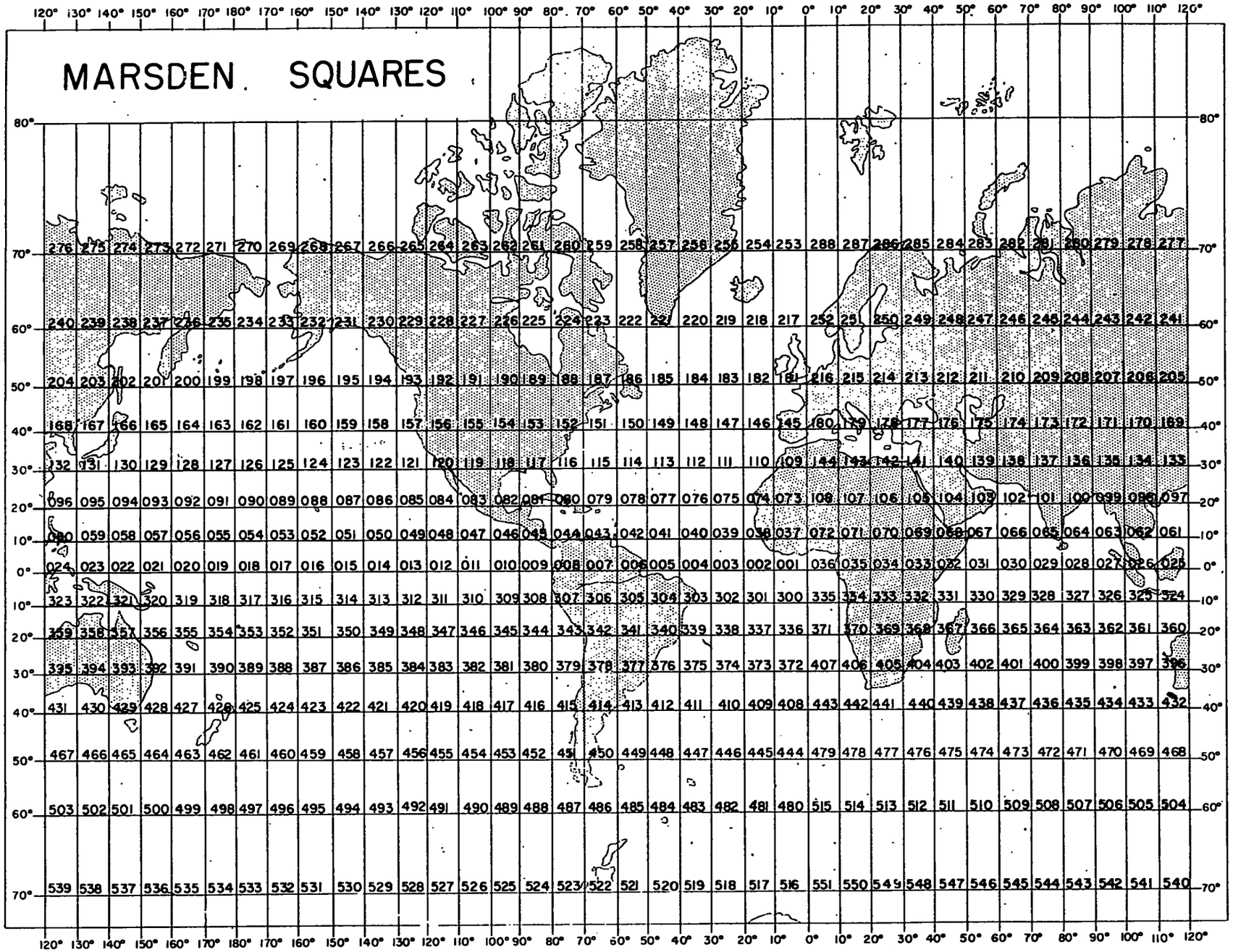

MARSDEN SQUARES
120° 130° 140° 150° 160° 170° 180° 170° 160° 150° 140° 130° 120° 110° 100° 90° 80° 70° 60° 50° 40° 30° 20° 10° 0° 10° 20° 30° 40° 50° 60° 70° 80° 90° 100° 110° 120°
80°
70° 276 275 274 273 272 271 270 269 268 267 266 265 264 263 262 261 260 259 258 257 256 255 254 253 288 287 286 285 284 283 282 281 280 279 278 277
60° 240 239 238 237 236 235 234 233 232 231 230 229 228 227 226 225 224 223 222 221 220 219 218 217 252 251 250 249 248 247 246 245 244 243 242 241
50° 204 203 202 201 200 199 198 197 196 195 194 193 192 191 190 189 188 187 186 185 184 183 182 181 216 215 214 213 212 211 210 209 208 207 206 205
40° 168 167 166 165 164 163 162 161 160 159 158 157 156 155 154 153 152 151 150 149 148 147 146 145 180 179 178 177 176 175 174 173 172 171 170 169
30° 132 131 130 129 128 127 126 125 124 123 122 121 120 119 118 117 116 115 114 113 112 111 110 109 144 143 142 141 140 139 138 137 136 135 134 133
20° 096 095 094 093 092 091 090 089 088 087 086 085 084 083 082 081 080 079 078 077 076 075 074 073 108 107 106 105 104 103 102 101 100 099 098 097
10° 060 059 058 057 056 055 054 053 052 051 050 049 048 047 046 045 044 043 042 041 040 039 038 037 072 071 070 069 068 067 066 065 064 063 062 061
0° 024 023 022 021 020 019 018 017 016 015 014 013 012 011 010 009 008 007 006 005 004 003 002 001 036 035 034 033 032 031 030 029 028 027 026 025
10° 323 322 321 320 319 318 317 316 315 314 313 312 311 310 309 308 307 306 305 304 303 302 301 300 335 334 333 332 331 330 329 328 327 326 325 324
20° 359 358 357 356 355 354 353 352 351 350 349 348 347 346 345 344 343 342 341 340 339 338 337 336 371 370 369 368 367 366 365 364 363 362 361 360
30° 395 394 393 392 391 390 389 388 387 386 385 384 383 382 381 380 379 378 377 376 375 374 373 372 407 406 405 404 403 402 401 400 399 398 397 396
40° 431 430 429 428 427 426 425 424 423 422 421 420 419 418 417 416 415 414 413 412 411 410 409 408 443 442 441 440 439 438 437 436 435 434 433 432
50° 467 466 465 464 463 462 461 460 459 458 457 456 455 454 453 452 451 450 449 448 447 446 445 444 479 478 477 476 475 474 473 472 471 470 469 468
60° 503 502 501 500 499 498 497 496 495 494 493 492 491 490 489 488 487 486 485 484 483 482 481 480 515 514 513 512 511 510 509 508 507 506 505 504
70° 539 538 537 536 535 534 533 532 531 530 529 528 527 526 525 524 523 522 521 520 519 518 517 516 551 550 549 548 547 546 545 544 543 542 541 540

TABLE 1 YEAR

Scale 9 - Last two digits
Scale 8 - x/units position = 1800

TABLE 2 MONTH

Scale	9	8	7	6*
Jan.	01	1	1	01
Feb.	02	2	2	02
March	03	3	3	03
April	04	4	4	04
May	05	5	5	05
June	06	6	6	06
July	07	7	7	07
Aug.	08	8	8	08
Sept.	09	9	9	09
Oct.	10	0	X/0	1 X/0
Nov.	11	X	X/1	1 X/1
Dec.	12	Y	X/2	1 X/2

* Scale 6. The tens position may be punched as indicated or left blank.

TABLE 3 DAY or DAY of the WEEK

Scale 9 01-31 day of Month
Scale 8 1 - 7 day of Week
"1" = Sunday
"2" = Monday, etc.

TABLE 4 HOUR or WATCH

Scale 9	8	7	6	5
GMT 00-23	LST 00-23	Watch # 1-6	LST 01-24	LST +50 50 - 74

(Watch: 1 = 00-04 LST
2 = 04-08
3 = 08-12
4 = 12-16
5 = 16-20
6 = 20-24)

Note. GMT = Greenwich Mean Time
LST = Local Standard Time

TABLE 5 POSITION 10° sq.

Scale 9 QL_aL_o

Code Figures	Longitude
	North Latitude
0	0°W. to 90° W.
1	90° W. to 180° W.
2	180° E. to 90° E.
3	90° E. to 0°,E.
	South Latitude
5	0° W. to 90° W.
6	90° W. to 180° W.
7	180° E. to 90° E.
8	90° E. to 0° E.

L_a 10s position of Latitude
L_o 10s position of Longitude
(Whole degrees only.)

Scale 8
Marsden 10° Square
See Map.

Scale 7 Deck 195 ($Q\ L_aL_{o_1}L_{o_2}$)
Quadrant $L_aL_{o_1}L_{o_2}$

(col. 14) Q = Quadrant instead of octant
Quadrant = 0 = N.Lat. W. Long.
1 = N.Lat. E. Long.
2 = S.Lat. W. Long.
3 = S.Lat. E. Long.

L_a = Tens position of Latitude Col. 15

L_{o_1} = Hundreds position of Longitude Col. 17.

