

# BUFR User's Guide

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# 1 Introduction

FM-94 BUFR (Binary Universal Form for data Representation) has been designed to achieve efficient exchange and storage of meteorological and oceanographic data. It is self defining, table driven and very flexible data representation system, especially for huge volumes of data.

The User's Guide is described in six sections.

Section 2 describes Bufr format in general, and it is useful for those who are not familiar with the Bufr concept.

Section 3 explains Bufr software usage. It contains FORTRAN subroutines for expanding and packing Bufr data. A number of routines described shall be used as a tools.

A quality control representation in the Bufr is given in section 4.

Section 5 contains few example programs to decode/repack bufr data, create a new bufr message and expand data descriptors only.

Useful WMO example templates are given in the section 6.

## 2 BUFR format

A full definition of the BUFR form is given in **WMO Manual on Codes, Volume I, International Codes, Part B-Binary Codes, WMO-No.306, FM 94-IX Ext. BUFR**. This section offers a brief description of the basic structure and representation of the BUFR code.

The BUFR form is a binary representation of meteorological data. It is a continuous bit stream made up of a sequence of octets (one octet is eight bits). The only part of BUFR where information does not end on byte boundaries is the data section, where a length of BUFR table B elements can have any number of bits (although it must not exceed the number of bits in a computer word for non-character data).

A BUFR message consists of six sections, some of which may be completely optional (section 2) or partially optional (section 1).

The representation of data in the form of a series of bits is independent of any particular machine representation. It is important to stress that the BUFR representation is not suitable for data visualisation without computer interpretation.

The data section consists of one or more data subsets of related meteorological data which are defined, described and represented by a single Bufr table D entry. For observational data, one subset corresponds to one observation. The data section can be in compressed or uncompressed form.

Each section included in the message always contain an even number of octets. If necessary, sections must be appended with bits set to zero to fulfil this requirement.

A BUFR message is comprised of the following sections:

- Indicator section
- Identification section
- Optional section
- Data description section
- Data section
- End section

### 2.1 Indicator section

Indicator section or Section 0 of a Bufr message has a fixed length of eight octets. Information about the total size of the BUFR message in octets 5-7 is very useful for reading BUFR data from pure binary files. The content of Section 0 is given in the Table 1.

### 2.2 Identification section

This section contains information relevant to data recognition without performing complete expansion of data. Data type and observation date and time are the most important parts of it. In the case of multi-subset data the time of the earliest observation should be packed into section 1. This section also contains all information necessary to define the Bufr tables used.

Table 1: Bufr Section - 0

Octet number	Content
1-4	BUFR four letters in CCITT International Alphabet No.5
5-7	Total length of Bufr message in bytes
8	Bufr Edition number (currently 4)

The layout of the Identification section is given in Table 2.

Table 2: Bufr Section - 1

Octet number	Content
1-3	Length of section 1
4	Bufr master table (zero if standard WMO FM 94-IX BUFR tables are used)
5-6	Identification of originating/generating centre
7-8	Identification of originating/generating sub-centre
9	Update sequence number (zero for original BUFR messages; incremented by one for updates)
10	Bit 1 = 0 No optional section Bit 1 = 1 Optional section follows Bit 2-8 Set to zero ( reserved)
11	Data Category (Table A)
12	International data sub-category
13	Local sub-category
14	Version number of master table used (currently 12 for WMO FM 94-IX Ext. BUFR tables)
15	Version number of local tables used to augment the master table in use
16-17	Year (4 digits)
18	Month
19	Day
20	Hour
21	Minute
22	second
23-	Reserved for local use by ADP centres

## 2.3 Optional section

The presence of Section 2 of the Bufr message is indicated by a flag in the 8<sup>th</sup> byte of Section 1. This section can be used locally by Automated Data Processing centres. This Section is used to keep the Report Data Base key.

The layout of Section 2 is given in table 3.

Table 3: Bufr Section - 2

Octet number	Content
1-3	Length of section in bytes
4	Set to zero (reserved)
5-	reserved for local use by ADP centres

## 2.4 Data description section

This section describes the data in the data section. The information which can be found in the first seven octets is the number of subsets in the message, their form and the type of data (observation/non-observation). The data descriptors start in the 8<sup>th</sup> octet of the section 3. Each descriptor is spread over two bytes and contains three parts. If  $F = 0$ , the descriptor is an element descriptor and values of X and Y define entries in Bufr Table

Table 4: Descriptor reference

F	X	Y
2 bits	6 bits	8 bits

B. For  $F = 1$ , the descriptor is a replication descriptor. If  $F = 2$ , the descriptor is one of the operators from bufr Table C.  $F = 3$  means that the descriptor represents the sequence descriptor from Bufr Table D. The table D entries contain a list of element descriptors, operators, and/or other sequence descriptors.

In an ideal situation, data in Section 4 should be described by one Bufr Table D entry only.

X stands for class of elements in the range from 0-63 and Y is an entry within class 0-255. Classes 48-63 are reserved for local use and entries from 192-255 within all classes are also reserved for local usage.

Layout of Data description section is given in the Table 5.

Table 5: Data description section

Octet number	Content
1-3	Length of section
4	set to zero (reserved)
5-6	Number of data subsets
7	Bit 1 = 1 Observed data Bit 1 = 0 Other data Bit 2 = 1 Compressed data Bit 2 = 0 Non compressed data Bits 3-8 set to zero ( reserved)
8-	A collection of element descriptors, replication descriptors, operator descriptors and sequence descriptors, which define the form and contents of individual data elements comprising one data subset in the data section.



## 2.5 Data section

The Data section, like all sections, starts with the length of Section 4 followed by a continuous stream of bits from byte 5 onward.

Layout of Data section is given in the Table 6.

*Table 6: Data section*

Octet number	Content
1-3	Length of section in bytes
4	set to zero (reserved)
5-	Binary data as defined by sequence descriptors

## 2.6 End section

The End section is comprised of four "7" characters in CCITT International Alphabet No.5 and this marks the end of the Bufr message. The layout of the End section is given in the Table 7.

*Table 7: End section*

Octet number	Content
1-4	"7777" (coded according to the CCITTIA No 5)

### 3 BUFR software

The first version of ECMWF Bufr software was designed and implemented in 1987. A great deal of experience has been gathered in handling binary coded observations since. Bufr software is written in FORTRAN 77.

Versions for C90, VAX, IBM, SGI, SUN, HP and for all UNIX and LINUX based platforms are available. It has been installed on Mac OSX as well.

#### 3.1 Bufr tables

BUFR is a table driven system. It uses three main tables.

- Bufr Table B - classification elements
- Bufr Table C - text and meaning of all code/flag tables
- Bufr Table D - list of common sequences

Bufr Tables B and D are used to collect all necessary information to pack/unpack Bufr data. Which table is to be loaded is decided at runtime using information from Section 1 of the Bufr message. The naming convention for Bufr binary tables is as follows:

Bssswwwwxxxxxyyyzzz.TXT Cssswwwwxxxxxyyyzzz.TXT Dssswwwwxxxxxyyyzzz.TXT where

- sss - Master table number (zero for WMO meteorological tables)
- wwwwww - Originating sub-centre
- xxxxx - Originating centre
- yyy - Version number of master table used
- zzz - Version number of local table used

ECMWF is currently using B0000000000098013001.TXT, C0000000000098013001.TXT and D0000000000098013001.TXT tables. Keep in mind that Bufr Table C in this software is a code table. Bufr has Table C in its definition, where Bufr Operators are defined. If standard WMO tables are used, the Originating centre xxxxx will be set to 00000.

Current version of the software will keep in memory up to JTMAX=10 versions of tables in the round robin fashion.

#### 3.2 Defaults

Integer **missing value** indicator:

**NVIND = 2147483647**

Real **missing value** indicator:

**RVIND = 1.7D38**

Default path for Bufr Tables is hard coded in the software. To change the path set environmental variable BUFR\_TABLES :

```
export BUFR_TABLES=/.../
```

The path must end with "/"

During decoding Bufr table path and the names are printed. If user does not want that, set: VARIABLE **PRINT\_TABLE\_NAMES=false**

```
export PRINT_TABLE_NAMES=false
```

During decoding code/flag tables could be read if code figure meaning is needed. If user want to use code and flag tables set: VARIABLE **USE\_TABLE\_C=true**

```
export USE_TABLE_C=true
```

### 3.3 Decoding and encoding

#### 3.3.1 Subroutine BUFREX

##### Purpose

Decodes Bufr message into fully expanded form, returning information relevant to all Bufr Sections, expanded values, Bufr Table B element names and units.

##### Interface

```
CALL BUFREX (KBUFL, KBUFF, KSUP, KSEC0, KSEC1, KSEC2, KSEC3, KSEC4,  
             KELEM, CNAME, CUNIT, KVALS, VALUES, CVALS, KERR)
```

where:

- Integer variables are denoted by first letter K.
- Real variables are denoted by first letter V.
- Character variables are denoted by first letter C.

##### Input arguments

- KBUFL - An INTEGER variable containing length of Bufr message in words.
- KBUFF - An INTEGER array containing Bufr message.
- KELEM - An INTEGER variable containing expected number of expanded elements
- KVALS - An INTEGER variable containing expected number of data values.

##### Output arguments

- KSEC0 - An INTEGER array (size 3) containing Bufr Section 0 information.
- KSEC1 - An INTEGER array of at least 40 words containing Bufr Section 1 information. When Section 1 contains data for local use, KSEC1 should be sized accordingly.
- KSEC2 - An INTEGER array of 4096 words containing Bufr Section 2 information. ECMWF uses this section to store Report Data Base key.
- KSEC3 - An INTEGER array of 4 words containing Bufr Section 3 information.
- KSEC4 - An INTEGER array of 2 words containing Section 4 information.
- KSUP - An INTEGER array (size 9) containing supplementary information.

- C NAMES - CHARACTER\*64 array of KELEM words containing element names.
- C UNITS - CHARACTER\*24 array of KELEM words containing element units.
- V ALUES - REAL\*8 array of KVALS words containing element values.
- C VALS - CHARACTER\*80 array of KVALS containing CCITT IA No.5 element entries.
- K ERR - An INTEGER containing an error code.

**KSEC0** - An INTEGER array (size 3) containing Bufr Section 0 information

Array index	Word content
1	Length of section 0 in bytes
2	Total length of Bufr message in bytes
3	Bufr Edition number (currently 4)

**KSEC1** - An INTEGER array of at least 40 words containing Bufr Section 1 information

Array index	Word content
1	Length of section 1 in bytes
2	Bufr Edition number (currently 4)
3	Originating centre
4	Update sequence number
5	Flag (presence of Section 2 in the message)
6	Bufr message type ( Bufr Table A)
7	Bufr message subtype (local use)
8	Version number of local table used
9	Year
10	Month
11	Day
12	Hour
13	Minute
14	Bufr Master Table used
15	Version number of Master table used
16	Originating sub-centre
17	International sub-category
18	Second
19-	Local ADP centre information (byte by byte)

**KSEC2** - An INTEGER array of 4096 words containing Bufr Section 2 information

Array index	Word content
1	Length of Section 2 in bytes
2-	Report Data Base key in packed form

**KSEC3** - An INTEGER array of 4 words containing Bufr Section 3 information

Array index	Word content
1	Length of Section 3 in bytes
2	Reserved
3	Number of subsets
4	Flag (data type, compression)

**KSEC4** - An INTEGER array of 2 words containing Section 4 information

Array index	Word content
1	Length of Section 4 in bytes
2-	Reserved

**KSUP** - An INTEGER array (size 9) containing supplementary information

Array index	Word content
1	Dimension of KSEC1 array
2	Dimension of KSEC2 array
3	Dimension of KSEC3 array
4	Dimension of KSEC4 array
5	Real number of expanded elements
6	Number of subsets
7	Real number of elements in CVALS array
8	Total Bufr message length in bytes
9	Dimension of KSEC0 array

## Method

A Bufr message passed as an argument to this routine is decoded section by section. Before Section 3 expansion Bufr tables are loaded using KSEC1 information to create table names. The loaded Bufr tables are kept in memory and swapped only if the next message is requesting different tables.

Section 3 Data descriptors are unpacked and expanded applying all necessary operators in force and creating a list of Bufr Table B elements which correspond one to one to the data in the Data section of the Bufr message. Word and bit pointers are calculated for each element in the message.

Having all this information, unpacking of the data is performed applying reference value and scaling to get the final value for one element in the Bufr message. Unpacked data are stored in VALUES array. The corresponding element names and units are stored in the C NAMES and C UNITS arrays respectively.

To achieve efficiency, original Data descriptors are saved for the following comparison. If the Data descriptors for the next observation are not different from the previous, the former word and bit pointers to the elements are used saving time for data descriptors expansion.

If a Bufr Table B element is type character, the corresponding VALUES element contains a real number which, when truncated to an integer represents

$$\text{index} * 1000 + \text{length}$$

where:

- index - subscript of the element in CVALS where character string is stored.
- length - number of characters represented.

In the case of multi subset data, the one dimensional array VALUES contains all subsets of data. The formula to find the index to the VALUES array of the i-th element of observation is:

$$\text{index} = i + (\text{nsb} - 1) * \text{KELEM}$$

so start of next subset is KELEM apart.

Current version of the Bufr software can handle KELEM up to 160000 and KVALS up to 4096000.

## Externals

BUEXS0	- Expands Section 0 of Bufr message
BUEXS1	- Expands Section 1 of Bufr message
BUEXS2	- Expands Section 2 of Bufr message
BUEXS3	- Expands Section 3 of Bufr message
BUGBTS	- Loads Bufr tables
BUEXS4	- Expands Section 4 of Bufr message
BUEXS5	- Expands Section 5 of Bufr message

## Reference

WMO -No. 306 Manual on Codes Volume I, Part B - Binary Codes: J.K. Gibson and M. Dragosavac 1988: Decoding Data Represented in FM 94-IX Ext. BUFR

### 3.3.2 Subroutine *BUFREN*

#### **Purpose**

Creates a packed Bufr message from the information contained in the arguments of the subroutine.

#### **Interface**

```
CALL BUFREN (KSEC0, KSEC1, KSEC2, KSEC3, KSEC4,  
             KTDLEN, KTDLST, KDLEN, KDATA, KELEM, KVALS,  
             VALUES, CVALS, KBUFL, KBUFF, KERR)
```

where

- Integer variables are denoted by first letter K.
- Real variables are denoted by first letter V.
- Character variables are denoted by first letter C

#### **Input arguments**

- KSEC0 - An INTEGER array (size 3) containing Bufr Section 0 information
- KSEC1 - An INTEGER array of at least 40 words containing Bufr Section 1 information. When Section 1 contains data for local use, KSEC1 should be sized accordingly.
- KSEC2 - An INTEGER array of 4096 words containing Bufr Section 2 information. ECMWF uses this section to store Report Data Base key.
- KSEC3 - An INTEGER array of 4 words containing Bufr Section 3
- KSEC4 - An INTEGER array of 2 words containing Section 4 information.
- KTDLEN - An INTEGER variable containing the number of data descriptors to be packed in Section 3 of Bufr message
- KTDLST - An INTEGER array containing the list of KTDLEN data descriptors
- KDLEN - An INTEGER variable containing the dimension of KDATA array
- KDATA - An INTEGER array containing the delayed replication factors which appear in the Data section of Bufr message
- KELEM - An INTEGER variable containing the expected number of expanded elements
- KVALS - An INTEGER variable containing the expected number of data values
- VALUES - REAL\*8 array of KVALS words containing element values.
- CVALS - CHARACTER\*80 array of KVALS containing CCITT IA No.5 element entries.



**KSEC0** An INTEGER array (size 3) containing Bufr Section 0 information

Array index	Word content
1	Length of section 0 in bytes
2	Total length of Bufr message in bytes
3	Bufr Edition number (currently 4)

**KSEC1** An INTEGER array of at least 40 words containing Bufr Section 1

Array index	Word content
1	Length of section 1 in bytes
2	Bufr Edition number (currently 4)
3	Originating centre
4	Update sequence number
5	Flag (presence of Section 2 in the message)
6	Bufr message type ( Bufr Table A)
7	Bufr message subtype (local use)
8	Version number of local table used
9	Year
10	Month
11	Day
12	Hour
13	Minute
14	Bufr Master Table used
15	Version number of Master table used
16	Originating sub-centre
17	International sub-category
18	Second
19-	Local ADP centre information (byte by byte)

**KSEC2** An INTEGER array of 4096 words containing Bufr Section 2

Array index	Word content
1	Length of Section 2 in bytes
2-	Report Data Base key in packed form

**KSEC3** An INTEGER array of 4 words containing Bufr Section 3

Array index	Word content
1	Length of Section 3 in bytes
2	Reserved
3	Number of subsets
4	Flag (data type, compression)

**KSEC4** An INTEGER array of 2 words containing Section 4 information

Array index	Word content
1	Length of Section 4 in bytes
2-	Reserved

### Output arguments

- KBUFL - An INTEGER variable containing the length of the Bufr message in words.
- KBUFF - An INTEGER array containing the Bufr message.
- KERR - An INTEGER containing an error code.

### Method

A basic approach when this software was designed to have a one to one correspondence between expanded data descriptors and the data itself.

The input arguments have to be filled in before packing,. The lengths of the Sections and the total Bufr message length are set by the software. The lengths of the Section 1 and 2 must be supplied by the user. The other Section lengths ought to be set to zero. The default size of the Section 1 is 18 octets and 22 octets for Bufr Edition 4, if there are no local entries. The Section 2 is optional section, and ECMWF uses it to store Report Data Base key. In this case the length of the Section 2 is 52 octets.

Before setting values in the VALUES array, it is recommended to initialise it with the MISSING value indicator.

The Optional Section 2 and a local part of Section 1 must be in the packed form because encoder packs these information in byte by byte manner.

The Data descriptors stored in the KTDLST array are expanded taking delayed replication factor values from KDATA array if needed. The order of replication factor values must be as they appear in the data. If 203YYY change reference value operator is used a reference value shall be in KDATA array.

The VALUES array must be filled in correspondence with previously described data elements. In the case of multi subsets, the pointer of the ith element in VALUES array is:

**$\text{index} = i + (\text{nsub} - 1) * \text{KELEM}$**

which implies that the first element of the second subset begins at KELEM+1 position even if the number of elements in the observation is less then KELEM.

For character information or elements having CCITT IA No.5 as units, VALUES array element contains a real number which, when truncated to an integer represents

**value=isub\*1000+length**

where isub is a subscript of the element in CVALS array, where the character string is stored and the length represents number of bytes/character occupied by this element.

To find out what one observation should look like, the BUXDES routine can be used. This routine expands data descriptors for the user. The procedure to print an expanded list of the data descriptors is the same as to print Section 3 of Bufr message.

### Externals

BUENS0 - Packs Section 0 of Bufr message  
BUENS1 - Packs Section 1 of Bufr message  
BUENS2 - Packs Section 2 of Bufr message  
BUENS3 - Packs Section 3 of Bufr message  
BUETAB - Loads required Bufr tables  
BUENS4 - Packs Section 4 of Bufr message  
BUENS5 - Packs Section 5 of Bufr message

### Reference

WMO -No. 306 Manual on Codes Volume I, Part B - Binary Codes: J.K. Gibson and M. Dragosavac 1988:Decoding Data Represented in FM 94-IX

### 3.4 Error codes

The errors returned by the Bufr decoding/encoding routines can be zero, negative and positive. The zero returned error code means no errors detected, negative error is a warning error which can occur during packing. If the value to be packed is too big, BUFREN will pack the truncated value and return a negative error code. The hard errors are positive.

The Error codes are given in Table 8.

Table 8: Return error codes

Error number	Meaning
1	Start of BUFR message not found
2	End of BUFR message not found
3	Array to receive BUFR message too small
4	JSEC1 parameter too small. Local ADP centre information skipped
5	JSEC2 parameter too small. Local ADP centre information skipped
6	Error during read BUFR table B
7	Error during read BUFR table C
8	Error during read BUFR table D
9	Open error
10	Error during closing BUFR table B
11	Error during close BUFR table C
12	Error during close BUFR table D
13	Number of bits to be extracted greater than number of bits per computer word
14	Argument KVALS too small
15	Increment value for compressed data too big
16	JSUBS parameter too small
17	JWORK parameter too small
18	Replication factor equal to zero
19	Delayed replication factor too big.
20	Table D reference not found
21	Data descriptors operator not found
22	BUFR Operator name not found
23	Table B reference not found
24	Augmented table B reference not found
25	KELEM argument too small
26	Word pointer out of range
27	Too many subsets to be packed
28	Number to be packed too big

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Error number	Meaning
29	Number of descriptors KTDLEN too big
30	Number of elements greater than JELEM
31	Too few elements in KDATA array
32	Number of subsets equal to zero
33	Negative value to be packed
34	Number of bits to be packed greater than number of bits per computer word
35	Not used
36	Bad order of data descriptors
37	Wrong data descriptors
38	Partial expansion on total message not supported
39	Can not recognise feedback data in this message
40	Request flag illegal
41	Bit map not set
42	This element must be data present indicator
43	Table B element must follow bit map
44	Requested subset does not exist
45	There is no one requested element in the data
46	Input array is too small to receive information

### 3.5 Partial expansion

It is possible to expand only the requested subset of elements without unpacking the whole Bufr message. This method is called partial expansion.

To do partial expansion, the request has to be set by calling the BUSRQ routine before calling BUFREX.

#### 3.5.1 Subroutine BUSRQ

##### Purpose

Sets flags and Bufr table B reference numbers of the requested elements for partial expansion.

##### Interface

```
CALL BUSRQ (KREQ, KRQL, KRQ, RQV, KERR)
```

where:

- Integer variable are denoted by first letter K.
- Real variables are denoted by first letter R.

##### Input arguments

- KREQ - An INTEGER array of 2 containing flags.

```
KREQ(1)  -  0 All elements
             1 All original observation without quality control
             2 All original elements with quality control
             2 All original elements with quality control
             3 Only feedback information
```

```
KREQ(2)  -  Flag of 6 bits
```

Bit number	Meaning
1	0 not used
2	0 - No partial expansion 1 - Partial expansion
3	0 - No quality control 1 - quality control
4	0 - No statistics 1 - Statistics
5	0 - No difference statistics 1 - Difference statistics

6	0 - No substituted values
	1 - Substituted values

Bit number 1 is right most bit.

- KRQL - An INTEGER containing the number of requested elements
- KRQ - An INTEGER array containing the list of requested elements (Bufr table B reference numbers)
- RQV - A REAL\*8 array of KRQL containing a list of values signifying requested elements

### Output arguments

- KERR - Error code

### Method

The lists of flags and Bufr Table B reference numbers are used to designate requested Bufr elements. The elements from class 7 and 8 are possible qualifiers for the other elements if supplied with corresponding values.

The partial expansion is not supported for the whole analysis feedback Bufr messages ( includes original observation and analysis variables followed by the statistics e.t.c.)

The list of the requested elements and corresponding word and bit pointers are created before expansion. These pointers are used to extract data from the Data section of the Bufr message.

The KRQ and RQV arrays have to be initialised by missing value indicators NVIND and RVIND respectively.

The KREQ(1) is useful to split the feedback Bufr message into original, quality control and analysis feed back data.

### Externals

BUNPCK - Unpacks bit pattern  
 BUNPKS - Unpacks bit pattern in repeated way.

### Reference

None

### 3.5.2 Example

Running BUFR program and answering prompts as below, 500 mb level information is unpacked by the BUFREX routine.

```
DO YOU WANT TO PRINT( Y/N ) :y
CODE TABLES TO BE PRINTED ( Y/N ) :n
DO YOU WANT ENCODING( Y/N ) :n
RECORD NUMBER TO START FROM :1
REQUESTED ELEMENT : 007004
REQUESTED VALUE   : 50000.
REQUESTED ELEMENT : 008001
REQUESTED VALUE   :
REQUESTED ELEMENT : 010003
REQUESTED VALUE   :
REQUESTED ELEMENT : 012001
REQUESTED VALUE   :
REQUESTED ELEMENT : 012003
REQUESTED VALUE   :
REQUESTED ELEMENT : 011001
REQUESTED VALUE   :
REQUESTED ELEMENT : 011002
REQUESTED VALUE   :
REQUESTED ELEMENT :
REQUESTED VALUE   :
REQUESTED FLAG 1  : 1
REQUESTED FLAG 2  : 2
```

```
DO YOU WANT TO PRINT SECTION 0-3( Y/N ) :y
```

This is the output from the program:

ECMWF

BUFR DECODING SOFTWARE VERSION - 7.1  
07 June 2005.

Your path for bufr tables is :

/home/ma/maa/bigtmp/wmo\_bufr\_crex\_000250/bufr\_000270/bufrtables  
BUFR TABLES TO BE LOADED B00000000000098006001,D00000000000098006001

1

BUFR SECTION 0

LENGTH OF SECTION 0 (BYTES)	8
TOTAL LENGTH OF BUFR MESSAGE (BYTES)	1406
BUFR EDITION NUMBER	3

1

BUFR SECTION 1

LENGTH OF SECTION 1 (BYTES)	18
BUFR EDITION NUMBER	3
ORIGINATING SUB-CENTRE	0
ORIGINATING CENTRE	98
UPDATE SEQUENCE NUMBER	1
FLAG (PRESENCE OF SECTION 2)	128
BUFR MESSAGE TYPE	2
BUFR MESSAGE SUBTYPE	101
VERSION NUMBER OF LOCAL TABLE	1
YEAR	5
MONTH	5
DAY	9
HOUR	10
MINUTE	0



```

VERSION NUMBER OF MASTER TABLE      6
BUFR MASTER TABLE                    0
1
    BUFR SECTION 2

LENGTH OF SECTION 2                    52

    REPORT DATA BASE KEY

RDB DATA TYPE                         5
RDB DATA SUBTYPE                      101
YEAR                                  2005
MONTH                                 5
DAY                                  9
HOUR                                 10
MINUTE                               0
SECOND                               0
LATITUDE 1                           51.20
LONGITUDE 1                           -1.80
IDENTIFIER                           03743
TOTAL BUFR MESSAGE LENGTH             1406
DAY (RDB INSERTION)                   9
HOUR (RDB INSERTION)                 10
MINUTE (RDB INSERTION)               53
SECOND (RDB INSERTION)               7
DAY (MDB ARRIVAL)                    9
HOUR (MDB ARRIVAL)                   10
MINUTE (MDB ARRIVAL)                 50
SECOND (MDB ARRIVAL)                 20
CORRECTION NUMBER                     1
PART OF MESSAGE                       1
CORRECTION NUMBER                     1
PART OF MESSAGE                       1
CORRECTION NUMBER                     0
PART OF MESSAGE                       0
CORRECTION NUMBER                     0
PART OF MESSAGE                       0
QUALITY CONTROL % CONF                 70
1
    BUFR SECTION 3

LENGTH OF SECTION 3 (BYTES)           40
RESERVED                              0
NUMBER OF DATA SUBSETS                1
FLAG (DATA TYPE/DATA COMPRESSION)     128

```

## DATA DESCRIPTORS (UNEXPANDED)

```

1 309007
2 104000
3 031001
4 007004
5 008001
6 011061
7 011062
8 222000
9 101000
10 031002
11 031031
12 001031
13 001032
14 101000
15 031002
16 033007

```

## DATA DESCRIPTORS (EXPANDED)

```
1 007004 PRESSURE
2 008001 VERTICAL SOUNDING SIGNIFICANCE
3 010003 GEOPOTENTIAL
4 012001 TEMPERATURE/DRY BULB TEMPERATURE
5 012003 DEW POINT TEMPERATURE
6 011001 WIND DIRECTION
7 011002 WIND SPEED
```

```
STARTING SUBSET TO BE PRINTED : 1
ENDING SUBSET TO BE PRINTED : 1
```

EXPANDED BUFR MESSAGE

```
1 PRESSURE          0.5000000000E+05 PA
2 VERTICAL SOUNDI    0.3600000000E+02 FLAG TABLE 008001
3 GEOPOTENTIAL       0.5374000000E+05 M**2/S**2
4 TEMPERATURE/DRY    0.2475000000E+03 K
5 DEW POINT TEMPE    0.2245000000E+03 K
6 WIND DIRECTION     0.3050000000E+03 DEGREE TRUE
7 WIND SPEED         0.2600000000E+02 M/S
```

The equivalent request in batch mode will be:

```
KREQ(1)=1
KREQ(2)=2
KRQL=7
```

```
KRQ(1)=007004      RQV(1)=50000.
KRQ(2)=008001      RQV(2)=RMISS
KRQ(3)=010003      RQV(3)=RMISS
KRQ(4)=012001      RQV(4)=RMISS
KRQ(5)=012003      RQV(5)=RMISS
KRQ(6)=011001      RQV(6)=RMISS
KRQ(7)=011002      RQV(7)=RMISS
```

where RMISS is missing value indicator RMISS=1.7E38

```
CALL BURQS(KREQ,KRQL,KRQ,RQV,KERR)
```

getting the same result as previously.

### 3.6 Printing routines

Bufr form is a binary representation of meteorological data and as such is not suitable for visualization. After expanding Bufr data using the BUFREX routine a number of printing routines can be used to print different parts of the Bufr message.

