LAYOUT FOR THE INTERNATIONAL MARITIME METEOROLOGICAL TAPE (IMMT) FORMAT IMMT-5 (Version 5)

Notes:

(a) The representation for missing data in any field is all blank(s).

(b) Many of the "Codes" in the IMMT format match "symbolic letters" as defined in the *Manual on Codes* (WMO–No.306) for the traditional alphanumeric (e.g. FM 13) SHIP code. However, the elements added for the VOSClim project (as introduced for IMMT-2), for example, did not appear in WMO–No.306, thus an effort was made to select unique new Codes to avoid conflicts in meaning between symbolic letter groups in WMO–No.306 versus Codes defined only in IMMT.

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
1	1	i_T	Format/temperature indicator	3 – temperatures in tenths of °C 4 – temperatures in halves of °C 5 – temperatures in whole °C [Note: codes 1-2 were previously used to refer to the obsolete IMMPC format; current codes all refer to the IMMT format]
2	2-5	AAAA	Year UTC	Four digits
3	6-7	MM	Month UTC	01 – 12 January to December
4	8-9	YY	Day UTC	01 – 31
5	10-11	GG	Time of observation	Nearest whole hour UTC, WMO specifications
6	12	Qc	Quadrant of the globe	WMO code table 3333
7	13-15	$L_aL_aL_a$	Latitude	Tenths of degrees, WMO specifications
8	16-19	$L_oL_oL_oL_o$	Longitude	Tenths of degrees
9	20		Cloud height (h) and visibility (VV) measuring indicator	0 – h and VV estimated 1 – h measured, VV estimated 2 – h and VV measured 3 – h estimated, VV measured
10	21	h	Height of clouds	WMO code table 1600
11	22-23	VV	Visibility	WMO code table 4377
12	24	N	Cloud amount	Oktas, WMO code table 2700; show 9 where applicable
13	25-26	dd	True wind direction	Tens of degrees, WMO code table 0877; show 00 or 99 where applicable
14	27	i_w	Indicator for wind speed	WMO code table 1855
15	28-29	ff	Wind speed	Units of knots or meters per second, hundreds omitted; values in excess of 99 knots are to be indicated in units of meters per second and i_w encoded accordingly; the method of estimation or measurement and the units used (knots or meters per second) are indicated in element 14. Wind is at observation height or anemometer height (i.e. it is not reduced to 10m).
16	30	s_n	Sign of temperature	WMO code table 3845
17	31-33	TTT	Air temperature	Tenths of degrees Celsius
18	34	s_t	Sign of dew-point temperature	0 – positive or zero measured dew-point temperature 1 – negative measured dew-point temperature

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*	
				2 – iced measured dew-point temperature 5 – positive or zero computed dew-point temperature 6 – negative computed dew-point temperature 7 – iced computed dew-point temperature	
19	35-37	$T_dT_dT_d$	Dew-point temperature	Tenths of degrees Celsius	
20	38-41	PPPP	Air pressure	Tenths of hectopascals	
21	42-43	ww	Present weather	WMO code table 4677 or 4680	
22	44	W_1	Past weather	WMO code table 4561 or 4531	
23	45	W_2	Past weather	WMO code table 4561 or 4531	
24	46	N_h	Amount of lowest clouds	As reported for C_L or, if no C_L cloud is present, for C_M, in oktas; WMO code table 2700	
25	47	C_L	Genus of CL clouds	WMO code table 0513	
26	48	C_M	Genus of CM clouds	WMO code table 0515	
27	49	C_H	Genus of CH clouds	WMO code table 0509	
28	50	s_n	Sign of sea-surface temperature	WMO code table 3845	
29	51-53	$T_WT_WT_W$	Sea surface temperature	Tenth of degrees Celsius	
30	54		Indicator for sea-surface temperature measurement	0 – Bucket thermometer 1 – Condenser inlet 2 – Trailing thermistor 3 – Hull contact sensor 4 – “Through hull” sensor 5 – Radiation thermometer 6 – Bait tanks thermometer 7 – Others	
31	55		Indicator for wave measurement	Shipborne wave recorder	0 – Wind sea and swell estimated 1 – Wind sea and swell measured 2 – Mixed wave measured, swell estimated 3 – Other combinations measured and estimated
				Buoy	4 – Wind sea and swell measured 5 – Mixed wave measured, swell estimated 6 – Other combinations measured and estimated
				Other measurement system	7 – Wind sea and swell measured 8 – Mixed wave measured, swell estimated 9 – Other combinations measured and estimated
32	56-57	P_WP_W	Period of wind waves or of measured waves	Whole seconds; show 99 where applicable in accordance with Note (3) under specification of P_WP_W in WMO–No.306.	
33	58-59	H_WH_W	Height of wind waves or of measured waves	Half-meter values. Examples: Calm or less than ¼m to be encoded 00; 3½m to be encoded 07; 7m to be encoded 14; 11½m to be encoded 23.	

