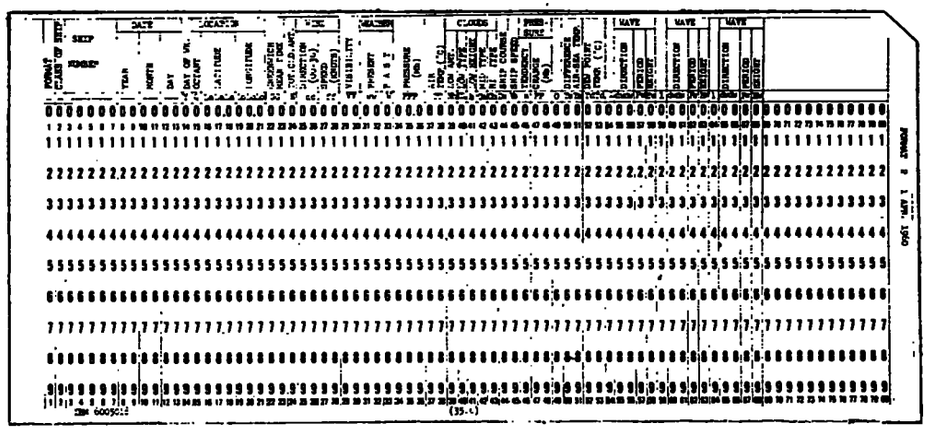
119 JAPANESE MARINE SURFACE OBSERVATIONS



AREA COVERAGE

Ocean areas transversed by Japanese ships. A card inventory by ten degree squares are maintained at the National Weather Records Center (NWRC), Asheville, North Carolina.

PERIOD OF RECORD

1953-1960 (for period 1934-1953 see Deck 118).

OBSERVATION TIME

00, 06, 12, 18 Greenwich Mean Time (GMT) observations were punched in most instances. The additional hours of 03, 09, 15, 21 GMT observations were punched by some ships.

CODE

WMO Code Form FM 21.A. WMO Code Tables indicated as 1949 code is applicable through 1959 unless otherwise indicated.

SOURCE

The data in this deck were extracted from the Japanese Ships' Logs by the Japanese Meteorological Agency for the U. S. Weather Bureau. Microfilm of the Logs are on file at the National Weather Records Center (NWRC), Asheville, North Carolina.

MISSING DATA

If an element(s) was missing within an observation the card columns for that element(s) were left blank. (In some instances an X was punched in the first column of the field and the remaining columns were left blank. This is particularly true in respect to wave data.) If an entire observation was missing, no identification card was punched.

COLUMNS AND ELEMENTS PUNCHED

Columns 1-68 were punched when data were available for the following elements: (Columns 69-80 were left blank)

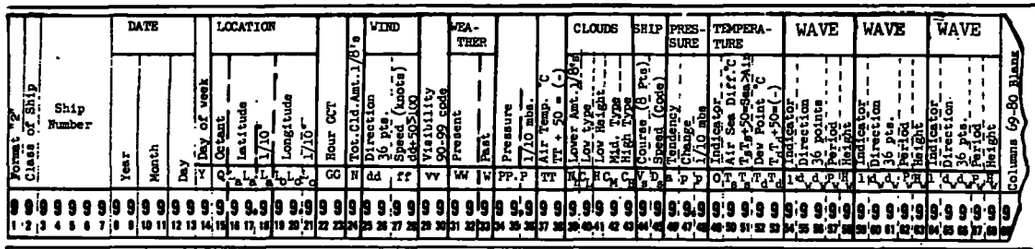
Total Cloud Amount
Wind Direction and Speed
Visibility
Present Weather
Pressure (Sea Level)
Temperature of Air
Clouds -
  Lower Amount and Type
  Height of Lower
  Type of Middle and High
Ships' Direction and Speed
Pressure Tendency and Amount of Change
Temperature (Air-Sea difference)
Temperature Dew Point
Waves (See Columns 54-58 Remarks.)
  Direction
  Period
  Height

ADDITIONAL REMARKS

Note: In some instances the temperature, dew point and air sea temperature differences were punched in whole degrees Fahrenheit (°F). In cases where the temperature and dew point were converted to °C the air sea temperature difference was not converted and punched in whole °F.

CORRECTION

Any errors detected in this manual should be called to the attention of Director, National Weather Records Center, or Chief, Data Processing Division, Climatic Center, USAF. Please give specific instances of error, and correct information if available.