#### 3.6.1 To print Section 0

```
CALL BUPRS0 (KSEC0)
```

#### 3.6.2 To print Section 1

```
CALL BUPRS1 (KSEC1)
```

#### 3.6.3 To print Section 2

Section 2 of the Bufr message is an optional section and every ADP centre can pack any information in this section. The Bufr software decodes this local information and stores it into KSEC2 array. ECMWF is storing RDB key in the Section 2 of the Bufr messages. To print content of the Section 2, subroutine BUUKEY must be called before the BUPRS2 routine.

For other cases, special routines have to be written to unpack this information.

```
CALL BUUKEY (KSEC1, KSEC2, KEY, KSUP, KERR)
```

```
CALL BUPRS2 (KSUP, KEY)
```

where

- KEY - An INTEGER array containing RDB key information
- The other arguments were described in previous routines.

**KEY** - An INTEGER array containing RDB key information

Array index	Word content
1	Length of Section 2 in bytes
2	RDB type

*continued on next page*

*continued from previous page*

Array index	Word content
3	RDB subtype
4	Year
5	Month
6	Day
7	Hour
8	Minute
9	Second
10	Longitude 1
10	Latitude 1
12	Longitude 2
13	Latitude 2
14	Number of subsets
15	Ident (numeric as satellite number)
16	Ident (CCITTIA5) one character
17	Ident (CCITTIA5) one character
18	Ident (CCITTIA5) one character
19	Ident (CCITTIA5) one character
20	Ident (CCITTIA5) one character
21	Ident (CCITTIA5) one character
22	Ident (CCITTIA5) one character
23	Ident (CCITTIA5) one character
24	Ident (CCITTIA5) one character
25	Total Bufr message length in bytes
26	Day (RDB insertion)
27	Hour (RDB insertion)
28	Minute (RDB insertion)
29	Second (RDB insertion)
30	Day (MDB insertion)
31	Hour (MDB insertion)
32	Minute (MDB insertion)
33	Second (MDB insertion)
34	Correction number
35	Part received (for TEMP/PILOT observations)
36	Not used
37	Correction number
38	Part received (for TEMP/PILOT observations)
39	Not used
40	Correction number

*continued on next page*

*continued from previous page*

Array index	Word content
41	Part received (for TEMP/PILOT observations)
42	Not used
43	Correction number
44	Part received (for TEMP/PILOT observations)
45	Not used
46	The lowest quality control % confidence

### 3.6.4 To print Section 3

Prior to calling the BUPRS3 routine, the BUSEL or BUSEL2 routine has to be called to get lists of unexpanded and fully expanded Data descriptors. In the case of multi-subset uncompressed bufr data the expanded list of descriptors might be different for different subsets.

```
CALL BUSEL (KTDLEN, KTDLST, KTDEXL, KTDEXP, KERR)
```

or

```
CALL BUSEL2 (KSUBSET, KELEM, KTDLEN, KTDLST, KTDEXL, KTDEXP, CNames, CUnits, KERR)
```

```
CALL BUPRS3 (KSEC3, KTDLEN, KTDLST, KTDEXL, KTDEXP, KELEM, CNames)
```

### 3.6.5 To print data

```
CALL BUPRT (K, KSUB1, KSUB2, KELEM, CNames, CUnits, CVals,
            KVals, Values, KSUP, KSEC1, KERR)
```

where:

- K - An INTEGER set to 0 - No Code table entry  
1 - Code table entry
- KSUB1 - An INTEGER containing the starting subset to print.
- KSUB2 - An INTEGER containing the ending subset to print.
- KELEM - An INTEGER containing the expected number of expanded elements.
- CNames - A CHARACTER\*64 array containing the element names.
- CUnits - A CHARACTER\*24 array containing the units.
- CVals - A CHARACTER\*80 array containing character values.
- KVals - An INTEGER containing the expected number of data values.
- Values - A REAL\*8 array containing the expanded values.

- KSUP - AN INTEGER array containing supplementary information.
- KSEC1 -An INTEGER array containing Section 1 information.
- KERR - An INTEGER containing an error code.

## 3.7 Bufr software tools

### 3.7.1 Subroutine BUS012

#### Purpose

Expands only Sections 0, 1 and 2 of Bufr message.

#### Interface

```
CALL BUS012 (KBUFL, KBUFF, KSUP, KSEC0, KSEC1, KSEC2, KERR)
```

where

- Integer variables are denoted by first letter K.

#### Input arguments

- KBUFL - An INTEGER variable containing the length of Bufr message in words.
- KBUFF - An INTEGER array containing the Bufr message.

#### Output argument

- KSUP - An INTEGER array size 9 containing supplementary information
- KSEC0 - An INTEGER array size 3 containing Bufr Section 0 information
- KSEC1 - An INTEGER array of at least 40 words containing Bufr Section 1 information. When Section 1 contains data for local use, KSEC1 should be sized accordingly.
- KSEC2 - An INTEGER array of 4096 words containing Bufr Section 2 information. ECMWF uses this section to store Report Data Base key.
- KERR - An Integer containing an error code.

**KSUP** AN INTEGER array containing supplementary information

Array index	Word content
1	Dimension of KSEC1 array
2	Dimension of KSEC2 array
3	Dimension of KSEC3 array
4	Dimension of KSEC4 array
5	Real number of expanded elements
6	Number of subsets
7	Real number of elements in CVALS array
8	Total Bufr message length in bytes
9	Dimension of KSEC0 array

**KSEC0** An INTEGER array size 3 containing Bufr Section 0 information

Array index	Word content
1	Length of section 0 in bytes
2	Total length of Bufr message in bytes
3	Bufr Edition number (currently 4)

**KSEC1** An INTEGER array of at least 40 words containing Bufr Section 1

Array index	Word content
1	Length of section 1 in bytes
2	Bufr Edition number (currently 4)
3	Originating centre
4	Update sequence number
5	Flag (presence of Section 2 in the message)
6	Bufr message type ( Bufr Table A)
7	Bufr message subtype (local use)
8	Version number of local table used
9	Year
10	Month
11	Day
12	Hour
13	Minute
14	Bufr Master Table used
15	Version number of Master table used
16	Originating sub-centre
17	International sub-category
18	Second
19-	Local ADP centre information (byte by byte)



**KSEC2** An INTEGER array of 4096 words containing Bufr Section 2

Array index	Word content
1	Length of Section 2 in bytes
2-	Report Data Base key in packed form

### Method

None .

### Externals

BUXS0    - Expands Section 0 of Bufr message  
BUXS1    - Expands Section 1 of Bufr message  
BUXS2    - Expands Section 2 of Bufr message

### Reference

None .

### 3.7.2 Subroutine *BUS0123*

#### **Purpose**

Expands only Sections 0, 1, 2 and 3 of Bufr message.

#### **Interface**

```
CALL BUS0123 (KBUFL, KBUFF, KSUP, KSEC0, KSEC1, KSEC2, KSEC3, KERR)
```

where

- Integer variables are denoted by first letter K.

#### **Input arguments**

- KBUFL - An INTEGER variable containing the length of Bufr message in words.
- KBUFF - An INTEGER array containing the Bufr message.

#### **Output argument**

- KSUP - An INTEGER array size 9 containing supplementary information
- KSEC0 - An INTEGER array size 3 containing Bufr Section 0 information
- KSEC1 - An INTEGER array of at least 40 words containing Bufr Section 1 information. When Section 1 contains data for local use, KSEC1 should be sized accordingly.
- KSEC2 - An INTEGER array of 4096 words containing Bufr Section 2 information. ECMWF uses this section to store Report Data Base key.
- KSEC3 - An INTEGER array of 4 containing Bufr section 3 header information
- KERR - An Integer containing an error code.

**KSUP** AN INTEGER array containing supplementary information

Array index	Word content
1	Dimension of KSEC1 array
2	Dimension of KSEC2 array
3	Dimension of KSEC3 array
4	Dimension of KSEC4 array
5	Real number of expanded elements
6	Number of subsets
7	Real number of elements in CVALS array
8	Total Bufr message length in bytes
9	Dimension of KSEC0 array

**KSEC0** An INTEGER array size 3 containing Bufr Section 0 information

Array index	Word content
1	Length of section 0 in bytes
2	Total length of Bufr message in bytes
3	Bufr Edition number (currently 4)

**KSEC1** An INTEGER array of at least 40 words containing Bufr Section 1

Array index	Word content
1	Length of section 1 in bytes
2	Bufr Edition number (currently 4)
3	Originating centre
4	Update sequence number
5	Flag (presence of Section 2 in the message)
6	Bufr message type ( Bufr Table A)
7	Bufr message subtype (local use)
8	Version number of local table used
9	Year
10	Month
11	Day
12	Hour
13	Minute
14	Bufr Master Table used
15	Version number of Master table used
16	Originating sub-centre
17	International sub-category
18	Second
19-	Local ADP centre information (byte by byte)

**KSEC2** An INTEGER array of 4096 words containing Bufr Section 2

Array index	Word content
1	Length of Section 2 in bytes
2-	Report Data Base key in packed form

**KSEC3** - An INTEGER array of 4 words containing Bufr Section 3 information

Array index	Word content
1	Length of Section 3 in bytes
2	Reserved
3	Number of subsets
4	Flag (data type, compression)

### Method

None.

### Externals

BUEXS0 - Expands Section 0 of Bufr message  
BUEXS1 - Expands Section 1 of Bufr message  
BUEXS2 - Expands Section 2 of Bufr message  
BUEXS3 - Expands Section 3 of Bufr message

### Reference

None.

### 3.7.3 Subroutine *BUSEL*

#### Purpose

Returns lists of unexpanded and expanded data descriptors from the Bufr message. The lists contains Bufr Table D sequence numbers, and the Bufr Table B reference numbers.

#### Interface

```
CALL BUSEL (KTDLEN, KTDLST, KTDEXL, KTDEXP, KERR)
```

where

- Integer variables are denoted by first letter K.

#### Input arguments

None .

#### Output arguments

- KTDLEN - An INTEGER variable containing number of data descriptors in KTDLST array
- KTDLST - An INTEGER array containing the list of KTDLEN data descriptors
- KTDEXL - An INTEGER variable containing number of expanded data descriptors
- KTDEXP - An INTEGER array containing the list of KTDEXL data descriptors
- KERR - An INTEGER containing error code.

#### Method

None

#### Externals

None

#### Reference

None

### 3.7.4 Subroutine *BUSEL2*

#### **Purpose**

Returns lists of unexpanded and expanded data descriptors from the Bufr message for particular subset.

#### **Interface**

```
CALL BUSEL2 (KSUBSET, KELEM, KTDLEN, KTDLST, KTDEXL, KTDEXP, CNAMES, CUNITS, KERR)
```

where

- Integer variables are denoted by first letter K.

#### **Input arguments**

- KSUBSET - Subset number
- KELEM - Number of expected elements

#### **Output arguments**

- KTDLEN - An INTEGER variable containing number of data descriptors in KTDLST array
- KTDLST - An INTEGER array containing the list of KTDLEN data descriptors
- KTDEXL - An INTEGER variable containing number of expanded data descriptors
- KTDEXP - An INTEGER array containing the list of KTDEXL data descriptors
- CNAMES - CHARACTER array containing element name
- CUNITS - CHARACTER array containing element unit
- KERR - An INTEGER containing error code.

#### **Method**

None

#### **Externals**

None

#### **Reference**

None

### 3.7.5 Subroutine BUUKEY

#### Purpose

Unpacks ECMWF Report Data Base Key.

#### Interface

```
CALL BUUKEY (KSEC1, KSEC2, KEY, KSUP, KERR)
```

where: zz

- Integer variables are denoted by first letter K.

#### Input arguments

- KSEC1 - An INTEGER array of at least 40 words containing Bufr Section 1 information. When Section 1 contains data for local use, KSEC1 should be sized accordingly.
- KSEC2 - An INTEGER array of 4096 words containing Bufr Section 2 information. ECMWF uses this section to store Report Data Base Key.
- KSUP - An INTEGER array (size 9) containing supplementary information.

**KSEC1** An INTEGER array of at least 40 words containing Bufr Section 1

Array index	Word content
1	Length of section 1 in bytes
2	Bufr Edition number (currently 4)
3	Originating centre
4	Update sequence number
5	Flag (presence of Section 2 in the message)
6	Bufr message type ( Bufr Table A)
7	Bufr message subtype (local use)
8	Version number of local table used
9	Year
10	Month
11	Day
12	Hour
13	Minute
14	Bufr Master Table used
15	Version number of Master table used
16	Originating sub-centre
17	International sub-category
18	Second
19-	Local ADP centre information (byte by byte)

**KSEC2** An INTEGER array of 4096 words containing Bufr Section 2

Array index	Word content
1	Length of Section 2 in bytes
2-	Report Data Base key in packed form

**KSUP** An INTEGER array size 9 containing supplementary information

Array index	Word content
1	Dimension of KSEC1 array
2	Dimension of KSEC2 array
3	Dimension of KSEC3 array
4	Dimension of KSEC4 array
5	Real number of expanded elements
6	Number of subsets
7	Real number of elements in CVALS array
8	Total Bufr message length in bytes
9	Dimension of KSEC0 array

### Output arguments

- KEY - An INTEGER array of 46 words containing unpacked RDB key.
- KERR - Error cod

**KEY** - An INTEGER array of 46 words containing unpacked RDB key.

Array index	Word content
1	Length of Section 2 in bytes
2	RDB type
3	RDB subtype
4	Year
5	Month
6	Day
7	Hour
8	Minute
9	Second
10	Longitude 1

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Array index	Word content
10	Latitude 1
12	Longitude 2
13	Latitude 2
14	Number of subsets
15	Ident (numeric as satellite number)
16	Ident (CCITTIA5) one character
17	Ident (CCITTIA5) one character
18	Ident (CCITTIA5) one character
19	Ident (CCITTIA5) one character
20	Ident (CCITTIA5) one character
21	Ident (CCITTIA5) one character
22	Ident (CCITTIA5) one character
23	Ident (CCITTIA5) one character
24	Ident (CCITTIA5) one character
25	Total Bufr message length in bytes
26	Day (RDB insertion)
27	Hour (RDB insertion)
28	Minute (RDB insertion)
29	Second (RDB insertion)
30	Day (MDB insertion)
31	Hour MDB insertion)
32	Minute (MDB insertion)
33	Second (MDB insertion)
34	Correction number
35	Part received (for TEMP/PILOT observations)
36	Not used
37	Correction number
38	Part received (for TEMP/PILOT observations)
39	Not used
40	Correction number
41	Part received (for TEMP/PILOT observations)
42	Not used
43	Correction number
44	Part received (for TEMP/PILOT observations)
45	Not used
46	The lowest quality control % confidence

## Method

The latitudes and longitudes are unpacked and stored as integers. To get real values apply the following

calculation:

$RLAT1 = (KEY(11) - 9000000)/100000.$

$RLON1 = (KEY(10) - 18000000)/100000.$

$RLAT2 = (KEY(13) - 9000000)/100000.$

$RLON2 = (KEY(12) - 18000000)/100000.$

## Externals

BUNPCK            - Unpack Bit pattern

BUNPKS           - Unpacks bit pattern in repeated way

## Reference

None.

### 3.7.6 Subroutine BUPKEY

#### Purpose

Packs ECMWF RDB Key into KSEC2 array.

#### Interface

```
CALL BUPKEY (KEY, KSEC1, KSEC2, KERR)
```

where:

- Integer variables are denoted by first letter K.

#### Input arguments

- KEY - An INTEGER array of 46 words containing unpacked RDB
- KSEC1 - An INTEGER array of at least 40 words containing Bufr Section 1 information. When Section 1 contains data for local use, KSEC1 should be sized accordingly.
- KSEC2 - An INTEGER array of 4096 words containing Bufr Section 2.

**KEY** An INTEGER array of 46 words containing unpacked RDB key.

Array index	Word content
Array index	Word content
1	Length of Section 2 in bytes
2	RDB type
3	RDB subtype
4	Year
5	Month
6	Day
7	Hour
8	Minute
9	Second
10	Longitude 1
10	Latitude 1

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Array index	Word content
12	Longitude 2
13	Latitude 2
14	Number of subsets
15	Ident (numeric as satellite number)
16	Ident (CCITTIA5) one character
17	Ident (CCITTIA5) one character
18	Ident (CCITTIA5) one character
19	Ident (CCITTIA5) one character
20	Ident (CCITTIA5) one character
21	Ident (CCITTIA5) one character
22	Ident (CCITTIA5) one character
23	Ident (CCITTIA5) one character
24	Ident (CCITTIA5) one character
25	Total Bufr message length in bytes
26	Day (RDB insertion)
27	Hour (RDB insertion)
28	Minute (RDB insertion)
29	Second (RDB insertion)
30	Day (MDB insertion)
31	Hour MDB insertion)
32	Minute (MDB insertion)
33	Second (MDB insertion)
34	Correction number
35	Part received (for TEMP/PILOT observations)
36	Not used
37	Correction number
38	Part received (for TEMP/PILOT observations)
39	Not used
40	Correction number
41	Part received (for TEMP/PILOT observations)
42	Not used
43	Correction number
44	Part received (for TEMP/PILOT observations)
45	Not used
46	The lowest quality control % confidence

**KSEC1** The content of the KSEC1 array is given in the following Table:

Array index	Word content
1	Length of section 1 in bytes
2	Bufr Edition number (currently 4)
3	Originating centre
4	Update sequence number
5	Flag (presence of Section 2 in the message)
6	Bufr message type ( Bufr Table A)
7	Bufr message subtype (local use)
8	Version number of local table used
9	Year
10	Month
11	Day
12	Hour
13	Minute
14	Bufr Master Table used
15	Version number of Master table used
16	Originating sub-centre
17	International sub-category
18	Second
19-	Local ADP centre information (byte by byte)

**KSEC2** The content of the KSEC2 array is given in the following Table:

Array index	Word content
1	Length of Section 2 in bytes
2-	Report Data Base key in packed form

### Output arguments

- KERR - Error code

### Method

The integer values in the KEY array for latitude and longitude must be calculated as:

$KEY(10) = NINT(RLON1 * 100000. + 18000000)$

$KEY(11) = NINT(RLAT1 * 100000. + 9000000)$

$KEY(12) = NINT(RLON2 * 100000. + 18000000)$

$KEY(13) = NINT(RLAT2 * 100000. + 9000000)$

### Externals

BUPCK      - Packs bit pattern

### 3.7.7 Subroutine BUXDES

#### Purpose

A basic principle in encoding Bufr data is to have a one to one correspondence between data descriptors and the values to be packed.

This routine is a tool to achieve this requirement. It expands Data descriptors and prints unexpanded and expanded lists. The Unexpanded list should be part of Section 3 of the Bufr message and the VALUES array ought to be filled with element values corresponding to the expanded data descriptors.

#### Interface

```
CALL BUXDES (K, KSEC1, KTDLEN, KTDLST, KDLEN, KDATA, KELEM,  
            KTDEXL, KTDEXP, CNames, CUnits, KERR)
```

where:

- Integer variables are denoted by first letter K.
- Character variables are denoted by first letter C.

#### Input arguments

- K - An INTEGER variable containing 0 - no print 1 - print
- KSEC1 - An INTEGER array of at least 40 words containing Bufr Section 1 information. When Section 1 contains data for local use, KSEC1 should be sized accordingly. The following words of KSEC1 must be filled:  
KSEC1(2) - Bufr Edition number (currently 4) KSEC1(3) - Originating centre KSEC1(8) - Version number of local tables used KSEC1(15) - Version number of Master table used
- KTDLEN - An INTEGER containing number of data descriptors
- KTDLST - An INTEGER array containing data descriptors for Bufr Section 3
- KDLEN - An INTEGER containing dimension of array KDATA
- KDATA - An INTEGER array containing delayed replication factors in the order they appear in the expanded list
- KELEM - An INTEGER containing expected number of expanded elements

### Output arguments

- KTDEXL - An INTEGER containing number of expanded elements.
- KTDEXP - An INTEGER array containing list of expanded elements.
- CNAMES - CHARACTER\*64 array containing list names of expanded element
- CUNITS -Character\*24 array containing list of units for expanded elements
- KERR - Return error code.

### Method

None .

### Externals

BUETAB - Loads required Bufr tables.

BUEDD - Expands data descriptors

### Reference

None .

### 3.7.8 Subroutine BUBOX

#### Purpose

The expanded Bufr message can be very lengthy containing many bit maps referring backwards to the data. This routine resolves bit maps for the user, returning two dimensional arrays containing the expanded observation and the corresponding applications (quality controls, statistics, differences e.t.c).

Every application appears as a new column. A new data are following each other in the first column, starting with the generating centre/application information.

#### Interface

```
CALL BUBOX (KSUB, KSUP, KELEM, KWTR, CNames, CUnits, KVals,  
            VALUES, KBOX, KAPP, KLEN, KBOXR, VALS, CBOXN, CBOXU, KERR)
```

where:

- Integer variables are denoted by first letter K.
- Real variable are denoted by first letter V.
- Character variables are denoted by first letter C.

#### Input arguments

- KSUB - An INTEGER containing subset number.
- KSUP - An INTEGER array size 9 containing supplementary information.
- KELEM - An INTEGER variable containing expected number of expanded. elements. It must be the same as used in BUFREX routine previously called.
- KWTR - An INTEGER array containing list of expanded Bufr table B reference numbers (KTDEXP output from BUSEL routine).
- CNames - A CHARACTER\*64 array of KELEM words containing element names.
- CUnits - A CHARACTER\*24 array of KELEM words containing element units.
- KVals - An INTEGER variable containing expected number of data values.
- VALUES - A REAL\*8 array of KVals words containing element values.



## Output arguments

- KBOX - An INTEGER containing number of elements in first column of box.
- KAPP - An INTEGER containing number of applications
- KLEN - An INTEGER containing max index for number of rows. The next column starts at KLEN +1 element or  $\text{index} = i + (\text{KAPP} - 1) * \text{KLEN}$  to address any value in the box.
- KBOXR - An INTEGER array of 80000 containing Bufr table B reference numbers.
- VALS - A REAL\*8 array of 80000 containing boxed values.
- CBOXN - A CHARACTER\*64 array of 80000 containing boxed element names.
- CBOXU - A CHARACTER\*24 array of 80000 containing boxed units.
- KERR - An INTEGER containing error code

## Method

The expanded Bufr message is passed in the subroutine to resolve backward reference bit maps associating all applications to the particular element. The output arrays containing boxed data are one dimensional arrays containing information as two dimensional table.

The first column contains in first 6 rows reserved information and the original observation starts at the index 7. Columns 2- KAPP are different generating applications corresponding through bit maps to the data in the column 1. Column 1 contains KLEN elements. Index to the i-th element can be calculated as:

$$\text{index} = i + (\text{KAPP}-1) * \text{KLEN}$$

The first row, columns 2 to KAPP contain quality control operators (222000, 225000 e.t.c) Rows 2 to 6, columns 2 to KAPP contain generating centre, generating application, statistics, incremental update number and minimisation simulation number respectively.

## Externals

BUERR     - Prints error

## Reference

None.

### 3.7.9 Subroutine BUPRTBOX

#### Purpose

Prints boxed expanded Bufr message.

#### Interface

```
CALL BUPRTBOX (KBOX, KAPP, KLEN, KBOXR, VALS, CBOXN, CBOXU)
```

#### Input arguments

- KBOX - An INTEGER containing number of elements in first column of box.
- KAPP - An INTEGER containing number of applications
- KLEN - An INTEGER containing max index for number of rows. The next column starts at KLEN +1 element or index= $i + (KAPP - 1) * KLEN$  to address any value in the box.
- KBOXR - An INTEGER array containing Bufr table B reference numbers.
- VALS - A REAL\*8 array containing boxed values.
- CBOXN - A CHARACTER\*64 array containing boxed element names.
- CBOXU - A CHARACTER\*24 array containing boxed units.

#### Output arguments

None .

#### Method

None .

#### Externals

None .

#### Reference

None .

### 3.7.10 Subroutine *BUGET\_OPERA\_IMAGE*

#### **Purpose**

Applies delayed repetition to create full image. The routine can be called after call to *bufrex* and *busel2* routines. It will return image array and imahe meta-data information.

#### **Interface**

```
BUGET_OPERA_IMAGE (KSEC1, KTDEXL, KTDEXP, CNames, CUnits,
                   KELEM, , KVALS, VALUES, CVALS,
                   KTDEXL_IMG, KTDEXP_IMG, CNames_IMG, CUnits_IMG,
                   KVALS_IMG, VALUES_IMG, CVALS_IMG, IMAGE, KERR)
```

#### **Input arguments**

- KSEC1 - An INTEGER array of at least 40 words containing Bufr Section 1
- KTDEXL - An INTEGER variable containing number of expanded data descriptors
- KTDEXP - An INTEGER array containing the list of KTDEXL data descriptors
- CNames - A CHARACTER\*64 array of *kelem* containing element names
- CUnits - A CHARACTER\*24 array of *kelem* containig bufr table B units
- KELEM - An INTEGER containing expected number of expanded elements
- KVALS - An INTEGER containing expected number of data elelemnts
- VALUES - A REAL\*8 array containing expanded values
- CVALS - A CHARACTER\*80 array containing character values

#### **Output arguments**

- KTDEXL\_IMG - An INTEGER variable containing number of expanded data descriptors
- KTDEXP\_IMG - An INTEGER array containing the list of KTDEXL\_IMG data descriptors
- CNames\_IMG - A CHARACTER\*64 array of *kelem* containing element names
- CUnits\_IMG - A CHARACTER\*24 array of *kelem* containig bufr table B units
- KVALS\_IMG - An INTEGER containing expected number of data elelemnts
- VALUES\_IMG - A REAL\*8 array containing expanded values
- CVALS\_IMG - A CHARACTER\*80 array containing character values
- IMAGE - INTEGER array containing image ( pixel values)
- KERR - RETURN error code

**Method**

None.

**Externals**

None.

## 3.8 Performance

The speed to decode Bufr messages is proportional to the number of messages. Since the same number of the same kind of observations can be packed into Bufr form in many ways, it is recommended to use multi subsets in compressed form whenever possible. To get the best performance from the software it is recommended that:

- The input file for expansion should contain Bufr messages sorted according to their types.
- Avoid usage of delayed data descriptor replication factors if possible.
- Avoid usage of Operator 203yyy to change reference values.
- Encode data into Bufr form in multi subset compressed form.

Here are some figures of real times used on IBM RS6000, single processor computer to expand:

- All conventional data for one analysis cycle (56945 Bufr messages, 197696 subsets) 18 seconds.
- All AIRS data for one analysis cycle (70 Mbytes, 7775 bufr messages with 80563 subsets) 122 seconds.

## 4 Quality control in BUFR

A quality control information in the Bufr shall be represented using Quality control operators from the Bufr Table C. Table 9 contains definition of possible operators and their usage.

Table 9: Bufr Tables C quality control operators

Table Reference F X	Operand	Operator name	Operation definition
2 22	000	Quality information	The Class 33 quality information which follows relates to the following N fully expanded (including all replications) data descriptors; this operator shall be followed by a replication operator and the data present indicator (031031); the replication factor shall define N, while the bit map defined within the data by the replicated 031031 descriptor shall indicate those elements for which quality control information is given.
2 23	000	Substituted values operator	The substituted values which follow relate to the previous N fully expanded (including all replications) data descriptors; this operator shall be followed by a replication operator and the data present indicator (031031); the replication factor shall define N, while the bit map defined within the data by the replicated 031031 descriptor shall indicate those elements for which substituted values are given
2 23	255	Substituted value marker operator	This operator shall indicate the relative position of the data element in the data stream where the descriptor(s) indicated as relevant by the 031031 descriptor shall have effect. This device allows for additional descriptors (and data) to be placed after the 031031 descriptor (and its associated bit map in the data) without losing the correspondence between the original descriptors and the substituted values.
2 24	000	First order statistical values follow	The statistical values which follow relate to the previous N fully expanded (including all replications) data descriptors; this operator shall be followed by a replication operator and the data present indicator (031031); the replication factor shall define N, while the bit map defined within the data described by the replicated 031031 descriptor shall indicate those elements for which statistical values are given; each statistical value shall be represented in the data according to the scheme described by the corresponding data descriptor, as possibly modified by any operator having scope over that descriptor when first used.

*continued on next page*

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Table Reference F X	Operand	Operator name	Operation definition
2 24	255	First order statistical values marker operator	This operator shall indicate the relative position of the data element in the data stream where the descriptor(s) indicated as relevant by the 031031 operator shall have effect. This device allows for additional descriptors (and data) to be placed after the 031031 descriptor (and its associated bit map in the data) without losing the correspondence between the original descriptors and the statistical values.
2 25	000	Difference statistical values follow	The statistical values which follow relate to the previous N fully expanded (including all replications) data descriptors; this operator shall be followed by a replication operator and the data present indicator (031031); the replication factor shall define N, while the bit map defined within the data by the replicated 031031 descriptor shall indicate those elements for which statistical values are given; each statistical value shall be represented in the data according to the scheme described by the corresponding data descriptor, as possibly modified by any operator having scope over that descriptor when first used, but with a reference value of $-2n$ and data width of $(n+1)$ , where $n$ is the data width given by the original descriptor. This special reference value allows the statistical difference values to be centred around zero.
2 25	255	Difference statistical values marker operator	This operator shall indicate the relative position of the data element in the data stream where the descriptor(s) indicated as relevant by the 031031 operator shall have effect. This device allows for additional descriptors (and data) to be placed after the 031031 descriptor (and its associated bit map in the data) without losing the correspondence between the original descriptors and the statistical values.
2 32	000	Replaced/ retained values follow	The replaced retained values which follows relate to the previous N fully expanded (including all replications) data descriptors; this operator shall be followed by a replication operator and the data present indicator (031031); the replication factor shall define N, while the bit map defined within the data by the replicated 031031 descriptor shall indicate those elements for which replace/retained values are given.