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
34	60-61	$d_{W1}d_{W1}$	Direction of predominant swell waves	Tens of degrees, WMO code table 0877; encoded 00 or 99 where applicable. Blanks = no observation of waves attempted.
35	62-63	$P_{W1}P_{W1}$	Period of predominant swell waves	Whole seconds; encoded 99 where applicable (see under element 32)
36	64-65	$H_{W1}H_{W1}$	Height of predominant swell waves	Half-meter values (see under element 33)
37	66	I_s	Ice accretion on ships	WMO code table 1751
38	67-68	E_sE_s	Thickness of ice accretion	In centimeters
39	69	R_s	Rate of ice accretion	WMO code table 3551
40	70		Source of observation	0 – Unknown 1 – Logbook (paper) 2 – National Telecommunication channels 3 – National Publications 4 – Logbook (electronic) 5 – Global Telecommunication channels (GTS) 6 – International Publications [Note: Formerly (usage now discontinued): codes 1-3 also referred to “National data exchange,” and codes 4-6 also referred to “International data exchange”; distinction added between paper and electronic logbook]
41	71		Observation platform	0 – Unknown 1 – Selected ship 2 – Supplementary ship 3 – Auxiliary ship 4 – Registered VOSClim ship 5 – Fixed sea station (e.g., rig or platform) 6 – Coastal station [Note: 7 – Reserved] [Note: 8 – Reserved] 9 – Others/data buoy [Note: Formerly (usage now discontinued): code 4 referred to “Automated station/data buoy;” and codes 7-8 referred to “Aircraft” and “Satellite,” respectively]
42	72-78		Ship’s call sign	Ship’s call sign stored left-justified (with right-blank fill) as follows: 7-character call sign: columns 72–78 6-character call sign: columns 72–77 5-character call sign: columns 72–76 4-character call sign: columns 72–75 3-character call sign: columns 72–74
43	79-80		Country which has recruited the ship	According to the 2-character alphabetical codes assigned by the International Organization for Standardization (ISO)
44	81		National use	
45	82		Quality control indicator	0 – no QC has been performed 1 – manual QC only 2 – automated QC only (such as using only MQC) 3 – automated QC only (with time sequence checks)

Element Number	Character Number	Code	Element	Coding procedure	
				4 – manual and automated QC (superficial) 5 – manual and automated QC (superficial; with time-sequence checks) 6 – manual and automated QC (intensive; with time-sequence checks) 7 – [reserved] 8 – [reserved] 9 – national system of QC (information to be furnished to WMO)	
46	83	i_X	Weather data indicator	1 – Manual	
				4 – Automatic	If present and past weather data included Code tables 4677 and 4561 used
				7 – Automatic	If present and past weather data included Code tables 4680 and 4531 used
47	84	i_R	Indicator for inclusion or omission of precipitation data	WMO code table 1819	
48	85-87	RRR	Amount of precipitation which has fallen during the period preceding the time of observation, as indicated by t_R	WMO code table 3590	
49	88	t_R	Duration of period of reference for amount of precipitation, ending at the time of the report	WMO code table 4019	
50	89	s_w	Sign of wet-bulb temperature	0 – positive or zero measured wet-bulb temperature 1 – negative measured wet-bulb temperature 2 – iced measured wet-bulb temperature 5 – positive or zero computed wet-bulb temperature 6 – negative computed wet-bulb temperature 7 – iced computed wet-bulb temperature	
51	90-92	$T_bT_bT_b$	Wet-bulb temperature	In tenths of degree Celsius, sign given by element 50	
52	93	a	Characteristic of pressure tendency during the three hours preceding the time of observation	WMO code table 0200	
53	94-96	ppp	Amount of pressure tendency at station level during the three hours preceding the time of observation	In tenths of hectopascal	
54	97	D_s	True direction of resultant displacement of the ship during the three	WMO code table 0700	