CARD CONTENT

Column	Item or Element	Symbolic Letter	Card Code	Card Code Definition	Remarks
14-68	All Elements		Blank	Missing Data	Card Columns left blank indicate missing data.
1	Format Number		2	Indicate data is in Format 2. See Deck 118 for Format #1.	In the period 1953 through 1960 the reporting forms were changed; therefore, the card format and codes were used to conform with these changes.
2	Ship Class		0-5	See Code 1.	
3-7	Ship Number		53001-60999	Indicates ship name	A list of the ship numbers and names are maintained at the NWRC. The first two digits are the same as the year.
8-9	Year		53-60	1953-1960	Date is in GMT
10-11	Month		01-12	January-December	
12-13	Day		01-31	1st-31st day of month	
14	Day of week		1-7	Sunday-Saturday, resp.	
15-21	LOCATION				Ships position in 1/10°
15	Octant	Q	0-3, 5-8	See Code 2	
16-18	Latitude	$L_aL_aL_a$	000-900	0.0-90.0° North or South	Column 15 indicates the North or South Latitude and the West or East Longitude direction and the hundreds position digit of the Longitude.
19-21	Longitude	$L_oL_oL_o$	000-999 000-800	0.0-99.9° West or East 100.0-180.0 " " "	
22-23	Hour	GG	00-23	Indicates the hour. 0000 (Midnight) - 2300 GMT. Punched to the nearest hour	
24	Total Cloud Amount	N	0-8, 9	See Code 3	
25-28	WIND				
25-26	Direction	dd	00-36	See Code 4	Wind speeds > 100 kts. were indicated by dd + 50 for direction, the speed in excess of 100 kts. were punched in columns 27-28
27-28	Speed	ff	00-99	Calm-99 knots See Code 5	
29-30	Visibility	VV	90-99	See Code 6	

CARD CONTENT

Column	Item or Element	Symbolic Letter	Card Code	Card Code Definition	Remarks
31-33	WEATHER				
31-32	Present	WW	00-99	See Code 7	
33	Past	W	0-9	See Code 8	
34-36	Pressure (1/10 mbs.)	PPP	000-999	0.0-99.9 mbs. at Mean Sea Level (MSL) See Code 9	The thousands and hundreds position digits are omitted.
37-38	Air Temperature Whole °C	TT	00-49 50-99	0 through 49°C -0 through -49°C See Code 10	Negative values indicated by adding the absolute value of TT to 50. See Additional Remarks, page 1.
39-43	CLOUDS				
39	Low Amount	N_h	0-8, X	See Code 3	
40	Low Type	C_L	0-9, X	See Code 11	
41	Height of Low	h	0-9, X	See Code 12	
42	Middle Type	C_M	0-9, X	See Code 13	
43	High Type	C_H	0-9, X	See Code 14	
44	Ship Direction	D_s	0-9	See Code 15	
45	Ship Speed	V_s	0-9	See Code 16	
46-48	PRESSURE				Characteristics of pressure tendency during the 3 hours preceeding the observations
46	Tendency	a	0-9	See Code 17	For period 1953-1954
		a	0-9	See Code 18	For period 1955-1960
47-48	Change 1/10 mbs.	pp	00-99	0.0-9.9 mb.	Amount of pressure tendency change
49-53	TEMPERATURE				
49	Indicator		0	group indicator	
50-51	Air-Sea Temperature difference in 1/2°C units	T_sT_s	00-49	0 through 24 1/2° C	Air higher than sea temperature in 1/2° C units
			50-99	0 through 24 1/2° C Rounded to the nearest 1/2° C i.e.: -0.2° C coded 50	Sea higher than Air temperature in 1/2° C units i.e.: Air = 22.5°C Sea = 25.0° C then coded 55 That is when the sea temperature is higher than the air temperature. 50 is added to the 1/2° C coded temperature difference value.
52-53	Dew Point	T_dT_d	00-49 50-99	0 through 49°C -0 through -49°C See Code 10	Rounded to the nearest whole °C. See columns 37-38 remarks.