*continued on next page*

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Table Reference F X	Operand	Operator name	Operation definition
2 32	255	Replaced/retained value marker operator	This operator shall indicate the relative position of the data element in the data stream where the descriptor(s) indicated as relevant by the 031031 operator shall have effect. This device allows for additional descriptors (and data) to be placed after the 031031 descriptor (and its associated bit map in the data) without losing the correspondence between the original descriptors and the replaced/retained values.
2 35	000	Cancel backward data reference	This operator terminates all previously define backward references.
2 36	000	Define backward reference bit map	This operator is used when defining backward reference bit maps which are likely to be reused; this operator shall be followed by a replication operator and the data present indicator (031031); the replication factor shall define N, while the bit map defined within the data by the replicated 031031 descriptor shall indicate the elements selected.
2 37	000	Used defined bit map	This operator may be used instead of the sequence "replication operator followed by data present indicator (031031)"; use of this operator shall indicate that the bit map defined by the operator 236000 be used again.
2 37	255	Cancel use defined bit map	This operator cancels the reuse of a previously defined bit map.



## 4.1 Quality control example

Bufr message containing analysis feedback data was expanded. List of descriptors in the section 3 shows how to use quality control operators to represent various quality controls and statistics. The output contains following information:

```

ECMWF

BUFR DECODING SOFTWARE VERSION - 7.1
07 June 2005.

Your path for bufr tables is :
/home/ma/maa/bigtmp/wmo_bufr_crex_000250/bufr_000270/bufrtables
BUFR TABLES TO BE LOADED B0000000000098006001,D0000000000098006001
1
    BUFR SECTION 0

    LENGTH OF SECTION 0 (BYTES)          8
    TOTAL LENGTH OF BUFR MESSAGE (BYTES) 3572
    BUFR EDITION NUMBER                  3
1
    BUFR SECTION 1

    LENGTH OF SECTION 1 (BYTES)          18
    BUFR EDITION NUMBER                  3
    ORIGINATING SUB-CENTRE               0
    ORIGINATING CENTRE                  98
    UPDATE SEQUENCE NUMBER              1
    FLAG (PRESENCE OF SECTION 2)        128
    BUFR MESSAGE TYPE                   4
    BUFR MESSAGE SUBTYPE                142
    VERSION NUMBER OF LOCAL TABLE      1
    YEAR                                4
    MONTH                               5
    DAY                                 20
    HOUR                                3
    MINUTE                              1
    VERSION NUMBER OF MASTER TABLE      6
    BUFR MASTER TABLE                 0
1
    BUFR SECTION 2

    LENGTH OF SECTION 2                  52

    REPORT DATA BASE KEY

    RDB DATA TYPE                      7
    RDB DATA SUBTYPE                  142
    YEAR                               2004
    MONTH                              5
    DAY                                 20
    HOUR                                3
    MINUTE                              1
    SECOND                              0
    LATITUDE 1                         -33.10
    LONGITUDE 1                        -169.55
    LATITUDE 2                          61.00
    LONGITUDE 2                        174.40
    NUMBER OF OBSERVATIONS              37
    IDENTIFIER                          0
    TOTAL BUFR MESSAGE LENGTH          3572
    DAY (RDB INSERTION)                0
    HOUR (RDB INSERTION)               0
    MINUTE (RDB INSERTION)             0
    SECOND (RDB INSERTION)             0
    DAY (MDB ARRIVAL)                 0
    HOUR (MDB ARRIVAL)                 0
    MINUTE (MDB ARRIVAL)               0
    SECOND (MDB ARRIVAL)               0
    CORRECTION NUMBER                  0
    PART OF MESSAGE                    0
    CORRECTION NUMBER                  0
    PART OF MESSAGE                    0
    CORRECTION NUMBER                  0
    PART OF MESSAGE                    0
    CORRECTION NUMBER                  0
    PART OF MESSAGE                    0
    QUALITY CONTROL % CONF              0
1
    BUFR SECTION 3

    LENGTH OF SECTION 3 (BYTES)          434
    RESERVED                            0
    NUMBER OF DATA SUBSETS              37
    FLAG (DATA TYPE/DATA COMPRESSION)    192

```

## DATA DESCRIPTORS (UNEXPANDED)

```
1 311001
2 222000
3 101018
4 031031
5 001031
6 001032
7 101018
8 033007
9 001031
10 001032
11 033220
12 033232
13 033222
14 033233
15 235000
16 001031
17 001032
18 007004
19 011003
20 011004
21 010195
22 012001
23 222000
24 236000
25 101005
26 031031
27 001031
28 001032
29 101005
30 033209
31 222000
32 237000
33 001031
34 001032
35 101005
36 033208
37 222000
38 237000
39 001031
40 001032
41 101005
42 033207
43 222000
44 237000
45 001031
46 001032
47 101005
48 033206
49 222000
50 237000
51 001031
52 001032
53 101005
54 033205
55 222000
56 237000
57 001031
58 001032
59 101005
60 033236
61 222000
62 237000
63 001031
64 001032
65 101005
66 033249
67 222000
68 237000
69 001031
70 001032
71 101005
72 033238
73 222000
74 237000
75 001031
76 001032
77 101005
78 033234
79 222000
80 237000
81 001031
82 001032
83 101005
84 033250
85 222000
86 237000
87 001031
88 001032
```

```
89 101005
90 033251
91 224000
92 237000
93 001031
94 001032
95 008023
96 101005
97 224255
98 224000
99 237000
100 001031
101 001032
102 008023
103 101005
104 224255
105 224000
106 237000
107 001031
108 001032
109 008023
110 101005
111 224255
112 224000
113 237000
114 001031
115 001032
116 008023
117 101005
118 224255
119 224000
120 237000
121 001031
122 001032
123 008023
124 101005
125 224255
126 225000
127 237000
128 001031
129 001032
130 008024
131 101005
132 225255
133 225000
134 237000
135 001031
136 001032
137 008024
138 033210
139 033211
140 101005
141 225255
142 225000
143 237000
144 001031
145 001032
146 008024
147 033210
148 033211
149 101005
150 225255
151 225000
152 237000
153 001031
154 001032
155 008024
156 033210
157 033211
158 101005
159 225255
160 225000
161 237000
162 001031
163 001032
164 008024
165 033210
166 033211
167 101005
168 225255
169 225000
170 237000
171 001031
172 001032
173 008024
174 033210
175 033211
176 101005
177 225255
178 225000
179 237000
180 001031
181 001032
```

182 008024  
183 033210  
184 033211  
185 101005  
186 225255  
187 225000  
188 237000  
189 001031  
190 001032  
191 008024  
192 033210  
193 033211  
194 101005  
195 225255  
196 225000  
197 237000  
198 001031  
199 001032  
200 008024  
201 033210  
202 033211  
203 101005  
204 225255  
205 225000  
206 237000  
207 001031  
208 001032  
209 008024  
210 033210  
211 033211  
212 101005  
213 225255

## DATA DESCRIPTORS (EXPANDED)

1 001006 AIRCRAFT FLIGHT NUMBER  
2 002061 AIRCRAFT NAVIGATIONAL SYSTEM  
3 004001 YEAR  
4 004002 MONTH  
5 004003 DAY  
6 004004 HOUR  
7 004005 MINUTE  
8 005001 LATITUDE (HIGH ACCURACY)  
9 006001 LONGITUDE (HIGH ACCURACY)  
10 008004 PHASE OF AIRCRAFT FLIGHT  
11 007002 HEIGHT OR ALTITUDE  
12 012001 TEMPERATURE/DRY BULB TEMPERATURE  
13 011001 WIND DIRECTION  
14 011002 WIND SPEED  
15 011031 DEGREE OF TURBULENCE  
16 011032 HEIGHT OF BASE OF TURBULENCE  
17 011033 HEIGHT OF TOP OF TURBULENCE  
18 020041 AIRFRAME ICING  
19 222000 QUALITY INFORMATION FOLLOW  
20 031031 DATA PRESENT INDICATOR  
21 031031 DATA PRESENT INDICATOR  
22 031031 DATA PRESENT INDICATOR  
23 031031 DATA PRESENT INDICATOR  
24 031031 DATA PRESENT INDICATOR  
25 031031 DATA PRESENT INDICATOR  
26 031031 DATA PRESENT INDICATOR  
27 031031 DATA PRESENT INDICATOR  
28 031031 DATA PRESENT INDICATOR  
29 031031 DATA PRESENT INDICATOR  
30 031031 DATA PRESENT INDICATOR  
31 031031 DATA PRESENT INDICATOR  
32 031031 DATA PRESENT INDICATOR  
33 031031 DATA PRESENT INDICATOR  
34 031031 DATA PRESENT INDICATOR  
35 031031 DATA PRESENT INDICATOR  
36 031031 DATA PRESENT INDICATOR  
37 031031 DATA PRESENT INDICATOR  
38 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE  
39 001032 GENERATING APPLICATION  
40 033007 % CONFIDENCE  
41 033007 % CONFIDENCE  
42 033007 % CONFIDENCE  
43 033007 % CONFIDENCE  
44 033007 % CONFIDENCE  
45 033007 % CONFIDENCE  
46 033007 % CONFIDENCE  
47 033007 % CONFIDENCE  
48 033007 % CONFIDENCE  
49 033007 % CONFIDENCE  
50 033007 % CONFIDENCE  
51 033007 % CONFIDENCE  
52 033007 % CONFIDENCE  
53 033007 % CONFIDENCE  
54 033007 % CONFIDENCE  
55 033007 % CONFIDENCE  
56 033007 % CONFIDENCE  
57 033007 % CONFIDENCE

```
58 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
59 001032 GENERATING APPLICATION
60 033220 VARIATIONAL ANALYSIS REPORT EVENTS (1)
61 033232 REPORT BLACK LIST EVENTS
62 033222 VARIATIONAL ANALYSIS AIREP EVENTS (2)
63 033233 VARIATIONAL ANALYSIS REPORT STATUS
64 235000 CANCEL BACKWARD DATA REFERENCE
65 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
66 001032 GENERATING APPLICATION
67 007004 PRESSURE
68 011003 U-COMPONENT
69 011004 V-COMPONENT
70 010195 HEIGHT(HIGH ACCURACY)
71 012001 TEMPERATURE/DRY BULB TEMPERATURE
72 222000 QUALITY INFORMATION FOLLOW
73 236000 BACKWARD REFERENCE BIT MAP
74 031031 DATA PRESENT INDICATOR
75 031031 DATA PRESENT INDICATOR
76 031031 DATA PRESENT INDICATOR
77 031031 DATA PRESENT INDICATOR
78 031031 DATA PRESENT INDICATOR
79 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
80 001032 GENERATING APPLICATION
81 033209 VARIATIONAL ANALYSIS FINAL FLAG
82 033209 VARIATIONAL ANALYSIS FINAL FLAG
83 033209 VARIATIONAL ANALYSIS FINAL FLAG
84 033209 VARIATIONAL ANALYSIS FINAL FLAG
85 033209 VARIATIONAL ANALYSIS FINAL FLAG
86 222000 QUALITY INFORMATION FOLLOW
87 237000 USE PREVIOUSLY DEFINED BIT MAP
88 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
89 001032 GENERATING APPLICATION
90 033208 VARIATIONAL ANALYSIS FIRST QUESS CHECK FLAG
91 033208 VARIATIONAL ANALYSIS FIRST QUESS CHECK FLAG
92 033208 VARIATIONAL ANALYSIS FIRST QUESS CHECK FLAG
93 033208 VARIATIONAL ANALYSIS FIRST QUESS CHECK FLAG
94 033208 VARIATIONAL ANALYSIS FIRST QUESS CHECK FLAG
95 222000 QUALITY INFORMATION FOLLOW
96 237000 USE PREVIOUSLY DEFINED BIT MAP
97 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
98 001032 GENERATING APPLICATION
99 033207 VARIATIONAL ANALYSIS DEPARTURE FLAG
100 033207 VARIATIONAL ANALYSIS DEPARTURE FLAG
101 033207 VARIATIONAL ANALYSIS DEPARTURE FLAG
102 033207 VARIATIONAL ANALYSIS DEPARTURE FLAG
103 033207 VARIATIONAL ANALYSIS DEPARTURE FLAG
104 222000 QUALITY INFORMATION FOLLOW
105 237000 USE PREVIOUSLY DEFINED BIT MAP
106 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
107 001032 GENERATING APPLICATION
108 033206 VARIATIONAL ANALYSIS QUALITY CONTROL FLAG
109 033206 VARIATIONAL ANALYSIS QUALITY CONTROL FLAG
110 033206 VARIATIONAL ANALYSIS QUALITY CONTROL FLAG
111 033206 VARIATIONAL ANALYSIS QUALITY CONTROL FLAG
112 033206 VARIATIONAL ANALYSIS QUALITY CONTROL FLAG
113 222000 QUALITY INFORMATION FOLLOW
114 237000 USE PREVIOUSLY DEFINED BIT MAP
115 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
116 001032 GENERATING APPLICATION
117 033205 VARIATIONAL ANALYSIS BLACK LIST FLAG
118 033205 VARIATIONAL ANALYSIS BLACK LIST FLAG
119 033205 VARIATIONAL ANALYSIS BLACK LIST FLAG
120 033205 VARIATIONAL ANALYSIS BLACK LIST FLAG
121 033205 VARIATIONAL ANALYSIS BLACK LIST FLAG
122 222000 QUALITY INFORMATION FOLLOW
123 237000 USE PREVIOUSLY DEFINED BIT MAP
124 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
125 001032 GENERATING APPLICATION
126 033236 VARIATIONAL ANALYSIS DATUM EVENTS (1)
127 033236 VARIATIONAL ANALYSIS DATUM EVENTS (1)
128 033236 VARIATIONAL ANALYSIS DATUM EVENTS (1)
129 033236 VARIATIONAL ANALYSIS DATUM EVENTS (1)
130 033236 VARIATIONAL ANALYSIS DATUM EVENTS (1)
131 222000 QUALITY INFORMATION FOLLOW
132 237000 USE PREVIOUSLY DEFINED BIT MAP
133 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
134 001032 GENERATING APPLICATION
135 033249 DATUM BLACK LIST EVENTS
136 033249 DATUM BLACK LIST EVENTS
137 033249 DATUM BLACK LIST EVENTS
138 033249 DATUM BLACK LIST EVENTS
139 033249 DATUM BLACK LIST EVENTS
140 222000 QUALITY INFORMATION FOLLOW
141 237000 USE PREVIOUSLY DEFINED BIT MAP
142 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
143 001032 GENERATING APPLICATION
144 033238 VARIATIONAL ANALYSIS AIREP DATUM EVENTS (2)
145 033238 VARIATIONAL ANALYSIS AIREP DATUM EVENTS (2)
146 033238 VARIATIONAL ANALYSIS AIREP DATUM EVENTS (2)
147 033238 VARIATIONAL ANALYSIS AIREP DATUM EVENTS (2)
148 033238 VARIATIONAL ANALYSIS AIREP DATUM EVENTS (2)
149 222000 QUALITY INFORMATION FOLLOW
150 237000 USE PREVIOUSLY DEFINED BIT MAP
```

151 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE  
152 001032 GENERATING APPLICATION  
153 033234 VARIATIONAL ANALYSIS DATUM STATUS  
154 033234 VARIATIONAL ANALYSIS DATUM STATUS  
155 033234 VARIATIONAL ANALYSIS DATUM STATUS  
156 033234 VARIATIONAL ANALYSIS DATUM STATUS  
157 033234 VARIATIONAL ANALYSIS DATUM STATUS  
158 222000 QUALITY INFORMATION FOLLOW  
159 237000 USE PREVIOUSLY DEFINED BIT MAP  
160 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE  
161 001032 GENERATING APPLICATION  
162 033250 PROBABILITY OF GROSS ERROR  
163 033250 PROBABILITY OF GROSS ERROR  
164 033250 PROBABILITY OF GROSS ERROR  
165 033250 PROBABILITY OF GROSS ERROR  
166 033250 PROBABILITY OF GROSS ERROR  
167 222000 QUALITY INFORMATION FOLLOW  
168 237000 USE PREVIOUSLY DEFINED BIT MAP  
169 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE  
170 001032 GENERATING APPLICATION  
171 033251 RANGE OF POSSIBLE VALUES  
172 033251 RANGE OF POSSIBLE VALUES  
173 033251 RANGE OF POSSIBLE VALUES  
174 033251 RANGE OF POSSIBLE VALUES  
175 033251 RANGE OF POSSIBLE VALUES  
176 224000 FIRST ORDER STATISTICS FOLLOW  
177 237000 USE PREVIOUSLY DEFINED BIT MAP  
178 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE  
179 001032 GENERATING APPLICATION  
180 008023 FIRST ORDER STATISTICS  
181 224255 PRESSURE  
182 224255 U-COMPONENT  
183 224255 V-COMPONENT  
184 224255 HEIGHT(HIGH ACCURACY)  
185 224255 TEMPERATURE/DRY BULB TEMPERATURE  
186 224000 FIRST ORDER STATISTICS FOLLOW  
187 237000 USE PREVIOUSLY DEFINED BIT MAP  
188 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE  
189 001032 GENERATING APPLICATION  
190 008023 FIRST ORDER STATISTICS  
191 224255 PRESSURE  
192 224255 U-COMPONENT  
193 224255 V-COMPONENT  
194 224255 HEIGHT(HIGH ACCURACY)  
195 224255 TEMPERATURE/DRY BULB TEMPERATURE  
196 224000 FIRST ORDER STATISTICS FOLLOW  
197 237000 USE PREVIOUSLY DEFINED BIT MAP  
198 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE  
199 001032 GENERATING APPLICATION  
200 008023 FIRST ORDER STATISTICS  
201 224255 PRESSURE  
202 224255 U-COMPONENT  
203 224255 V-COMPONENT  
204 224255 HEIGHT(HIGH ACCURACY)  
205 224255 TEMPERATURE/DRY BULB TEMPERATURE  
206 224000 FIRST ORDER STATISTICS FOLLOW  
207 237000 USE PREVIOUSLY DEFINED BIT MAP  
208 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE  
209 001032 GENERATING APPLICATION  
210 008023 FIRST ORDER STATISTICS  
211 224255 PRESSURE  
212 224255 U-COMPONENT  
213 224255 V-COMPONENT  
214 224255 HEIGHT(HIGH ACCURACY)  
215 224255 TEMPERATURE/DRY BULB TEMPERATURE  
216 224000 FIRST ORDER STATISTICS FOLLOW  
217 237000 USE PREVIOUSLY DEFINED BIT MAP  
218 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE  
219 001032 GENERATING APPLICATION  
220 008023 FIRST ORDER STATISTICS  
221 224255 PRESSURE  
222 224255 U-COMPONENT  
223 224255 V-COMPONENT  
224 224255 HEIGHT(HIGH ACCURACY)  
225 224255 TEMPERATURE/DRY BULB TEMPERATURE  
226 225000 DIFFERENCE STATISTICAL VALUES FOLLOW  
227 237000 USE PREVIOUSLY DEFINED BIT MAP  
228 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE  
229 001032 GENERATING APPLICATION  
230 008024 DIFFERENCE STATISTICS  
231 225255 PRESSURE  
232 225255 U-COMPONENT  
233 225255 V-COMPONENT  
234 225255 HEIGHT(HIGH ACCURACY)  
235 225255 TEMPERATURE/DRY BULB TEMPERATURE  
236 225000 DIFFERENCE STATISTICAL VALUES FOLLOW  
237 237000 USE PREVIOUSLY DEFINED BIT MAP  
238 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE  
239 001032 GENERATING APPLICATION  
240 008024 DIFFERENCE STATISTICS  
241 033210 INCREMENTAL VARIATIONAL ANALYSIS UPDATE NUMBER  
242 033211 MINIMISATION SIMULATION NUMBER  
243 225255 PRESSURE

```
244 225255 U-COMPONENT
245 225255 V-COMPONENT
246 225255 HEIGHT(HIGH ACCURACY)
247 225255 TEMPERATURE/DRY BULB TEMPERATURE
248 225000 DIFFERENCE STATISTICAL VALUES FOLLOW
249 237000 USE PREVIOUSLY DEFINED BIT MAP
250 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
251 001032 GENERATING APPLICATION
252 008024 DIFFERENCE STATISTICS
253 033210 INCREMENTAL VARIATIONAL ANALYSIS UPDATE NUMBER
254 033211 MINIMISATION SIMULATION NUMBER
255 225255 PRESSURE
256 225255 U-COMPONENT
257 225255 V-COMPONENT
258 225255 HEIGHT(HIGH ACCURACY)
259 225255 TEMPERATURE/DRY BULB TEMPERATURE
260 225000 DIFFERENCE STATISTICAL VALUES FOLLOW
261 237000 USE PREVIOUSLY DEFINED BIT MAP
262 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
263 001032 GENERATING APPLICATION
264 008024 DIFFERENCE STATISTICS
265 033210 INCREMENTAL VARIATIONAL ANALYSIS UPDATE NUMBER
266 033211 MINIMISATION SIMULATION NUMBER
267 225255 PRESSURE
268 225255 U-COMPONENT
269 225255 V-COMPONENT
270 225255 HEIGHT(HIGH ACCURACY)
271 225255 TEMPERATURE/DRY BULB TEMPERATURE
272 225000 DIFFERENCE STATISTICAL VALUES FOLLOW
273 237000 USE PREVIOUSLY DEFINED BIT MAP
274 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
275 001032 GENERATING APPLICATION
276 008024 DIFFERENCE STATISTICS
277 033210 INCREMENTAL VARIATIONAL ANALYSIS UPDATE NUMBER
278 033211 MINIMISATION SIMULATION NUMBER
279 225255 PRESSURE
280 225255 U-COMPONENT
281 225255 V-COMPONENT
282 225255 HEIGHT(HIGH ACCURACY)
283 225255 TEMPERATURE/DRY BULB TEMPERATURE
284 225000 DIFFERENCE STATISTICAL VALUES FOLLOW
285 237000 USE PREVIOUSLY DEFINED BIT MAP
286 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
287 001032 GENERATING APPLICATION
288 008024 DIFFERENCE STATISTICS
289 033210 INCREMENTAL VARIATIONAL ANALYSIS UPDATE NUMBER
290 033211 MINIMISATION SIMULATION NUMBER
291 225255 PRESSURE
292 225255 U-COMPONENT
293 225255 V-COMPONENT
294 225255 HEIGHT(HIGH ACCURACY)
295 225255 TEMPERATURE/DRY BULB TEMPERATURE
296 225000 DIFFERENCE STATISTICAL VALUES FOLLOW
297 237000 USE PREVIOUSLY DEFINED BIT MAP
298 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
299 001032 GENERATING APPLICATION
300 008024 DIFFERENCE STATISTICS
301 033210 INCREMENTAL VARIATIONAL ANALYSIS UPDATE NUMBER
302 033211 MINIMISATION SIMULATION NUMBER
303 225255 PRESSURE
304 225255 U-COMPONENT
305 225255 V-COMPONENT
306 225255 HEIGHT(HIGH ACCURACY)
307 225255 TEMPERATURE/DRY BULB TEMPERATURE
308 225000 DIFFERENCE STATISTICAL VALUES FOLLOW
309 237000 USE PREVIOUSLY DEFINED BIT MAP
310 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
311 001032 GENERATING APPLICATION
312 008024 DIFFERENCE STATISTICS
313 033210 INCREMENTAL VARIATIONAL ANALYSIS UPDATE NUMBER
314 033211 MINIMISATION SIMULATION NUMBER
315 225255 PRESSURE
316 225255 U-COMPONENT
317 225255 V-COMPONENT
318 225255 HEIGHT(HIGH ACCURACY)
319 225255 TEMPERATURE/DRY BULB TEMPERATURE
320 225000 DIFFERENCE STATISTICAL VALUES FOLLOW
321 237000 USE PREVIOUSLY DEFINED BIT MAP
322 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
323 001032 GENERATING APPLICATION
324 008024 DIFFERENCE STATISTICS
325 033210 INCREMENTAL VARIATIONAL ANALYSIS UPDATE NUMBER
326 033211 MINIMISATION SIMULATION NUMBER
327 225255 PRESSURE
328 225255 U-COMPONENT
329 225255 V-COMPONENT
330 225255 HEIGHT(HIGH ACCURACY)
331 225255 TEMPERATURE/DRY BULB TEMPERATURE
332 225000 DIFFERENCE STATISTICAL VALUES FOLLOW
333 237000 USE PREVIOUSLY DEFINED BIT MAP
334 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
335 001032 GENERATING APPLICATION
336 008024 DIFFERENCE STATISTICS
```

```
337 033210 INCREMENTAL VARIATIONAL ANALYSIS UPDATE NUMBER
338 033211 MINIMISATION SIMULATION NUMBER
339 225255 PRESSURE
340 225255 U-COMPONENT
341 225255 V-COMPONENT
342 225255 HEIGHT(HIGH ACCURACY)
343 225255 TEMPERATURE/DRY BULB TEMPERATURE
```

```
STARTING SUBSET TO BE PRINTED : 1
ENDING SUBSET TO BE PRINTED : 1
```

```
1 AIRCRAFT FLIGHT      0.1008000000E+04 CCITTIA5          UAL364
2 AIRCRAFT NAVIGA      MISSING CODE TABLE 002061
3 YEAR                 0.2004000000E+04 YEAR
4 MONTH                0.5000000000E+01 MONTH
5 DAY                  0.2000000000E+02 DAY
6 HOUR                 0.3000000000E+01 HOUR
7 MINUTE               0.1000000000E+01 MINUTE
8 LATITUDE (HIGH      0.4015000000E+02 DEGREE
9 LONGITUDE (HIGH     -0.9261000000E+02 DEGREE
10 PHASE OF AIRCRA     MISSING CODE TABLE 008004
11 HEIGHT OR ALTIT     0.1006000000E+05 M
12 TEMPERATURE/DRY    0.2282000000E+03 K
13 WIND DIRECTION      0.2800000000E+03 DEGREE TRUE
14 WIND SPEED          0.1500000000E+02 M/S
15 DEGREE OF TURBU     MISSING CODE TABLE 011031
16 HEIGHT OF BASE      MISSING M
17 HEIGHT OF TOP O     MISSING M
18 AIRFRAME ICING      MISSING CODE TABLE 020041
19 QUALITY INFORMA     0.0000000000E+00
20 DATA PRESENT IN    0.0000000000E+00 NUMERIC
21 DATA PRESENT IN    0.0000000000E+00 NUMERIC
22 DATA PRESENT IN    0.0000000000E+00 NUMERIC
23 DATA PRESENT IN    0.0000000000E+00 NUMERIC
24 DATA PRESENT IN    0.0000000000E+00 NUMERIC
25 DATA PRESENT IN    0.0000000000E+00 NUMERIC
26 DATA PRESENT IN    0.0000000000E+00 NUMERIC
27 DATA PRESENT IN    0.0000000000E+00 NUMERIC
28 DATA PRESENT IN    0.0000000000E+00 NUMERIC
29 DATA PRESENT IN    0.0000000000E+00 NUMERIC
30 DATA PRESENT IN    0.0000000000E+00 NUMERIC
31 DATA PRESENT IN    0.0000000000E+00 NUMERIC
32 DATA PRESENT IN    0.0000000000E+00 NUMERIC
33 DATA PRESENT IN    0.0000000000E+00 NUMERIC
34 DATA PRESENT IN    0.0000000000E+00 NUMERIC
35 DATA PRESENT IN    0.0000000000E+00 NUMERIC
36 DATA PRESENT IN    0.0000000000E+00 NUMERIC
37 DATA PRESENT IN    0.0000000000E+00 NUMERIC
38 IDENTIFICATION      0.9800000000E+02 CODE TABLE 001031
39 GENERATING APPL     0.1000000000E+01 CODE TABLE 001032
40 % CONFIDENCE         0.7000000000E+02 NUMERIC
41 % CONFIDENCE         0.7000000000E+02 NUMERIC
42 % CONFIDENCE         0.7000000000E+02 NUMERIC
43 % CONFIDENCE         0.7000000000E+02 NUMERIC
44 % CONFIDENCE         0.7000000000E+02 NUMERIC
45 % CONFIDENCE         0.7000000000E+02 NUMERIC
46 % CONFIDENCE         0.7000000000E+02 NUMERIC
47 % CONFIDENCE         0.8900000000E+02 NUMERIC
48 % CONFIDENCE         0.8900000000E+02 NUMERIC
49 % CONFIDENCE         0.7000000000E+02 NUMERIC
50 % CONFIDENCE         0.7900000000E+02 NUMERIC
51 % CONFIDENCE         0.7000000000E+02 NUMERIC
52 % CONFIDENCE         0.7000000000E+02 NUMERIC
53 % CONFIDENCE         0.7000000000E+02 NUMERIC
54 % CONFIDENCE         0.7000000000E+02 NUMERIC
55 % CONFIDENCE         0.7000000000E+02 NUMERIC
56 % CONFIDENCE         0.7000000000E+02 NUMERIC
57 % CONFIDENCE         0.7000000000E+02 NUMERIC
58 IDENTIFICATION      0.9800000000E+02 CODE TABLE 001031
59 GENERATING APPL     0.6400000000E+02 CODE TABLE 001032
60 VARIATIONAL ANA     0.4000000000E+01 FLAG TABLE 33220
61 REPORT BLACK LI     0.0000000000E+00 FLAG TABLE 33232
62 VARIATIONAL ANA     0.0000000000E+00 FLAG TABLE 33222
63 VARIATIONAL ANA     0.8000000000E+01 FLAG TABLE 33233
64 CANCEL BACKWARD     0.0000000000E+00
65 IDENTIFICATION      0.9800000000E+02 CODE TABLE 001031
66 GENERATING APPL     0.6500000000E+02 CODE TABLE 001032
67 PRESSURE            0.2622000000E+05 PA
68 U-COMPONENT         0.1480000000E+02 M/S
69 V-COMPONENT         -0.2600000000E+01 M/S
70 HEIGHT(HIGH ACC     MISSING M
71 TEMPERATURE/DRY    0.2282000000E+03 K
72 QUALITY INFORMA     0.0000000000E+00
73 BACKWARD REFERE     0.0000000000E+00
74 DATA PRESENT IN    0.0000000000E+00 NUMERIC
75 DATA PRESENT IN    0.0000000000E+00 NUMERIC
76 DATA PRESENT IN    0.0000000000E+00 NUMERIC
77 DATA PRESENT IN    0.0000000000E+00 NUMERIC
78 DATA PRESENT IN    0.0000000000E+00 NUMERIC
79 IDENTIFICATION      0.9800000000E+02 CODE TABLE 001031
80 GENERATING APPL     0.6600000000E+02 CODE TABLE 001032
81 VARIATIONAL ANA     MISSING CODE TABLE 33209
82 VARIATIONAL ANA     0.0000000000E+00 CODE TABLE 33209
```