Element Number	Character Number	Code	Element	Coding procedure
			hours preceding the time of observation	
55	98	v_s	Ship's average speed made good during the three hours preceding the time of observation	WMO code table 4451
56	99-100	$d_{W2}d_{W2}$	Direction of secondary swell waves	Tens of degrees, WMO code table 0877; encoded 00 or 99 where applicable. Blanks – no observation of waves attempted.
57	101-102	$P_{W2}P_{W2}$	Period of secondary swell waves	Whole seconds; encoded 99 where applicable (see under element 32)
58	103-104	$H_{W2}H_{W2}$	Height of secondary swell waves	Half-meter values (see under element 33)
59	105	c_i	Concentration or arrangement of sea ice	WMO code table 0639
60	106	S_i	Stage of development	WMO code table 3739
61	107	b_i	Ice of land origin	WMO code table 0439
62	108	D_i	True bearing of principal ice edge	WMO code table 0739
63	109	z_i	Present ice situation and trend of conditions over the preceding three hours	WMO code table 5239
64	110		FM code version	0 – previous to FM 24-V 1 – FM 24-V 2 – FM 24-VI Ext. 3 – FM 13-VII 4 – FM 13-VIII 5 – FM 13-VIII Ext. 6 – FM 13-IX 7 – FM 13-IX Ext. 8 – FM 13-X 9 – FM 13-XI A – FM 13-XII Ext. B – FM 13-XIII C – FM 13-XIV Ext. [Note: etc. for future configurations]
65	111		IMMT version	0 – IMMT version just prior to version number being included 1 – IMMT-1 (in effect from 2 Nov. 1994) 2 – IMMT-2 (in effect from Jan. 2003) 3 – IMMT-3 (in effect from Jan. 2007) 4 – IMMT-4 (in effect from Jan. 2011) 5 – IMMT-5 (in effect from June 2012) [Note: etc. for future configurations]
66	112	Q_1	Quality control indicator for (h)	0 – no QC has been performed on this element 1 – QC performed; element appears correct 2 – QC performed; element appears inconsistent with other elements 3 – QC performed; element appears doubtful 4 – QC performed; element appears erroneous

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
				5 – QC performed; element changed (possibly to missing) as a result 6 – QC flag amended: element flagged by CM as correct (1), but according to MQCS still appears suspect (2-4) or missing (9) 7 – QC flag amended: element flagged by CM as changed (5), but according to MQCS still appears suspect (2-4) 8 – [reserved] 9 – element is missing
67	113	Q_2	QC indicator for (VV)	- idem -
68	114	Q_3	QC indicator for (N and clouds: elements 12, 24–27)	- idem -
69	115	Q_4	QC indicator for (dd)	- idem -
70	116	Q_5	QC indicator for (ff)	- idem -
71	117	Q_6	QC indicator for (s_n and TTT)	- idem -
72	118	Q_7	QC indicator for (s_t and $T_dT_dT_d$)	- idem -
73	119	Q_8	QC indicator for (PPPP)	- idem -
74	120	Q_9	QC indicator for (weather: ww, W_1, W_2; elements 21–23)	- idem -
75	121	Q_{10}	QC indicator for (s_n and $T_WT_WT_W$)	- idem -
76	122	Q_{11}	QC indicator for (P_WP_W)	- idem -
77	123	Q_{12}	QC indicator for (H_WH_W)	- idem -
78	124	Q_{13}	QC indicator for (swell: elements 34–36, 56–58)	- idem -
79	125	Q_{14}	QC indicator for (i_RRRRt_R)	- idem -
80	126	Q_{15}	QC indicator for (a)	- idem -
81	127	Q_{16}	QC indicator for (ppp)	- idem -
82	128	Q_{17}	QC indicator for (D_s)	- idem -
83	129	Q_{18}	QC indicator for (v_s)	- idem -
84	130	Q_{19}	QC indicator for (s_w and $T_bT_bT_b$)	- idem -
85	131	Q_{20}	QC indicator for ships' position	- idem -
86	132	Q_{21}	Version identification for Minimum Quality Control Standard	1 – MQCS-1 (Original version, Feb. 1989): CMM-X 2 – MQCS-2 (Version 2, March 1997) CMM-XII 3 – MQCS-3 (Version 3, April 2000) SGMC-VIII 4 – MQCS-4 (Version 4, June 2001): JCOMM-I

