A N N E X   IX

Annex to Recommendation 23 (CMM-III)

PART A

LAY-OUT FOR AN INTERNATIONAL MARITIME METEOROLOGICAL PUNCH-CARD

Column	Element	Punching procedures
1	Temperature indicator	1 = Celsius, 2 = Fahrenheit
2- 3	Year GMT	Last 2 digits
4- 5	Month GMT	01-12 January to December
6- 7	Day GMT	01-31
8	Octant of the Globe, Q	WMO Code 3300
9-11	Latitude, $L_a L_a L_a$	Tenths of degrees, WMO specifications
12-14	Longitude $L_o L_o L_o$	Tenths of degrees, WMO specifications
15-16	Time of observation, GG	Nearest whole hour GMT, WMO specifications
17	Cloud amount, N	Oktas, WMO Code 2700
18-19	True wind direction, dd	Tens of degrees, WMO Code 0877. If the data for wind direction and speed have been measured an x overpunch is given in column 18
20-21	Wind speed, ff	Tens and units of knots; hundreds omitted; values in excess of 99 knots to be indicated by an x overpunch in column 20
22-23	Visibility, VV	WMO Code 4377
24-25	Present weather, ww	WMO Code 4677
26	Past weather, W	WMO Code 4500
27-31	Air pressure	Tenths of millibars
32-34	Air temperature	Tenths of degrees Celsius or Fahrenheit, as indicated by column 1. Negative temperatures to be indicated by an x overpunch in column 32
35-37	Wet bulb temperature	Tenths of degrees Celsius or Fahrenheit, as indicated by column 1. Negative temperatures to be indicated by an x overpunch in column 35; ice on wet bulb to be indicated by an x overpunch in column 37
38	Amount of lowest clouds, N_h	As reported for C_L or, if no C_L cloud is present, for C_M; in oktas, WMO Code 2700

Column	Element	Punching procedures
39	Type of C_L clouds	WMO Code 0513
40	Height of clouds, h	WMO Code 1600
41	Type of C_M clouds	WMO Code 0515
42	Type of C_H clouds	WMO Code 0509
43-45	Sea temperature	Tenths of degrees Celsius or Fahrenheit, as indicated by column 1. Negative temperatures to be indicated by an x overpunch in column 43
46-48	Air-sea temperature difference*	Difference air minus sea surface temperature in tenths of degrees Celsius or Fahrenheit, as indicated in column 1. Negative differences to be indicated by an x overpunch in column 46
49-50	Direction of wind waves, $d_w d_w$	Tens of degrees, WMO Code 0885
51-52	Period of wind waves	WMO Code 3155 (use column 51 when one figure is punched for P_W)
53-54	Height of wind waves	Half meter values, based on WMO Code 1555
55-56	Direction of swell waves	Tens of degrees, WMO Code 0885
57-58	Period of swell waves	WMO Code 3155 (use column 57 when one figure is punched for P_W)
59-60	Height of swell waves	Half-meter values, based on WMO Code 1555
61-62	Country which has recruited ship	Number to be assigned by WMO
63	Card indicator	0 = punched according to WMO codes, effective in year indicated in columns 2/3
64-73		Not to be punched
74-76	Dew-point temperature*	Tenths of degrees Celsius or Fahrenheit, as indicated in column 1. Negative temperatures to be indicated by an x overpunch in column 74
77	Wind force	Beaufort wind scale 0-9 values 10-12 to be punched 0-2 with an x overpunch in column 77
78-80		Not to be punched

* Should be included, if available, in tenths of degrees.

N O T E S :

(1)   Members using the punch-card system for their current maritime observations will reproduce the international maritime punch-cards mechanically from their own punch-cards, punching zero in column 63

and leaving blank the spare columns 64-73, 78-80, which may be used
by the responsible Members for computing purposes.

(2)   When preparing for exchange of data from former years on request of
the responsible Member concerned, a Member may use the columns 64-73,
78-80 for providing additional data. In this case, column 63 is
punched 1, 2, 3 or 4 (see Part B) and all columns will be punched
according to Annex 1 modified by Part B as far as requested by the
responsible Member.

(3)   When temperature and pressure are reported in whole units, the column
of the tenths of these units is to be punched 0.

(4)   The x's appearing in some of the above-mentioned WMO codes must not
be punched.

(5)   If an element is missing the columns concerned are left blank.

OVERPUNCHES

x/ = x or 11 overpunch in column specified

x/ in column 18 = measured data for wind direction and speed
x/ in column 20 = wind speed, 100 knots or more
x/ in column 32 = negative values of air temperature in °C or °F
x/ in column 35 = negative values of wet-bulb temperature in °C or
                  °F
x/ in column 37 = ice on wet bulb
x/ in column 43 = negative values of sea surface temperature in °C
x/ in column 46 = air temperature lower than sea temperature
x/ in column 74 = negative value of dew point in °C or °F
x/ in column 77 = Beaufort wind scale, 10 or more.