83	VARIATIONAL ANA	0.0000000000E+00	CODE TABLE	33209
84	VARIATIONAL ANA	MISSING	CODE TABLE	33209
85	VARIATIONAL ANA	0.0000000000E+00	CODE TABLE	33209
86	QUALITY INFORMA	0.0000000000E+00		
87	USE PREVIOUSLY	0.0000000000E+00		
88	IDENTIFICATION	0.9800000000E+02	CODE TABLE	001031
89	GENERATING APPL	0.6600000000E+02	CODE TABLE	001032
90	VARIATIONAL ANA	MISSING	CODE TABLE	033208
91	VARIATIONAL ANA	0.0000000000E+00	CODE TABLE	033208
92	VARIATIONAL ANA	0.0000000000E+00	CODE TABLE	033208
93	VARIATIONAL ANA	MISSING	CODE TABLE	033208
94	VARIATIONAL ANA	0.0000000000E+00	CODE TABLE	033208
95	QUALITY INFORMA	0.0000000000E+00		
96	USE PREVIOUSLY	0.0000000000E+00		
97	IDENTIFICATION	0.9800000000E+02	CODE TABLE	001031
98	GENERATING APPL	0.6600000000E+02	CODE TABLE	001032
99	VARIATIONAL ANA	MISSING	CODE TABLE	33207
100	VARIATIONAL ANA	0.0000000000E+00	CODE TABLE	33207
101	VARIATIONAL ANA	0.0000000000E+00	CODE TABLE	33207
102	VARIATIONAL ANA	MISSING	CODE TABLE	33207
103	VARIATIONAL ANA	0.0000000000E+00	CODE TABLE	33207
104	QUALITY INFORMA	0.0000000000E+00		
105	USE PREVIOUSLY	0.0000000000E+00		
106	IDENTIFICATION	0.9800000000E+02	CODE TABLE	001031
107	GENERATING APPL	0.6600000000E+02	CODE TABLE	001032
108	VARIATIONAL ANA	MISSING	CODE TABLE	33206
109	VARIATIONAL ANA	0.0000000000E+00	CODE TABLE	33206
110	VARIATIONAL ANA	0.0000000000E+00	CODE TABLE	33206
111	VARIATIONAL ANA	MISSING	CODE TABLE	33206
112	VARIATIONAL ANA	0.0000000000E+00	CODE TABLE	33206
113	QUALITY INFORMA	0.0000000000E+00		
114	USE PREVIOUSLY	0.0000000000E+00		
115	IDENTIFICATION	0.9800000000E+02	CODE TABLE	001031
116	GENERATING APPL	0.6600000000E+02	CODE TABLE	001032
117	VARIATIONAL ANA	MISSING	CODE TABLE	33205
118	VARIATIONAL ANA	0.0000000000E+00	CODE TABLE	33205
119	VARIATIONAL ANA	0.0000000000E+00	CODE TABLE	33205
120	VARIATIONAL ANA	MISSING	CODE TABLE	33205
121	VARIATIONAL ANA	0.0000000000E+00	CODE TABLE	33205
122	QUALITY INFORMA	0.0000000000E+00		
123	USE PREVIOUSLY	0.0000000000E+00		
124	IDENTIFICATION	0.9800000000E+02	CODE TABLE	001031
125	GENERATING APPL	0.6700000000E+02	CODE TABLE	001032
126	VARIATIONAL ANA	MISSING	FLAG TABLE	33236
127	VARIATIONAL ANA	0.2621440000E+06	FLAG TABLE	33236
128	VARIATIONAL ANA	0.2621440000E+06	FLAG TABLE	33236
129	VARIATIONAL ANA	MISSING	FLAG TABLE	33236
130	VARIATIONAL ANA	0.2621440000E+06	FLAG TABLE	33236
131	QUALITY INFORMA	0.0000000000E+00		
132	USE PREVIOUSLY	0.0000000000E+00		
133	IDENTIFICATION	0.9800000000E+02	CODE TABLE	001031
134	GENERATING APPL	0.6700000000E+02	CODE TABLE	001032
135	DATUM BLACK LIS	MISSING	FLAG TABLE	33249
136	DATUM BLACK LIS	0.0000000000E+00	FLAG TABLE	33249
137	DATUM BLACK LIS	0.0000000000E+00	FLAG TABLE	33249
138	DATUM BLACK LIS	MISSING	FLAG TABLE	33249
139	DATUM BLACK LIS	0.0000000000E+00	FLAG TABLE	33249
140	QUALITY INFORMA	0.0000000000E+00		
141	USE PREVIOUSLY	0.0000000000E+00		
142	IDENTIFICATION	0.9800000000E+02	CODE TABLE	001031
143	GENERATING APPL	0.6700000000E+02	CODE TABLE	001032
144	VARIATIONAL ANA	MISSING	FLAG TABLE	033238
145	VARIATIONAL ANA	0.0000000000E+00	FLAG TABLE	033238
146	VARIATIONAL ANA	0.0000000000E+00	FLAG TABLE	033238
147	VARIATIONAL ANA	MISSING	FLAG TABLE	033238
148	VARIATIONAL ANA	0.0000000000E+00	FLAG TABLE	033238
149	QUALITY INFORMA	0.0000000000E+00		
150	USE PREVIOUSLY	0.0000000000E+00		
151	IDENTIFICATION	0.9800000000E+02	CODE TABLE	001031
152	GENERATING APPL	0.6700000000E+02	CODE TABLE	001032
153	VARIATIONAL ANA	MISSING	FLAG TABLE	33234
154	VARIATIONAL ANA	0.8000000000E+01	FLAG TABLE	33234
155	VARIATIONAL ANA	0.8000000000E+01	FLAG TABLE	33234
156	VARIATIONAL ANA	MISSING	FLAG TABLE	33234
157	VARIATIONAL ANA	0.8000000000E+01	FLAG TABLE	33234
158	QUALITY INFORMA	0.0000000000E+00		
159	USE PREVIOUSLY	0.0000000000E+00		
160	IDENTIFICATION	0.9800000000E+02	CODE TABLE	001031
161	GENERATING APPL	0.6500000000E+02	CODE TABLE	001032
162	PROBABILITY OF	MISSING	NUMERIC	
163	PROBABILITY OF	MISSING	NUMERIC	
164	PROBABILITY OF	MISSING	NUMERIC	
165	PROBABILITY OF	MISSING	NUMERIC	
166	PROBABILITY OF	MISSING	NUMERIC	
167	QUALITY INFORMA	0.0000000000E+00		
168	USE PREVIOUSLY	0.0000000000E+00		
169	IDENTIFICATION	0.9800000000E+02	CODE TABLE	001031
170	GENERATING APPL	0.6500000000E+02	CODE TABLE	001032
171	RANGE OF POSSIB	MISSING	NUMERIC	
172	RANGE OF POSSIB	0.5000000000E+01	NUMERIC	
173	RANGE OF POSSIB	0.5000000000E+01	NUMERIC	
174	RANGE OF POSSIB	MISSING	NUMERIC	
175	RANGE OF POSSIB	0.5000000000E+01	NUMERIC	

```
176 FIRST ORDER STA      0.0000000000E+00
177 USE PREVIOUSLY       0.0000000000E+00
178 IDENTIFICATION        0.9800000000E+02 CODE TABLE 001031
179 GENERATING APPL       0.6500000000E+02 CODE TABLE 001032
180 FIRST ORDER STA      0.3500000000E+02 CODE TABLE 008023
181 PRESSURE               MISSING PA
182 U-COMPONENT           0.3300000000E+01 M/S
183 V-COMPONENT           0.3300000000E+01 M/S
184 HEIGHT(HIGH ACC       MISSING M
185 TEMPERATURE/DRY       0.1200000000E+01 K
186 FIRST ORDER STA      0.0000000000E+00
187 USE PREVIOUSLY       0.0000000000E+00
188 IDENTIFICATION        0.9800000000E+02 CODE TABLE 001031
189 GENERATING APPL       0.6500000000E+02 CODE TABLE 001032
190 FIRST ORDER STA      0.3300000000E+02 CODE TABLE 008023
191 PRESSURE               MISSING PA
192 U-COMPONENT           0.3300000000E+01 M/S
193 V-COMPONENT           0.3300000000E+01 M/S
194 HEIGHT(HIGH ACC       MISSING M
195 TEMPERATURE/DRY       0.1200000000E+01 K
196 FIRST ORDER STA      0.0000000000E+00
197 USE PREVIOUSLY       0.0000000000E+00
198 IDENTIFICATION        0.9800000000E+02 CODE TABLE 001031
199 GENERATING APPL       0.6500000000E+02 CODE TABLE 001032
200 FIRST ORDER STA      0.3400000000E+02 CODE TABLE 008023
201 PRESSURE               MISSING PA
202 U-COMPONENT           MISSING M/S
203 V-COMPONENT           MISSING M/S
204 HEIGHT(HIGH ACC       MISSING M
205 TEMPERATURE/DRY       MISSING K
206 FIRST ORDER STA      0.0000000000E+00
207 USE PREVIOUSLY       0.0000000000E+00
208 IDENTIFICATION        0.9800000000E+02 CODE TABLE 001031
209 GENERATING APPL       0.6500000000E+02 CODE TABLE 001032
210 FIRST ORDER STA      0.3600000000E+02 CODE TABLE 008023
211 PRESSURE               MISSING PA
212 U-COMPONENT           MISSING M/S
213 V-COMPONENT           MISSING M/S
214 HEIGHT(HIGH ACC       MISSING M
215 TEMPERATURE/DRY       MISSING K
216 FIRST ORDER STA      0.0000000000E+00
217 USE PREVIOUSLY       0.0000000000E+00
218 IDENTIFICATION        0.9800000000E+02 CODE TABLE 001031
219 GENERATING APPL       0.6500000000E+02 CODE TABLE 001032
220 FIRST ORDER STA      0.3200000000E+02 CODE TABLE 008023
221 PRESSURE               MISSING PA
222 U-COMPONENT           0.2000000000E+01 M/S
223 V-COMPONENT           0.2000000000E+01 M/S
224 HEIGHT(HIGH ACC       MISSING M
225 TEMPERATURE/DRY       0.5000000000E+00 K
226 DIFFERENCE STAT      0.0000000000E+00
227 USE PREVIOUSLY       0.0000000000E+00
228 IDENTIFICATION        0.9800000000E+02 CODE TABLE 001031
229 GENERATING APPL       0.6500000000E+02 CODE TABLE 001032
230 DIFFERENCE STAT      0.3200000000E+02 CODE TABLE 008024
231 PRESSURE               MISSING PA
232 U-COMPONENT           -0.1400000000E+01 M/S
233 V-COMPONENT           -0.1000000000E+00 M/S
234 HEIGHT(HIGH ACC       MISSING M
235 TEMPERATURE/DRY       0.1000000000E+00 K
236 DIFFERENCE STAT      0.0000000000E+00
237 USE PREVIOUSLY       0.0000000000E+00
238 IDENTIFICATION        0.9800000000E+02 CODE TABLE 001031
239 GENERATING APPL       0.6500000000E+02 CODE TABLE 001032
240 DIFFERENCE STAT      0.3300000000E+02 CODE TABLE 008024
241 INCREMENTAL VAR       0.1000000000E+01 NUMERIC
242 MINIMISATION SI       0.0000000000E+00 NUMERIC
243 PRESSURE               MISSING PA
244 U-COMPONENT           MISSING M/S
245 V-COMPONENT           MISSING M/S
246 HEIGHT(HIGH ACC       MISSING M
247 TEMPERATURE/DRY       MISSING K
248 DIFFERENCE STAT      0.0000000000E+00
249 USE PREVIOUSLY       0.0000000000E+00
250 IDENTIFICATION        0.9800000000E+02 CODE TABLE 001031
251 GENERATING APPL       0.6500000000E+02 CODE TABLE 001032
252 DIFFERENCE STAT      0.3300000000E+02 CODE TABLE 008024
253 INCREMENTAL VAR       0.1000000000E+01 NUMERIC
254 MINIMISATION SI       0.1001000000E+04 NUMERIC
255 PRESSURE               MISSING PA
256 U-COMPONENT           -0.1400000000E+01 M/S
257 V-COMPONENT           -0.1000000000E+00 M/S
258 HEIGHT(HIGH ACC       MISSING M
259 TEMPERATURE/DRY       0.1000000000E+00 K
260 DIFFERENCE STAT      0.0000000000E+00
261 USE PREVIOUSLY       0.0000000000E+00
262 IDENTIFICATION        0.9800000000E+02 CODE TABLE 001031
263 GENERATING APPL       0.6500000000E+02 CODE TABLE 001032
264 DIFFERENCE STAT      0.3300000000E+02 CODE TABLE 008024
265 INCREMENTAL VAR       0.1000000000E+01 NUMERIC
266 MINIMISATION SI       0.1002000000E+04 NUMERIC
267 PRESSURE               MISSING PA
268 U-COMPONENT           MISSING M/S
```

```

269 V-COMPONENT                MISSING M/S
270 HEIGHT(HIGH ACC            MISSING M
271 TEMPERATURE/DRY            MISSING K
272 DIFFERENCE STAT            0.0000000000E+00
273 USE PREVIOUSLY              0.0000000000E+00
274 IDENTIFICATION              0.9800000000E+02 CODE TABLE 001031
275 GENERATING APPL             0.6500000000E+02 CODE TABLE 001032
276 DIFFERENCE STAT            0.3300000000E+02 CODE TABLE 008024
277 INCREMENTAL VAR            0.1000000000E+01 NUMERIC
278 MINIMISATION SI             0.9990000000E+03 NUMERIC
279 PRESSURE                     MISSING PA
280 U-COMPONENT                 MISSING M/S
281 V-COMPONENT                 MISSING M/S
282 HEIGHT(HIGH ACC            MISSING M
283 TEMPERATURE/DRY            MISSING K
284 DIFFERENCE STAT            0.0000000000E+00
285 USE PREVIOUSLY              0.0000000000E+00
286 IDENTIFICATION              0.9800000000E+02 CODE TABLE 001031
287 GENERATING APPL             0.6500000000E+02 CODE TABLE 001032
288 DIFFERENCE STAT            0.3300000000E+02 CODE TABLE 008024
289 INCREMENTAL VAR            0.2000000000E+01 NUMERIC
290 MINIMISATION SI             0.0000000000E+00 NUMERIC
291 PRESSURE                     MISSING PA
292 U-COMPONENT                 MISSING M/S
293 V-COMPONENT                 MISSING M/S
294 HEIGHT(HIGH ACC            MISSING M
295 TEMPERATURE/DRY            MISSING K
296 DIFFERENCE STAT            0.0000000000E+00
297 USE PREVIOUSLY              0.0000000000E+00
298 IDENTIFICATION              0.9800000000E+02 CODE TABLE 001031
299 GENERATING APPL             0.6500000000E+02 CODE TABLE 001032
300 DIFFERENCE STAT            0.3300000000E+02 CODE TABLE 008024
301 INCREMENTAL VAR            0.2000000000E+01 NUMERIC
302 MINIMISATION SI             0.1001000000E+04 NUMERIC
303 PRESSURE                     MISSING PA
304 U-COMPONENT                 MISSING M/S
305 V-COMPONENT                 MISSING M/S
306 HEIGHT(HIGH ACC            MISSING M
307 TEMPERATURE/DRY            MISSING K
308 DIFFERENCE STAT            0.0000000000E+00
309 USE PREVIOUSLY              0.0000000000E+00
310 IDENTIFICATION              0.9800000000E+02 CODE TABLE 001031
311 GENERATING APPL             0.6500000000E+02 CODE TABLE 001032
312 DIFFERENCE STAT            0.3300000000E+02 CODE TABLE 008024
313 INCREMENTAL VAR            0.2000000000E+01 NUMERIC
314 MINIMISATION SI             0.1002000000E+04 NUMERIC
315 PRESSURE                     MISSING PA
316 U-COMPONENT                 MISSING M/S
317 V-COMPONENT                 MISSING M/S
318 HEIGHT(HIGH ACC            MISSING M
319 TEMPERATURE/DRY            MISSING K
320 DIFFERENCE STAT            0.0000000000E+00
321 USE PREVIOUSLY              0.0000000000E+00
322 IDENTIFICATION              0.9800000000E+02 CODE TABLE 001031
323 GENERATING APPL             0.6500000000E+02 CODE TABLE 001032
324 DIFFERENCE STAT            0.3300000000E+02 CODE TABLE 008024
325 INCREMENTAL VAR            0.2000000000E+01 NUMERIC
326 MINIMISATION SI             0.9990000000E+03 NUMERIC
327 PRESSURE                     MISSING PA
328 U-COMPONENT                 MISSING M/S
329 V-COMPONENT                 MISSING M/S
330 HEIGHT(HIGH ACC            MISSING M
331 TEMPERATURE/DRY            MISSING K
332 DIFFERENCE STAT            0.0000000000E+00
333 USE PREVIOUSLY              0.0000000000E+00
334 IDENTIFICATION              0.9800000000E+02 CODE TABLE 001031
335 GENERATING APPL             0.6500000000E+02 CODE TABLE 001032
336 DIFFERENCE STAT            0.3300000000E+02 CODE TABLE 008024
337 INCREMENTAL VAR            0.9000000000E+01 NUMERIC
338 MINIMISATION SI             0.9990000000E+03 NUMERIC
339 PRESSURE                     MISSING PA
340 U-COMPONENT                 -0.1400000000E+01 M/S
341 V-COMPONENT                 -0.4000000000E+00 M/S
342 HEIGHT(HIGH ACC            MISSING M
343 TEMPERATURE/DRY            0.0000000000E+00 K

```

## 5 Examples

### 5.1 To unpack and print data

This program is an interactive version to expand Bufr data. It can decode and encode unpacked data as a single or multi-subset Bufr messages. It calls BUBOX and BUPRTBOX routines to resolve the bit map. The outputs of the expanded AIREP data using Bufr print routines and BUPRTBOX are attached.

```
PROGRAM BUFR
C
C**** *BUFR*
C
C
C PURPOSE.
C -----
C      EXAMPLE OF USING BUFR UNPACKING/PACKING SOFTWARE.
C
C** INTERFACE.
C -----
C      NONE.
C
C METHOD.
C -----
C      NONE.
C
C EXTERNALS.
C -----
C      CALL BUSEL2
C      CALL BUFREX
C      CALL BUFREN
C      CALL BUPRS0
C      CALL BUPRS1
C      CALL BUPRS2
C      CALL BUPRS3
C      CALL BUPRT
C      CALL BUUKEY
C
C REFERENCE.
C -----
C      NONE.
C
C AUTHOR.
C -----
C      M. DRAGOSAVAC      *ECMWF*      15/09/87.
C
C MODIFICATIONS.
C -----
C      NONE.
C
C IMPLICIT LOGICAL (L,O,G), CHARACTER*8 (C,H,Y)
C
C PARAMETER (JSUP = 9,JSEC0= 3,JSEC1= 40,JSEC2=4096,JSEC3= 4,
1 JSEC4=2,JELEM=320000,JSUBS=400,JCVAl=150 ,JBUFL=512000,
2 JBPW = 32,JTAB =3000,JCTAB=3000,JCTST=3000,JCTEXT=6000,
3 JWORK=4096000,JKEY=46, JTMAl=10,JTCLAS=64,JTEL=255)
C
C PARAMETER (KELEM=80000)
C PARAMETER (KVALS=4096000)
C
C DIMENSION KBUFF (JBUFL)
C DIMENSION KBUFR (JBUFL)
C DIMENSION KSUP (JSUP) ,KSEC0 (JSEC0),KSEC1 (JSEC1)
C DIMENSION KSEC2 (JSEC2),KSEC3 (JSEC3),KSEC4 (JSEC4)
C DIMENSION KEY (JKEY),KREQ (2)
C DIMENSION NREQUEST (2)
C
C REAL*8 VALUES (KVALS),VALUE (KVALS)
C DIMENSION KTDLST (JELEM),KTDEXP (JELEM),KRQ (KELEM)
C REAL*8 RQV (KELEM)
C DIMENSION KDATA (200),KBOXR (JELEM*4)
C REAL*8 VALS (KVALS)
C
C CHARACTER*256 CF,COUT,CARG (4)
```

```

      CHARACTER*64 CNAMES (KELEM),CBOXN (JELEM*4)
      CHARACTER*24 CUNITS (KELEM),CBOXU (JELEM*4)
      CHARACTER*80 CVALS (kelem)
      CHARACTER*80 CVAL (kelem)
      CHARACTER*80 YENC
      REAL*8 RVIND
      REAL*8 EPS

C
      EXTERNAL GETARG

C
      -----
C*      1. INITIALIZE CONSTANTS AND VARIABLES.
C      -----
100 CONTINUE
C
      MISSING VALUE INDICATOR
C
      NBYTPW=JBPW/8
      RVIND=1.7D38
      NVIND=21474834096647
      IOBS=0
      EPS=10.D-8
      NPACK=0
      IYEAR=NVIND
      N=0
      NCOM=0
      OO=.FALSE.

C
C
C
C      GET INPUT AND OUTPUT FILE NAME.
C
      NARG=IARGC ()

C
C
      DO 104 J=1,NARG
      CALL GETARG (J,CARG (J))
104 CONTINUE

      II=0
      IO=0
      DO 105 J=1,NARG
      IF (CARG (J).EQ.'-i') THEN
          IN=J
      ELSEIF (CARG (J).EQ.'-o') THEN
          IO=J
      END IF
105 CONTINUE
      IF (IN.EQ.0) THEN
          PRINT*, 'USAGE -- decode_buftr -i infile'
          STOP
      END IF
      IF (IO.EQ.0.and.IN.EQ.0) THEN
          PRINT*, 'USAGE -- decode_buftr -i infile -o outfile'
          STOP
      END IF

C
      IF (IO.NE.0) COUT=CARG (IO+1)

C
      IF (IO.LT.IN) THEN
          IST=IN+1
          IEND=NARG
      ELSE
          IST=IN+1
          IEND=IO-1
      END IF

C
C
      IF (IO.NE.0) THEN
          JJ=INDEX (COUT,' ')
          JJ=JJ-1
          CALL PBOPEN (IUNIT1,COUT (1:JJ),'W',IRET)
          IF (IRET.EQ.-1) STOP 'OPEN FAILED ON BUFR.DAT'
          IF (IRET.EQ.-2) STOP 'INVALID FILE NAME'
          IF (IRET.EQ.-3) STOP 'INVALID OPEN MODE SPECIFIED'
      END IF

C
      DO 101 II=IST,IEND

      CF=CARG (II)
      ILN=INDEX (CF,' ')
      ILN=ILN-1

      KRQL=0
      NR=0
      KREQ (1)=0
      KREQ (2)=0
      DO 103 I=1,KELEM
          RQV (I)=RVIND
          KRQ (I)=NVIND
103 CONTINUE
C

```

```
C*          1.2 OPEN FILE CONTAINING BUFR DATA.
C          -----
120 CONTINUE
C
      IRET=0
      CALL PBPEN(IUNIT,CF(1:ILN),'R',IRET)
      IF (IRET.EQ.-1) STOP 'OPEN FAILED'
      IF (IRET.EQ.-2) STOP 'INVALID FILE NAME'
      IF (IRET.EQ.-3) STOP 'INVALID OPEN MODE SPECIFIED'
C
      IF (IO.NE.0) THEN
        CALL PBPEN(IUNIT1,COUT(1:JJ),'W',IRET)
        IF (IRET.EQ.-1) STOP 'OPEN FAILED ON BUFR.DAT'
        IF (IRET.EQ.-2) STOP 'INVALID FILE NAME'
        IF (IRET.EQ.-3) STOP 'INVALID OPEN MODE SPECIFIED'
      END IF
C
C
C          -----
C*          2. SET REQUEST FOR EXPANSION.
C          -----
200 CONTINUE
C
      OPRT=.FALSE.
      OENC=.FALSE.
      WRITE(*,'(A,$)') ' DO YOU WANT TO PRINT( Y/N ) : '
      READ (*,'(A)') YENC
      IF (YENC(1:1).EQ.'Y'.OR.YENC(1:1).EQ.'y') THEN
        OPRT=.TRUE.
      END IF
      ICODE=0
      WRITE(*,'(A,$)') ' CODE TABLES TO BE PRINTED ( Y/N ) : '
      READ (*,'(A)') YCODC
      IF (YCODC(1:1).EQ.'Y'.OR.YCODC(1:1).EQ.'y') THEN
        ICODE=1
      END IF
      WRITE(*,'(A,$)') ' DO YOU WANT ENCODING( Y/N ) : '
      READ (*,'(A)') YENC
      IF (YENC(1:1).EQ.'Y'.OR.YENC(1:1).EQ.'y') THEN
        OENC=.TRUE.
        WRITE(*,'(A,$)') ' NUMBER OF SUBSETS TO PACK : '
        READ (*,'(BN,I4)') NCOM
        OCOMP=.FALSE.
        WRITE(*,'(A,$)') ' DO YOU WANT COMPRESSION( Y/N ) : '
        READ (*,'(A)') YCOMP
        IF (YCOMP(1:1).EQ.'Y'.OR.YCOMP(1:1).EQ.'y') OCOMP=.TRUE.
      END IF
      WRITE(*,'(A,$)') ' RECORD NUMBER TO START FROM : '
      READ (*,'(BN,I6)') NR
C
201 CONTINUE
C
      WRITE(*,'(A,$)') ' REQUESTED ELEMENT : '
      READ (*,'(BN,I6)') IEL
      WRITE(*,'(A,$)') ' REQUESTED VALUE : '
      READ (*,'(BN,F12.2)') VAL
      IF (IEL.EQ.0) THEN
        KRQL=J
      ELSE
        J=J+1
        KRQ(J)=IEL
        RQV(J)=VAL
        IF (VAL.EQ.0.) RQV(J)=RVIND
        GO TO 201
      END IF
C
      WRITE(*,'(A,$)') ' REQUESTED FLAG 1 : '
      READ (*,'(BN,I6)') KREQ(1)
C
      WRITE(*,'(A,$)') ' REQUESTED FLAG 2 : '
      READ (*,'(BN,I6)') KREQ(2)
C
      WRITE(*,'(A,$)') ' DO YOU WANT TO PRINT SECTION 0-3( Y/N ) : '
      READ (*,'(A,$)') YENC
      OSEC3=.FALSE.
      IF (YENC(1:1).EQ.'Y'.OR.YENC(1:1).EQ.'y') OSEC3=.TRUE.
C
C*          2.1 SET REQUEST FOR PARTIAL EXPANSION.
C          -----
210 CONTINUE
C
      IERR=0
      CALL BUSRQ(KREQ,KRQL,KRQ,RQV,IERR)
C
      SET VARIABLE TO PACK BIG VALUES AS MISSING VALUE INDICATOR
C
      KPMISS=1
      KPRUS=0
      KOKEY=0
      CALL BUPRQ(KPMISS,KPRUS,KOKEY)
C
```

```

C -----
C IF (NCOM.NE.0) THEN
C   KEL1=KVALS/NCOM
C   IF (KEL1.GT.KELEM) KEL1=KELEM
C END IF
C
C*      3.  READ BUFR MESSAGE.
C -----
300 CONTINUE
C
C   IERR=0
C   KBUFL=0
C
C CALL PBBUFR (IUNIT,KBUFF,JBYTE*4,KBUFL,IERR)
C IF (IERR.EQ.-1) THEN
C   IF (NPACK.NE.0) GO TO 600
C   PRINT*, 'NUMBER OF SUBSETS      ', IOBS
C   PRINT*, 'NUMBER OF MESSAGES    ', N
C   STOP 'EOF'
C END IF
C IF (IERR.EQ.-2) STOP 'FILE HANDLING PROBLEM'
C IF (IERR.EQ.-3) STOP 'ARRAY TOO SMALL FOR PRODUCT'
C
C N=N+1
C PRINT*, '-----', N, ' ', KBUFL
C KBUFL=KBUFL/NBYTPW+1
C IF (N.LT.NR) GO TO 300
C
C -----
C*      4.  EXPAND BUFR MESSAGE.
C -----
400 CONTINUE
C
C CALL BUS0123( KBUFL,KBUFF,KSUP,KSEC0,KSEC1,KSEC2,KSEC3,IERR)
C IF (IERR.NE.0) THEN
C   PRINT*, 'ERROR IN BUS012: ', IERR
C   PRINT*, ' BUFR MESSAGE NUMBER ', N, ' CORRUPTED.'
C   IERR=0
C   GO TO 300
C END IF
C
C KEL=KVALS/KSEC3(3)
C IF (KEL.GT.KELEM) KEL=KELEM
C
C CALL BUFRX(KBUFL,KBUFF,KSUP,KSEC0 ,KSEC1,KSEC2 ,KSEC3 ,KSEC4,
1      KEL,CNAMES,CUNITS,KVALS,VALUES,CVALS,IERR)
C
C IF (IERR.NE.0) THEN
C   CALL EXIT(2)
C END IF
C
C IOBS=IOBS+KSEC3(3)
C
C ISUBSET=1
C CALL BUSEL2 (ISUBSET,KEL,KTDLEN,KTDLST,KTDEXL,KTDEXP,CNAMES,
1      CUNITS,IERR)
C IF (IERR.NE.0) CALL EXIT(2)
C
C DO 401 IK=1,KSEC3(3)
C
C   CALL BUSEL2 (IK,KEL,KTDLEN,KTDLST,KTDEXL,KTDEXP,CNAMES,
c   1      CUNITS,IERR)
c   KSEP(5)=KTDEXL
c   CALL BUBOX (IK,KSUP,KEL,KTDEXP,CNAMES,CUNITS,KVALS,VALUES,
c   1      KBOX,KAPP,KLEN,KBOXR,VALS,CBOXN,CBOXU,IERR)
C
c 401 CONTINUE
C
C
C*      4.1 PRINT CONTENT OF EXPANDED DATA.
C -----
410 CONTINUE
C
C IF (.NOT.OPRT) GO TO 500
C IF (.NOT.OSEC3) GO TO 450
C
C*      4.2 PRINT SECTION ZERO OF BUFR MESSAGE.
C -----
420 CONTINUE
C
C CALL BUPRS0 (KSEC0)
C
C*      4.3 PRINT SECTION ONE OF BUFR MESSAGE.
C -----
430 CONTINUE
C
C CALL BUPRS1 (KSEC1)
C
C