CARD CONTENT

Column	Item or Element	Symbolic Letter	Card Code	Card Code Definition	Remarks
54-58	First Wave Group				The data for the 3 wave groups were punched when data were available. There was not any order of column assignments or distinction made when sea and/or swell were reported. An X was punched in column 59 when an observation ended with an element preceeding or including the first wave group. An X was punched in columns 64 or 69 when the observations included 2 or 3 wave groups, respectively.
54	Indicator		1	Indicator	
55-56	Direction	$d_w d_w$	00-36 49, 99	See Code 19 See column 58	
57	Period	P_w	0-9	See Code 20	
58	Height	H_w	0-9	See Code 21	
59-63	Second Wave Group				
59	Indicator		1	Indicator	
60-61	Direction	$d_w d_w$	00-36, 49, 99	See Code 19	
62	Period	P_w	0-9	See Code 20	
63	Height	H_w	0-9	See Code 21	
64-68	Third Wave Group				
64	Indicator		1	Indicator	
65-66	Direction	$d_w d_w$	00-36, 49,99	See Code 19	
67	Period	P_w	0-9	See Code 20	
68	Height	H_w	0-9	See Code 21	
69				See remarks	
70-80	Blank			Not used	

CODE TABLES

When coding a meteorological report, symbolic letters are replaced by figures, which specify the value or the state of the corresponding element. In some cases, the specification of the symbolic letter (or group of letters) is sufficient to permit a direct transcription into figures (e.g., GG or FFF). In other cases, these figures are obtained by means of a special code table (or code, in short) for each element.

The codes elaborated to this end, as far as they are in world-wide use, are called international meteorological code tables. These same codes are used inversely for decoding observations and thus making available the information contained in them.

Besides the specifications given by the code tables in world-wide use, other sets of code tables are established by the WMO for regional use. Further arbitrary codes have been made necessary by the use of data in card decks which were never encoded into WMO forms.

Only codes pertinent to this card deck are included in the present manual. They appear in the order in which the elements were introduced in the description of the card content. They are numbered consecutively, and if applicable, the corresponding WMO code numbers are shown.

Code 1

Ships Class - Code Unknown

Code 2

(1949 WMO Code 70)
(1960 WMO Code 3300)

Q Octant of the globe

Code Figure	Greenwich Longitude	Hemisphere
0	0°-90°W	North
1	90°-180°W	
2	180°-90°E	
3	90°-0°E	
5	0°-90°W	South
6	90°-180°W	
7	180°-90°E	
8	90°-0°E	

Code 3

(1949 WMO Code 60)
(1960 WMO Code 2700)

N - The fraction of the celestial dome covered by cloud

N_h - The fraction of the celestial dome covered by the cloud(s) reported for C_L or, if no C_L-cloud present, for C_M

Code figure		
0	0	0
1	1 okta or less, but not zero	1/10 or less, but not zero
2	2 oktas	2/10 - 3/10
3	3 oktas	4/10
4	4 oktas	5/10
5	5 oktas	6/10
6	6 oktas	7/10 - 8/10
7	7 oktas or more, but not 8 oktas	9/10 or more, but not 10/10
8	8 oktas	10/10
9	Sky obscured, or cloud amount cannot be estimated	

Code 4

(1949 WMO Code 23)
(1960 WMO Code 0877)

dd - True direction, in tens of degrees, from which wind is blowing (or will blow)

Code figure		Code figure	
00	Calm	19	185° - 194°
01	5° - 14°	20	195° - 204°
02	15° - 24°	21	205° - 214°
03	25° - 34°	22	215° - 224°
04	35° - 44°	23	225° - 234°
05	45° - 54°	24	235° - 244°
06	55° - 64°	25	245° - 254°
07	65° - 74°	26	255° - 264°
08	75° - 84°	27	265° - 274°
09	85° - 94°	28	275° - 284°
10	95° - 104°	29	285° - 294°
11	105° - 114°	30	295° - 304°
12	115° - 124°	31	305° - 314°
13	125° - 134°	32	315° - 324°
14	135° - 144°	33	325° - 334°
15	145° - 154°	34	335° - 344°
16	155° - 164°	35	345° - 354°
17	165° - 174°	36	355° - 4°
18	175° - 184°		

Code 5

ff - Wind speed in knots

Code figure	
00	Calm
01	1 knot
02	2 knots
03	3 knots
04	4 knots
etc.	etc.
95	95 knots
96	96 knots
97	97 knots
98	98 knots
99	99 knots or 100 knots
01	101 knots *)
02	102 knots *)
03	103 knots *)
04	104 knots *)
etc.	etc.

*) 50 added to direction.