L_{o_2} = Tens position of Longitude Col. 18

Tables 1-6
Table 1 - Year
Table 2 - Month
Table 3 - Day or Day of Week
Table 4 - Hour or Watch
Table 5 - Position
Table 6 - Position

TABLE 6 POSITION

Scale 9 1° sq. 00-99
Unit of latitude
Unit of longitude

Scale 8 1/10° Latitude and Longitude

Scale 7 1/6° Latitude and Longitude
20' squares (see 194)

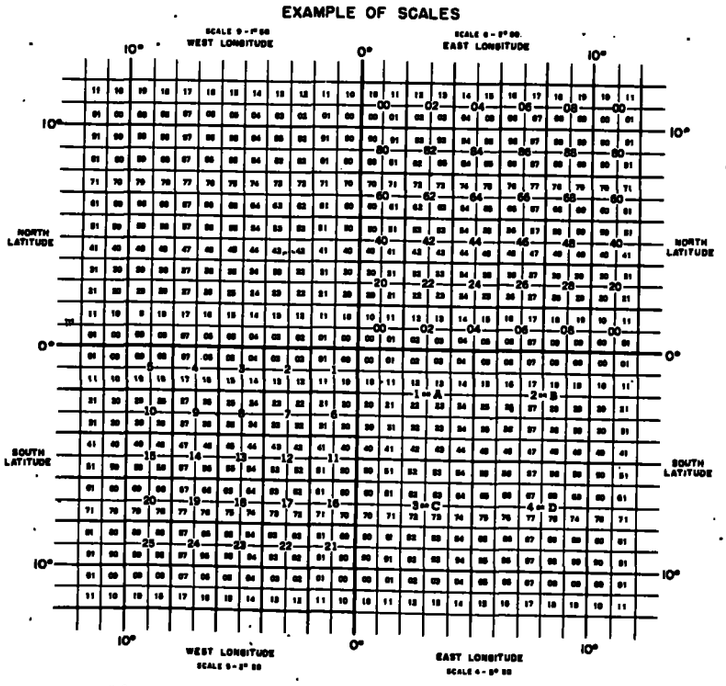
Scale 6 2° Sq. (QLL type)
Identified by lowest 1° of the 2° sq.

Scale 5 2° Sq. (Marsden)

2° sqs.	1° sqs.	2° sqs.	1° sqs.
1	00, 01, 10, 11	14	46, 47, 56, 57
2	02, 03, 12, 13	15	48, 49, 58, 59
3	04, 05, 14, 15	16	60, 61, 70, 71
4	06, 07, 16, 17	17	62, 63, 72, 73
5	08, 09, 18, 19	18	64, 65, 74, 75
6	20, 21, 30, 31	19	66, 67, 76, 77
7	22, 23, 32, 33	20	68, 69, 78, 79
8	24, 25, 34, 35	21	80, 81, 90, 91
9	26, 27, 36, 37	22	82, 83, 92, 93
10	28, 29, 38, 39	23	84, 85, 94, 95
11	40, 41, 50, 51	24	86, 87, 96, 97
12	42, 43, 52, 53	25	88, 89, 98, 99
13	44, 45, 54, 55		

Scale 4 5° Sq.

EXAMPLE OF SCALES



* Squares are always oriented so that the lowest number is nearest intersection of the Greenwich meridian and the Equator.

REFERENCE MANUAL

COMBINED MARINE

TABLE 8 C_L

Scale 9 1949 Code

Symbol C_L - Clouds of Types Stratocumulus, Stratus, Cumulus, and Cumulonimbus

Code Figures	Description
0	No stratocumulus, stratus, cumulus, or cumulonimbus clouds.
1	Cumulus with little vertical development and seemingly flattened.
2	Cumulus of considerable development, generally towering, with or without other cumulus or stratocumulus; bases all at the same level.
3	Cumulonimbus with tops lacking clear-cut outlines but distinctly not cirriform or anvil-shaped; with or without cumulus, stratocumulus, or stratus.
4	Stratocumulus formed by the spreading out of cumulus; cumulus also often present.
5	Stratocumulus not formed by the spreading out of cumulus.
6	Stratus or fractostratus or both, but not fractostratus of bad weather.
7	Fractostratus and/or fractocumulus of bad weather ("scud") usually under altostratus and nimbostratus.
8	Cumulus and stratocumulus other than those formed by the spreading out of cumulus, with bases at different levels.
9	Cumulonimbus having a clearly fibrous (cirriform) top, often anvil-shaped, with or without cumulus, stratocumulus, stratus or "scud".

Scale 8 1929 Code

Symbol C_L - Form of low cloud

Code Figures	Form of cloud
0	No lower clouds
1	Cumulus of fine weather.
2	Cumulus heavy and swelling, without anvil top.
3	Cumulonimbus.
4	Stratocumulus formed by the flattening of cumulus clouds.
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.

Scale 7

Code	Code definition	Units or Symbols	
0	Stratus	St	
6	Stratocumulus	St Cu	
7	Nimbus	Nb	21
8	Cumulus	Cu	Code
9	Cumulonimbus	Cu Nb	
X	No observation		
Y	No lower cloud		
00	No observation		
1	Stratocumulus	St Cu, Sc	30 and
2	Nimbus (not in 49 Code)	Nb	49 Code
3	Cumulus	Cu	
4	Cumulonimbus	Cu Nb, Cb	
5	Stratus	St	
6	Scud		
7	Nimbostratus	Ns	
88	Overcast		
99	No lower cloud		

Note. Space for two cloud types available, if but one was reported, that type was punched in column 47, and column 48 was punched Y in the 1921 code or 9 in 1930 and 1949 codes.

Scale 6

Deck 195 cols. 42, 43, 44

0 = clear or no clouds
1 = cumulus or fractocumulus
2 = Stratocumulus
3 = Stratus or fractostratus
4 = Cumulonimbus

Scale 4 Deck 110

0 = No low cloud
1 = Stratus (St)
2 = Stratocumulus (Sc)
3 = Cumulus (Cu)
4 = Cumulonimbus (Cb)
5 = Nimbus (Ns)
6 = Fog (F)

Scale 5 Deck 281 col. 53

0 = No low clouds
1 = Fog
2 = Cumulus, fractocumulus
3 = Cumulonimbus
4 = Stratocumulus
5 = Stratus or fractostratus
6 = Nimbostratus

Scale 3 Deck 117 Cols. 51, 56, 62, 68

0 = No low clouds
1 = Fog (F)
2 = Stratus (St)
3 = Stratocumulus (Sc)
4 = Cumulus
5 = Cumulonimbus (Cb)
X = obscuring phenomena other than fog
x/2 = Fractostratus
x/4 = Fractocumulus
x/5 = Cumulomammatus

Tables 8-9
Table 8 - C_L
Table 9 - C_M

TABLE 9 C_M

Scale 9 1949 Code

Symbol C_M - Clouds of Types Altocumulus, Altostratus, and Nimbostratus

Code Figures	Description
0	No altocumulus, altostratus, or nimbostratus clouds.
1	Thin altostratus (semitransparent everywhere) through which the sun or moon would be seen dimly as through ground glass.
2	Thick altostratus, or nimbostratus.
3	Thin (semitransparent) altocumulus; not changing much; at a single level.
4	Thin (semitransparent) altocumulus in patches (often almond or fish-shaped); cloud elements continually changing and/or occurring at more than one level.
5	Thin (semitransparent) altocumulus in bands or in a layer gradually spreading over the sky and usually thickening as a whole; it may become partly opaque or double-layered.
6	Altocumulus formed by the spreading out of cumulus.
7	Any of the following cases: (a) Double-layered altocumulus, usually opaque in parts, not increasing (b) a thick (opaque) layer of altocumulus, not increasing; (c) altostratus and altocumulus both present at the same or different levels.
8	Altocumulus in the form of cumulus-shaped tufts or altocumulus with turrets.
9	Altocumulus of a chaotic sky; generally at different levels; dense cirrus in patches is usually present also.

Scale 8 1929 Code

Symbol C_M - Form of middle cloud

Code Figures	Form of cloud
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 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.

Scale 7 Deck 194

4	Altocumulus		(A Cu)
5	Altostratus	21	(A St)
X	No observation	Code	
Y	No middle cloud		
0	No observation		
1	Altocumulus	30 and 49	(A Cu)
2	Altostratus	Code	(A St)
3	Altocumulus and Altostratus		(A Cu and A St)
9	No middle cloud		

Scale 6 Deck 195 Cols. 42, 43, 44

5 = Nimbostratus
6 = Altocumulus
7 = Altostratus

Scale 5 Deck 281 Col. 45

0 = No middle clouds
4 = Altocumulus
5 = Altostratus
6 = Altocumulus Castellatus

Scale 4 Deck 110

0 = No middle clouds
1 = Altostratus (As)
2 = Altocumulus (Ac)
3 = High cumulus (Cu)
4 = High Cumulonimbus (Cb)
5 = Nimbostratus (Ns)

Scale 3 Deck 117 Cols. 51, 56, 62, 68

0 = No middle clouds
6 = Altostratus
x/6 = Nimbostratus
7 = Altocumulus
x/7 = Altocumulus Castellatus

TABLE 10 C_H

Scale 9 1949 Code

Symbol C_H - Clouds of Types Cirrus, Cirrostratus, and Cirrocumulus

Code Figures	Description
0	No cirrus, cirrocumulus, or cirrostratus clouds.
1	Filaments or strands of cirrus, scattered and not increasing (often "Mares' tails").
2	Dense cirrus in patches or twisted sheaves usually not increasing; possibly but not certainly the remains of upper parts of cumulonimbus.
3	Cirrus, often anvil-shaped; either the remains of the upper portions of cumulonimbus or part of a distant cumulonimbus the rest of which is not visible.
4	Cirrus (often hook-shaped) gradually spreading over the sky and usually thickening as a whole.
5	Cirrus and cirrostratus alone; in either case gradually spreading over the sky and usually thickening as a whole, but the continuous layer not reaching 45° altitude.
6	Cirrus and cirrostratus, often in bands converging toward the horizon; or cirrostratus alone; in either case gradually spreading over the sky and usually thickening as a whole and the continuous layer exceeding 45° altitude.
7	Cirrostratus covering the whole sky.
8	Cirrostratus not increasing and not covering the whole sky; cirrus and cirrocumulus may be present.
9	Cirrocumulus alone or cirrocumulus with some cirrus or cirrostratus, but the cirrocumulus being the main cirriform cloud present.