Element Number	Character Number	Code	Element	Coding procedure
			(MQCS)	5 – MQCS-5 (Version 5, July 2004): ETMC-I 6 – MQCS-6 (Version 6, November 2009)) JCOMM-III 7 – MQCS-7 (Version 7, in effect from June 2012) JCOMM-IV [Note: etc. for future configurations]
			Additional Requirements for VOSClim:	
87	133-135	HDG	Ship's heading; the direction to which the bow is pointing, referenced to true North	(001-360); e.g. 360 = North 090 = East
88	136-138	COG	Ship's ground course; the direction the vessel actually moves over the fixed earth and referenced to True North	(000-360); e.g. 360 = North 000 = No Movement 090 = East
89	139-140	SOG	Ship's ground speed; the speed the vessel actually moves over the fixed earth	(00-99); Round to nearest whole knot
90	141-142	SLL	Maximum height in meters of deck cargo above Summer maximum load line (reference level)	(00-99); Round to nearest whole meter
91	143	s_L	Sign of departure of reference level	0 = positive or zero, 1 = negative
92	144-145	hh	Departure of reference level (Summer maximum load line) from actual sea level	Difference to the nearest whole meter (00-99) between the Summer maximum load line and the sea level (water line); positive when the Summer maximum load line is above the level of the sea and negative if below the water line
93	146-148	RWD	Relative wind direction in degrees off the bow	Relative wind direction; e.g. 000 = no apparent relative wind speed (calm conditions on deck). Reported direction for relative wind = 001-360 degrees in a clockwise direction off the bow of the ship. When directly on the bow, RWD = 360.
94	149-151	RWS	Relative wind speed indicated by i_w (knots or m s^{-1})	Reported in either whole knots or whole meters per second (e.g. 010 knots or 005 m s^{-1}). Units established by i_w (element 14) [Note: RWS is a 3-character field to store values of RWS larger than ff (if i_w indicates knots), e.g. ff=98 knots, RWS=101 knots; see also element 15.]
95	152	Q_{22}	QC indicator for (HDG)	[Note: coding as for element 66]
96	153	Q_{23}	QC indicator for (COG)	– idem –
97	154	Q_{24}	QC indicator for (SOG)	– idem –

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
98	155	Q_{25}	QC indicator for (SLL)	– idem –
	156		blank	[Note: Formerly (usage now discontinued): QC indicator for (s_L); now Q_{27} serves as the indicator for both s_L and hh]
99	157	Q_{27}	QC indicator for (s_L and hh)	– idem –
100	158	Q_{28}	QC indicator for (RWD)	– idem –
101	159	Q_{29}	QC indicator for (RWS)	– idem –
102	160-163	RH	Relative humidity	Tenths of Percentage
103	164	RHi	Relative humidity indicator	0 – Relative humidity in tenths of Percentage, measured and originally reported 1 – Relative humidity in whole Percentage, measured and originally reported [Note: 2 – Reserved] 3 – Relative humidity in tenths of Percentage, computed 4 – Relative humidity in whole Percentage, computed
104	165	AWSi	AWS indicator	0 – No Automated Weather Station (AWS) 1 – AWS 2 – AWS plus Manual Observation
105	166-172	IMOno	IMO number	Seven digits (or left justified with right-blank fill)