Code 6

(1949 WMO Code 84)
(1955 WMO Code 84)
(1960 WMO Code 4377)
(90 - 99 Decade only)

VV - Horizontal visibility

Code Figure	Km.	Yards (Approx.)	Statute Miles (Approx.)	Nautical Miles (Approx.)
90	<0.05	<55	<1/32	
91	0.05	55	1/32	
92	0.2	220	1/8	
93	0.5	550	5/16	1/4
94	1	1,100	5/8	1/2
95	2	2,200	1 1/4	1
96	4	4,400	2 1/2	2
97	10	11,000	6 1/4	5
98	20	22,000	12 1/2	10
99	≥ 50	≥ 55,000	≥ 31 1/4	> 25

If the observed visibility is between two of the reportable distances as given in the table, the code figure for the lower reportable distance is reported.

Maximum visible distance regardless of direction.

Code 7
(1949 WMO Code 92)
(1960 WMO Code 4677)

ww - Present weather

ww 00 - 49 No precipitation at the station at the time of observation

ww 00 - 19 No precipitation, fog, ice fog (except 11 and 12), duststorm, sandstorm, drifting or blowing snow at the station (land station or ship) at the time of observation or, except for 09 and 17, during the preceding hour.

Code figure

ww

No Meteors except photometeors

- 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)

Haze, dust, sand or smoke

- 04 Visibility reduced by smoke, e.g. veldt or forest fires, industrial smoke or volcanic ashes
- 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 whirl(s) or sand whirl(s), and no duststorm or sandstorm seen
- 08 Well developed dust whirl(s) or sand whirl(s) seen at or near the station during the preceding hour or at the time of observation, but no duststorm or sandstorm
- 09 Duststorm or sandstorm within sight at the time of observation, or at the station during the preceding hour

- 10 Mist
- 11 (Patches of / More or less / continuous) shallow fog or ice fog at the station, whether on land or sea, not deeper than about 2 metres on land or 10 metres at sea
- 12 (Patches of / More or less / continuous) shallow fog or ice 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, not reaching the ground or the surface of the sea
- 15 Precipitation within sight, reaching the ground or the surface of the sea, but distant (i.e. estimated to be more than 5 km) from the station
- 16 Precipitation within sight, reaching the ground or the surface of the sea, near to, but not at the station
- 17 Thunderstorm, but no precipitation at the time of observation
- 18 Squalls
- 19 Funnel cloud(s) (tornado cloud or waterspout)

(at or within sight of the station during the preceding hour or at the time of observation)

Code 7, continued

ww 20 - 29 Precipitation, fog, ice fog or thunderstorm at the station during the preceding hour but not at the time of observation

Code figure

ww

- 20 Drizzle (not freezing) or snow grains
- 21 Rain (not freezing)
- 22 Snow
- 23 Rain and snow or ice pellets, type (a)
- 24 Freezing drizzle or freezing rain

(not falling as shower(s))

- 25 Shower(s) of rain
- 26 Shower(s) of snow, or of rain and snow
- 27 Shower(s) of hail (ice pellets, type (b), snow pellets), or of rain and hail (ice pellets, type (b), snow pellets)
- 28 Fog or ice fog
- 29 Thunderstorm (with or without precipitation)

ww 30 - 39 Duststorm, sandstorm, drifting or blowing snow

ww

- 30 Slight or moderate duststorm or sandstorm (has decreased during the preceding hour)
- 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
- 37 Heavy drifting snow

(generally low (below eye level))

- 38 Slight or moderate blowing snow
- 39 Heavy blowing snow

(generally high (above eye level))

ww 40 - 49 Fog or ice fog at the time of observation

ww

- 40 Fog or ice fog at a distance at the time of observation, but not at the station during the preceding hour, the fog or ice fog extending to a level above that of the observer

Code 7, continued

Code figure

- 41 Fog or ice fog in patches
- 42 Fog or ice fog, sky visible
- 43 Fog or ice fog, sky invisible

(has become thinner during the preceding hour)

- 44 Fog or ice fog, sky visible
- 45 Fog or ice fog, sky invisible

(no appreciable change during the preceding hour)

- 46 Fog or ice fog, sky visible
- 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

ww 50 - 99 Precipitation at the station at the time of observation

ww 50 - 55 Drizzle

ww

- 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, continuous

(heavy (dense) at time of observation)

- 56 Drizzle, freezing, slight
- 57 Drizzle, freezing, moderate or heavy (dense)
- 58 Drizzle and rain, slight
- 59 Drizzle and rain, moderate or heavy

ww 60 - 69 Rain

ww

- 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

Code 7, continued

ww 70 - 79 Solid precipitation not in showers

ww

- 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 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)

ww 80 - 99 Showery precipitation, or precipitation with current or recent thunderstorm

ww

- 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 Shower(s) of snow pellets or ice pellets, type (b), with or without
- 88 rain or rain and snow mixed