Scale 8 1929 Code

Symbol C_H - Form of high cloud (cirrus cloud)

Code Figures	Form of cloud
0	No upper clouds (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.

Scale 7 Deck 194

(1929 Code)

1 = Cirrus	Ci
2 = Cirrostratus	Ci St
3 = Cirrocumulus	Ci Cu
X = No observation	
Y = No upper cloud	

(1930 and 1949 Code)

0 = No observation	
1 = Cirrus	Ci
2 = Cirrostratus	Ci St
3 = Cirrocumulus	Ci Cu
4 = Cirrus and Cirrostratus	Ci and Ci St
5 = Cirrus and Cirrocumulus	Ci and Ci Cu
6 = Cirrostratus and Cirrocumulus	Ci St and Ci Cu
9 = No upper cloud	

Scale 6 Deck 193 (Upper cloud type)

1 = Cirrus
2 = Cirrostratus
3 = Cirrocumulus
4 = Altocumulus
5 = Altostratus
Blank = missing data

Scale 5 Deck 195 Cols. 42, 43, 44

8 = Cirrus
9 = Cirrostratus
X = Cirrocumulus

Scale 4 Deck 281 Col. 45

0 = No high clouds
1 = Cirrus
2 = Cirrostratus
3 = Cirrocumulus

Scale 3 Deck 110

0 = No high clouds
1 = Cirrostratus (Cs)
2 = Cirrus (Ci)
3 = Cirrocumulus (Cc)

Scale 2 Deck 117 Cols. 51, 56, 62, 68

8 = Cirrus
9 = Cirrostratus
x/9 = Cirrocumulus

TABLE 11

Scale 9 WMO 10 1955 (Eff. 1/1/55)

Significant Cloud Type (C_S)

Code	Symbol	Description
0	Ci	Cirrus
1	Cc	Cirrocumulus
2	Cs	Cirrostratus
3	Ac	Altocumulus
4	As	Altostratus
5	Ns	Nimbostratus
6	Sc	Stratocumulus
7	St	Stratus
8	Cu	Cumulus
9	Cb	Cumulonimbus
x or Blank		Cloud not visible owing to darkness, fog, duststorm, sandstorm, or other similar phenomena.

Scale 8 1949 Code WMO 10

C - Genus (type) of significant cloud

Code figure	
0	Stratus or fractostratus
1	Cirrus
2	Cirrostratus
3	Cirrocumulus
4	Altocumulus
5	Altostratus
6	Stratocumulus
7	Nimbostratus
8	Cumulus or fractocumulus
9	Cumulonimbus
X	No observation; or cloud not visible owing to darkness, fog, duststorm, sandstorm, or other similar phenomena.

TABLE 12 DIRECTION

	36 Pts. +50	36 Pts. +40	36 Pts.	Scale 9, 10, 11 Limits in degrees	16 of 32 Pts. Limits in degrees	32 Pts. rounded Actual degrees	16 Of 32 Pts.	32 Pts.	32 Pts. +50	16 Pts.	Description x = by	8 Pts.	16 Pts. Arrows	WBAN Code	8 Pts.	Quadrant
Scale	11	10	9				8	7	3	6		5	4		2	1
	50	40	00	Calm			00	00	50	00	Calm	0	Calm	00		
	51	41	01	5-14		11		01	51		N x E					
	52	42	02	15-24	12-33	23	02	02	52	01	NNE			12		
	53	43	03	25-34		34		03	53		NE x N					
	54	44	04	35-44												
	55	45	05	45-54	35-56	45	04	04	54	02	NE	1		22	2	1
	56	46	06	55-64		56		05	55		NE x E					
	57	47	07	65-74	57-78	68	06	06	56	03	ENE			32		
	58	48	08	75-84		79		07	57		E x N					
	59	49	09	85-94	79-101	90	08	08	58	04	E	2		33	3	
	60	50	10	95-104		101		09	59		E x S					
	61	51	11	105-114	102-123	113	10	10	60	05	ESE			34		
	62	52	12	115-124		124		11	61		SE x E					
	63	53	13	125-134												
	64	54	14	135-144	124-146	135	12	12	62	06	SE	3		44	4	2
	65	55	15	145-154		146		13	63		SE x S					
	66	56	16	155-164	147-168	158	14	14	64	07	SSE			54		
	67	57	17	165-174		169		15	65		S x E					
	68	58	18	175-184	169-191	180	16	16	66	08	S	4		55	5	
	69	59	19	185-194		191		17	67		S x W					
	70	60	20	195-204	192-213	203	18	18	68	09	SSW			56		
	71	61	21	205-214		214		19	69		SW x S					
	72	62	22	215-224												
	73	63	23	225-234	214-236	225	20	20	70	10	SW	5		66	6	3
	74	64	24	235-244		236		21	71		SW x W					
	75	65	25	245-254	237-258	248	22	22	72	11	WSW			76		
	76	66	26	255-264		259		23	73		W x S					
	77	67	27	265-274	259-281	270	24	24	74	12	W	6		77	7	
	78	68	28	275-284		281		25	75		W x N					
	79	69	29	285-294	282-303	293	26	26	76	13	WNW			78		
	80	70	30	295-304		304		27	77		NW x W					
	81	71	31	305-314												
	82	72	32	315-324	304-326	315	28	28	78	14	NW	7		88	8	4
	83	73	33	325-334		326		29	79		NW x N					
	84	74	34	335-344	327-348	338	30	30	80	15	NNW			18		
	85	75	35	345-354		349		31	81		N x W					
	86	76	36	355-004	349-011	360	32	32	82	16	N	8		11	1	
Confused			49													
			99													

TABLE 13 F, ff. SPEED

Scale

9	Beaufort 00-12
8	Knots
7	Miles per hour
6	Meters per second
5	Km./hr.
4	Beaufort 0-9, x/o = 10, x/1 = 11, x/2 = 12
3	Beaufort 0-9, 9-1 = 10, 9-2 = 11, 9-3 = 12, two cols.

Scale 1. Ship speed

Code	Speed	Code	Speed
0	Stopped	5	13-15 Knots
1	1-3 Knots	6	16-18 "
2	4-6 "	7	19-21 "
3	7-9 "	8	22-24 "
4	10-12 "	9	>24

See conversion tables.

TABLE 14 h

Scale 9 1949 Code

Symbol h - Height of Base of Cloud Above Sea

Code Figures	Feet	Meters
0	0 to 150	0 to 50
1	150 to 300	50 to 100
2	300 to 600	100 to 200
3	600 to 1000	200 to 300
4	1000 to 2000	300 to 600
5	2000 to 3000	600 to 1000
6	3000 to 5000	1000 to 1500
7	5000 to 6500	1500 to 2000
8	6500 to 8000	2000 to 2500
9	No cloud below 8000	No cloud below 2500

Scale 8

Values punched in 100's of feet
2 digits

Scale 7

Code figure	Meters	Feet (approx.)	Code figure	Meters	Feet (approx.)	Code figure	Meters	Feet (approx.)
00	<30	<100				67	2,010	6,700
01	30	100	34	1,020	3,400	68	2,040	6,800
02	60	200	35	1,050	3,500	69	2,070	6,900
03	90	300	36	1,080	3,600	70	2,100	7,000
04	120	400	37	1,110	3,700	71	2,130	7,100
05	150	500	38	1,140	3,800	72	2,160	7,200
06	180	600	39	1,170	3,900	73	2,190	7,300
07	210	700	40	1,200	4,000	74	2,220	7,400
08	240	800	41	1,230	4,100	75	2,250	7,500
09	270	900	42	1,260	4,200	76	2,280	7,600
10	300	1,000	43	1,290	4,300	77	2,310	7,700
11	330	1,100	44	1,320	4,400	78	2,340	7,800
12	360	1,200	45	1,350	4,500	79	2,370	7,900
13	390	1,300	46	1,380	4,600	80	2,400	8,000
14	420	1,400	47	1,410	4,700	81	2,700	9,000
15	450	1,500	48	1,440	4,800	82	-	-
16	480	1,600	49	1,470	4,900	83	3,000	10,000 - 12,000
17	510	1,700	50	1,500	5,000	84	4,000	13,000 - 15,000
18	540	1,800	51	1,530	5,100	85	5,000	16,000 - 19,000
19	570	1,900	52	1,560	5,200	86	6,000	20,000 - 22,000
20	600	2,000	53	1,590	5,300	87	7,000	23,000 - 25,000
21	630	2,100	54	1,620	5,400	88	8,000	26,000 - 29,000
22	660	2,200	55	1,650	5,500	89	9,000 or higher	30,000 or higher
23	690	2,300	56	1,680	5,600			
24	720	2,400	57	1,710	5,700	90	less than	50 m
25	750	2,500	58	1,740	5,800	91	50 to	100 m
26	780	2,600	59	1,770	5,900	92	100 to	200 m
27	810	2,700	60	1,800	6,000	93	200 to	300 m
28	840	2,800	61	1,830	6,100	94	300 to	600 m
29	870	2,900	62	1,860	6,200	95	600 to	1000 m
30	900	3,000	63	1,890	6,300	96	1,000 to	1500 m
31	930	3,100	64	1,920	6,400	97	1,500 to	2000 m
32	960	3,200	65	1,950	6,500	98	2,000 to	2500 m
33	990	3,300	66	1,980	6,600	99	2,500 m or more, or no clouds	