```

```
C*          4.4 PRINT SECTION TWO OF BUFR MESSAGE.
C          -----
C 440 CONTINUE
C
C          AT ECMWF SECTION 2 CONTAINS RDB KEY.
C          SO UNPACK KEY
C
C          CALL BUUKEY(KSEC1,KSEC2,KEY,KSUP,IERR)
C
C          PRINT KEY
C
C          CALL BUPRS2(KSUP ,KEY)
C
C*          4.5 PRINT SECTION 3 OF BUFR MESSAGE.
C          -----
C 450 CONTINUE
C
C          FIRST GET DATA DESCRIPTORS
C
C          Multi subset uncompressed data descriptors for the 1st subset
C          Each subset can contain completely different list of expanded
C          descriptors
C
C          ISUBSET=1
C          CALL BUSEL2 (ISUBSET,KEL,KTDLEN,KTDLST,KTDEXL,KTDEXP,CNAMES,
1          CUNITS,IERR)
C          IF (IERR.NE.0) CALL EXIT(2)
C
C          PRINT  CONTENT
C
C          IF (OSEC3) THEN
C            CALL BUPRS3 (KSEC3,KTDLEN,KTDLST,KTDEXL,KTDEXP,KEL,CNAMES)
C          END IF
C
C*          4.6 PRINT SECTION 4 (DATA) .
C          -----
C 460 CONTINUE
C
C          IN THE CASE OF MANY SUBSETS DEFINE RANGE OF SUBSETS
C
C          IF (.NOT.OO) THEN
C            WRITE (*,' (A,$) ' ) ' STARTING SUBSET TO BE PRINTED : '
C            READ (*,' (BN,I4) ' )   IST
C            WRITE (*,' (A,$) ' ) ' ENDING SUBSET TO BE PRINTED : '
C            READ (*,' (BN,I4) ' )   IEND
C            OO=.FALSE.
C          END IF
C
C          PRINT DATA
C
C          ICODE=0
C
C          IF (KSEC1(6).EQ.11) THEN
C
C            IST=1
C            IEND=KSEC3(3)
C
C            CALL BUPRT (ICODE,IST,IEND,KEL,CNAMES,CUNITS,CVALS,
1            KVALS,VALUES,KSUP,KSEC1,IERR)
C          ELSE
C
C            RESOLVE BIT MAPS FOR EACH SUBSET
C
C            ist=1
C            iend=ksec3(3)
C
C            IF (IEND.GT.KSEC3(3)) IEND=KSEC3(3)
C
C            DO 461 IK=IST,IEND
C
C              CALL BUSEL2 (IK,KEL,KTDLEN,KTDLST,KTDEXL,KTDEXP,CNAMES,
C 1              CUNITS,IERR)
C
C              KSUP(5)=KTDEXL
C              CALL BUBOX (IK,KSUP,KEL,KTDEXP,CNAMES,CUNITS,KVALS,VALUES,
C 1              KBOX,KAPP,KLEN,KBOXR,VALS,CBOXN,CBOXU,IERR)
C              IF (IERR.NE.0) CALL EXIT(2)
C
C              CALL BUPRTBOX (KBOX,KAPP,KLEN,KBOXR,VALS,CBOXN,CBOXU)
C
C461 CONTINUE
C          END IF
C
C          -----
C*          5. COLLECT DATA FOR REPACKING.
C          -----
C 500 CONTINUE
C
C          IF (.NOT.OENC) GO TO 300
C
C          ISUBS=KSEC3(3)
C          DO J=1,ISUBS
```



```

C      NPACK=NPACK+1
C
C      FIRST GET DATA DESCRIPTORS
C
C      CALL BUSEL2(J,KEL,KTDLEN,KTDLST,KTDEXL,KTDEXP,CNAMES,
1      CUNITS,IERR)
C      IF(IERR.NE.0) CALL EXIT(2)
C
C      DO I=1,KTDEXL
C      IO=I+(NPACK-1)*KEL1
C      IN=I+(J-1)*KEL
C
C      IF(CUNITS(I).EQ.'CCITTIA5') THEN
C      IPOS =VALUES(IN)/1000.
C      ICH=NINT(VALUES(IN)-IPOS*1000)
C      KKK=KKK+1
C      VALUE(IO)=KKK*1000+ICH
C      CVAL(KKK)=CVALS(IPOS)
C      ELSE
C      VALUE(IO)=VALUES(IN)
C      END IF
C      IF(KTDEXP(I).EQ.31001.OR.KTDEXP(I).EQ.31002) THEN
C      KK=KK+1
C      KDATA(KK)=NINT(VALUE(IO))
C      END IF
C      IF(KTDEXP(I).EQ.004001) THEN
C      IF(IYEAR.EQ.NVIND) THEN
C      IYEAR=NINT(VALUE(IO))
C      END IF
C      END IF
C
C      END DO
C
C      KDLEN=KK
C      IF(NPACK.EQ.NCOM) THEN
C
C      KSEC3(3)=NPACK
C      KSEC1(5)=0
C      KSEC1(8)=1
C      KSEC1(15)=12
C      IF(KSEC0(3).LT.4) THEN
C      KSEC1(17)=255
C      KSEC1(18)=0
C      END IF
C      KSEC0(3)=4      ! EDITION 4 OF BUFR MESSAGE
C      IF(KSEC0(3).GE.4) KSEC1(1)=22
C      KSEC3(4)=0      ! NO COMPRESSION
C      IF(KSEC1(9).LT.101) THEN
C      KSEC1(9)=IYEAR
C      END IF
C      IF(OCOMP) KSEC3(4)=64 ! COMPRESSION
C      KBUFL=JBUFL
C      CALL BUFREN( KSEC0,KSEC1,KSEC2,KSEC3,KSEC4,
1      KTDLEN,KTDLST,KDLEN,KDATA,KEL1,
2      KVALS,VALUE,CVAL,KBUFL,KBUFR,IERR)
C      IF(IERR.NE.0) THEN
C      PRINT*,'ERROR IS ',IERR
C      PRINT*,'ERROR DURING ENCODING.'
C      CALL EXIT(2)
C      END IF
C
C      ILEN=KBUFL*NBYTPW
C
C      IERR=0
C
C      CALL PBWRITE(IUNIT1,KBUFR,ILEN,IERR)
C      IF(IERR.LT.0) THEN
C      PRINT*,'ERROR WRITING INTO TARGET FILE.'
C      CALL EXIT(2)
C      END IF
C      PRINT*,'RECORD WRITTEN INTO FILE '
C
C      NPACK=0
C      KKK=0
C      KK=0
C      END IF
C
C      END DO
C
C      GO TO 300
C
C      -----
C*      6. PACK BUFR MESSAGE BACK INTO BUFR.
C      -----
600 CONTINUE
C
C      KSEC3(3)=NPACK
C      KSEC1(8)=1
C      KSEC1(15)=12
C      KSEC0(3)=4      ! EDITION 4 OF BUFR MESSAGE
C      IF(KSEC0(3).GE.4) KSEC1(1)=22

```

```
      IF (KSEC0(3).LT.4) THEN
        KSEC1(17)=255
        KSEC1(18)=0
      END IF

      KSEC3(4)=0           ! NO COMPRESSION
      IF (KSEC1(9).LT.101) THEN
        KSEC1(9)=IYEAR
      END IF

C
      IF (OCOMP) KSEC3(4)=64 ! COMPRESSION
      KBUFL=JBUFL

C
C
C*      6.2 ENCODE DATA INTO BUFR MESSAGE.
C      -----
620    CONTINUE
C
      CALL BUFREN( KSEC0,KSEC1,KSEC2,KSEC3,KSEC4,
1         KTDLEN,KTDLST,KDLEN,KDATA,KEL1,
2         KVALS,VALUE,CVAL,KBUFL,KBUFR,IERR)
      IF (IERR.NE.0) THEN
        PRINT*,'ERROR IS ',IERR
        PRINT*,'ERROR DURING ENCODING.'
        CALL EXIT(2)
      END IF

C
C      6.3 WRITE PACKED BUFR MESSAGE INTO FILE.
C      -----
630    CONTINUE
C
      ILEN=KBUFL*NBYTPW

C
      CALL PBWRITE(IUNIT1,KBUFR,ILEN,IERR)
      IF (IERR.LT.0) THEN
        PRINT*,'ERROR WRITING INTO TARGET FILE.'
        CALL EXIT(2)
      END IF
      PRINT*,'RECORD WRITTEN INTO FILE '

C
      NPACK=0
      KKK=0

C
      GO TO 300
C      -----
C
810    CONTINUE
C
      WRITE(*,'(1H ,A)') 'OPEN ERROR ON INPUT FILE'
      GO TO 900

C
800    CONTINUE
C
      IF (IRET.EQ.-1) THEN
        PRINT*,'NUMBER OF RECORDS PROCESSED ',N
        PRINT*,'NUMBER OF OBSERVATIONS      ',IOBS
      ELSE
        PRINT*,' BUFR : ERROR= ',IERR
      END IF

C
900    CONTINUE
C
      CALL PBCLOSE(IUNIT,IRET)
101    CONTINUE
      CALL PBCLOSE(IUNIT1,IRET)

C
      END
```

This is an example of the expanded AIREP data containing quality control information.

```

ECMWF

BUFR DECODING SOFTWARE VERSION - 7.1
07 June 2005.

Your path for bufr tables is :
/home/ma/maa/bigtmp/wmo_bufr_crex_000250/bufr_000270/bufrtables
BUFR TABLES TO BE LOADED B0000000000098006001,D0000000000098006001
1
    BUFR SECTION 0

    LENGTH OF SECTION 0 (BYTES)          8
    TOTAL LENGTH OF BUFR MESSAGE (BYTES) 162
    BUFR EDITION NUMBER                  3
1
    BUFR SECTION 1

    LENGTH OF SECTION 1 (BYTES)          18
    BUFR EDITION NUMBER                   3
    ORIGINATING SUB-CENTRE                0
    ORIGINATING CENTRE                    98
    UPDATE SEQUENCE NUMBER                 1
    FLAG (PRESENCE OF SECTION 2)          128
    BUFR MESSAGE TYPE                      4
    BUFR MESSAGE SUBTYPE                  142
    VERSION NUMBER OF LOCAL TABLE        1
    YEAR                                  5
    MONTH                                 5
    DAY                                   9
    HOUR                                  9
    MINUTE                                6
    VERSION NUMBER OF MASTER TABLE        6
    BUFR MASTER TABLE                    0
1
    BUFR SECTION 2

    LENGTH OF SECTION 2                   52

    REPORT DATA BASE KEY

    RDB DATA TYPE                        7
    RDB DATA SUBTYPE                     142
    YEAR                                  2005
    MONTH                                 5
    DAY                                   9
    HOUR                                  9
    MINUTE                                6
    SECOND                                 4
    LATITUDE 1                            23.50
    LONGITUDE 1                           -62.55
    IDENTIFIER                             DRD0872
    TOTAL BUFR MESSAGE LENGTH             162
    DAY (RDB INSERTION)                    9
    HOUR (RDB INSERTION)                   9
    MINUTE (RDB INSERTION)                 28
    SECOND (RDB INSERTION)                 17
    DAY (MDB ARRIVAL)                      9
    HOUR (MDB ARRIVAL)                     9
    MINUTE (MDB ARRIVAL)                   24
    SECOND (MDB ARRIVAL)                    8
    CORRECTION NUMBER                      0
    PART OF MESSAGE                        1
    CORRECTION NUMBER                      0
    PART OF MESSAGE                        0
    CORRECTION NUMBER                      0
    PART OF MESSAGE                        0
    CORRECTION NUMBER                      0
    PART OF MESSAGE                        0
    CORRECTION NUMBER                      0
    PART OF MESSAGE                        0
    QUALITY CONTROL % CONF                 70
1
    BUFR SECTION 3

    LENGTH OF SECTION 3 (BYTES)            24
    RESERVED                                0
    NUMBER OF DATA SUBSETS                 1
    FLAG (DATA TYPE/DATA COMPRESSION)      128

    DATA DESCRIPTORS (UNEXPANDED)

    1 311001
    2 222000
    3 101018
    4 031031
    5 001031

```

6 001032  
7 101018  
8 033007

## DATA DESCRIPTORS (EXPANDED)

1 001006 AIRCRAFT FLIGHT NUMBER  
2 002061 AIRCRAFT NAVIGATIONAL SYSTEM  
3 004001 YEAR  
4 004002 MONTH  
5 004003 DAY  
6 004004 HOUR  
7 004005 MINUTE  
8 005001 LATITUDE (HIGH ACCURACY)  
9 006001 LONGITUDE (HIGH ACCURACY)  
10 008004 PHASE OF AIRCRAFT FLIGHT  
11 007002 HEIGHT OR ALTITUDE  
12 012001 TEMPERATURE/DRY BULB TEMPERATURE  
13 011001 WIND DIRECTION  
14 011002 WIND SPEED  
15 011031 DEGREE OF TURBULENCE  
16 011032 HEIGHT OF BASE OF TURBULENCE  
17 011033 HEIGHT OF TOP OF TURBULENCE  
18 020041 AIRFRAME ICING  
19 222000 QUALITY INFORMATION FOLLOW  
20 031031 DATA PRESENT INDICATOR  
21 031031 DATA PRESENT INDICATOR  
22 031031 DATA PRESENT INDICATOR  
23 031031 DATA PRESENT INDICATOR  
24 031031 DATA PRESENT INDICATOR  
25 031031 DATA PRESENT INDICATOR  
26 031031 DATA PRESENT INDICATOR  
27 031031 DATA PRESENT INDICATOR  
28 031031 DATA PRESENT INDICATOR  
29 031031 DATA PRESENT INDICATOR  
30 031031 DATA PRESENT INDICATOR  
31 031031 DATA PRESENT INDICATOR  
32 031031 DATA PRESENT INDICATOR  
33 031031 DATA PRESENT INDICATOR  
34 031031 DATA PRESENT INDICATOR  
35 031031 DATA PRESENT INDICATOR  
36 031031 DATA PRESENT INDICATOR  
37 031031 DATA PRESENT INDICATOR  
38 001031 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE  
39 001032 GENERATING APPLICATION  
40 033007 % CONFIDENCE  
41 033007 % CONFIDENCE  
42 033007 % CONFIDENCE  
43 033007 % CONFIDENCE  
44 033007 % CONFIDENCE  
45 033007 % CONFIDENCE  
46 033007 % CONFIDENCE  
47 033007 % CONFIDENCE  
48 033007 % CONFIDENCE  
49 033007 % CONFIDENCE  
50 033007 % CONFIDENCE  
51 033007 % CONFIDENCE  
52 033007 % CONFIDENCE  
53 033007 % CONFIDENCE  
54 033007 % CONFIDENCE  
55 033007 % CONFIDENCE  
56 033007 % CONFIDENCE  
57 033007 % CONFIDENCE

STARTING SUBSET TO BE PRINTED : 1  
ENDING SUBSET TO BE PRINTED : 1

1	AIRCRAFT FLIGHT	0.1008000000E+04	CCITTIA5	DRD0872
2	AIRCRAFT NAVIGA		MISSING CODE TABLE 002061	
3	YEAR	0.2005000000E+04	YEAR	
4	MONTH	0.5000000000E+01	MONTH	
5	DAY	0.9000000000E+01	DAY	
6	HOUR	0.9000000000E+01	HOUR	
7	MINUTE	0.6000000000E+01	MINUTE	
8	LATITUDE (HIGH	0.2350000000E+02	DEGREE	
9	LONGITUDE (HIGH	-0.6255000000E+02	DEGREE	
10	PHASE OF AIRCRA		MISSING CODE TABLE 008004	
11	HEIGHT OR ALTIT	0.1219000000E+05	M	
12	TEMPERATURE/DRY	0.2132000000E+03	K	
13	WIND DIRECTION	0.2550000000E+03	DEGREE TRUE	
14	WIND SPEED	0.4100000000E+02	M/S	
15	DEGREE OF TURBU		MISSING CODE TABLE 011031	
16	HEIGHT OF BASE		MISSING M	
17	HEIGHT OF TOP O		MISSING M	
18	AIRFRAME ICING		MISSING CODE TABLE 020041	
19	QUALITY INFORMA	0.0000000000E+00		
20	DATA PRESENT IN	0.0000000000E+00	NUMERIC	
21	DATA PRESENT IN	0.0000000000E+00	NUMERIC	
22	DATA PRESENT IN	0.0000000000E+00	NUMERIC	
23	DATA PRESENT IN	0.0000000000E+00	NUMERIC	
24	DATA PRESENT IN	0.0000000000E+00	NUMERIC	
25	DATA PRESENT IN	0.0000000000E+00	NUMERIC	

```

26 DATA PRESENT IN      0.0000000000E+00 NUMERIC
27 DATA PRESENT IN      0.0000000000E+00 NUMERIC
28 DATA PRESENT IN      0.0000000000E+00 NUMERIC
29 DATA PRESENT IN      0.0000000000E+00 NUMERIC
30 DATA PRESENT IN      0.0000000000E+00 NUMERIC
31 DATA PRESENT IN      0.0000000000E+00 NUMERIC
32 DATA PRESENT IN      0.0000000000E+00 NUMERIC
33 DATA PRESENT IN      0.0000000000E+00 NUMERIC
34 DATA PRESENT IN      0.0000000000E+00 NUMERIC
35 DATA PRESENT IN      0.0000000000E+00 NUMERIC
36 DATA PRESENT IN      0.0000000000E+00 NUMERIC
37 DATA PRESENT IN      0.0000000000E+00 NUMERIC
38 IDENTIFICATION        0.9800000000E+02 CODE TABLE 001031
39 GENERATING APPL       0.1000000000E+01 CODE TABLE 001032
40 % CONFIDENCE           0.7000000000E+02 NUMERIC
41 % CONFIDENCE           0.7000000000E+02 NUMERIC
42 % CONFIDENCE           0.7000000000E+02 NUMERIC
43 % CONFIDENCE           0.7000000000E+02 NUMERIC
44 % CONFIDENCE           0.7000000000E+02 NUMERIC
45 % CONFIDENCE           0.7000000000E+02 NUMERIC
46 % CONFIDENCE           0.7000000000E+02 NUMERIC
47 % CONFIDENCE           0.7000000000E+02 NUMERIC
48 % CONFIDENCE           0.7000000000E+02 NUMERIC
49 % CONFIDENCE           0.7000000000E+02 NUMERIC
50 % CONFIDENCE           0.7900000000E+02 NUMERIC
51 % CONFIDENCE           0.7000000000E+02 NUMERIC
52 % CONFIDENCE           0.7000000000E+02 NUMERIC
53 % CONFIDENCE           0.7000000000E+02 NUMERIC
54 % CONFIDENCE           0.7000000000E+02 NUMERIC
55 % CONFIDENCE           0.7000000000E+02 NUMERIC
56 % CONFIDENCE           0.7000000000E+02 NUMERIC
57 % CONFIDENCE           0.7000000000E+02 NUMERIC

```

Output of the AIREP data after calling BUBOX and BUPRTBOX routines.

```

1 OPERATOR                ***** 222000.0
2 GENERATING CENTRE( CODE TABLE 00 ***** 98.0
3 GENERATING APPLICATION (CODE TAB ***** 1.0
4 STATISTICS (008024/008023) *****
5 INCREMENTAL UPDATE NUMBER *****
6 MINIMISATION SIMULATION NUMBER *****
7 AIRCRAFT FLIGHT NUMBER      1008.0 70.0
8 AIRCRAFT NAVIGATIONAL SYSTEM ***** 70.0
9 YEAR                      2005.0 70.0
10 MONTH                     5.0 70.0
11 DAY                       9.0 70.0
12 HOUR                      9.0 70.0
13 MINUTE                    6.0 70.0
14 LATITUDE (HIGH ACCURACY)   23.5 70.0
15 LONGITUDE (HIGH ACCURACY)  -62.5 70.0
16 PHASE OF AIRCRAFT FLIGHT ***** 70.0
17 HEIGHT OR ALTITUDE        12190.0 79.0
18 TEMPERATURE/DRY BULB TEMPERATURE 213.2 70.0
19 WIND DIRECTION            255.0 70.0
20 WIND SPEED                 41.0 70.0
21 DEGREE OF TURBULENCE ***** 70.0
22 HEIGHT OF BASE OF TURBULENCE ***** 70.0
23 HEIGHT OF TOP OF TURBULENCE ***** 70.0
24 AIRFRAME ICING            ***** 70.0

```

## An example of Bufr edition 4 data:

```

                                ECMWF

    BUFR DECODING SOFTWARE VERSION - 7.1
                                07 January 2005.

Your path for bufr tables is :
/bigtmp/wmo_bufr_crex_000250/bufr_000270/bufrtables/
BUFR TABLES TO BE LOADED B00000000000098012001,D0000000000098012001
1
    BUFR SECTION 0

    LENGTH OF SECTION 0 (BYTES)          8
    TOTAL LENGTH OF BUFR MESSAGE (BYTES) 332
    BUFR EDITION NUMBER                   4
1
    BUFR SECTION 1

    LENGTH OF SECTION 1 (BYTES)          22
    BUFR MASTER TABLE                   0
    ORIGINATING CENTRE                   98
    ORIGINATING SUB-CENTRE                0
    UPDATE SEQUENCE NUMBER                1
    FLAG (PRESENCE OF SECTION 2)          0
    DATA CATEGORY                        0
    DATA SUB-CATEGORY                    0
    LOCAL DATA SUB-CATEGORY              1
    VERSION NUMBER OF MASTER TABLE       12
    VERSION NUMBER OF LOCAL TABLE        1
    YEAR                                  2005
    MONTH                                 12
    DAY                                   1
    HOUR                                  12
    MINUTE                                0
    SECOND                                0

    BUUKEY : KEY DEFINITION NOT KNOWN

    PRUKEY : RDB KEY NOT DEFINED IN SECTION 2.
1
    BUFR SECTION 3

    LENGTH OF SECTION 3 (BYTES)          148
    RESERVED                              0
    NUMBER OF DATA SUBSETS               1
    FLAG (DATA TYPE/DATA COMPRESSION)     0

    DATA DESCRIPTORS (UNEXPANDED)

    1 301001
    2 001011
    3 001003
    4 002001
    5 301011
    6 301012
    7 301021
    8 007030
    9 007031
    10 302001
    11 007004
    12 010009
    13 007032
    14 012101
    15 012103
    16 013003
    17 007032
    18 020001
    19 007032
    20 013023
    21 007032
    22 302004
    23 101004
    24 302005
    25 105003
    26 008002
    27 020011
    28 020012
    29 020014
    30 020017
    31 020062
    32 013013
    33 012113
    34 020003
    35 004024
    36 020004
```

```

37 020005
38 004024
39 002004
40 013033
41 004024
42 014031
43 004025
44 014002
45 014004
46 014016
47 014028
48 014029
49 014030
50 007032
51 102002
52 004024
53 013011
54 007032
55 101002
56 004024
57 012111
58 004024
59 012112
60 007032
61 002002
62 008021
63 004025
64 011001
65 011002
66 008021
67 103002
68 004025
69 011043
70 011041

```

## DATA DESCRIPTORS (EXPANDED)

```

1 001001 WMO BLOCK NUMBER
2 001002 WMO STATION NUMBER
3 001011 SHIP OR MOBILE LAND STATION IDENTIFIER
4 001003 WMO REGION NUMBER/GEOGRAPHICAL AREA
5 002001 TYPE OF STATION
6 004001 YEAR
7 004002 MONTH
8 004003 DAY
9 004004 HOUR
10 004005 MINUTE
11 005001 LATITUDE (HIGH ACCURACY)
12 006001 LONGITUDE (HIGH ACCURACY)
13 007030 HEIGHT OF STATION GROUND ABOVE MEAN SEA LEVEL (SEE NOTE 3)
14 007031 HEIGHT OF BAROMETER ABOVE MEAN SEA LEVEL (SEE NOTE 4)
15 010004 PRESSURE
16 010051 PRESSURE REDUCED TO MEAN SEA LEVEL
17 010061 3-HOUR PRESSURE CHANGE
18 010063 CHARACTERISTIC OF PRESSURE TENDENCY
19 007004 PRESSURE
20 010009 GEOPOTENTIAL HEIGHT
21 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
22 012101 TEMPERATURE/DRY-BULB TEMPERATURE
23 012103 DEW-POINT TEMPERATURE
24 013003 RELATIVE HUMIDITY
25 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
26 020001 HORIZONTAL VISIBILITY
27 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
28 013023 TOTAL PRECIPITATION PAST 24 HOURS
29 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
30 020010 CLOUD COVER (TOTAL)
31 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
32 020011 CLOUD AMOUNT
33 020013 HEIGHT OF BASE OF CLOUD
34 020012 CLOUD TYPE
35 020012 CLOUD TYPE
36 020012 CLOUD TYPE
37 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
38 020011 CLOUD AMOUNT
39 020012 CLOUD TYPE
40 020013 HEIGHT OF BASE OF CLOUD
41 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
42 020011 CLOUD AMOUNT
43 020012 CLOUD TYPE
44 020013 HEIGHT OF BASE OF CLOUD
45 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
46 020011 CLOUD AMOUNT
47 020012 CLOUD TYPE
48 020013 HEIGHT OF BASE OF CLOUD
49 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
50 020011 CLOUD AMOUNT
51 020012 CLOUD TYPE
52 020013 HEIGHT OF BASE OF CLOUD
53 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
54 020011 CLOUD AMOUNT
55 020012 CLOUD TYPE