(87 - slight; 88 - moderate or heavy)

- 89 Shower(s) of hail, with or without rain or rain and snow mixed
- 90 not associated with thunder

(89 - slight; 90 - 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 (ice pellets, type (b), snow pellets), at time of observation
- 94 Moderate or heavy snow, or rain and snow mixed or hail (ice pellets, type (b), snow pellets) at time of observation
- 95 Thunderstorm, slight or moderate, without hail (ice pellets, type (b), snow pellets); but with rain and/or snow at time of observation
- 96 Thunderstorm, slight or moderate, with hail (ice pellets, type (b), snow pellets) at time of observation

(91 - 96: thunderstorm during the preceding hour but not at time of observation; 96: thunderstorm at time of observation)

Code 7, continued

Code figure

97 Thunderstorm, heavy, without hail (ice pellets,type(b), snow pellets), but with rain and/or snow at time of obeervation

98 Thunderstorm combined with duststorm or sandstorm at time of observation

99 Thunderstorm, heavy, with hail (ice pellets, type(b), snow pellets) at time of observation

} thunderstorm at time of observation

Code 8
(1949 WMO Code 90)
(1960 WMO Code 4500)

W - Past weather

Code figure

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

5 Drizzle

6 Rain

7 Snow, or rain and snow mixed

8 Shower(s)

9 Thunderstorm(s) with or without precipitation

Notes:

(1) In the case of a sandstorm, with a temperature below 0°C, the word SANDSTORM is added at the end of the report; but is omitted in punching.

(2) In the case of a shower or a thunderstorm,accompanied by hail, the words PAST HAIL are added at the end of the report, but are omitted in punching.

(3) In the case of a snow shower or a shower of rain and snow mixed, with a temperature above 0°C, the word SNOW or SLEET is added at the end of the report, but is omitted in punching.

Code 9

PPP - Air Pressure

Code Figure			
600	960.0 MB	000	1000.0 MB
601	960.1 MB	001	1000.1 MB
602	960.2 MB	002	1000.2 MB
603	960.3 MB	003	1000.3 MB
604	960.4 MB	004	1000.4 MB
ETC		ETC	
999	999.9 MB	599	1059.9 MB

Code 10

TT - Air Temperature

TdTd - Dew Point Temperature

Code Figure		Code Figure	
00	00°C	50	-00°C
01	01°C	51	-01°C
02	02°C	52	-02°C
03	03°C	53	-03°C
04	04°C	54	-04°C
ETC		ETC	
49	49°C	99	-49°C

Code 11
(1949 WMO Code 11)
(1960 WMO Code 0513)

C_L - Clouds of the genera Stratocumulus, Stratus, Cumulus and Cumulonimbus

Code figure — Non technical specifications

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 bases 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

X Stratocumulus, Stratus, Cumulus and Cumulonimbus invisible owing to darkness, fog, blowing dust or sand, or other similar phenomena

Code 12
(1949 WMO Code 43)
(1960 WMO Code 1600)

h - Height, above ground, of the base of the cloud

Code figure

0	0 to 50 m
1	50 to 100 m
2	100 to 200 m
3	200 to 300 m
4	300 to 600 m
5	600 to 1,000 m
6	1,000 to 1,500 m
7	1,500 to 2,000 m
8	2,000 to 2,500 m
9	2,500 m or more, or no clouds
X	Height of base of cloud not known or base of clouds at a level lower and tops at a level higher than that of the station;

Code 12, continued

Notes:

(1) A height exactly equal to one of the values at the ends of the ranges is to be coded in the higher range; e.g. a height of 600 m is reported by code figure 5.

(2) The term "height above ground" is considered as being the height above the official aerodrome elevation or above station level at a non-aerodrome station.

Code 13
(1949 WMO Code 12)
(1960 WMO Code 0515)

C_M - Clouds of the genera Altocumulus,Altostratus and Nimbostratus

Code figure

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 spreading 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, generally at several levels

X Altocumulus,Altostratus and Nimbostratus 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

Code 14
(1949 WMO Code 13)
(1960 WMO Code 0509)

C_H - Clouds of the genera Cirrus, Cirrocumulus and Cirrostratus

Code figure	Non technical specifications
0	No Cirrus, Cirrocumulus or Cirrostratus
1	Cirrus in the form of filaments, strands or hooks, not progressively invading the sky
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
3	Dense Cirrus, often in the form of an anvil, being the remains of the upper parts of Cumulonimbus
4	Cirrus in the form of hooks or of filaments, or both, progressively invading the sky; they generally become denser as a whole
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
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
7	Veil of Cirrostratus covering the celestial dome
8	Cirrostratus not progressively invading the sky and not completely covering the celestial dome
9	Cirrocumulus alone, or Cirrocumulus accompanied by Cirrus or Cirrostratus, or both, but Cirrocumulus is predominant
X	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