Scale 6

Values punched in 100's of feet
3 digits

Scale 5

Values punched in thousands of feet
2 digits

TABLE 15 ICE

Scale 1

Symbol c_2 - Description of kind of ice

Code figure	Description
0	None or "ice-blink"
1	New ice
2	Fast ice
3	Drift ice (Pack ice, eff. 1/58)
4	Packed (compact) slush (sludge, eff. 1/1958)
5	Open lead near shore
6	Heavy fast ice
7	Heavy drift ice (or heavy pack ice, eff. 1/1958)
8	Hummocked ice
9	Ice jamming (until 12/57)
.	Icebergs (eff. 1/58)

Scale 2

Symbol K. - Effect of ice on navigation

Code figure	Description
0	Navigation unobstructed.
1	Navigation slightly obstructed.
2	Navigation difficult for low powered ships.
3	Navigation possible only for powerful ships.
4	Navigation possible only for ships contructed to withstand ice pressure.
5	Navigation possible with the assistance of ice-breakers.
6	Channel open in the solid-ice.
7	Navigation temporarily closed.
8	Navigation closed.
9	Navigation conditions unknown (e.g., owing to bad weather).

Scale 3

Symbol D_i - Bearing of ice-limit

Code figure	Description
0	Unknown
1	Ice-limit toward NE.
2	Ice-limit toward E.
3	Ice-limit toward SE.
4	Ice-limit toward S.
5	Ice-limit toward SW.
6	Ice-limit toward W.
7	Ice-limit toward NW.
8	Ice-limit toward N.
9	Ice-limit in several directions.

Note. If more than one ice-limit can be stated, the nearest or most important is reported.

Scale 4

Symbol r - Distance to ice-limit from reporting ship

Code figure	Description
0	0 to 1 mile.
1	1 to 2 miles.
2	2 to 4 miles.
3	4 to 6 miles.
4	6 to 8 miles.
5	8 to 12 miles.
6	12 to 16 miles.
7	16 to 20 miles.
8	More than 20 miles.
9	Unknown.

Note. If the exact bounding distance for the ice-limit corresponds to two code figures, the lower code figure is reported.

Scale 5 Symbol e - orientation of ice-limit

Code figure	Description
0	Orientation of ice-limit impossible to estimate - ship outside the ice.
1	Ice-edge lying in a direction NE. to SW. with ice situated to the N. W.
2	Ice-edge lying in a direction E. to W. with ice situated to the northward.
3	Ice-edge lying in a direction SE. to NW. with ice situated to the NE.
4	Ice-edge lying in a direction S. to N. with ice situated to the eastward.
5	Ice-edge lying in a direction SW. to NE. with ice situated to the SE.
6	Ice-edge lying in a direction W. to E. with ice situated to the southward.
7	Ice-edge lying in a direction NW. to SE. with ice situated to the SW.
8	Ice-edge lying in a direction N. to S. with ice situated to the westward.
9	Orientation of ice-limit impossible to estimate - ship inside the ice.

TABLE 16 PERIOD or DURATION

Scale 9

Code	Period in seconds
2	<5
3	5 to 7
4	7 to 9
5	9 to 11
6	11 to 13
7	13 to 15
8	15 to 17
9	17 to 19
0	19 to 21
1	>21
x	Calm or indeterminable
(y)	Calm or indeterminable (Deck 189)

Scale 7 4 hourly periods

Code	Limits
0 = <4 hours	<4 hours
1 = 4 (average number of hours in period)	>0 to 8 hours
2 = 8 "	>4 to 12
3 = 12 "	>8 to 16
4 = 16 "	>12 to 20
5 = 20 "	>16 to 24
6 = 24 "	>20 to 28
7 = 28-36 "	>24 to 40
8 = 40-48 "	>36 to 52
9 = 52-72 "	>48 to 76
X = 76-92 "	>72 to 96
Y = >96 "	>92 -

Scale 8 1/4 hr. periods

00 = <15 minutes
01 = 15 minutes
02 = 30 minutes
03 = 45 minutes
04 = 1 hour
08 = 2 hours
24 = 6 hours

Scale 6

3 digits:
tens, units, tenths of hour

Scale 5

In seconds 00-99

xx = confused (Deck 117)

Scale 4 (Deck 196)

Duration Period of Storm (Col. 77)
Duration Period of Fog (Col. 78)

Code	Description
0	Only between the periods.
1	One period.
2	Two periods.
3	Three periods.
4	Four periods.
5	Five periods.
6	Six periods.
7	Seven thru nine periods.
8	Ten thru twelve periods.
9	Thirteen thru eighteen periods.
X	Nineteen thru twenty-three periods.
Y	Twenty-four and more periods.

TABLE 17 PRESSURE

Scale 9 In 1/10 mbs. 5 digits. 1017.5 mbs.

Scale 8 In 1/10 mbs. 4 digits. 017.5 mbs. Thousands position missing.

Scale 7 Whole mbs. 2 digits. 50-99=950-999 mbs. 00-49 = 1000-1049 mbs.

Scale 6 In 1/10 millimeters. 3 digits. Hundreds position missing, i.e. 45.6 = 745.6 mm.

Scale 5 In 1/100 Inch. 4 digits. 2799=27.99 inches.

Scale 4 In 1/10 mbs. 3 digits. Thousands and hundreds values indicated by x-overpunch in 10's position, thus x = less than 1000 mbs.

Scale 3 In 1/10 mbs. 3 digits. No indicator for thousands and hundreds position.

See conversion tables.

TABLE 18 PRESSURE CHANGE

Scale 9 (1949 Code) In 1/10 mbs. 2 digits. 00-99 = 0-9.9 mbs. change. x-overpunch in 10's position = 10 mbs. change; x-overpunch in units position = 20 mbs. change.

Scale 8 In 1/5 mbs. 2 digits, 00-99 = 00-99 (1/5 mbs.) or 0 - 19.8 mbs. Note: In Deck 115 x-overpunch in 10's position = 100(1/5 mbs) or 20 mbs.

Scale 7 In 1/10 millimeter 00-99 = 0-9.9 millimeters change. x-overpunch in 10's position = 10 millimeters; x-overpunch in units position = 20 millimeters.

Scale 6 In 1/10 mbs. 3 digits. 000-999 = 0-99.9 mbs. change.

TABLE 19 N, N_h, N_s

Scale 9 In eighths - 1 digit. 1949 Code

Symbol N - Total amount of all clouds
Symbol N_h - Total amount of low cloud

Code figures	Proportion of sky covered (in tenths)	Code figures	Proportion of sky covered (in tenths)
0	0	7	More than 0.9 but with openings.
1	Less than 0.1	8	Sky completely covered with clouds
2	0.1	9	Sky obscured by fog, duststorm, or other phenomenon.
3	0.2 to 0.3		
4	0.4 to 0.6		
5	0.7 to 0.8		
6	0.9		

Scale 7 (Deck 194)

Amount of Lower or Middle Cloud	Blank		(21 Code)	
	0	No obs.		
	1	0 to 1 tenth		0-1/10
	2	2 tenths		2/10
	3	3 tenths	(30 Code)	3/10
	4	4 tenths		4/10
	5	5 tenths		5/10
	6	6 tenths		6/10
	7	7 tenths		7/10
	8	8 tenths		8/10
	9	9 or 10 tenths		9/10 or 10/10
Amount of Low Cloud		(49 Code)		
	0	No low clouds		
	1 to 8	1 eighth to 8 eighths		1/8 to 8/8
	9	Sky obscured due to darkness		
	X	No observation		
Total cloud Amount		(21 Code)		
	1 to 9	1 tenth to 9 tenths		1/10 to 9/10 or .1 to .9
	0	Clear sky		
	X	No observation		
	Y	Overcast		
	0-9	Same as 1930 code for amount of lower or middle cloud		
	0-9, X	Same as 1949 code for amount of lower or middle cloud		

Description of symbols in Scales 1 and 2

0	Clear or < 1/10 cloudiness
⦶	Scattered 1/10 to not > 5/10 cloudiness
⦷	Broken > 5/10 thru 9/10 cloudine s
⊕	Overcast > 9/10 (9/10 and 10/10)
-	Thin celestial bodies may show thru
+	Dark, threatening, ugly sky
X	Obscured by weather
/	High clouds > 9,750 feet

Scale 8 In tenths - 1 digit.