*

*   *

PART B

SUPPLEMENTARY PUNCHING PROCEDURES FOR USE OF AN
INTERNATIONAL MARITIME METEOROLOGICAL PUNCH-CARD FOR EXCHANGE
OF CARDS WITH DEVIATING CODES OR ADDITIONAL DATA

Column	Element	Supplementary punching procedures
1	Temperature indicator	1 = tenths of degrees Celsius 2 = tenths of degrees Fahrenheit 3 = whole degrees Celsius (col. 34, 37, 45, 48, 76 punched 0) 4 = whole degrees Fahrenheit (col. 34, 37, 45, 48, 76 punched 0) 5 = halves of degrees Celsius 6 = halves of degrees Fahrenheit 7 = tenths of degrees Fahrenheit, but whole degrees for dew point (col. 76 punched 0)
2- 3	Year GMT	Last 2 digits; dates from the 19th century to be indicated by an x overpunch in column 2
63	Card indicator	1 = data with deviating codes or additional groups as indicated in col. 64-68; col. 78-80 left blank; 2 = data with deviating codes or additional groups as indicated in col. 64-68; ship or log number punched in col. 78-80; 3 = data with deviating codes or additional groups as indicated in col. 64-68; col. 74-80 left blank for special purposes (Indian Ocean Survey); 4 = data with deviating codes or additional groups as indicated in col. 64-67, indicator in col. 68 must be 4. Col. 52, 54, 58 and 60 must not be used for punching wave data. Col. 78-80 left blank.

64	Indicator for location	0 = Q $L_aL_aL_aL_oL_oL_o$ in col. 8-14
		1 = 10° Marsden square in col. 8-10
		   1° unit of latitude in col. 11
		   1° unit of longitude in col. 12

Column	Element	Supplementary punching procedures
		1/10° unit of latitude in col. 13 1/10° unit of longitude in col. 14 2 = ocean station vessel,* Q $L_aL_aL_aL_oL_oL_o$ in col. 8-14. An ocean station vessel occupying an ocean weather station to be indicated by an x overpunch in col. 64 3 = ocean station vessel,* location in Marsden squares in col. 8-14. An ocean station vessel occupying an ocean weather station to be indicated by an x overpunch in col. 64 4 = anchored, Q $L_aL_aL_aL_oL_oL_o$ in col. 8-14 5 = anchored, location in Marsden squares in col. 8-14
65	Indicator for wind data in col. 18-21 included	dd ff 0 = 36 pts knots 1 = 32 pts knots 2 = 36 pts Beaufort 3 = 32 pts Beaufort 4 = 36 pts metres per second 5 = 32 pts metres per second
66	Indicator for VV	0 = WMO Code 4377 1 = VV = 00-89, WMO Code 1949
67	Indicator for waves	0 = WMO Codes 0885, 3155 and 1555 in col. 49-60 1 = WMO Code 75 (1954) WMO Code 75 (Nov. 1957), code renumbered 3700 effective 1960, in col. 49-50, 53 2 = Sea code (Douglas or Copenhagen 1929 scales) in col. 49-50, 53 Swell code (Douglas or Copenhagen 1929, Berlin 1939 scales) in col. 55-56, 59 3 = Sea code (Paris 1919 scale) in col. 49-50, 53 Swell code (Douglas or Copenhagen 1929, Berlin 1939 scales) in col. 55-56, 59

---

* By "ocean station vessel" is meant a ship meteorologically equipped to occupy an ocean weather station.

Column	Element	Supplementary punching procedures
68	Indicator for use of additional groups	

0 = no additional data

1 = ship's course and speed, pressure tendency and precipitation data in col. 69-77

    - col. 69, D_s = ship's course (true) made good during the three hours preceding the time of observation, WMO Code 0700

    - col. 70, v_s = ship's average speed made good during the three hours preceding the time of observation, WMO Code 4451

    - col. 71, a = characteristic of pressure tendency during the three hours preceding the time of observation, WMO Code 0200

    - col. 72-73, pp = amount of pressure tendency during the three hours preceding the time of observation, expressed in tenths of millibars. Tens of millibars are indicated by overpunches, an x overpunch in col. 72 is given for values 10.0-19.9 mb, an x overpunch in col. 73 for values 20.0-29.9 mb

    - col. 74-75, RR = amount of precipitation, WMO Code 3577

    - col. 76-77, $T_R T_R$ = duration of precipitation, WMO Code 4080

2 = ice data in col. 69-73

    - col. 69, c_2 = description of kind of ice, WMO Code 0663

    - col. 70, K = effect of the ice on navigation, WMO Code 2100

    - col. 71, D_i = bearing of ice edge, WMO Code 0739

    - col. 72, r = distance to ice edge from reporting ship, WMO Code 3600

    - col. 73, e = orientation of ice edge, WMO Code 1000

3 = unassigned

4 = Beaufort weather notation according to note 1 in col. 52, 54, 58, 60, 74-76. Indicator in col. 63 must be 4