Code 15
(1949 WMO Code 20)
(1960 WMO Code 0700)

D_s Ships Course (true)

Direction toward which ship is moving

Code Figure	Direction	Code Figure	Direction
0	Ship hove to	5	SW
1	NE	6	W
2	E	7	NW
3	SE	8	N
4	S	9	All directions or unknown

Code 16
(1949 WMO Code 88)
(1960 WMO Code 4451)

V_s Ship's speed (In Nautical Miles per hour)

Code Figure	Speed	Code Figure	Speed
0	0	5	13-15
1	1-3	6	16-18
2	4-6	7	19-21
3	7-9	8	22-24
4	10-12	9	over 24

Code 17
(1949 WMO Code 02)

a - Characteristic of barometric tendency during the period of three hours preceding the time of observation

Code figure		
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	

Code 18
(1955 WMO Code 02)
(1960 WMO Code 0200)

a - Characteristic of pressure tendency during the three hours preceding the time of observation

Code figure		
0	Increasing, then decreasing; atmospheric pressure the 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);	
3	Decreasing or steady, then increasing; or increasing, then increasing more rapidly;	
4	Steady; atmospheric pressure the 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);	
8	Steady or increasing, then decreasing or decreasing, then decreasing more rapidly;	

Code 19
(1949 WMO Code 23B)
(1960 WMO Code 0885)

$d_w d_w$ - Direction from which waves come, in tens of degrees

Code Figure		Code Figure	
00	Calm (no waves)	19	185° - 194°
01	5° - 14°	20	195° - 204°
02	15° - 24°	21	205° - 214°
03	25° - 34°	22	215° - 224°
04	35° - 44°	23	225° - 234°
05	45° - 54°	24	235° - 244°
06	55° - 64°	25	245° - 254°
07	65° - 74°	26	255° - 264°
08	75° - 84°	27	265° - 274°
09	85° - 94°	28	275° - 284°
10	95° - 104°	29	285° - 294°
11	105° - 114°	30	295° - 304°
12	115° - 124°	31	305° - 314°
13	125° - 134°	32	315° - 324°
14	135° - 144°	33	325° - 334°
15	145° - 154°	34	335° - 344°
16	155° - 164°	35	345° - 354°
17	165° - 174°	36	355° - 4°
18	175° - 184°	49	Waves confused, direction indeterminate (waves equal to or less than 4 3/4 metres)
		99	Waves confused, direction indeterminate (waves greater than 4 3/4 metres)

Code 20
(1949 WMO Code 69)
(1960 WMO Code 3155)

P_w - Period of the Waves

Code Figure	
2	5 seconds or less
3	5 - 7 "
4	7 - 9 "
5	9 - 11 "
6	11 - 13 "
7	13 - 15 "
8	15 - 17 "
9	17 - 19 "
0	19 - 21 "
1	Over 21 "
x	Calm or period not determined

NOTES: The period is measured to the nearest second. If the exact number of seconds for the period of the waves corresponds to two code figures, the lower code figure should be reported.

Code 21
(1949 WMO Code 42)
(1960 WMO Code 1555)

H_w - Mean Maximum Height of the Waves

Code Figure *) / **)		If 50 is added to $d_w d_w$	
0	Less than 1/4 m (1 ft)	0	5 m (16 ft)
1	1/2 m (1 1/2 ft)	1	5 1/2 m (17 1/2 ft)
2	1 m (3 ft)	2	6 m (19 ft)
3	1 1/2 m (5 ft)	3	6 1/2 m (21 ft)
4	2 m (6 1/2 ft)	4	7 m (22 1/2 ft)
5	2 1/2 m (8 ft)	5	7 1/2 m (24 ft)
6	3 m (9 1/2 ft)	6	8 m (25 1/2 ft)
7	3 1/2 m (11 ft)	7	8 1/2 m (27 ft)
8	4 m (13 ft)	8	9 m (29 ft)
9	4 1/2 m (14 ft)	9	9 1/2 m (30 1/2 ft)
x	Height not determined		

*) 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.

**) If a wave height comes exactly midway between the heights corresponding to two code figures, the lower code figure should be reported.