Punched	10ths
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
X	10
Blank	Obscured or Unknown

Scale 6 In tenths - 2 digits.

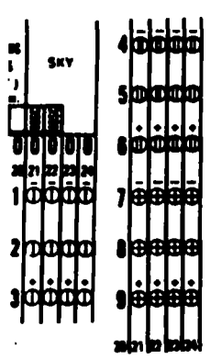
00 - 10 = 0 - 10/10

Scale 3 Cloud Density

1 - Transparent
2 - Semi-transparent
3 - Medium
4 - Dense
5 - Very dense
X - No clouds

Code when Type is Fog
1 - Very thin fog
2 - Thin fog
3 - Thin spots, light gray
4 - Dense fog
5 - Very dense fog
Blank - Unknown

Scale 2 (Deck 117)



Scale 1 (Deck 110)

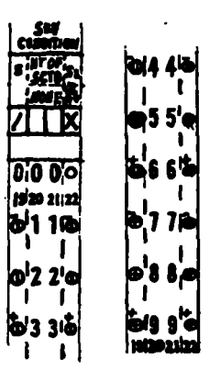


TABLE 20 SEA CONDITION or STATE OF SEA

Approx. Ht. in Meters	Approx. Ht. in Feet	Scale 9 Code	Scale 9 Description	Scale 8 Code	Scale 8 Description	Scale 8 Berlin 1939 Description
			1. Douglas Code 2. 1929 Copenhagen 3. U.S.N. Hydro-office 4. Dutch 1883-		1. Paris 1919 Code 2. Berlin 1939 Code	
0	0	0	Calm	0	Calm	Calm
<0.3	<1	1	Smooth	1	Very smooth	Very quiet
.3 - .6	1-2	2	Slight (1-3 ft)	2	Smooth	Quiet
.6 - 1	2-3			3	Slight	Light movement
1 - 1.5	3-5	3	Moderate	4	Moderate	Moderate
1.5-2.5	5-8	4	Rough	5	Rather rough	Fairly rough
2.5-4.0	8-12	5	Very rough	6	Rough	Rough
4.0-7.0	12-20	6	High	7	High	High
7.0-13.0	20-40	7	Very high	8	Very high	Very high
>13.0	>40	8	Mountainous	9	Precipitous	Very heavy
Confused	Confused	9	Confused sea			

Scale 7 Code	Scale 7 Description	Actual Ht. in Meters	Actual Ht. in Feet
	1. 1949 WMO Code 75		
0	Calm(glassy)	0	0
1	Calm(rippled)	0 to 1/4	0-1
2	Smooth (wavelets)	1/4 to 1/2	1-2
3	Slight	1/2 to 1-1/4	2-4
4	Moderate	1-1/4 to 2-1/2	4-8
5	Rough	2-1/2 to 4	8-13
6	Very rough	4 to 6	13-20
7	High	6 to 9	20-30
8	Very high	9 to 14	30-45
9	Phenomenal	>14	>45
X	Confused		

Scale 6

WMO Code 42 Wave Height

Code	A Height in Feet	A Ht. in Meters	B $d_w d_w$ + 50 Height in Feet	B Ht. in Meters	C $d_w d_w$ + 50 and x-overpunch in H_w col. Height in Feet	C Ht. in Meters
0	<1	<1/4	16	5	33	10
1	1-1/2	1/2	17-1/2	5-1/2	36	11
2	3	1	19	6	39-1/2	12
3	5	1-1/2	21	6-1/2	42-1/2	13
4	6-1/2	2	22-1/2	7	46	14
5	8	2-1/2	24	7-1/2	49	15
6	9-1/2	3	25-1/2	8	52-1/2	16
7	11	3-1/2	27	8-1/2	56	17
8	13	4	29	9	59	18
9	14	4-1/2	30-1/2	9-1/2	62	19
X	Not determined					

Notes:

1) 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.
2) If a wave height comes exactly midway between the heights corresponding to two code figures, the lower code figure is reported; e.g. a height of 2-3/4 m is reported by code figure 5.
3) The average value of the wave height (vertical distance between trough and crest) is reported, as obtained from the larger well formed waves of the wave system being observed.

Scale 5

In units of 1/2 meters

Scale 4

In units of 1/10 meters

Scale 3

Ht. in Feet	Code	Description
0	0	Flat or oily
0	1	Calm or rippled
<1	2	Smooth or wavelets
1-3	3	Slight
3-5	4	Moderate
5-8	5	Rough
8-12	6	Very rough
12-20	7	High
20-40	8	Very high
>40	9	Mountainous

Scale 2

Height in feet; 2 digits

Universal Code	Height in Feet	Deck 110 col. 71	Decks 111, 112, 115 col. 31	Decks 116, 184, 189 cols. 73, 52, 63, 52	Deck 117 cols. 79-80	Deck 192 col. 50	Deck 193 col. 50	Deck 194 col. 59 (21 Code)	Deck 194 col. 72 (30 Code)	Deck 194 col. 72 (49 Code)	Deck 195 (1942) col. 53	Deck 195 6/1944 col. 53	Deck 196 col. 61	Wave Data Deck 196 cols. 63-64	Deck 281 Before 6/39 col. 33	Deck 281 6/39-44 col. 33
0	0	0, 1	0	0 xx	00	0	0	0	0	0 xx	0	0	0	00	0, 1, 2	0
1	<1	2	1	0	00	1	1	1	1	0	1, 2	1	1	00	"	1
2	1-3	3	2	1	01-02	2	2	2, 3	2	1		2	2	01-02	"	2
3	3-5	4	3	2, 3 Scale A	03-05	3	3	4	3	2, 3 Scale A	3, 4, 5	3	3	03-04	3, 4, 5	3
4	5-8	5	4	4, 5	06-08	4	4	5	4	4, 5	6, 7	4	4	05-06	6	4
5	8-12	6	5	6, 7	09-12	5	5	6	5	6, 7	8	5	5	07-08	7	5
6	12-20	7	6	8, 9	12-20	6	6	7	6	8, 9		6	6	09-14	8	6
7	20-40	8	7	0, 1, 2 # Scale B >3 # 0, 1, 2 ##	21-40	7, 8	7	8	7	0, 1, 2 # Scale B >3 # " 0, 1, 2 ##		7	7, 8	15-26	8	7 8
8	>40	9	8	>3 ## Scale C	>40	9	8	9	8	>3 ## Scale C	9	8	9	>26	9	9
9	Cont. >40			49 = <15 ft.			9		9	49 = <15 ft.						
9*	Confused	x col. 72	9	99 = >15 ft.	xx col. 75	x/col. 53				99 = >15 ft.		9*				

xx = Calm Direction
* = Confused, height unknown
# = 50 added to $d_w d_w$ Decks 116, 184 or x-overpunch in units col. of d_w (Deck 189)
= 50 added to $d_w d_w$ Decks 116, 184 or x-overpunch in units col. of d_w (Deck 189) and x-overpunch in H_w column.

TABLE 21 SWELL

Scale 9

1. 1929 Copenhagen Code
2. Douglas Code

Approx. Ht. in Meters	Feet	Code	Description
<1/3	<1	0	No swell
1/3 - 2	1-6	1	Low swell, short, or average length
"	"	2	" " long length
2 - 4	6-12	3	Moderate swell, short length
"	"	4	" " average length
"	"	5	" " long "
>4	>12	6	Heavy swell, short length
"	"	7	" " average length
"	"	8	" " long "
Non-measurable		9	Confused swell

Scale 8

1. London 1920-21 Code
2. Dutch Code prior to 1931
3. International Code 1920-21

Approx. Swell Ht. Meters	Feet	Code	Description	
<1/3	<1	0	No or slight swell	and sea smooth to moderate >1-5ft and >1 to 1-2/3 m
2 - 4	6-12	1	Moderate "	
>4	>12	2	Heavy "	
1/3 - 2	1-6	3	Long low "	
Unknown		4	Confused "	
<1/3	<1	5	No or slight swell	and sea rough or above or >5 ft >1-2/3 m
2 - 4	6-12	6	Moderate "	
>4	>12	7	Heavy "	
1/3 - 2	1-6	8	Long low "	
Uknown		9	Confused "	

Scale 7

Navy Log 1942 - 5/1944

Approx. Swell Ht. Meters	Feet	Code	Description		Approx. Ht. of Sea Feet	Meters
0-2	0-6	0	No or low swell	calm or slight sea	0-3	0-1
2-4	6-12	1	Moderate		"	"
>4	>12	2	Heavy		"	"
0-2	0-6	3	No or low	moderate sea	3-5	1 to 1-2/3
2-4	6-12	4	Moderate		"	"
>4	>12	5	Heavy		"	"
Unknown		6	Rather rough sea		5-8	1-2/3 to 2-2/3
"		7	Rough sea		8-12	2-2/3 to 4
"		8	Very rough sea		12-40	4 - 13
"		9	Mountainous sea		>40	>13