```

56 020014 HEIGHT OF TOP OF CLOUD  
57 020017 CLOUD TOP DESCRIPTION  
58 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)  
59 020011 CLOUD AMOUNT  
60 020012 CLOUD TYPE  
61 020014 HEIGHT OF TOP OF CLOUD  
62 020017 CLOUD TOP DESCRIPTION  
63 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)  
64 020011 CLOUD AMOUNT  
65 020012 CLOUD TYPE  
66 020014 HEIGHT OF TOP OF CLOUD  
67 020017 CLOUD TOP DESCRIPTION  
68 020062 STATE OF THE GROUND (WITH OR WITHOUT SNOW)  
69 013013 TOTAL SNOW DEPTH  
70 012113 GROUND MINIMUM TEMPERATURE, PAST 12 HOURS  
71 020003 PRESENT WEATHER (SEE NOTE 1)  
72 004024 TIME PERIOD OR DISPLACEMENT  
73 020004 PAST WEATHER (1) (SEE NOTE 2)  
74 020005 PAST WEATHER (2) (SEE NOTE 2)  
75 004024 TIME PERIOD OR DISPLACEMENT  
76 002004 TYPE OF INSTRUMENTATION FOR EVAPORATION MEASUREMENT OR TYPE OF C  
77 013033 EVAPORATION/EVAPOTRANSPIRATION  
78 004024 TIME PERIOD OR DISPLACEMENT  
79 014031 TOTAL SUNSHINE  
80 004025 TIME PERIOD OR DISPLACEMENT  
81 014002 LONG-WAVE RADIATION, INTEGRATED OVER PERIOD SPECIFIED  
82 014004 SHORT-WAVE RADIATION, INTEGRATED OVER PERIOD SPECIFIED  
83 014016 NET RADIATION, INTEGRATED OVER PERIOD SPECIFIED  
84 014028 GLOBAL SOLAR RADIATION (HIGH ACCURACY), INTEGRATED OVER PERIOD S  
85 014029 DIFFUSE SOLAR RADIATION (HIGH ACCURACY), INTEGRATED OVER PERIOD  
86 014030 DIRECT SOLAR RADIATION (HIGH ACCURACY), INTEGRATED OVER PERIOD S  
87 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)  
88 004024 TIME PERIOD OR DISPLACEMENT  
89 013011 TOTAL PRECIPITATION/TOTAL WATER EQUIVALENT  
90 004024 TIME PERIOD OR DISPLACEMENT  
91 013011 TOTAL PRECIPITATION/TOTAL WATER EQUIVALENT  
92 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)  
93 004024 TIME PERIOD OR DISPLACEMENT  
94 004024 TIME PERIOD OR DISPLACEMENT  
95 012111 MAXIMUM TEMPERATURE, AT HEIGHT AND OVER PERIOD SPECIFIED  
96 004024 TIME PERIOD OR DISPLACEMENT  
97 012112 MINIMUM TEMPERATURE, AT HEIGHT AND OVER PERIOD SPECIFIED  
98 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)  
99 002002 TYPE OF INSTRUMENTATION FOR WIND MEASUREMENT  
100 008021 TIME SIGNIFICANCE  
101 004025 TIME PERIOD OR DISPLACEMENT  
102 011001 WIND DIRECTION  
103 011002 WIND SPEED  
104 008021 TIME SIGNIFICANCE  
105 004025 TIME PERIOD OR DISPLACEMENT  
106 011043 MAXIMUM WIND GUST DIRECTION  
107 011041 MAXIMUM WIND GUST SPEED  
108 004025 TIME PERIOD OR DISPLACEMENT  
109 011043 MAXIMUM WIND GUST DIRECTION  
110 011041 MAXIMUM WIND GUST SPEED

STARTING SUBSET TO BE PRINTED : 1  
ENDING SUBSET TO BE PRINTED : 1

1	WMO BLOCK NUMBE	0.1300000000E+02	NUMERIC	
2	WMO STATION NUM	0.2720000000E+03	NUMERIC	
3	SHIP OR MOBILE	0.1009000000E+04	CCITTIA5	SURCIN
4	WMO REGION NUMB	0.6000000000E+01	CODE TABLE 1003	
5	TYPE OF STATION	0.0000000000E+00	CODE TABLE 2001	
6	YEAR	0.2005000000E+04	YEAR	
7	MONTH	0.1200000000E+02	MONTH	
8	DAY	0.1000000000E+01	DAY	
9	HOUR	0.1200000000E+02	HOUR	
10	MINUTE	0.0000000000E+00	MINUTE	
11	LATITUDE (HIGH	0.4482000000E+02	DEGREE	
12	LONGITUDE (HIGH	0.2028000000E+02	DEGREE	
13	HEIGHT OF STATI	0.9600000000E+02	M	
14	HEIGHT OF BAROM	0.9900000000E+02	M	
15	PRESSURE	0.1010000000E+04	PA	
16	PRESSURE REDUCE	0.1030000000E+04	PA	
17	3-HOUR PRESSURE	-0.1900000000E+03	PA	
18	CHARACTERISTIC	0.7000000000E+01	CODE TABLE 10063	
19	PRESSURE		MISSING PA	
20	GEOPOTENTIAL HE		MISSING GPM	
21	HEIGHT OF SENSO	0.2000000000E+01	M	
22	TEMPERATURE/DRY	0.2926000000E+03	K	
23	DEW-POINT TEMPE	0.2880000000E+03	K	
24	RELATIVE HUMIDI		MISSING %	
25	HEIGHT OF SENSO	0.1000000000E+01	M	
26	HORIZONTAL VISI	0.2000000000E+05	M	
27	HEIGHT OF SENSO	0.3000000000E+00	M	
28	TOTAL PRECIPITA		MISSING KG/M**2	
29	HEIGHT OF SENSO		MISSING M	
30	CLOUD COVER (TO	0.4000000000E+02	%	
31	VERTICAL SIGNIF	0.1000000000E+01	CODE TABLE 8002	
32	CLOUD AMOUNT	0.0000000000E+00	CODE TABLE 20011	
33	HEIGHT OF BASE	0.8000000000E+04	M	
34	CLOUD TYPE	0.3000000000E+02	CODE TABLE 20012	



35 CLOUD TYPE	0.2000000000E+02	CODE TABLE 20012
36 CLOUD TYPE	0.1100000000E+02	CODE TABLE 20012
37 VERTICAL SIGNIF		MISSING CODE TABLE 8002
38 CLOUD AMOUNT		MISSING CODE TABLE 20011
39 CLOUD TYPE		MISSING CODE TABLE 20012
40 HEIGHT OF BASE		MISSING M
41 VERTICAL SIGNIF		MISSING CODE TABLE 8002
42 CLOUD AMOUNT		MISSING CODE TABLE 20011
43 CLOUD TYPE		MISSING CODE TABLE 20012
44 HEIGHT OF BASE		MISSING M
45 VERTICAL SIGNIF		MISSING CODE TABLE 8002
46 CLOUD AMOUNT		MISSING CODE TABLE 20011
47 CLOUD TYPE		MISSING CODE TABLE 20012
48 HEIGHT OF BASE		MISSING M
49 VERTICAL SIGNIF		MISSING CODE TABLE 8002
50 CLOUD AMOUNT		MISSING CODE TABLE 20011
51 CLOUD TYPE		MISSING CODE TABLE 20012
52 HEIGHT OF BASE		MISSING M
53 VERTICAL SIGNIF		MISSING CODE TABLE 8002
54 CLOUD AMOUNT		MISSING CODE TABLE 20011
55 CLOUD TYPE		MISSING CODE TABLE 20012
56 HEIGHT OF TOP O		MISSING M
57 CLOUD TOP DESCR		MISSING CODE TABLE 20017
58 VERTICAL SIGNIF		MISSING CODE TABLE 8002
59 CLOUD AMOUNT		MISSING CODE TABLE 20011
60 CLOUD TYPE		MISSING CODE TABLE 20012
61 HEIGHT OF TOP O		MISSING M
62 CLOUD TOP DESCR		MISSING CODE TABLE 20017
63 VERTICAL SIGNIF		MISSING CODE TABLE 8002
64 CLOUD AMOUNT		MISSING CODE TABLE 20011
65 CLOUD TYPE		MISSING CODE TABLE 20012
66 HEIGHT OF TOP O		MISSING M
67 CLOUD TOP DESCR		MISSING CODE TABLE 20017
68 STATE OF THE GR		MISSING CODE TABLE 20062
69 TOTAL SNOW DEPT		MISSING M
70 GROUND MINIMUM		MISSING K
71 PRESENT WEATHER	0.2000000000E+01	CODE TABLE 20003
72 TIME PERIOD OR	0.2400000000E+02	hour
73 PAST WEATHER (1	0.1000000000E+01	CODE TABLE 20004
74 PAST WEATHER (2	0.1000000000E+01	CODE TABLE 20005
75 TIME PERIOD OR		MISSING hour
76 TYPE OF INSTRUM		MISSING CODE TABLE 2004
77 EVAPORATION/EVA		MISSING KG/M**2
78 TIME PERIOD OR		MISSING hour
79 TOTAL SUNSHINE		MISSING MINUTE
80 TIME PERIOD OR		MISSING MINUTE
81 LONG-WAVE RADIA		MISSING J/M**2
82 SHORT-WAVE RADI		MISSING J/M**2
83 NET RADIATION,		MISSING J/M**2
84 GLOBAL SOLAR RA		MISSING J/M**2
85 DIFFUSE SOLAR R		MISSING J/M**2
86 DIRECT SOLAR RA		MISSING J/M**2
87 HEIGHT OF SENSO	0.0000000000E+00	M
88 TIME PERIOD OR	-0.6000000000E+01	hour
89 TOTAL PRECIPITA	0.2000000000E+01	KG/M**2
90 TIME PERIOD OR		MISSING hour
91 TOTAL PRECIPITA		MISSING KG/M**2
92 HEIGHT OF SENSO		MISSING M
93 TIME PERIOD OR	-0.2400000000E+02	hour
94 TIME PERIOD OR	0.0000000000E+00	hour
95 MAXIMUM TEMPERA	0.2752200000E+03	K
96 TIME PERIOD OR	-0.6000000000E+01	hour
97 MINIMUM TEMPERA	0.2687000000E+03	K
98 HEIGHT OF SENSO	0.1000000000E+02	M
99 TYPE OF INSTRUM	0.1000000000E+01	FLAG TABLE 2002
100 TIME SIGNIFICAN	0.2000000000E+01	CODE TABLE 8021
101 TIME PERIOD OR	-0.1000000000E+02	MINUTE
102 WIND DIRECTION	0.1000000000E+03	DEGREE TRUE
103 WIND SPEED	0.1000000000E+01	M/S
104 TIME SIGNIFICAN		MISSING CODE TABLE 8021
105 TIME PERIOD OR		MISSING MINUTE
106 MAXIMUM WIND GU		MISSING DEGREE TRUE
107 MAXIMUM WIND GU		MISSING M/S
108 TIME PERIOD OR		MISSING MINUTE
109 MAXIMUM WIND GU		MISSING DEGREE TRUE
110 MAXIMUM WIND GU		MISSING M/S

## 5.2 To expand data descriptors only

```
PROGRAM TDEXP
C
C**** *TDEXP*
C
C
C PURPOSE.
C -----
C     Expands list of Bufr data descriptors.
C
C
C** INTERFACE.
C -----
C
C     NONE.
C
C METHOD.
C -----
C
C     NONE.
C
C EXTERNALS.
C -----
C
C     CALL BUSEL
C     CALL BUFREX
C     CALL BUFREN
C     CALL BUPRS0
C     CALL BUPRS1
C     CALL BUPRS2
C     CALL BUPRS3
C     CALL BUPRT
C     CALL BUUKEY
C
C REFERENCE.
C -----
C
C     NONE.
C
C AUTHOR.
C -----
C
C     M. DRAGOSAVAC   *ECMWF*   June 2005.
C
C MODIFICATIONS.
C -----
C
C     NONE.
C
C IMPLICIT LOGICAL(L,O,G), CHARACTER*8(C,H,Y)
C
C PARAMETER (JSEC1=40,JSEC3=4)
C PARAMETER (KDLEN=200,KELEM=40000,KVALS=360000)
C
C DIMENSION KSEC1(JSEC1)      ! ,KSEC3(JSEC3)
C
C DIMENSION KTDLST(KELEM),KTDEXP(KELEM)
C DIMENSION KDATA(KDLEN)
C
C CHARACTER*64 CNames(KELEM)
C CHARACTER*24 CUnits(KELEM)
C
C -----
C* 1. INITIALIZE CONSTANTS AND VARIABLES.
C -----
100 CONTINUE
C
C RVIND=1.7D38
C
C INITIALIZE DELAYED REPLICATION FACTORS OR REFERENCE VALUES ETD.
C
C KDATA(1)=2
C KDATA(2)=14
C KDATA(3)=2
C KDATA(4)=2
C
C SET DATA DECSRIPTORS
C
C KTDLST( 1)=301001
C KTDLST( 2)=301011
C KTDLST( 3)=301012
C KTDLST( 4)=301021
C KTDLST( 5)=107000
```

```

KTDLST( 6)=031001
KTDLST( 7)=007004
KTDLST( 8)=008001
KTDLST( 9)=010003
KTDLST(10)=012001
KTDLST(11)=012003
KTDLST(12)=011003
KTDLST(13)=011004
KTDLST(14)=224000
KTDLST(15)=236000
KTDLST(16)=101000
KTDLST(17)=031001
KTDLST(18)=031031
KTDLST(19)=001031
KTDLST(20)=001032
KTDLST(21)=008023
KTDLST(22)=105000
KTDLST(23)=031001
KTDLST(24)=204002
KTDLST(25)=031021
KTDLST(26)=204002
KTDLST(27)=031021
KTDLST(28)=224255
KTDLST(29)=204000
KTDLST(30)=225000
KTDLST(31)=237000
KTDLST(32)=001031
KTDLST(33)=001032
KTDLST(34)=008024
KTDLST(35)=101000
KTDLST(36)=031001
KTDLST(37)=225255
C
KTDLEN=37
C
C SET DATA DESCRIPTORS
C
C SECTION 1 CONTENT
C
KSEC1(2)=4      ! BUFR EDITION NUMBER
KSEC1(14)=0     ! BUFR MASTER TABLE USED
ksec1(16)=0     ! ORIGINATING SUB-CENTRE
KSEC1(3)=98     ! ORIGINATING CENTRE
KSEC1(8)=1      ! VERSION NUMBER OF LOCAL TABLE USED
KSEC1(15)=12    ! VERSION NUMBER OF MASTER TABLE USED
C
C SECTION 3 CONTENT
C
C
K=1
CALL BUXDES(K,KSEC1,KTDLEN,KTDLST,KDLEN,KDATA,KELEM,
1          KTDEXL,KTDEXP,CNAMES,CUNITS,KERR)
C
END

```

The output of the expanded data using BUXDES routine is given below.

```

ECMWF

BUFR ENCODING SOFTWARE VERSION - 7.1
07 June 2005.

Your path for bufr tables is :
/home/ma/maa/bigtmp/wmo_bufr_crex_000250/bufr_000270/bufrtables
BUFR TABLES TO BE LOADED B0000000000098012001,D0000000000098012001

```

#### DATA DESCRIPTORS (UNEXPANDED)

```

1 301001
2 301011
3 301012
4 301021
5 107000
6 031001
7 007004
8 008001
9 010003
10 012001
11 012003
12 011003
13 011004
14 224000
15 236000
16 101000

```

17 031001  
18 031031  
19 001031  
20 001032  
21 008023  
22 105000  
23 031001  
24 204002  
25 031021  
26 204002  
27 031021  
28 224255  
29 204000  
30 225000  
31 237000  
32 001031  
33 001032  
34 008024  
35 101000  
36 031001  
37 225255

## DATA DESCRIPTORS (EXPANDED)

	ELEMENT NAME	UNIT
1	001001 WMO BLOCK NUMBER	NUMERIC
2	001002 WMO STATION NUMBER	NUMERIC
3	004001 YEAR	YEAR
4	004002 MONTH	MONTH
5	004003 DAY	DAY
6	004004 HOUR	HOUR
7	004005 MINUTE	MINUTE
8	005001 LATITUDE (HIGH ACCURACY)	DEGREE
9	006001 LONGITUDE (HIGH ACCURACY)	DEGREE
10	031001 DELAYED DESCRIPTOR REPLICATION FACTOR	NUMERIC
11	007004 PRESSURE	PA
12	008001 VERTICAL SOUNDING SIGNIFICANCE	FLAG TABLE 8001
13	010003 GEOPOTENTIAL	M**2/S**2
14	012001 TEMPERATURE/DRY-BULB TEMPERATURE	K
15	012003 DEW-POINT TEMPERATURE	K
16	011003 U-COMPONENT	M/S
17	011004 V-COMPONENT	M/S
18	007004 PRESSURE	PA
19	008001 VERTICAL SOUNDING SIGNIFICANCE	FLAG TABLE 8001
20	010003 GEOPOTENTIAL	M**2/S**2
21	012001 TEMPERATURE/DRY-BULB TEMPERATURE	K
22	012003 DEW-POINT TEMPERATURE	K
23	011003 U-COMPONENT	M/S
24	011004 V-COMPONENT	M/S
25	224000 FIRST ORDER STATISTICS FOLLOW	
26	236000 BACKWARD REFERENCE BIT MAP	
27	031001 DELAYED DESCRIPTOR REPLICATION FACTOR	NUMERIC
28	031031 DATA PRESENT INDICATOR	NUMERIC
29	031031 DATA PRESENT INDICATOR	NUMERIC
30	031031 DATA PRESENT INDICATOR	NUMERIC
31	031031 DATA PRESENT INDICATOR	NUMERIC
32	031031 DATA PRESENT INDICATOR	NUMERIC
33	031031 DATA PRESENT INDICATOR	NUMERIC
34	031031 DATA PRESENT INDICATOR	NUMERIC
35	031031 DATA PRESENT INDICATOR	NUMERIC
36	031031 DATA PRESENT INDICATOR	NUMERIC
37	031031 DATA PRESENT INDICATOR	NUMERIC
38	031031 DATA PRESENT INDICATOR	NUMERIC
39	031031 DATA PRESENT INDICATOR	NUMERIC
40	031031 DATA PRESENT INDICATOR	NUMERIC
41	031031 DATA PRESENT INDICATOR	NUMERIC
42	001031 IDENTIFICATION OF ORIGINATING/GENERATING	CODE TABLE 1031
43	001032 GENERATING APPLICATION	CODE TABLE 1032
44	008023 FIRST ORDER STATISTICS	CODE TABLE 8023
45	031001 DELAYED DESCRIPTOR REPLICATION FACTOR	NUMERIC
46	031021 ASSOCIATED FIELD SIGNIFICANCE	CODE TABLE 31021
47	031021 ASSOCIATED FIELD SIGNIFICANCE	CODE TABLE 31021
48	000000 ASSOCIATED FIELD	
49	224255 FIRST ORDER STATISTICS VALUE MARKER	
50	031021 ASSOCIATED FIELD SIGNIFICANCE	CODE TABLE 31021
51	031021 ASSOCIATED FIELD SIGNIFICANCE	CODE TABLE 31021
52	000000 ASSOCIATED FIELD	
53	224255 FIRST ORDER STATISTICS VALUE MARKER	
54	225000 DIFFERENCE STATISTICAL VALUES FOLLOW	
55	237000 USE PREVIOUSLY DEFINED BIT MAP	
56	999999 ASSOCIATED FIELD	
57	001031 IDENTIFICATION OF ORIGINATING/GENERATING	CODE TABLE 1031
58	999999 ASSOCIATED FIELD	
59	001032 GENERATING APPLICATION	CODE TABLE 1032
60	999999 ASSOCIATED FIELD	
61	008024 DIFFERENCE STATISTICS	CODE TABLE 8024
62	031001 DELAYED DESCRIPTOR REPLICATION FACTOR	NUMERIC
63	000000 ASSOCIATED FIELD	
64	225255 DIFFERENCE STATISTICS VALUE MARKER	
65	000000 ASSOCIATED FIELD	
66	225255 DIFFERENCE STATISTICS VALUE MARKER	

## 5.3 To create bufr message

```

PROGRAM BUFR
C
C**** *BUFR*
C
C
C    PURPOSE.
C    -----
C        An example of using Bufr packing/unpacking software.
C        It will create synop data in bufr edition 4
C
C
C**  INTERFACE.
C    -----
C
C        NONE.
C
C    METHOD.
C    -----
C
C        NONE.
C
C    EXTERNALS.
C    -----
C
C    REFERENCE.
C    -----
C
C        NONE.
C
C    AUTHOR.
C    -----
C
C        M. DRAGOSAVAC    *ECMWF*    05/04/2005.
C
C
C    MODIFICATIONS.
C    -----
C
C        NONE.
C
C
C    IMPLICIT LOGICAL (O,G) , CHARACTER*8 (C,H,Y)
C
C
C    PARAMETER (JSUP = 9,JSEC0= 3,JSEC1= 40,JSEC2=4096,JSEC3= 4,
1      JSEC4=2,JELEM=320000,JSUBS=400,JCVAl=150 ,JBUFL=512000,
#ifdef JBPW_64
2      JBPW = 64,JTAB =3000,JCTAB=3000,JCTST=3000,JCTEXT=6000,
#else
2      JBPW = 32,JTAB =3000,JCTAB=3000,JCTST=3000,JCTEXT=6000,
#endif
3      JWORK=4096000,JKEY=46, JTMAX=10, JTCLAS=64, JTEL=255)
C
C    PARAMETER (KDLEN=200,KELEM=4000)
C    parameter (KVALS=4000,KVALS1=4000)
C
C    DIMENSION KBUFR(JBUFL)
C    DIMENSION KSUP (JSUP) ,KSEC0 (JSEC0),KSEC1 (JSEC1)
C    DIMENSION KSEC2 (JSEC2),KSEC3 (JSEC3),KSEC4 (JSEC4)
C    DIMENSION KEY (JKEY)
C    DIMENSION ISUP (JSUP) ,ISEC0 (JSEC0),ISEC1 (JSEC1)
C    DIMENSION ISEC2 (JSEC2),ISEC3 (JSEC3),ISEC4 (JSEC4)
C
#ifdef R_4
REAL*8  VALUES (KVALS) ,VALUE (KVALS1)
REAL*8  RQV (KELEM)
REAL*8  RVIND
#else
REAL  VALUES (KVALS) ,VALUE (KVALS1)
REAL  RQV (KELEM)
REAL  RVIND
#endif

DIMENSION KIDLST (KELEM) ,KTDEXP (KELEM) ,KRQ (KELEM)
DIMENSION ITDLST (KELEM) ,ITDEXP (KELEM)
DIMENSION KDATA (KDLEN) ,IDATA (KDLEN)
C
C    CHARACTER*8  CF
C    CHARACTER*64  CNAME (KELEM) ,CNAME (KELEM)
C    CHARACTER*24  CUNITS (KELEM) ,CUNIT (KELEM)
C    CHARACTER*80  CVALS (KVALS)
C    CHARACTER*80  CVAL (KVALS1)
C    CHARACTER*80  YENC
C
C
C    -----
C* 1. INITIALIZE CONSTANTS AND VARIABLES.

```

```
C -----
100 CONTINUE
C
C
C   RVIND=1.7D38
C
C   CALL POPEN(IUNIT1,'synop.bufr','W',IRET)
C   IF(IRET.EQ.-1) STOP 'OPEN FAILED ON synop.dat'
C   IF(IRET.EQ.-2) STOP 'INVALID FILE NAME'
C   IF(IRET.EQ.-3) STOP 'INVALID OPEN MODE SPECIFIED'
C
C
C   INITIALIZE DELAYED REPLICATION FACTORS OR REFERENCE VALUES ETD.
C
C   DO 101 I=1,KDLEN
C     KDATA(I)=0
C     VALUES(I)=RVIND
101 CONTINUE
C
C   KDATA(1)=10
C
C   KDLENG=3
C
C   SET DATA DECSRIPTORS
C
C
C   ktdlst( 1)= 301001
C   ktdlst( 2)= 001011
C   ktdlst( 3)= 001003
C   ktdlst( 4)= 002001
C   ktdlst( 5)= 301011
C   ktdlst( 6)= 301012
C   ktdlst( 7)= 301021
C   ktdlst( 8)= 007030
C   ktdlst( 9)= 007031
C   ktdlst(10)= 302001
C   ktdlst(11)= 007004
C   ktdlst(12)= 010009
C
C   !      Temperature data
C   ktdlst(13)= 007032
C   ktdlst(14)= 012101
C   ktdlst(15)= 012103
C   ktdlst(16)= 013003
C
C   !      Visibility data
C   ktdlst(17)= 007032
C   ktdlst(18)= 020001
C
C   !      Precipitation past 24 hours
C   ktdlst(19)= 007032
C   ktdlst(20)= 013023
C   ktdlst(21)= 007032
C
C   !      Cloud data
C   ktdlst(22)= 302004
C   ktdlst(23)= 101004
C   ktdlst(24)= 302005
C
C   !      Clouds with bases below station level
C   ktdlst(25)= 105003
C   ktdlst(26)= 008002
C   ktdlst(27)= 020011
C   ktdlst(28)= 020012
C   ktdlst(29)= 020014
C   ktdlst(30)= 020017
C
C   !      State of ground, snow depth, ground minimum temperature
C   ktdlst(31)= 020062
C   ktdlst(32)= 013013
C   ktdlst(33)= 012113
C
C   !      Present weather
C   ktdlst(34)= 020003
C   ktdlst(35)= 004024
C   ktdlst(36)= 020004
C   ktdlst(37)= 020005
C
C   !      Evaporation measurements
C   ktdlst(38)= 004024
C   ktdlst(39)= 002004
C   ktdlst(40)= 013033
C
C   !      Sunshine data
C   ktdlst(41)= 004024
C   ktdlst(42)= 014031
C
C   !      Radiation data
C   ktdlst(43)= 004025
C   ktdlst(44)= 014002
C   ktdlst(45)= 014004
C   ktdlst(46)= 014016
C   ktdlst(47)= 014028
C   ktdlst(48)= 014029
C   ktdlst(49)= 014030
C
C   !      Precipitation measurements
C   ktdlst(50)= 007032
C   ktdlst(51)= 102002
C   ktdlst(52)= 004024
```

```

ktdlst( 53)= 013011
!      Extreme temperature data
ktdlst( 54)= 007032
ktdlst( 55)= 101002
ktdlst( 56)= 004024
ktdlst( 57)= 012111
ktdlst( 58)= 004024
ktdlst( 59)= 012112
!      Wind data
ktdlst( 60)= 007032
ktdlst( 61)= 002002
ktdlst( 62)= 008021
ktdlst( 63)= 004025
ktdlst( 64)= 011001
ktdlst( 65)= 011002
ktdlst( 66)= 008021
ktdlst( 67)= 103002
ktdlst( 68)= 004025
ktdlst( 69)= 011043
ktdlst( 70)= 011041

ktdlen=70

values( 1)=13.      ! 001001 WMO BLOCK NUMBER          NUMERIC
values( 2)=272.     ! 001002 WMO STATION NUMBER          NUMERIC
values( 3)=1009.    ! 001011 SHIP OR MOBILE LAND STATION IDENTIFIER    CCITTIA5
values( 4)=6.       ! 001003 WMO REGION NUMBER/GEOGRAPHICAL AREA      CODE TABLE 001003
values( 5)=0.       ! 002001 TYPE OF STATION                  CODE TABLE 002001
values( 6)=2005.    ! 004001 YEAR                            YEAR
values( 7)=12.     ! 004002 MONTH                          MONTH
values( 8)=1.       ! 004003 DAY                            DAY
values( 9)=12.     ! 004004 HOUR                          HOUR
values(10)=0.       ! 004005 MINUTE                        MINUTE
values(11)=44.82    ! 005001 LATITUDE (HIGH ACCURACY)        DEGREE
values(12)=20.28    ! 006001 LONGITUDE (HIGH ACCURACY)       DEGREE
values(13)=96       ! 007030 HEIGHT OF STATION GROUND ABOVE MEAN SEA M

!      Pressure
values(14)=99       ! 007031 HEIGHT OF BAROMETER ABOVE MEAN SEA LEVEL M
values(15)=1014.    ! 010004 PRESSURE                      PA
values(16)=1026.1   ! 010051 PRESSURE REDUCED TO MEAN SEA LEVEL PA
values(17)=-190.    ! 010061 3 HOUR PRESSURE CHANGE        PA
values(18)=7.       ! 010063 CHARACTERISTIC OF PRESSURE TENDENCY CODE TABLE 010063
values(19)=rvind    ! 007004 PRESSURE                      PA
values(20)=rvind    ! 010009 GEOPOTENTIAL HEIGHT           GPM

!      Temperature data
values(21)=2.       ! 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND ( OR M
values(22)=292.6    ! 012101 TEMPERATURE/DRY BULB TEMPERATURE K
values(23)=288.     ! 012103 DEW-POINT TEMPERATURE         K
values(24)=rvind    ! 013003 RELATIVE HUMIDITY             %

!      Visibility data
values(25)=1.       ! 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND ( OR M
values(26)=20000    ! 020001 HORIZONTAL VISIBILITY         M

!      Precipitation past 24 hours
values(27)=0.3      ! 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND ( OR M
values(28)=rvind    ! 013023 TOTAL PRECIPITATION PAST 24 HOURS KG/M**2
values(29)=rvind    ! 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND ( OR M

!      Cloud data
values(30)=40.      ! 020010 CLOUD COVER (TOTAL)           %
values(31)=1.       ! 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATI CODE TABLE 008002
values(32)=0.       ! 020011 CLOUD AMOUNT                  CODE TABLE 020011
values(33)=8000.    ! 020013 HEIGHT OF BASE OF CLOUD       M
values(34)=30.      ! 020012 CLOUD TYPE                    CODE TABLE 020012
values(35)=20.      ! 020012 CLOUD TYPE                    CODE TABLE 020012
values(36)=11.      ! 020012 CLOUD TYPE                    CODE TABLE 020012
values(37)=rvind    ! 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATI CODE TABLE 008002
values(38)=rvind    ! 020011 CLOUD AMOUNT                  CODE TABLE 020011
values(39)=rvind    ! 020012 CLOUD TYPE                    CODE TABLE 020012
values(40)=rvind    ! 020013 HEIGHT OF BASE OF CLOUD       M
values(41)=rvind    ! 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATI CODE TABLE 008002
values(42)=rvind    ! 020011 CLOUD AMOUNT                  CODE TABLE 020011
values(43)=rvind    ! 020012 CLOUD TYPE                    CODE TABLE 020012
values(44)=rvind    ! 020013 HEIGHT OF BASE OF CLOUD       M
values(45)=rvind    ! 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATI CODE TABLE 008002
values(46)=rvind    ! 020011 CLOUD AMOUNT                  CODE TABLE 020011
values(47)=rvind    ! 020012 CLOUD TYPE                    CODE TABLE 020012
values(48)=rvind    ! 020013 HEIGHT OF BASE OF CLOUD       M
values(49)=rvind    ! 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATI CODE TABLE 008002
values(50)=rvind    ! 020011 CLOUD AMOUNT                  CODE TABLE 020011
values(51)=rvind    ! 020012 CLOUD TYPE                    CODE TABLE 020012
values(52)=rvind    ! 020013 HEIGHT OF BASE OF CLOUD       M

!      Clouds with bases below station level
values(53)=rvind    ! 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATI CODE TABLE 008002
values(54)=rvind    ! 020011 CLOUD AMOUNT                  CODE TABLE 020011
values(55)=rvind    ! 020012 CLOUD TYPE                    CODE TABLE 020012
values(56)=rvind    ! 020014 HEIGHT OF TOP OF CLOUD        M
values(57)=rvind    ! 020017 CLOUD TOP DESCRIPTION         CODE TABLE 020017

