

SPECIFICATIONS OF OCTET CONTENTS

Section 0 – Indicator section

Octet No.	Contents
1–4	GRIB (coded according to the International Alphabet No. 5)
5–6	Reserved
7	Discipline – GRIB Master table number (see Code table 0.0)
8	GRIB edition number (currently 2)
9–16	Total length of GRIB message in octets (including Section 0)

Section 1 – Identification section

Octet No.	Contents
1–4	Length of section in octets (21 or nn)
5	Number of section (1)
6–7	Identification of originating/generating centre (see Common Code table C–11)
8–9	Identification of originating/generating subcentre (allocated by originating/ generating centre)
10	GRIB Master tables version number (see Code table 1.0 and Note 1)
11	Version number of GRIB Local tables used to augment Master tables (see Code table 1.1 and Note 2)
12	Significance of reference time (see Code table 1.2)
13–14	Year (4 digits)
15	Month
16	Day
17	Hour
18	Minute
19	Second
20	Production status of processed data in this GRIB message (see Code table 1.3)
21	Type of processed data in this GRIB message (see Code table 1.4)
22–23	Identification template number (optional, see Code table 1.5)
24–nn	Identification template (optional, see template 1.X, where X is the identification template number given in octets 22–23)

Notes:

- (1) Local tables shall define those parts of the Master table which are reserved for local use except for the case described below. In any case, the use of Local tables in messages intended for non-local or international exchange is strongly discouraged.
- (2) If octet 10 contains 255 then only Local tables are in use, the Local table version number (octet 11) must not be zero nor missing, and Local tables may include entries from the entire range of the tables.
- (3) If octet 11 is zero, octet 10 must contain a valid Master table version number and only those parts of the tables not reserved for local use may be used.

Section 2 – Local use section

Octet No.	Contents
1–4	Length of section in octets (nn)
5	Number of section (2)
6–nn	Local use

Section 3 – Grid definition section

Octet No.	Contents
1–4	Length of section in octets (nn)
5	Number of section (3)
6	Source of grid definition (see Code table 3.0 and Note 1)
7–10	Number of data points
11	Number of octets for optional list of numbers (see Note 2)
12	Interpretation of list of numbers (see Code table 3.11)
13–14	Grid definition template number (= N) (see Code table 3.1)
15–xx	Grid definition template (see template 3.N, where N is the grid definition template number given in octets 13–14)
[xx+1]–nn	Optional list of numbers defining number of points (see Notes 2, 3 and 4)

Notes:

- (1) If octet 6 is not zero, octets 15–xx (15–nn if octet 11 is zero) may not be supplied. This should be documented with all bits set to 1 (missing value) in the grid definition template number.
- (2) An optional list of numbers may be used to document a quasi-regular grid. In such a case, octet 11 is non zero and gives the number of octets used per item on the list. For all other cases, such as regular grids, octets 11 and 12 are zero and no list is appended to the grid definition template.
- (3) If a list of numbers defining number of points is present, it is appended at the end of the grid definition template (or directly after the grid definition template number if the template is missing), the length of the list is given by the grid definition. When the grid definition template is present, the length is given according to bit 3 of scanning mode flag octet (length is N_j or N_y for flag value 0). List ordering is implied by data scanning.
- (4) Depending on code value given in octet 12, the list of numbers either:
 - corresponds to the coordinate lines as given in the grid definition, or
 - corresponds to a full circle, or
 - does not apply.

Section 4 – Product definition section

Octet No.	Contents
1–4	Length of section in octets (nn)
5	Number of section (4)
6–7	Number of coordinate values after template or number of information according to 3D vertical coordinate GRIB2 message (see Notes 1 and 5)
8–9	Product definition template number (see Code table 4.0)
10–xx	Product definition template (see template 4.X, where X is the product definition template number given in octets 8–9)
[xx+1]–nn	Optional list of coordinate values or vertical grid information (see Notes 2, 3, 4 and 5)

Notes:

- (1) Coordinate values are intended to document the vertical discretization associated with model data on hybrid coordinate vertical levels. A number of zero in octets 6–7 indicates that no such values are present. Otherwise the number corresponds to the whole set of values.
- (2) Hybrid systems, in this context, employ a means of representing vertical coordinates in terms of a mathematical combination of pressure and sigma coordinates. When used in conjunction with a surface pressure field and an appropriate mathematical expression, the vertical coordinate parameters may be used to interpret the hybrid vertical coordinate.
- (3) Hybrid coordinate values, if present, should be encoded in IEEE 32-bit floating point format. They are intended to be encoded as pairs.
- (4) Two distinct pressure-based hybrid coordinate formulations can be expressed in GRIB Edition 2. If the hybrid coordinate being used is based on pressure, then level type 105 (Code table 4.5) shall be used to specify the vertical level type. If the formulation is based on the natural logarithm of pressure then level type 113 (Code table 4.5) shall be used. In both cases Notes 1 to 3 (above) apply fully.

- (5) In the case of a generalized vertical height coordinate (fixed surface type 150), no pairs of coordinate values follow after the template, but six sets of additional information (each 4 octets long and encoded in IEEE 32-bit floating point format) follow, starting with the number of vertical levels and the identification number of the used vertical system in the additional GRIB2 message with the 3D vertical system. This identification number together with an UUID (Universally Unique Identifier) in four parts allows a unique identification of the grid.

[xx+1] – [xx+4]	Number of vertical levels
[xx+5] – [xx+8]	Identification number of 3D vertical grid GRIB2 message (defined by originating centre)
[xx+9] – [xx+12]	UUID part 1 of 4
[xx+13] – [xx+16]	UUID part 2 of 4
[xx+17] – [xx+20]	UUID part 3 of 4
[xx+21] – [xx+24]	UUID part 4 of 4

Section 5 – Data representation section

Octet No.	Contents
1–4	Length of section in octets (nn)
5	Number of section (5)
6–9	Number of data points where one or more values are specified in Section 7 when a bit map is present, total number of data points when a bit map is absent.
10–11	Data representation template number (see Code table 5.0)
12–nn	Data representation template (see template 5.X, where X is the data representation template number given in octets 10–11)

Section 6 – Bit-map section

Octet No.	Contents
1–4	Length of section in octets (nn)
5	Number of section (6)
6	Bit-map indicator (see Code table 6.0 and the Note)
7–nn	Bit-map – Contiguous bits with a bit to data point correspondence, ordered as defined in Section 3. A bit set to 1 implies the presence of a data value at the corresponding data point, whereas a value of 0 implies the absence of such a value.

Note: If octet 6 is not zero, the length of the section is 6 and octets 7–nn are not present.

Section 7 – Data section

Octet No.	Contents
1–4	Length of section in octets (nn)
5	Number of section (7)
6–nn	Data in a format described by data template 7.X, where X is the data representation template number given in octets 10–11 of Section 5.

Section 8 – End section

Octet No.	Contents
1–4	“7777” (coded according to the International Alphabet No. 5)