Scale 6

German Scale - Deck 192

Approx. Ht. in Meters	Feet	Code	Description
>1/3	>1	0	None
1/3 - 2	1-6	1	Very low
"	"	2	Low
2 - 4	6-12	3	Light
"	"	4	Moderate
"	"	5	Fairly rough, heavy
>4	>12	6	Rough, heavy short swell
"	"	7	High
"	"	8	Very high
"	"	9	Very heavy
Confused		X	Convergent

Scale 5

1921 Code - Deck 194

Approx. Ht. in Meters	Feet	Code	Description
>1/3	>1	0	No swell or no obs.
1/3 - 2	1-6	1	Slight swell
"	"	2	" "
2 - 4	6-12	3	Moderate "
"	"	4	Rather rough "
"	"	5	Rough "
>4	>12	6	Heavy "
"	"	7	" "
"	"	8	Very heavy "
"	"	9	Abnormal "

Scale 4

Deck 195, Deck 281 (6/39-12/44)

Approx. Swell Ht. Meters	Feet	Code	Description
0-2	0-6	0	Calm or no swell
2-4	6-12	1	Smooth sea, mod. swell
>4	>12	2	Slight sea, heavy swell
0	0-6	3	Moderate sea, no swell
2-4	6-12	4	Rough sea, mod. swell
>4	>12	5	Very rough sea, heavy swell
Unknown		6	High sea
"		7	Very high
"		8	Precipitous
Confused		9	Confused

Scale 3

Deck 281 (prior to 3/1939)

Approx. Swell Ht. Meters	Feet	Code	Description	Feet	Meters
0-2	0-6	0	Calm or slight sea with no swell	0-3	0-1
2-4	6-12	1	" " " " mod. "	"	"
>4	>12	2	" " " " heavy "	"	"
0-2	0-6	3	Moderate sea with no swell	3-5	1 to 1-2/3
2-4	6-12	4	" " " mod. "	"	"
>4	>12	5	" " " heavy "	"	"
		6	Rather rough sea	5-8	1-2/3 to 2
		7	Rough	8-12	2-4
		8	Very rough	12-40	4-13
		9	Mountainous	>40	>13

Scale 2

Height in feet 2 digits

Universal Combination of all Swell Codes

Approx. Ht. in Feet	Universal Code	Deck Col.	110 73-74	111 37	112 37	115 37	192 53	1922-30 193 53	1931-44 193 53	1921-29 194 62	1930-50 194 62	1942-5/44 195 53*	6/1944-45 195 56*	196xx 64	197 51	281 33
>1	0		00	0	0	0	0	0, 5	0	0	0	0, 3	0	0	0	0, 3
1-6	1		01-06	1	1	1	1	3, 8	1	1	1	"	1	1	1	"
"	2		"	2	2	2	2		2	2	2	"	2	2	2	"
6-12	3		07-12	3	3	3	3	1, 6	3	3	3	1, 4	3	3	3	1, 4
"	4		"	4	4	4	4		4	4	4	"	4	4	4	"
"	5		"	5	5	5	5		5	5	5	"	5	5	5	"
>12	6		13-99	6	6	6	6	2, 7	6	6, 7	6	2, 5	6	6	6	2, 5
"	7			7	7	7	7		7	8	7	"	7	7	7	
"	8			8	8	8	8, 9		8	9	8	"	8	8	8	
Confused	9			9	9	9	x/col. 53	4, 9	9		9	#	9	9	9	x col. 34

* Deck 195 1942 Code indicated by x col. 54; 1944 Code indicated by No x col. 54
\# Col. 51-52 = 99
xx Deck 196: Sea and swell reported when col. 6 is not x over-punched and 40 is not added to Dir. Cols.

Definition of swell description

(a) For length of swell

Short	0-300 ft.	0-100 meters
Average	300-600 ft.	100-200 meters
Long	>600 ft.	>200 meters

(b) For height of swell

Low	0-7 ft.	0-2 meters
Moderate	7-13 ft.	2-4 meters
Heavy	>13 ft.	>4 meters

(c) Exact bounding values included in the lower category.

TABLE 22 TEMPERATURES

T, T_d, T_{wet}, T_{sea}, $T_{air-sea\ dif.}$

Scale 9 = 1/10 ° F

Scale 8 = 1/10 ° C

Scale 7 = Whole ° F

Scale 6 = Whole ° C

Scale 5 = Air-sea temperature difference

Code figures		
0	More than 9° F	Air temperature same as or higher than sea temperature.
1	6° to 9°	
2	3° to 6°	
3	1° to 3°	
4	No difference or less than 1° F higher	
5	Less than 1° F	Air temperature lower than sea temperature.
6	1° to 3°	
7	3° to 6°	
8	6° to 9°	
9	More than 9°	

Scale 4 = 1/10° C Negative or (-) value = T + 50.0

Scale 3 = Air-sea dif. °F, T_{dif} + 50 = Air < Sea Temp.

Scale 2 = RH % 2 digits

Scale 1 = RH % 3 digits

TABLE 23 PRESSURE TENDENCY

Scale 9 1955 Code

Symbol a - Barometer change characteristics in the last 3 hours

Code figures	Description	
0	Rising, then falling. Barometer the same or higher than 3 hours ago.	Barometer now higher than 3 hours ago.
1	Rising, then steady; or rising then rising more slowly.	
2	Rising, steadily or unsteadily.	
3	Falling or steady, then rising; or rising then rising more quickly.	
4	Steady. The barometer the same as 3 hours ago.	
5	Falling, then rising. Barometer the same or lower than 3 hours ago.	Barometer now lower than 3 hours ago.
6	Falling, then steady; or falling then falling more slowly.	
7	Falling, steadily or unsteadily.	
8	Steady or rising, then falling; or falling, then falling more quickly.	

Scale 8 1949 and 1921 Code

Symbol a - Characteristic of changes of barometer in the last 3 hours

Code figures	Description	
0	Rising, then falling.	Barometer now higher than or the same as 3 hours ago.
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.	Barometer now lower than 3 hours ago.
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.	

Scale 7 1929 Code

Symbol A - Barometric tendency and amount of change in last 3 hours

Code figures	Barometric tendency and amount of change
0	Barometer steady. (Has not fallen or risen more than 0.01 inch (1/2 millibar).)
1	Barometer rising slowly. (Has risen 0.03 to 0.04 inch (1 to 1-1/2 millibars).)
2	Barometer rising. (Has risen 0.06 to 0.10 inch (2 to 3-1/2 millibars).)
3	Barometer rising quickly. (Has risen 0.12 to 0.18 inch (4 to 6 millibars).)
4	Barometer rising very rapidly. (Has risen more than 0.18 inch (6 millibars).)
5	Barometer falling slowly. (Has fallen 0.03 to 0.04 inch (1 to 1-1/2 millibars).)
6	Barometer falling. (Has fallen 0.06 to 0.10 inch (2 to 3-1/2 millibars).)
7	Barometer falling quickly. (Has fallen 0.12 to 0.18 inch (4 to 6 millibars).)
8	Barometer falling very rapidly. (Has fallen more than 0.18 inch (6 millibars).)

Scale 1 WBAN	7 WMO 84 1955 Code	6 WMO 84 1949 Code	Statute Miles	Nautical Miles	Yards	Km.
000	00	x0			< 22	<.02
		x1			22	.02
		x2			44	.04
		x3			66	.06
		x4	<1/16		88	.08
001	01	x5	1/16	1/16	110	.1
		x6			132	.12
		x7			153	.14
		x8			175	.16
		x9			198	.18
		00	<1/8	<1/8	<220	<.2
002	02	01	1/8	1/8	220	.2
003	03		3/16	3/16	330	.3
004	04	02	1/4	1/4	440	.4
005	05		5/16	5/16	550	.5
006	06	03	3/8	3/8	660	.6
	07		7/16	7/16	770	.7
007	08	04	1/2	1/2	880	.8
	09		9/16	9/16	990	.9
008	10	05	5/8	5/8	1100	1.0
	11		11/16		1210	1.1
009	12	06	3/4	3/4	1320	1.2
	13		13/16		1430	1.3
	14	07	7/8		1540	1.4
	15		15/16		1650	1.5
	16	08	1.0		1760	1.6
	17		1-1/16		1870	1.7
010	18	09	1-1/8	1.0	1980	1.8
	19		1-3/16		2090	1.9
	20	10	1-1/4		2200	2.0
	21		1-5/16		2310	2.1
014	22	11	1-3/8	1-1/4	2420	2.2
	23		1-7/16		2530	2.3
	24	12	1-1/2		2640	2.4
	25		1-9/16		2750	2.5
017	26	13	1-5/8	1-1/2	2860	2.6
	27		1-11/16		2970	2.7
	28	14	1-3/4		3080	2.8
	29		1-13/16		3190	2.9
	30	15	1-7/8		3300	3.0
	31		1-15/16		3410	3.1
019	32	16	2	1-3/4	3520	3.2
	33		2-1/16		3630	3.3
	34	17	2-1/8		3740	3.4
	35		2-3/16		3850	3.5
020	36	18	2-1/4	2.0	3960	3.6
	37		2-5/16		4070	3.7
	38	19	2-3/8		4180	3.8
	39		2-7/16		4290	3.9
024	40	20	2-1/2	2-1/4	4400	4.0
	41		2-9/16		4510	4.1
	42	21	2-5/8		4620	4.2
	43		2-11/16		4730	4.3
	44	22	2-3/4		4840	4.4
	45		2-13/16		4950	4.5
027	46	23	2-7/8	2-1/2	5060	4.6
	47		2-15/16		5170	4.7
	48	24	3		5280	4.8
	49		3-1/16		5390	4.9
	50	25	3-1/8		5500	5.0
		26	3-3/16			5.2
030		27	3-1/4	3.0		5.4
		28	3-5/16			5.6
		29	3-3/8			5.8
	56	30	3-3/4		6600	6.0
		31				6.2
		32	4.0			6.4
		33				6.6
		34				6.8
	57	35	4-3/8		7700	7.0
		36				7.2
040		37		4.0		7.4
		38				7.6
		39				7.8
	58	40	5.0		8800	8.0
		41				8.2
		42				8.4
		43				8.6
		44				8.8
	59	45	5-5/8		9900	9.0
050		46		5.0		9.2
		47				9.4
		48	6.0			9.6
		49				9.8