```

```

values( 58)=rvind ! 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATI CODE TABLE 008002
values( 59)=rvind ! 020011 CLOUD AMOUNT CODE TABLE 020011
values( 60)=rvind ! 020012 CLOUD TYPE CODE TABLE 020012
values( 61)=rvind ! 020014 HEIGHT OF TOP OF CLOUD M
values( 62)=rvind ! 020017 CLOUD TOP DESCRIPTION CODE TABLE 020017
values( 63)=rvind ! 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATI CODE TABLE 008002
values( 64)=rvind ! 020011 CLOUD AMOUNT CODE TABLE 020011
values( 65)=rvind ! 020012 CLOUD TYPE CODE TABLE 020012
values( 66)=rvind ! 020014 HEIGHT OF TOP OF CLOUD M
values( 67)=rvind ! 020017 CLOUD TOP DESCRIPTION CODE TABLE 020017

! State of ground, snow depth, ground minimum temperature
values( 68)=rvind ! 020062 STATE OF THE GROUND (WITH OR WITHOUT SNO CODE TABLE 020062
values( 69)=rvind ! 013013 TOTAL SNOW DEPTH M
values( 70)=rvind ! 012113 GROUND MINIMUM TEMPERATURE, PAST 12 HOUR K

! Present weather
values( 71)=2. ! 020003 PRESENT WEATHER CODE TABLE 020003
values( 72)=24. ! 004024 TIME PERIOD OR DISPLACEMENT HOUR
values( 73)=1. ! 020004 PAST WEATHER (1) CODE TABLE 020004
values( 74)=1. ! 020005 PAST WEATHER (2) CODE TABLE 020005

! Evaporation measurements
values( 75)=rvind ! 004024 TIME PERIOD OR DISPLACEMENT HOUR
values( 76)=rvind ! 002004 TYPE OF INSTRUMENTATION FOR EVAPORATION CODE TABLE 002004
values( 77)=rvind ! 013033 EVAPORATION/EVAPOTRANSPIRATION KG/M**2

! Sunshine data
values( 78)=rvind ! 004024 TIME PERIOD OR DISPLACEMENT HOUR
values( 79)=rvind ! 014031 TOTAL SUNSHINE MINUTE

! Radiation data
values( 80)=rvind ! 004025 TIME PERIOD OR DISPLACEMENT MINUTE
values( 81)=rvind ! 014002 LONG-WAVE RADIATION, INTEGRATED OVER PERI J/M**2
values( 82)=rvind ! 014004 SHORT-WAVE RADIATION, INTEGRATED OVER PER J/M**2
values( 83)=rvind ! 014016 NET RADIATION, INTEGRATED OVER PERIOD SPE J/M**2
values( 84)=rvind ! 014028 GLOBAL SOLAR RADIATION INTEGRATED OVERPE J/M**2
values( 85)=rvind ! 014029 DIFFUSE SOLAR RADIATION INTEGRATED OVERP J/M**2
values( 86)=rvind ! 014030 DIRECT SOLAR RADIATION INTEGRATED OVERPE J/M**2

! Precipitation measurements
values( 87)=0. ! 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND ( OR M
values( 88)=-6 ! 004024 TIME PERIOD OR DISPLACEMENT HOUR
values( 89)=2. ! 013011 TOTAL PRECIPITATION/TOTAL WATER EQUIVALE KG/M**2

! Extreme temperature data
values( 90)=rvind ! 004024 TIME PERIOD OR DISPLACEMENT HOUR
values( 91)=rvind ! 013011 TOTAL PRECIPITATION/TOTAL WATER EQUIVALE KG/M**2
values( 92)=rvind ! 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND ( OR M
values( 93)=-24 ! 004024 TIME PERIOD OR DISPLACEMENT HOUR
values( 94)=0 ! 004024 TIME PERIOD OR DISPLACEMENT HOUR
values( 95)=275.22 ! 012111 MAXIMUM TEMPERATURE, AT HEIGHT AND OVER P K
values( 96)=-6 ! 004024 TIME PERIOD OR DISPLACEMENT HOUR
values( 97)=268.7 ! 012112 MINIMUM TEMPERATURE, AT HEIGHT AND OVER P K

! Wind data
values( 98)=10. ! 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND ( OR M
values( 99)=1. ! 002002 TYPE OF INSTRUMENTATION FOR WIND MEASURE FLAG TABLE 002002
values( 100)=2. ! 008021 TIME SIGNIFICANCE CODE TABLE 008021
values( 101)=-10. ! 004025 TIME PERIOD OR DISPLACEMENT MINUTE
values( 102)=100. ! 011001 WIND DIRECTION DEGREE TRUE
values( 103)=1. ! 011002 WIND SPEED M/S
values( 104)=rvind ! 008021 TIME SIGNIFICANCE CODE TABLE 008021
values( 105)=rvind ! 004025 TIME PERIOD OR DISPLACEMENT MINUTE
values( 106)=rvind ! 011043 MAXIMUM WIND GUST DIRECTION DEGREE TRUE
values( 107)=rvind ! 011041 MAXIMUM WIND SPEED (GUSTS) M/S
values( 108)=rvind ! 004025 TIME PERIOD OR DISPLACEMENT MINUTE
values( 109)=rvind ! 011043 MAXIMUM WIND GUST DIRECTION DEGREE TRUE
values( 110)=rvind ! 011041 MAXIMUM WIND SPEED (GUSTS) M/S

C
C SET CCITTIA5 STATION OR SITE NAME

cvals(1)='SURCIN'

C
C
C SECTION 0 CONTENT
C
KSEC0(1)=0 ! TOTAL LENGTH OF SECTION 0
KSEC0(2)=0 ! TOTAL LENGTH OF BUFR MESSAGE
KSEC0(3)=4 ! BUFR EDITION NUMBER

C
C SECTION 1 CONTENT
C
KSEC1(1)=22 ! TOTAL LENGTH OF SECTION 1 ( set to 18 for edition <= 3)
KSEC1(2)=4 ! BUFR EDITION NUMBER
KSEC1(3)=98 ! ORIGINATING CENTRE
KSEC1(4)=1 ! UPDATE SEQUENCE NUMBER
KSEC1(5)=0 !128 ! FLAG (PRESENCE OF SECTION 2)
KSEC1(6)=0 ! BUFR MESSAGE TYPE
KSEC1(7)=1 ! BUFR_MESSAGE SUBTYPE
KSEC1(8)=1 ! VERSION NUMBER OF LOCAL TABLE USED
KSEC1(9)=nint(values(6))
if (KSEC1(2).le.3) then

```



```

        if(ksec1(9).gt.2000) then
            ksec1(9)=ksec1(9)-2000
        else
            ksec1(9)=ksec1(9)-1900
        end if
    end if
    KSEC1(10)=nint(values(7))
    KSEC1(11)=nint(values(8))    ! DAY
    KSEC1(12)=nint(values(9))    ! HOUR
    KSEC1(13)=nint(values(10))   ! MINUTE
    KSEC1(14)=0    ! BUFR MASTER TABLE( ZERO) FOR METEOROLOGICAL DATA)
    KSEC1(15)=12   ! VERSION NUMBER OF MASTER TABLE USED
    KSEC1(16)=0    ! ORIGINATING SUB-CENTRE
    KSEC1(17)=0    ! International sub-category
    KSEC1(18)=0    ! Second

C
C    SECTION 2 CONTENT
C
    KSEC2(1)=52

C
    DO 110 I=2,JSEC2
        KSEC2(I)=0
110    CONTINUE
C
C    SECTION 3 CONTENT
C
    KSEC3(1)=0    ! TOTAL LENGTH OF SECTION 3
    KSEC3(2)=0    ! RESERVED
    KSEC3(3)=1
    KSEC3(4)=0    ! 64 FOR COMPRESSION/ 0 MANY SUBSETS

C
    IREP=0

C
C
C*      6. PACK BUFR MESSAGE
C      -----
600    CONTINUE
C
C-----
C          This call is not needed for packing. It just
C          prints expanded list corresponding to ktdlst sequence
C          and delayed replications in kdata array. This four
C          lines can be deleted or commented out.
C
    K=1
    CALL BUXDES(K,KSEC1,KTDLEN,KTDLST,KDLENG,KDATA,KELEM,
1         KTDEXL,KTDEXP,CNAMES,CUNITS,KERR)
C
    IF(KERR.NE.0) CALL EXIT(2)
C-----
C
C
C*      6.2 ENCODE DATA INTO BUFR MESSAGE.
C      -----
620    CONTINUE
C
    KBUFL=3000
    KPMISS=1
    KPRUS=1
    NOKEY=0
    CALL BUPRQ(KPMISS,KPRUS,NOKEY)
C
    KERR=0
    CALL BUFREN( KSEC0,KSEC1,KSEC2,KSEC3,KSEC4,
1         KTDLEN,KTDLST,KDLENG,KDATA,KELEM,
2         KVALS,VALUES,CVALS,KBUFL,KBUFR,KERR)
C
    IF(KERR.GT.0) THEN
        CALL EXIT(2)
    ELSEIF(KERR.LT.0) then
        print*,'Encoding return_code=',kerr
    END IF
C
    ILEN=KBUFL*JBPF/8
C
    IERR=0
    CALL PEWRITE(IUNIT1,KBUFR,ILEN,IERR)
    IF(IERR.LT.0) THEN
        PRINT*,'ERROR WRITING INTO TARGET FILE.'
        CALL EXIT(2)
    END IF

C
C-----
C*      7. UNPACK MESSAGE.
C      -----
700    CONTINUE
C
    DO 702 I=1,KVALS1
        VALUE(I)=RVIND
702    CONTINUE
C

```

```
701 CONTINUE
C
  CALL BUFREX(KBUFL,KBUFR,ISUP,ISEC0 , ISEC1, ISEC2 , ISEC3 , ISEC4,
1          KELEM,CNAME,CUNIT,KVALS1,VALUE,CVAL,IERR)
C
  IF(IERR.NE.0) CALL EXIT(2)
C
  CALL BUPRS0( ISEC0)
  CALL BUPRS1( ISEC1)
  CALL BUUKEY( ISEC1, ISEC2,KEY,ISUP,KERR)
  CALL BUPRS2( ISUP ,KEY)
  ISUBSET=1
  CALL BUSEL2( ISUBSET,KELEM,KTDLEN,KTDLST,KTDEXL,KTDEXP,CNAMES,
1          CUNITS,IERR)
  CALL BUPRS3( ISEC3,KTDLEN,KTDLST,KTDEXL,KTDEXP,KELEM,CNAME)
C
  WRITE(*,'(a,$)') ' STARTING SUBSET TO BE PRINTED : '
  READ(*,'(I5)')   IST
  WRITE(*,'(a,$)') ' ENDING SUBSET TO BE PRINTED : '
  READ(*,'(I6)')   IEND
C
  ICODE=0
  CALL BUPRT(ICODE,IST,IEND,KELEM,CNAME,CUNIT,CVAL,
1          KVALS1,VALUE,ISUP,ISEC1,IERR)
C
C
  IREP=IREP+1
C
  IF(IREP.GT.3) GO TO 900
  GO TO 900
C
810 CONTINUE
C
  WRITE(*,'(1H ,A)') 'OPEN ERROR ON INPUT FILE'
  GO TO 900
C
800 CONTINUE
C
  IF(IERR.EQ.-1) THEN
    print*,'Number of records processed ',IREP
  ELSE
    print*,' BUFR : error= ',ierr
  END IF
C
900 CONTINUE
C
  STOP
  END
```

## 5.4 An example of decoding Opera radar composite images

```

C Copyright 1981-2007 ECMWF
C
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C incorporates the terms and conditions of version 3 of the GNU
C General Public License.
C See LICENSE and gpl-3.0.txt for details.
C
C
C      PROGRAM DECODE_BUFR_IMAGE
C
C**** *DECODE_BUFR_IMAGE*
C
C
C      PURPOSE.
C      -----
C      Expnds Opera run-length encoded composite images
C      and creates image header and image file.
C
C
C**  INTERFACE.
C      -----
C
C      NONE.
C
C      METHOD.
C      -----
C
C      NONE.
C
C      EXTERNALS.
C      -----
C
C      REFERENCE.
C      -----
C
C      NONE.
C
C      AUTHOR.
C      -----
C
C      M. DRAGOSAVAC      *ECMWF*      15/07/2008.
C
C      MODIFICATIONS.
C      -----
C
C      NONE.
C
C      IMPLICIT LOGICAL (L,O,G) , CHARACTER*8 (C,H,Y)
C
C      PARAMETER (JSUP = 9,JSEC0= 3,JSEC1= 40,JSEC2=4096 ,JSEC3= 4,
1      JSEC4= 2,JELEM=320000,JSUBS=400,JCVAl=150 ,JBUFL=300000,
2      JBPW = 32,JTAB =3000,JCTAB=120,JCTST=1800,JCTEXT=1200,
3      JWORK=4096000,JKEY=46,JBYTE=440000)
C
C      PARAMETER (KELEM=320000)
C      PARAMETER (KVALS=4096000)
C
C      DIMENSION KBUFF (JBUFL)
C      DIMENSION KBUFR (JBUFL)
C      DIMENSION KSUP (JSUP) ,KSEC0 (JSEC0),KSEC1 (JSEC1)
C      DIMENSION KSEC2 (JSEC2),KSEC3 (JSEC3),KSEC4 (JSEC4)
C
C      REAL*8 VALUES (KVALS),VALUES_IMG (500)
C      DIMENSION IMAGE8 (522500)
C      DIMENSION KTDLST (KELEM),KTDEXP (KELEM)
C      DIMENSION KTDEXP_IMG (KELEM)
C
C      CHARACTER*256 CF,COUT,CARG (4),COUT1,COUT2,COUT3
C      CHARACTER*64 CNAME (KELEM),CNAME_IMG (KELEM)
C      CHARACTER*24 CUNIT (KELEM),CUNIT_IMG (KELEM)
C      CHARACTER*80 CVAL (KELEM),CVAL_IMG (KELEM)
C      REAL*8 RVIND
C
C      EQUIVALENCE (IMAGE1,IMAGE2,IMAGE4)
C      -----
C*      1. INITIALIZE CONSTANTS AND VARIABLES.
C      -----
C
100  CONTINUE
C
C      MISSING VALUE INDICATOR
C
C      NBYTPW=JBPW/8
C      RVIND=1.7D38
C      NVIND=2147483647
C      IOBS=0

```

```

      N=0
C
C
C
C      GET INPUT AND OUTPUT FILE NAME.
C
      NARG=IARGC()
C
C
      DO 104 J=1,NARG
      CALL GETARG(J,CARG(J))
104  CONTINUE

      IF(NARG.EQ.0) THEN
        PRINT*,'USAGE -- decode_bufr_image infile'
        STOP
      END IF
C
      DO 101 II=1,NARG

      CF=CARG(II)
      ILN=INDEX(CF,' ') -1
C
C*      1.2 OPEN FILE CONTAINING BUFR DATA.
C      -----
120  CONTINUE
C
      IRET=0
      CALL PBOpen(IUNIT,CF(1:ILN),'R',IRET)
      IF(IRET.EQ.-1) STOP 'OPEN FAILED'
      IF(IRET.EQ.-2) STOP 'INVALID FILE NAME'
      IF(IRET.EQ.-3) STOP 'INVALID OPEN MODE SPECIFIED'
C
      COUT1=CF(1:ILN-5) //' .img'
      ILN1=INDEX(COUT1,' ') -1
      CALL PBOpen(IUNIT1,COUT1(1:ILN1),'W',IRET)
      IF(IRET.EQ.-1) STOP 'OPEN FAILED ON *.img file'
      IF(IRET.EQ.-2) STOP 'INVALID FILE NAME'
      IF(IRET.EQ.-3) STOP 'INVALID OPEN MODE SPECIFIED'
C
      COUT2=CF(1:ILN-5) //' .img_header'
      ILN2=INDEX(COUT2,' ') -1
      IUNIT2=40
      OPEN(UNIT=IUNIT2,FILE=COUT2(1:ILN2),STATUS='UNKNOWN',Iostat=ios)
      IF(IOS.NE.0) THEN
        PRINT*,'Open error on ',COUT2(1:ILN2)
        STOP
      END IF
C
      COUT3=CF(1:ILN-5) //' .section_1'
      ILN3=INDEX(COUT3,' ') -1
      IUNIT3=41
      OPEN(UNIT=IUNIT3,FILE=COUT3(1:ILN3),STATUS='UNKNOWN',Iostat=ios)
      IF(IOS.NE.0) THEN
        PRINT*,'Open error on ',COUT3(1:ILN3)
        STOP
      END IF
C
C      -----
C
C*      3.  READ BUFR MESSAGE.
C      -----
300  CONTINUE
C
      IERR=0
      KBUFL=0
C
      CALL PBBUFR(IUNIT,KBUFF,JBYTE*4,KBUFL,IERR)
      IF(IERR.EQ.-1) THEN
        PRINT*,'NUMBER OF SUBSETS      ',IOBS
        PRINT*,'NUMBER OF MESSAGES     ',N
        STOP 'EOF'
      END IF
      IF(IERR.EQ.-2) STOP 'FILE HANDLING PROBLEM'
      IF(IERR.EQ.-3) STOP 'ARRAY TOO SMALL FOR PRODUCT'
C
      N=N+1
      PRINT*,'-----',N,' ',KBUFL
      KBUFL=KBUFL/NBYTPW+1
C
C      -----
C*      4.  EXPAND BUFR MESSAGE.
C      -----
400  CONTINUE
C
      CALL BUS0123( KBUFL,KBUFF,KSUP,KSEC0,KSEC1,KSEC2,KSEC3,IERR)
      IF(IERR.NE.0) THEN
        PRINT*,'ERROR IN BUS012: ',IERR
        PRINT*,' BUFR MESSAGE NUMBER ',N,' CORRUPTED.'
        IERR=0
        GO TO 300
      END IF

```

```

C      KEL=KVALS/KSEC3(3)
C      IF (KEL.GT.KELEM) KEL=KELEM
C
C      CALL BUFRX(KBUFL,KBUFF,KSUP,KSEC0 ,KSEC1,KSEC2 ,KSEC3 ,KSEC4,
1      KEL,CNAMES,CUNITS,KVALS,VALUES,CVALS,IERR)
C
C      IF (IERR.NE.0) THEN
C        CALL EXIT(2)
C      END IF
C
C      IOBS=IOBS+KSEC3(3)
C
C      ISUBSET=1
C      CALL BUSEL2 (ISUBSET,KEL,KTDLEN,KTDLST,KTDEXL,KTDEXP,CNAMES,
1      CUNITS,IERR)
C      IF (IERR.NE.0) CALL EXIT(2)
C
C      Get full image as array of pixel values
C
C      CALL BUGET_OPERA_IMAGE (KSEC1,KTDEXL,KTDEXP,CNAMES,CUNITS,
1      KELEM,KVALS,VALUES,CVALS,KTDEXL_IMG,KTDEXP_IMG,
2      CNAMES_IMG,CUNITS_IMG,KVALS_IMG,VALUES_IMG,
3      CVALS_IMG,KSIZE_IMG_BYTES,IMAGE8,KPIXEL_SIZE,KERR)
C
C
C
C      Write image meta data into file
C      -----
C      DO I=1,KTDEXL_IMG
C        WRITE(IUNIT2,'(I6,1X,A64,1X,F20.8,1X,a24)') I,CNAMES_IMG(I),
C        VALUES_IMG(I),CUNITS_IMG(I)
C      END DO
C
C
C      Write bufr section 1 into file
C      -----
C      CALL BBUPRS1(IUNIT3,KSEC1)
C      imx=KSIZE_IMG_BYTES
C      print*,'printing bytes=',imx
C
C      Write image ( pixel values ) into file
C      -----
C      CALL PBWRITE(IUNIT1,IMAGE8,imx,IERR)
C
C
C      GO TO 900
C      -----
C
C      810 CONTINUE
C
C      WRITE(*,'(1H ,A)') 'OPEN ERROR ON INPUT FILE'
C      GO TO 900
C
C      800 CONTINUE
C
C      IF (IRET.EQ.-1) THEN
C        PRINT*,'NUMBER OF RECORDS PROCESSED ',N
C        PRINT*,'NUMBER OF OBSERVATIONS      ',IOBS
C      ELSE
C        PRINT*,' BUFR : ERROR= ',IERR
C      END IF
C
C      900 CONTINUE
C
C      CALL PBCLOSE(IUNIT,IRET)
C      CALL PBCLOSE(IUNIT1,IRET)
C      CLOSE(IUNIT2)
C      CLOSE(IUNIT3)
C
C      101 CONTINUE
C
C      END

```

## 5.5 An example of C program calling fortran bufr subroutines

```
#include "stdio.h"
#include "stdlib.h"

int main(int argc, char *argv[])
/*****
*
* Program : Bufr_decode
*
* Author: Milan Dragosavac    ECMWF    July 1996
*
* Purpose: Decode bufr message
*
* Usage:
*
* References:
*
* File formats:
*
* Restrictions:
*
* Error handling:
*
* Notes:
*
*****/
{
#define KVALS 360000
#define KELEM 40000

FILE *fp;
char bufr_message[15000];
char filename[256];
long int length=15000;
long int status;
int Nbpw;

unsigned long int *kbuff;
long int ksup[9];
long int ksec0[3];
long int ksec1[40];
long int ksec2[4096];
long int ksec3[4];
long int ksec4[2];
long int key[46];
long int kerr;

int i;
long kelem = KELEM,kvals = KVALS;

static char cnames[KELEM][64],cunits[KELEM][24];

char cvals[KVALS][80];

float values[KVALS],vals[KVALS];
long icode = 0;
long ktdlst[KELEM],ktdexp[KELEM],ktdlen,ktdexl;

if(sizeof(long) == 4) Nbpw=32;
else if(sizeof(long) == 8) Nbpw=64;
else{
    printf("Abort.....\n");
}

printf("%d\n",Nbpw);

/*      Get input and output file name.  */
/*      ----- */

if(argc != 3) {
```

```

    printf("Usage: bufr_decode -i infile \n");
    printf("Please try again. \n");
    exit(1);
}

printf("%c",argc);

if(!strcmp(argv[1],"-i")) strcpy(filename,argv[2]);
else {
    printf("Usage: bufr_decode -i infile \n");
    exit(1);
}

/*      Open input file          */
/*      -----          */

if((fp = fopen(filename,"r")) == NULL) {
    printf("cannot open file\n");
    exit(1);
}

/*      Read in bufr messages */
/*      -----          */

while(status >= 0){
    status = readbufr( fp,&bufr_message,&length);

    if( status == -1 ) printf("End of file.\n");
    else if(status == -2 ) printf("Error in file handling\n");
    else if(status == -3 ) printf("Too small input array.\n");
    else if(status == -4 ) printf("Too small input array.\n");
    else {
        printf("It is OK.\n");
        printf("message read ");
        printf("%d\n",length);
        printf("%s\n",&bufr_message[0]);
    }
    status=-1;
}

/*      Expand bufr message calling fortran program */
    kbuff = (long *) bufr_message;
    length /= 4;

    bus012_(&length, kbuff , ksup, ksec0, ksec1, ksec2, &kerr) ;
    buprs0_(ksec0);
    buprs1_(ksec1);

    if (ksup[5] > 1)
        kelem = kvals/ksup[5];
    else
        kelem = KELEM;

    if ( kelem > KELEM ) kelem = KELEM;
    kerr = 0;
    bufrex_(&length, (long *)kbuff,ksup,ksec0,ksec1,ksec2,ksec3,ksec4,
        &kelem, (char **)cnames, (char **)cunits,&kvals,
        values, (char **)cvals,&kerr);
    if ( kerr )
    {
        kerr = 0;
    }

    buukey_(ksec1,ksec2,key,ksup,&kerr);

    busel_(&ktdlen,&ktdlst,&ktdexl,&ktdexp,&kerr);
    buprs3_(ksec3,&ktdlen,&ktdlst,&ktdexl,&ktdexp,&kelem, (char **)cnames);

    icode = 0;
    long current_ss;
    current_ss = 1;
    buprt_(&icode,&current_ss,&current_ss,&kelem, (char **)cnames,
        (char **)cunits, (char **)cvals,
        &kvals,values,ksup,ksec1,&kerr);

}

return kerr;
}

```

## 6 WMO observation templates

### 6.1 WMO AWS (automatic and manned station) template, one hour period

```
ECMWF

BUFR DECODING SOFTWARE VERSION - 7.1
07 June 2005.

Your path for bufr tables is :
/home/ma/maa/bigtmp/wmo_bufr_crex_000250/bufr_000270/bufrtables
BUFR TABLES TO BE LOADED B0000000000078011007,D0000000000078011007
1
    BUFR SECTION 0

    LENGTH OF SECTION 0 (BYTES)          8
    TOTAL LENGTH OF BUFR MESSAGE (BYTES) 320
    BUFR EDITION NUMBER                  3
1
    BUFR SECTION 1

    LENGTH OF SECTION 1 (BYTES)          18
    BUFR EDITION NUMBER                   3
    ORIGINATING SUB-CENTRE                0
    ORIGINATING CENTRE                    78
    UPDATE SEQUENCE NUMBER                 0
    FLAG (PRESENCE OF SECTION 2)          0
    BUFR MESSAGE TYPE                     0
    BUFR MESSAGE SUBTYPE                  0
    VERSION NUMBER OF LOCAL TABLE        7
    YEAR                                  5
    MONTH                                 5
    DAY                                   4
    HOUR                                  9
    MINUTE                                0
    VERSION NUMBER OF MASTER TABLE       11
    BUFR MASTER TABLE                    0

    BUUKEY : KEY DEFINITION NOT KNOWN

    PRKEY : RDB KEY NOT DEFINED IN SECTION 2.
1
    BUFR SECTION 3

    LENGTH OF SECTION 3 (BYTES)          74
    RESERVED                              0
    NUMBER OF DATA SUBSETS                1
    FLAG (DATA TYPE/DATA COMPRESSION)     128

    DATA DESCRIPTORS (UNEXPANDED)

    1 301090
    2 008010
    3 301091
    4 302001
    5 007004
    6 010009
    7 302072
    8 101005
    9 307063
    10 302069
    11 007032
    12 007033
    13 020031
    14 020032
    15 002038
    16 022043
    17 302021
    18 302078
    19 302073
    20 302074
    21 302075
    22 004025
    23 302076
    24 302071
    25 302077
    26 007033
    27 302079
    28 007032
    29 302080
    30 302081
    31 302082
    32 004025
    33 013059
```