5 = Beaufort weather notation according to note 2 in col. 69-72

Column	Element	Supplementary punching procedures

6 = ship's course and speed, and pressure tendency in col. 69-73
- col. 69, D_s = ship's course (true) made good during the three hours preceding the time of observation, WMO Code 0700
- col. 70, v_s = ship's average speed made good during the three hours preceding the time of observation, WMO Code 4451
- col. 71, a = characteristic of pressure tendency during the three hours preceding the time of observation, WMO Code 0200
- col. 72-73, pp = amount of pressure tendency during the three hours preceding the time of observation, expressed in tenths of millibars. Tens of millibars are indicated by overpunches, an x overpunch in col. 72 is given for values 10.0-19.9 mb, an x overpunch in col. 73 for values 20.0-29.9 mb

7 = precipitation data in col. 69-72
- col. 69-70, RR = amount of precipitation, WMO Code 3577
- col. 71-72, $t_R t_R$ = duration of precipitation, WMO Code 4080

8 = cloud data in col. 69-72
- col. 69, N_s = amount of individual cloud layer or mass, of genus (type) C, WMO Code 2700
- col. 70, C = genus (type) of cloud, WMO Code 0500 (x not to be punched)
- col. 71-72, $h_s h_s$ = height of base of cloud layer or mass whose genus (type) is indicated by C, WMO Code 1577

9 = special phenomena in col. 69-72 according to regional codes, viz. :
in Region I WMO Code 169
in Region II WMO Code 268
in Region III WMO Code 383
in Regions IV and V WMO Code 483
in Region VI WMO Code 668
in Antarctica WMO Code 768

N O T E S :

(1)   Beaufort weather notation (German system) according to the following
          code :

          Column 52   0 = cloud amount $< 2/8$
                           1 = $2/8 <$ cloud amount $< 6/8$
                           2 = cloud amount $> 6/8$
                           3 = overcast and cloud amount $> 6/8$ combined
                           4 = overcast
                           5 = no data concerning cloudiness
                           6 = unassigned
                           7 = unassigned
                           8 = unassigned
                           9 = no data concerning the weather

          Column 54   0 = fog
                           1 = thick fog
                           2 = slight mist
                           3 = mist
                           4 = abnormal visibility
                           5 = very abnormal visibility
                           6 = dust haze
                           7 = gloom
                           8 = ugly sky
                           9 = unassigned

          Column 58   0 = drizzle
                           1 = thick drizzle
                           2 = rain
                           3 = heavy rain
                           4 = rain squalls or showers of rain
                           5 = heavy rain squalls or heavy showers of rain
                           6 = unassigned
                           7 = snow squalls or showers of snow
                           8 = heavy snow squalls or heavy showers of snow
                           9 = squalls of drizzle

          Column 60   0 = snow
                           1 = heavy snow
                           2 = hail
                           3 = heavy hail
                           4 = snow and hail
                           5 = heavy snow and hail together
                           6 = snow and rain together
                           7 = heavy snow and rain together
                           8 = unassigned
                           9 = unassigned

Column 74   0 = lightning
                 1 = intense lightning
                 2 = thunder
                 3 = heavy thunder
                 4 = thunderstorm
                 5 = heavy thunderstorm
                 6 = drizzle and rain together
                 7 = heavy drizzle and rain together
                 8 = rain and hail together
                 9 = heavy rain and hail together

Column 75   0 = squalls
                 1 = heavy squalls
                 2 = ground fog
                 3 = fog in patches
                 4 = wet fog
                 5 = fog on shore
                 6 = solar halo
                 7 = solar halo complex
                 8 = lunar halo
                 9 = lunar halo complex
         x or 11 = waterspout (tornado)

Column 76   0 = dew
                 1 = heavy dew
                 2 = sandstorm
                 3 = hoarfrost
                 4 = soft rime
                 5 = glazed frost
                 6 = ice, pack ice
                 7 = icebergs
                 8 = aurora
                 9 = mirage
         x or 11 = St. Elmo's fire
         r or 12 = sudden increase of wind

(2)   Beaufort weather notation (British system) according to the follow-
         ing code (used from the 1st January 1949 to the 31st March 1953) :

Column 69   0 = no visibility observation
                 1 = abnormal visibility
                 2 = unassigned
                 3 = mist or haze (visibility 1-2 km)
                 4 = fog (visibility less than 1 km)
                 5 = unassigned
                 6 = unassigned
                 7 = unassigned
                 8 = unassigned
                 9 = visibility greater than 2 km

Columns 70-72   000 = no observation of weather
                         1 = snow
                         2 = squalls
                         3 = rain
                         4 = showers
                         5 = drizzle
                         6 = thunder
                         7 = hail
                         8 = lightning
                       999 = none of above reported

OVERPUNCHES

x/ = x or 11 overpunch in column specified
r/ = r or 12 overpunch in column specified
x/ in column 2 = observations from 19th century
x/ in column 64 = ocean weather station
x/ in column 72 = pp = 10 mb + value punched
x/ in column 73 = pp = 20 mb + value punched
x/ in column 75 = waterspout (tornado)
x/ in column 76 = St. Elmo's fire
r/ in column 76 = sudden increase of wind