8 1929 Code	9 1949 Code	9 1955 Code	Statute Miles	Nautical Miles	Yards	Km.
0	90	90	<1/32		<55	<.05
1	91	91	1/32		55	.05
2	92	92	1/8		220	.2
3	93	93	5/16	1/4	550	.5
4	94	94	5/8	1/2	1100	1.0
5	95	95	1-1/4	1	2200	2.0
6	96	96	2-1/2	2	4400	4.0
7	97	97	6-1/4	5	11,000	10.0
8	98	98	12-1/2	10	22,000	20.0
9	99	99	> 31-1/4	>25	55,000	>50.0

1 yd. = .9144 meter = 3 ft. =

1 Km. = 1093.6 yds. = 3280.8 ft.

1 nautical mile = 6080.27 ft. = 2027 yds. = 1.853248 km. = 1.15 statute miles

1 statute mile = 1760 yds. = 1609 meters = 5280 ft. = 1.6093 km

Scale 1 WBAN	7 1955 Code	6 1949 Code	Statute Miles	Nautical Miles	Yards	Km.
	60	50	6-1/4		11000	10.0
		51				10.2
		52				10.4
		53				10.6
		54				10.8
060	61	55	6-7/8	6.0	12100	11.0
		56	7.0			11.2
		57				11.4
		58				11.6
		59				11.8
	62	60	7-1/2		13200	12.0
		61				12.2
		62				12.4
		63				12.6
070		64	8.0	7		12.8
	63	65	8-1/8		14300	13.0
		66				13.2
		67				13.4
		68				13.6
		69				13.8
	64	70	8-3/4		15400	14.0
		71				14.2
		72	9.0			14.4
		73				14.6
080		74		8		14.8
	65	75	9-3/8		16500	15.0
		76				15.2
		77				15.4
		78				15.6
		79				15.8
090	66	80	10	9	17600	16.0
	67		10-5/8		18700	17.0
100	68		11-1/4	10	19800	18.0
	69		11-7/8		20900	19.0
110	70	81	12-1/2	11	22000	20.0
	71		13-1/8		23100	21.0
120	72		13-3/4	12	24200	22.0
	73		14-3/8		25300	23.0
130	74		15	13	26400	24.0
	75		15-5/8		27500	25.0
140	76		16-1/4	14	28600	26.0
	77		16-7/8		29700	27.0
150	78		17-1/2	15	30800	28.0
	79		18-1/8		31900	29.0
	80		18-3/4		33000	30.0
200	81		21-7/8	20	38500	35.0
250	82	82	25	25	44000	40.0
	83		28-1/8		49500	45.0
	84		31-1/4		55000	50.0
	85		34-3/8			55.0
350	86	83	37-1/2	35		60.0
	87		40-5/8			65.0
	88		43-3/4			70.0
450	89	84	50	45		80.0
550		85	65	55		100.0
850		86	95	85		150.0
		87	125	110		200.0
		88	190	165		300.0
		89	>315	>270		>500.0

Scale 9 (1949 Code)

Symbol "WW" - Present Weather

Figures 00 to 19: No precipitation, fog, duststorm, sandstorm or drifting snow at the station at the time of observation or during the preceding hour, except for 09.

Figures 00 to 03: No hydrometers except clouds

00 Cloud development not observed or not observable.
01 Clouds generally dissolving or becoming less developed.
02 State of sky on the whole unchanged.
03 Clouds generally forming or developing

} Characteristic change of the state of sky during the past hour.

Figures 04 to 09: Haze, dust, sand or smoke

04 Visibility reduced by smoke, e.g., veldt or forest fires, industrial smoke or volcanic ashes.
05 Dry 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 devil(s), and no duststorm or sandstorm seen.
08 Well developed dust devil(s) seen at or near the station within the past hour, but no duststorm or sandstorm.
09 Duststorm or sandstorm in sight of station or at station during the past hour.
10 Light fog. 1
11 Patches of
12 More or less continuous

} shallow fog at the station whether on land or sea, not deeper than about 2 metres on land or 10 metres at sea.

13 Lightning visible, no thunder heard.
14 Precipitation within sight, but not reaching the ground at the station.
15 Precipitation within sight, reaching the ground but distant (i.e., estimated to be more than 3.1 miles) from station.
16 Precipitation within sight, reaching the ground, near but not at the station.
17 Thunder heard but no precipitation at the station.
18 Squall(s) within sight during the past hour.
19 Funnel cloud(s) within sight during the past hour.

Figures 20 to 29: Precipitation, fog, or thunderstorm at the station during the preceding hour, but NOT at the time of observation.

20 Drizzle (not freezing).
21 Rain (" ")
22 Snow
23 Rain and snow
24 Freezing drizzle or freezing rain

} not falling as shower(s)

25 Shower(s) of rain
26 Shower(s) of snow, or rain and snow.
27 Shower(s) of hail, or of hail and rain.
28 Fog
29 Thunderstorm (with or without precipitation)

Figures 30 to 39: Duststorm, sandstorm, or drifting snow

30, 31, 32 Slight or moderate duststorm or sandstorm
- has decreased during the preceding hour
- no appreciable change during the preceding hour
- has increased during the preceding hour.

33, 34, 35 Severe duststorm or sandstorm
- has decreased during the preceding hour
- no appreciable change during the preceding hour.
- has increased during the preceding hour.

36 Slight or moderate drifting snow, generally low.
37 Heavy drifting snow, generally low.
38 Slight or moderate drifting snow, generally high.
39 Heavy drifting snow, generally high.

Figures 40 to 49: Fog at the time of observation.

40 Fog at a distance at the time of observation, but not at the station during the last hour, the fog extending to a level above that of the observer.
41 Fog in patches.
42 Fog, sky discernible
43 Fog, sky not discernible

} has become thinner during the preceding hour

44 Fog, sky discernible
45 Fog, sky not discernible

} no appreciable change during the preceding hour.

46 Fog, sky discernible
47 Fog, sky not discernible

} has begun or has become thicker during the preceding hour.

48 Fog depositing rime, sky discernible
49 Fog depositing rime, sky not discernible

Figures 50 to 99: Precipitation at the station at the time of observation.

Figures 50 to 59: Drizzle

50 Drizzle, not freezing, intermittent
51 Drizzle, not freezing, continuous

} slight at time of observation

52 Drizzle, not freezing, intermittent
53 Drizzle, not freezing, continuous

} moderate at time of observation

54 Drizzle, not freezing, intermittent
55 Drizzle, not freezing, continous

} thick at time of observation

56 Drizzle, freezing, slight
57 Drizzle, freezing, moderate or thick
58 Drizzle and rain, slight
59 Drizzle and rain, moderate or heavy.

Figures 60 to 69: Rain

60 Rain, not freezing, intermittent
61 Rain, not freezing, continuous

} slight at time of observation

62 Rain, not freezing, intermittent
63 Rain, not freezing, continuous

} moderate at time of observation

64 Rain, not freezing, intermittent
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

Figures 70 to 79: Solid precipitation, not in showers

70 Intermittent fall of snow flakes
71 Continuous fall of snow flakes

} slight at time of observation

72 Intermittent fall of snow flakes
73 Continuous fall of snow flakes

} moderate at time of observation

74 Intermittent fall of snow flakes
75 Continuous fall of snow flakes

} heavy at time of observation

76 Ice needles (with or without fog).
77 Granular snow (with or without fog).
78 Isolated starlike snow crystals (with or without fog).
79 Ice pellets (sleet, U.S. definition).

Figures 80 to 99: Showery precipitation, or precipitation with current or recent thunderstorm.

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, 88 Shower(s) of soft or small hail with or without rain or rain and snow mixed — slight, moderate or heavy
89, 90 Shower(s) of hail**, with or without rain or rain and snow mixed, not associated with thunder. — slight, moderate or heavy
91 Slight rain at time of observation.
92 Moderate or heavy rain at time of observation
93 Slight snow or rain and snow mixed or hail* at time of observation.
94 Moderate or heavy snow or rain and snow mixed or hail* at time of observation.

} 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.

} thunderstorm at time of observation.

1 The U.S. term "light fog" is synonymous with the European term "mist."
** Refers to hail only.
* Refers to "soft hail", "small hail," and "hail."

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WEATHER BUREAU, CLIMATOLOGICAL SERVICES DIV.
REFERENCE MANUAL
COMBINED MARINE

Scale 8 (1929 Code)

Symbol WW - Present Weather

Figures 00 to 19: Abbreviated description of sky and special phenomena.

00 Cloudless (from no clouds up to but not including 1/10)
01 Partly cloudy (from exactly 1/10 to exactly 5/10)
02 Cloudy (over 5/10 up to and including exactly 9/10)
03 Overcast (over 9/10)
04 Low fog, whether on land or sea.
05 Haze (but visibility 1000 meters, 1100 yards or more)
06 Dust devils seen.
07 Distant lightning.
08 Light fog (visibility 1000 meters, 1100 yards or more)
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 the last three hours.
16 Waterspouts seen in the last three hours.
17 Visibility reduced by smoke.
18 Blowing dust (visibility 1000 meters, 1100 yards or more)
19 Signs of tropical storm or hurricane.

Figures 20 to 29: Precipitation in last hour. (But not at time of observation)

20 Precipitation in any form.
21 Drizzle
22 Continuous or intermittent rain
23 Continuous or intermittent snow
24 Continuous or intermittent rain and snow mixed
25 Rain showers
26 Snow showers
27 Hail, or rain and hail, showers

} In the last hour but not at the time of observation

28 Light or moderate thunderstorm
29 Heavy thunderstorm

} with precipitation in the last hour, but no precip. at time of observation

Figures 30 to 39: Duststorms and storms of drifting snow (Visibility less than 1000 meters, 1100 yards)

30 Duststorm or sandstorm
31 Duststorm or sandstorm, has decreased
32 Duststorm or sandstorm, no appreciable change
33 Duststorm or sandstorm, has increased
34 Line of duststorms.
35 Storm of drifting snow.
36 Light or moderate storm of drifting snow, generally low
37 Heavy storm of drifting snow, generally low
38 Light or moderate storm of drifting snow, generally high
39 Heavy storm of drifting snow, generally high

Figures 40 to 49: Fog (Visibility less than 1000 meters, 1100 yards)

40 Fog
41 Moderate fog in last hour, but not at time of observation.
42 Thick or dense fog in last hour, but not at time of observation.
43 Fog, sky discernible
44 Fog, sky not discernible

} has become thinner during last hour

45 Fog, sky discernible
46 Fog, sky not discernible

} no appreciable change during last hour

47 Fog, sky discernible
48 Fog, sky not discernible

} has begun or become thicker during last hour

49 Fog in patches

Figures 50 to 59: Drizzle (Precipitation consisting of numerous minute drops)

50 Drizzle
51 Intermittent light drizzle
52 Continuous light drizzle
53 Intermittent moderate drizzle
54 Continuous moderate drizzle
55 Intermittent heavy drizzle
56 Continuous heavy drizzle
57 Drizzle and fog
58 Light or moderate drizzle and rain
59 Heavy drizzle and light rain

Figures 60 to 69: Rain

60 Rain
61 Intermittent light rain
62 Continuous light rain
63 Intermittent moderate rain
64 Continuous moderate rain
65 Intermittent heavy rain
66 Continuous heavy rain
67 Rain and fog
68 Light or moderate rain and snow mixed
69 Heavy rain and snow mixed

Figures 70 to 79: Snow

70 Snow
71 Intermittent light snow in flakes
72 Continuous light snow in flakes
73 Intermittent moderate snow in flakes
74 Continuous moderate snow in flakes
75 Intermittent heavy snow in flakes
76 Continuous heavy snow in flakes
77 Snow and fog
78 Snow grains
79 Ice crystals; or sleet (U.S. definition)

Figures 80 to 89: Showers

80 Showers
81 Showers of light or moderate rain
82 Showers of heavy rain
83 Showers of light or moderate snow
84 Showers of heavy snow
85 Showers of light or moderate rain and snow
86 Showers of heavy rain and snow
87 Showers of snow pellets
88 Showers of light or moderate hail, or rain and hail
89 Showers of hail, or rain and hail

Figures 90 to 99: Thunderstorm

90 Thunderstorm with precipitation falling
91 Rain and thunder in last hour, but only rain
92 Precipitation and thunder during last hour, but only snow or snow and rain mixed
93 Light thunderstorm without hail, but with rain or snow
94 Light thunderstorm, with small hail
95 Moderate thunderstorm, without hail but with rain or snow
96 Moderate thunderstorm, with small hail
97 Heavy thunderstorm, without hail but with rain or snow
98 Thunderstorm, combined with duststorm
99 Heavy thunderstorm, with hail

} at time of observation

Scale 6 (Deck 196)
Significant Weather (Cols. 74-76)

Code	74	75	76
0	Squalls	Dew	No ice or ice blink
1	Heavy squalls	Heavy dew	Slush or young ice
2	Wind gusts	Hoar frost	Fast ice
3	Water spout	Glazed frost and rime	Drift ice
4	Drizzle, Fog	Icing, smooth ice	Packed slush or strips of hummocked ice
5	Fog shower Fog bank	Rainbow	Open lead near shore
6	Coastal fog otherwise good visibility	Corona	
7	Unusual visibility, light visibility	Moon Corona	Heavy drift ice
8	Optical phenomena	Sun halo	Packed ice
9	Northern lights	Moon halo	Ice jamming
X	St. Elmo's fire	Sand or dust fall	Iceberg or icebergs

Scale 5 (Deck 194) Weather A (Visibility) col. 41

0	Ordinary visibility	(1921 Code)
1	Exceptional visibility	
2	Haze	
3	Mist	(1921 and 1930 Code)
4	Fog	
X	No observation	
0	No observation	(1930 Code)
9	Ordinary visibility	
0	No observation	
1	Exceptional visibility	(1949 Code)
3	Mist or haze	
4	Fog	
9	Ordinary visibility	

Scale 4 (Deck 194) Weather B - cols. 42-44

0	None of the active weather elements reported	(1921 Code)
1	Snow	
2	Squalls	
3	Rain	
4	Passing showers	
5	Drizzle	(1921 and 1930 Code)
6	Thunder	
7	Hail	
8	Lightning	
X	No observation	(1921 Code)
000	No observation	(1930 Code)
9	None of the active weather elements reported	(1930 Code)
1	Snow	
2	Squalls	
3	Rain	
4	Showers	
5	Drizzle	
6	Thunder	(1949 Code)
7	Hail	
8	Lightning	
9	No active weather reported	
000	No observation	

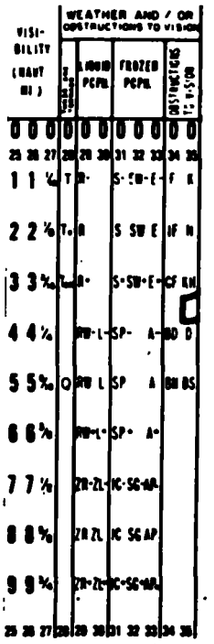
TABLE 25 Present Weather Continued

Scale 3 (Deck 189)

Symbol $S_p S_p$ -- Special Phenomena

Code	Plain language specifications
	Numbers 00-68. (The logbook contains details about):
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. Elmos 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.
60	Sand in the air, red fog, trade-wind dust, desert-dust.
65	Dimensions of hail-stones.
68	Abnormal radar reach.
	x punching in column 70 means that the logbook contains more particulars.
	x punching in column 71 means that the logbook contains an extra series of surface temperature observations.

Scale 2 (Deck 117)



Scale 1 (Deck 110)

A - Hail
B - Blowing
D - Dust
E - Sleet
F - Fog
G - Drifting snow or ground fog
H - Haze
I - Ice
K - Smoke
L - Drizzle
N - Sand
P - Pellets
Q - Squall
R - Rain
S - Snow
T - Thunderstorm
Tor. - Tornado
W - Showers
Water Spout (4 in Col. 26)
Z - Freezing
+ - Heavy or Dense
- - Light
No Sign - Moderate

See page 34 describing methods for determining intensity for weather and obstruction to vision.

TABLE 26 Past Weather W

Scale 9 (1949 Code)

Code figures	Description
0	Clear or few clouds
1	Partly cloudy or variable sky
2	Cloudy or overcast
3	Sandstorm or duststorm or drifting or blowing snow
4	Fog, smoke, or thick dust haze.
5	Drizzle
6	Rain
7	Snow or rain and snow mixed or sleet.
8	Shower(s).
9	Thunderstorm with or without precipitation.

Scale 8 (Deck 281) **Past Weather**

Code	Obstruction to Vision (col. 72)		Precipitation (col. 73)		Misc. Weather (col. 74)	
0	None		None		None	
1	Exceptional visibility	V	Precipitation in sight	jp	Clear	b
2	Drifting snow, light or moderate	ks	Thunder, no precip	t	Partly cloudy	bc
3	Drifting snow, heavy	Sk	Drizzle	d	Cloudy	c
4	Haze	Z	Showers	P	Overcast	o
5	Low fog	fg	Rain	r	Ugly, threatening sky	u
6	Mist	m	Snow	s	Lightning	1
7	Light fog	f	Rain and snow	rs	Gale	Gale
8	Fog	F	Hail	h	Squally weather	q
9	Fog	F	Thunderstorm with precipitation	t	Heavy squalls	KQ
Blank	Unknown		Unknown		Unknown	