DATA DESCRIPTORS (EXPANDED)		
1	001001	WMO BLOCK NUMBER
2	001002	WMO STATION NUMBER
3	001015	STATION OR SITE NAME
4	002001	TYPE OF STATION
5	004001	YEAR
6	004002	MONTH
7	004003	DAY
8	004004	HOURLY
9	004005	MINUTE
10	005001	LATITUDE (HIGH ACCURACY)
11	006001	LONGITUDE (HIGH ACCURACY)
12	007030	HEIGHT OF STATION GROUND ABOVE MEAN SEA LEVEL (SEE NOTE 3)
13	007031	HEIGHT OF BAROMETER ABOVE MEAN SEA LEVEL (SEE NOTE 4)
14	008010	SURFACE QUALIFIER (TEMPERATURE DATA)
15	002180	MAIN PRESENT WEATHER DETECTING SYSTEM
16	002181	SUPPLEMENTARY PRESENT WEATHER SENSOR
17	002182	VISIBILITY MEASUREMENT SYSTEM
18	002183	CLOUD DETECTION SYSTEM
19	002184	TYPE OF LIGHTNING DETECTION SENSOR
20	002179	TYPE OF SKY CONDITION ALGORITHM
21	002186	CAPABILITY TO DETECT PRECIPITATION PHENOMENA
22	002187	CAPABILITY TO DETECT OTHER WEATHER PHENOMENA
23	002188	CAPABILITY TO DETECT OBSCURATION
24	002189	CAPABILITY TO DISCRIMINATE LIGHTNING STRIKES
25	010004	PRESSURE
26	010051	PRESSURE REDUCED TO MEAN SEA LEVEL
27	010061	3-HOUR PRESSURE CHANGE
28	010063	CHARACTERISTIC OF PRESSURE TENDENCY
29	007004	PRESSURE
30	010009	GEOPOTENTIAL HEIGHT
31	007032	HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
32	007033	HEIGHT OF SENSOR ABOVE WATER SURFACE (SEE NOTE 6)
33	012101	TEMPERATURE/DRY-BULB TEMPERATURE
34	012103	DEW-POINT TEMPERATURE
35	013003	RELATIVE HUMIDITY
36	007061	DEPTH BELOW LAND SURFACE
37	012130	SOIL TEMPERATURE
38	007061	DEPTH BELOW LAND SURFACE
39	012130	SOIL TEMPERATURE
40	007061	DEPTH BELOW LAND SURFACE
41	012130	SOIL TEMPERATURE
42	007061	DEPTH BELOW LAND SURFACE
43	012130	SOIL TEMPERATURE
44	007061	DEPTH BELOW LAND SURFACE
45	012130	SOIL TEMPERATURE
46	007032	HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
47	007033	HEIGHT OF SENSOR ABOVE WATER SURFACE (SEE NOTE 6)
48	033041	ATTRIBUTE OF FOLLOWING VALUE
49	020001	HORIZONTAL VISIBILITY
50	007032	HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
51	007033	HEIGHT OF SENSOR ABOVE WATER SURFACE (SEE NOTE 6)
52	020031	ICE DEPOSIT (THICKNESS)
53	020032	RATE OF ICE ACCRETION
54	002038	METHOD OF WATER TEMPERATURE AND/OR SALINITY MEASUREMENT
55	022043	SEA/WATER TEMPERATURE
56	022001	DIRECTION OF WAVES
57	022011	PERIOD OF WAVES
58	022021	HEIGHT OF WAVES
59	002176	METHOD OF STATE OF GROUND MEASUREMENT
60	020062	STATE OF THE GROUND (WITH OR WITHOUT SNOW)
61	002177	METHOD OF SNOW DEPTH MEASUREMENT
62	013013	TOTAL SNOW DEPTH
63	020010	CLOUD COVER (TOTAL)
64	008002	VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
65	020011	CLOUD AMOUNT
66	020012	CLOUD TYPE
67	033041	ATTRIBUTE OF FOLLOWING VALUE
68	020013	HEIGHT OF BASE OF CLOUD
69	008002	VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
70	020011	CLOUD AMOUNT
71	020012	CLOUD TYPE
72	033041	ATTRIBUTE OF FOLLOWING VALUE
73	020013	HEIGHT OF BASE OF CLOUD
74	008002	VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
75	020011	CLOUD AMOUNT
76	020012	CLOUD TYPE
77	033041	ATTRIBUTE OF FOLLOWING VALUE
78	020013	HEIGHT OF BASE OF CLOUD
79	008002	VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
80	020011	CLOUD AMOUNT
81	020012	CLOUD TYPE
82	033041	ATTRIBUTE OF FOLLOWING VALUE
83	020013	HEIGHT OF BASE OF CLOUD
84	020003	PRESENT WEATHER (SEE NOTE 1)
85	004025	TIME PERIOD OR DISPLACEMENT
86	020004	PAST WEATHER (1) (SEE NOTE 2)
87	020005	PAST WEATHER (2) (SEE NOTE 2)
88	008021	TIME SIGNIFICANCE
89	004025	TIME PERIOD OR DISPLACEMENT
90	013055	INTENSITY OF PRECIPITATION

91 013058 SIZE OF PRECIPITATING ELEMENT  
92 008021 TIME SIGNIFICANCE  
93 004025 TIME PERIOD OR DISPLACEMENT  
94 020021 TYPE OF PRECIPITATION  
95 020022 CHARACTER OF PRECIPITATION  
96 026020 DURATION OF PRECIPITATION  
97 020023 OTHER WEATHER PHENOMENA  
98 020024 INTENSITY OF PHENOMENA  
99 020025 OBSCURATION  
100 020026 CHARACTER OF OBSCURATION  
101 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)  
102 007033 HEIGHT OF SENSOR ABOVE WATER SURFACE (SEE NOTE 6)  
103 008021 TIME SIGNIFICANCE  
104 004025 TIME PERIOD OR DISPLACEMENT  
105 011001 WIND DIRECTION  
106 011002 WIND SPEED  
107 008021 TIME SIGNIFICANCE  
108 004025 TIME PERIOD OR DISPLACEMENT  
109 011043 MAXIMUM WIND GUST DIRECTION  
110 011041 MAXIMUM WIND GUST SPEED  
111 004025 TIME PERIOD OR DISPLACEMENT  
112 011043 MAXIMUM WIND GUST DIRECTION  
113 011041 MAXIMUM WIND GUST SPEED  
114 004025 TIME PERIOD OR DISPLACEMENT  
115 011016 EXTREME COUNTERCLOCKWISE WIND DIRECTION OF A VARIABLE WIND  
116 011017 EXTREME CLOCKWISE WIND DIRECTION OF A VARIABLE WIND  
117 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)  
118 007033 HEIGHT OF SENSOR ABOVE WATER SURFACE (SEE NOTE 6)  
119 004025 TIME PERIOD OR DISPLACEMENT  
120 012111 MAXIMUM TEMPERATURE, AT HEIGHT AND OVER PERIOD SPECIFIED  
121 012112 MINIMUM TEMPERATURE, AT HEIGHT AND OVER PERIOD SPECIFIED  
122 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)  
123 004025 TIME PERIOD OR DISPLACEMENT  
124 012112 MINIMUM TEMPERATURE, AT HEIGHT AND OVER PERIOD SPECIFIED  
125 007033 HEIGHT OF SENSOR ABOVE WATER SURFACE (SEE NOTE 6)  
126 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)  
127 002175 METHOD OF PRECIPITATION MEASUREMENT  
128 002178 METHOD OF LIQUID CONTENT MEASUREMENT OF PRECIPITATION  
129 004025 TIME PERIOD OR DISPLACEMENT  
130 013011 TOTAL PRECIPITATION/TOTAL WATER EQUIVALENT  
131 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)  
132 002185 METHOD OF EVAPORATION MEASUREMENT  
133 004025 TIME PERIOD OR DISPLACEMENT  
134 013033 EVAPORATION/EVAPOTRANSPIRATION  
135 004025 TIME PERIOD OR DISPLACEMENT  
136 014031 TOTAL SUNSHINE  
137 004025 TIME PERIOD OR DISPLACEMENT  
138 014002 LONG-WAVE RADIATION, INTEGRATED OVER PERIOD SPECIFIED  
139 014004 SHORT-WAVE RADIATION, INTEGRATED OVER PERIOD SPECIFIED  
140 014016 NET RADIATION, INTEGRATED OVER PERIOD SPECIFIED  
141 014028 GLOBAL SOLAR RADIATION (HIGH ACCURACY), INTEGRATED OVER PERIOD S  
142 014029 DIFFUSE SOLAR RADIATION (HIGH ACCURACY), INTEGRATED OVER PERIOD  
143 014030 DIRECT SOLAR RADIATION (HIGH ACCURACY), INTEGRATED OVER PERIOD S  
144 004025 TIME PERIOD OR DISPLACEMENT  
145 013059 NUMBER OF FLASHES (THUNDERSTORM)

STARTING SUBSET TO BE PRINTED : 1  
ENDING SUBSET TO BE PRINTED : 1

1	WMO BLOCK NUMBE	0.1000000000E+02	NUMERIC	
2	WMO STATION NUM	0.3930000000E+03	NUMERIC	
3	STATION OR SITE	0.1020000000E+04	CCITIA5	Lindenberg
4	TYPE OF STATION	0.1000000000E+01	CODE TABLE 2001	
5	YEAR	0.2005000000E+04	YEAR	
6	MONTH	0.5000000000E+01	MONTH	
7	DAY	0.4000000000E+01	DAY	
8	HOUR	0.9000000000E+01	HOUR	
9	MINUTE	0.0000000000E+00	MINUTE	
10	LATITUDE (HIGH	0.5220970000E+02	DEGREE	
11	LONGITUDE (HIGH	0.1412030000E+02	DEGREE	
12	HEIGHT OF STATI	0.9800000000E+02	M	
13	HEIGHT OF BAROM	0.1038000000E+03	M	
14	SURFACE QUALIFI	0.3000000000E+01	CODE TABLE 8010	
15	MAIN PRESENT WE	0.0000000000E+00	CODE TABLE 2180	
16	SUPPLEMENTARY P	0.1048576000E+07	FLAG TABLE 2181	
17	VISIBILITY MEAS	0.0000000000E+00	CODE TABLE 2182	
18	CLOUD DETECTION	0.1000000000E+01	CODE TABLE 2183	
19	TYPE OF LIGHTNI	0.0000000000E+00	CODE TABLE 2184	
20	TYPE OF SKY CON	0.0000000000E+00	CODE TABLE 2179	
21	CAPABILITY TO D	0.0000000000E+00	FLAG TABLE 2186	
22	CAPABILITY TO D	0.0000000000E+00	FLAG TABLE 2187	
23	CAPABILITY TO D	0.0000000000E+00	FLAG TABLE 2188	
24	CAPABILITY TO D	0.2048000000E+04	FLAG TABLE 2189	
25	PRESSURE	0.9966000000E+05	PA	
26	PRESSURE REDUCE	0.1008900000E+06	PA	
27	3-HOUR PRESSURE	0.5000000000E+02	PA	
28	CHARACTERISTIC	0.2000000000E+01	CODE TABLE 10063	
29	PRESSURE		MISSING PA	
30	GEOPOTENTIAL HE		MISSING GPM	
31	HEIGHT OF SENSO	0.2000000000E+01	M	
32	HEIGHT OF SENSO		MISSING M	
33	TEMPERATURE/DRY	0.2881500000E+03	K	
34	DEW-POINT TEMPE	0.2843500000E+03	K	

35	RELATIVE HUMIDI	0.7800000000E+02	%
36	DEPTH BELOW LAN	0.5000000000E-01	M
37	SOIL TEMPERATUR	0.2896500000E+03	K
38	DEPTH BELOW LAN	0.1000000000E+00	M
39	SOIL TEMPERATUR	0.2893500000E+03	K
40	DEPTH BELOW LAN	0.2000000000E+00	M
41	SOIL TEMPERATUR	0.2892500000E+03	K
42	DEPTH BELOW LAN	0.5000000000E+00	M
43	SOIL TEMPERATUR	0.2883500000E+03	K
44	DEPTH BELOW LAN	0.1000000000E+01	M
45	SOIL TEMPERATUR	0.2850500000E+03	K
46	HEIGHT OF SENSO	0.2000000000E+01	M
47	HEIGHT OF SENSO	MISSING	M
48	ATTRIBUTE OF FO	0.0000000000E+00	CODE TABLE 33041
49	HORIZONTAL VISI	0.1200000000E+05	M
50	HEIGHT OF SENSO	MISSING	M
51	HEIGHT OF SENSO	MISSING	M
52	ICE DEPOSIT (TH	MISSING	M
53	RATE OF ICE ACC	MISSING	CODE TABLE 20032
54	METHOD OF WATER	MISSING	CODE TABLE 2038
55	SEA/WATER TEMPE	MISSING	K
56	DIRECTION OF WA	MISSING	DEGREE TRUE
57	PERIOD OF WAVES	MISSING	S
58	HEIGHT OF WAVES	MISSING	M
59	METHOD OF STATE	0.0000000000E+00	CODE TABLE 2176
60	STATE OF THE GR	MISSING	CODE TABLE 20062
61	METHOD OF SNOW	MISSING	CODE TABLE 2177
62	TOTAL SNOW DEPT	MISSING	M
63	CLOUD COVER (TO	0.8700000000E+02	%
64	VERTICAL SIGNIF	0.1000000000E+01	CODE TABLE 8002
65	CLOUD AMOUNT	0.4000000000E+01	CODE TABLE 20011
66	CLOUD TYPE	0.8000000000E+01	CODE TABLE 20012
67	ATTRIBUTE OF FO	0.0000000000E+00	CODE TABLE 33041
68	HEIGHT OF BASE	0.6300000000E+03	M
69	VERTICAL SIGNIF	0.2000000000E+01	CODE TABLE 8002
70	CLOUD AMOUNT	0.7000000000E+01	CODE TABLE 20011
71	CLOUD TYPE	0.6000000000E+01	CODE TABLE 20012
72	ATTRIBUTE OF FO	0.0000000000E+00	CODE TABLE 33041
73	HEIGHT OF BASE	0.9000000000E+03	M
74	VERTICAL SIGNIF	MISSING	CODE TABLE 8002
75	CLOUD AMOUNT	MISSING	CODE TABLE 20011
76	CLOUD TYPE	MISSING	CODE TABLE 20012
77	ATTRIBUTE OF FO	MISSING	CODE TABLE 33041
78	HEIGHT OF BASE	MISSING	M
79	VERTICAL SIGNIF	MISSING	CODE TABLE 8002
80	CLOUD AMOUNT	MISSING	CODE TABLE 20011
81	CLOUD TYPE	MISSING	CODE TABLE 20012
82	ATTRIBUTE OF FO	MISSING	CODE TABLE 33041
83	HEIGHT OF BASE	MISSING	M
84	PRESENT WEATHER	0.5080000000E+03	CODE TABLE 20003
85	TIME PERIOD OR	0.1800000000E+03	MINUTE
86	PAST WEATHER (1	0.1000000000E+02	CODE TABLE 20004
87	PAST WEATHER (2	0.1000000000E+02	CODE TABLE 20005
88	TIME SIGNIFICAN	0.2000000000E+01	CODE TABLE 8021
89	TIME PERIOD OR	-0.1000000000E+02	MINUTE
90	INTENSITY OF PR	MISSING	KG/(M**2)S
91	SIZE OF PRECIP	MISSING	M
92	TIME SIGNIFICAN	MISSING	CODE TABLE 8021
93	TIME PERIOD OR	-0.1000000000E+02	MINUTE
94	TYPE OF PRECIP	MISSING	FLAG TABLE 20021
95	CHARACTER OF PR	MISSING	CODE TABLE 20022
96	DURATION OF PRE	MISSING	MINUTE
97	OTHER WEATHER P	MISSING	FLAG TABLE 20023
98	INTENSITY OF PH	MISSING	CODE TABLE 20024
99	OBSCURATION	MISSING	FLAG TABLE 20025
100	CHARACTER OF OB	MISSING	CODE TABLE 20026
101	HEIGHT OF SENSO	0.1040000000E+02	M
102	HEIGHT OF SENSO	MISSING	M
103	TIME SIGNIFICAN	0.2000000000E+01	CODE TABLE 8021
104	TIME PERIOD OR	-0.1000000000E+02	MINUTE
105	WIND DIRECTION	0.2800000000E+03	DEGREE TRUE
106	WIND SPEED	0.6000000000E+01	M/S
107	TIME SIGNIFICAN	MISSING	CODE TABLE 8021
108	TIME PERIOD OR	-0.1000000000E+02	MINUTE
109	MAXIMUM WIND GU	MISSING	DEGREE TRUE
110	MAXIMUM WIND GU	0.9000000000E+01	M/S
111	TIME PERIOD OR	-0.6000000000E+02	MINUTE
112	MAXIMUM WIND GU	MISSING	DEGREE TRUE
113	MAXIMUM WIND GU	0.1000000000E+02	M/S
114	TIME PERIOD OR	-0.1000000000E+02	MINUTE
115	EXTREME COUNTER	MISSING	DEGREE TRUE
116	EXTREME CLOCKWI	MISSING	DEGREE TRUE
117	HEIGHT OF SENSO	0.2300000000E+01	M
118	HEIGHT OF SENSO	MISSING	M
119	TIME PERIOD OR	-0.9000000000E+03	MINUTE
120	MAXIMUM TEMPERA	MISSING	K
121	MINIMUM TEMPERA	0.2868500000E+03	K
122	HEIGHT OF SENSO	0.5000000000E-01	M
123	TIME PERIOD OR	-0.9000000000E+03	MINUTE
124	MINIMUM TEMPERA	0.2871500000E+03	K
125	HEIGHT OF SENSO	MISSING	M
126	HEIGHT OF SENSO	0.1000000000E+01	M
127	METHOD OF PRECI	0.2000000000E+01	CODE TABLE 2175

```
128 METHOD OF LIQUI      0.0000000000E+00 CODE TABLE 2178
129 TIME PERIOD OR      -0.6000000000E+02 MINUTE
130 TOTAL PRECIPITA      0.0000000000E+00 KG/M**2
131 HEIGHT OF SENSO      MISSING M
132 METHOD OF EVAPO      MISSING CODE TABLE 2185
133 TIME PERIOD OR      -0.6000000000E+02 MINUTE
134 EVAPORATION/EVA      MISSING KG/M**2
135 TIME PERIOD OR      -0.6000000000E+02 MINUTE
136 TOTAL SUNSHINE       0.1000000000E+01 MINUTE
137 TIME PERIOD OR      -0.6000000000E+02 MINUTE
138 LONG-WAVE RADIA      MISSING J/M**2
139 SHORT-WAVE RADIA     MISSING J/M**2
140 NET RADIATION,       MISSING J/M**2
141 GLOBAL SOLAR RA      0.7100000000E+06 J/M**2
142 DIFFUSE SOLAR R      0.6300000000E+06 J/M**2
143 DIRECT SOLAR RA      MISSING J/M**2
144 TIME PERIOD OR      -0.6000000000E+02 MINUTE
145 NUMBER OF FLASH      MISSING NUMERIC
```

## 6.2 WMO SYNOP template

BUFR TABLES TO BE LOADED B0000000000000013000.TXT,D0000000000000013000.TXT

### BUFR SECTION 0

LENGTH OF SECTION 0 (BYTES)	8
TOTAL LENGTH OF BUFR MESSAGE (BYTES)	2498
BUFR EDITION NUMBER	4

### BUFR SECTION 1

LENGTH OF SECTION 1 (BYTES)	22
BUFR MASTER TABLE	0
ORIGINATING CENTRE	89
ORIGINATING SUB-CENTRE	0
UPDATE SEQUENCE NUMBER	0
FLAG (PRESENCE OF SECTION 2)	0
DATA CATEGORY	0
DATA SUB-CATEGORY	0
LOCAL DATA SUB-CATEGORY	0
VERSION NUMBER OF MASTER TABLE	13
VERSION NUMBER OF LOCAL TABLE	0
YEAR	2007
MONTH	10
DAY	10
HOUR	20
MINUTE	0
SECOND	0

BUUKEY : KEY DEFINITION NOT KNOWN

PRTKEY : RDB KEY NOT DEFINED IN SECTION 2.

### BUFR SECTION 3

LENGTH OF SECTION 3 (BYTES)	10
RESERVED	0
NUMBER OF DATA SUBSETS	36
FLAG (DATA TYPE/DATA COMPRESSION)	64

### DATA DESCRIPTORS (UNEXPANDED)

1 307080

### DATA DESCRIPTORS (EXPANDED)

1	001001	WMO BLOCK NUMBER
2	001002	WMO STATION NUMBER
3	001015	STATION OR SITE NAME
4	002001	TYPE OF STATION
5	004001	YEAR
6	004002	MONTH
7	004003	DAY
8	004004	HOUR
9	004005	MINUTE
10	005001	LATITUDE (HIGH ACCURACY)
11	006001	LONGITUDE (HIGH ACCURACY)
12	007030	HEIGHT OF STATION GROUND ABOVE MEAN SEA LEVEL (SEE NOTE 3)
13	007031	HEIGHT OF BAROMETER ABOVE MEAN SEA LEVEL (SEE NOTE 4)
14	010004	PRESSURE
15	010051	PRESSURE REDUCED TO MEAN SEA LEVEL
16	010061	3-HOUR PRESSURE CHANGE
17	010063	CHARACTERISTIC OF PRESSURE TENDENCY
18	010062	24-HOUR PRESSURE CHANGE
19	007004	PRESSURE
20	010009	GEOPOTENTIAL HEIGHT
21	007032	HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
22	012101	TEMPERATURE/DRY-BULB TEMPERATURE
23	012103	DEW-POINT TEMPERATURE
24	013003	RELATIVE HUMIDITY
25	007032	HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
26	020001	HORIZONTAL VISIBILITY
27	007032	HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
28	013023	TOTAL PRECIPITATION PAST 24 HOURS
29	007032	HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
30	020010	CLOUD COVER (TOTAL)
31	008002	VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
32	020011	CLOUD AMOUNT
33	020013	HEIGHT OF BASE OF CLOUD
34	020012	CLOUD TYPE
35	020012	CLOUD TYPE
36	020012	CLOUD TYPE
37	031001	DELAYED DESCRIPTOR REPLICATION FACTOR
38	008002	VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
39	020011	CLOUD AMOUNT
40	020012	CLOUD TYPE

```
41 020013 HEIGHT OF BASE OF CLOUD
42 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
43 020011 CLOUD AMOUNT
44 020012 CLOUD TYPE
45 020013 HEIGHT OF BASE OF CLOUD
46 031001 DELAYED DESCRIPTOR REPLICATION FACTOR
47 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
48 020011 CLOUD AMOUNT
49 020012 CLOUD TYPE
50 020014 HEIGHT OF TOP OF CLOUD
51 020017 CLOUD TOP DESCRIPTION
52 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
53 020054 TRUE DIRECTION FROM WHICH CLOUDS ARE MOVING
54 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
55 020054 TRUE DIRECTION FROM WHICH CLOUDS ARE MOVING
56 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
57 020054 TRUE DIRECTION FROM WHICH CLOUDS ARE MOVING
58 008002 VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
59 005021 BEARING OR AZIMUTH
60 007021 ELEVATION (SEE NOTE 2)
61 020012 CLOUD TYPE
62 005021 BEARING OR AZIMUTH
63 007021 ELEVATION (SEE NOTE 2)
64 020062 STATE OF THE GROUND (WITH OR WITHOUT SNOW)
65 013013 TOTAL SNOW DEPTH
66 012113 GROUND MINIMUM TEMPERATURE, PAST 12 HOURS
67 020003 PRESENT WEATHER (SEE NOTE 1)
68 004024 TIME PERIOD OR DISPLACEMENT
69 020004 PAST WEATHER (1) (SEE NOTE 2)
70 020005 PAST WEATHER (2) (SEE NOTE 2)
71 004024 TIME PERIOD OR DISPLACEMENT
72 014031 TOTAL SUNSHINE
73 004024 TIME PERIOD OR DISPLACEMENT
74 014031 TOTAL SUNSHINE
75 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
76 004024 TIME PERIOD OR DISPLACEMENT
77 013011 TOTAL PRECIPITATION/TOTAL WATER EQUIVALENT
78 004024 TIME PERIOD OR DISPLACEMENT
79 013011 TOTAL PRECIPITATION/TOTAL WATER EQUIVALENT
80 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
81 004024 TIME PERIOD OR DISPLACEMENT
82 004024 TIME PERIOD OR DISPLACEMENT
83 012111 MAXIMUM TEMPERATURE, AT HEIGHT AND OVER PERIOD SPECIFIED
84 004024 TIME PERIOD OR DISPLACEMENT
85 004024 TIME PERIOD OR DISPLACEMENT
86 012112 MINIMUM TEMPERATURE, AT HEIGHT AND OVER PERIOD SPECIFIED
87 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
88 002002 TYPE OF INSTRUMENTATION FOR WIND MEASUREMENT
89 008021 TIME SIGNIFICANCE
90 004025 TIME PERIOD OR DISPLACEMENT
91 011001 WIND DIRECTION
92 011002 WIND SPEED
93 008021 TIME SIGNIFICANCE
94 004025 TIME PERIOD OR DISPLACEMENT
95 011043 MAXIMUM WIND GUST DIRECTION
96 011041 MAXIMUM WIND GUST SPEED
97 004025 TIME PERIOD OR DISPLACEMENT
98 011043 MAXIMUM WIND GUST DIRECTION
99 011041 MAXIMUM WIND GUST SPEED
100 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
101 004024 TIME PERIOD OR DISPLACEMENT
102 002004 TYPE OF INSTRUMENTATION FOR EVAPORATION MEASUREMENT OR TYPE OF C
103 013033 EVAPORATION/EVAPOTRANSPIRATION
104 004024 TIME PERIOD OR DISPLACEMENT
105 014002 LONG-WAVE RADIATION, INTEGRATED OVER PERIOD SPECIFIED
106 014004 SHORT-WAVE RADIATION, INTEGRATED OVER PERIOD SPECIFIED
107 014016 NET RADIATION, INTEGRATED OVER PERIOD SPECIFIED
108 014028 GLOBAL SOLAR RADIATION (HIGH ACCURACY), INTEGRATED OVER PERIOD S
109 014029 DIFFUSE SOLAR RADIATION (HIGH ACCURACY), INTEGRATED OVER PERIOD
110 014030 DIRECT SOLAR RADIATION (HIGH ACCURACY), INTEGRATED OVER PERIOD S
111 004024 TIME PERIOD OR DISPLACEMENT
112 014002 LONG-WAVE RADIATION, INTEGRATED OVER PERIOD SPECIFIED
113 014004 SHORT-WAVE RADIATION, INTEGRATED OVER PERIOD SPECIFIED
114 014016 NET RADIATION, INTEGRATED OVER PERIOD SPECIFIED
115 014028 GLOBAL SOLAR RADIATION (HIGH ACCURACY), INTEGRATED OVER PERIOD S
116 014029 DIFFUSE SOLAR RADIATION (HIGH ACCURACY), INTEGRATED OVER PERIOD
117 014030 DIRECT SOLAR RADIATION (HIGH ACCURACY), INTEGRATED OVER PERIOD S
118 004024 TIME PERIOD OR DISPLACEMENT
119 004024 TIME PERIOD OR DISPLACEMENT
120 012049 TEMPERATURE CHANGE OVER SPECIFIED PERIOD

STARTING SUBSET TO BE PRINTED : 1
ENDING SUBSET TO BE PRINTED : 1

1 WMO BLOCK NUMBER 0.11000000000000E+002 NUMERIC
2 WMO STATION NUMBER 0.42300000000000E+003 NUMERIC
3 STATION OR SITE NAME 0.10200000000000E+004 CCITIA5 Primda
4 TYPE OF STATION 0.10000000000000E+001 CODE TABLE 2001
5 YEAR 0.20070000000000E+004 YEAR
6 MONTH 0.10000000000000E+002 MONTH
7 DAY 0.10000000000000E+002 DAY
8 HOUR 0.20000000000000E+002 HOUR
9 MINUTE 0.00000000000000E+000 MINUTE
```

10	LATITUDE (HIGH ACCURACY)	0.496694400000000E+002	DEGREE
11	LONGITUDE (HIGH ACCURACY)	0.126777800000000E+002	DEGREE
12	HEIGHT OF STATION GROUND ABOVE M	0.742200000000000E+003	M
13	HEIGHT OF BAROMETER ABOVE MEAN S	0.747000000000000E+003	M
14	PRESSURE	0.937700000000000E+005	PA
15	PRESSURE REDUCED TO MEAN SEA LEV	MISSING	PA
16	3-HOUR PRESSURE CHANGE	0.900000000000000E+002	PA
17	CHARACTERISTIC OF PRESSURE TENDE	0.200000000000000E+001	CODE TABLE 10063
18	24-HOUR PRESSURE CHANGE	MISSING	PA
19	PRESSURE	0.925000000000000E+005	PA
20	GEOPOTENTIAL HEIGHT	0.860000000000000E+003	GPM
21	HEIGHT OF SENSOR ABOVE LOCAL GRO	0.195000000000000E+001	M
22	TEMPERATURE/DRY-BULB TEMPERATURE	0.279450000000000E+003	K
23	DEW-POINT TEMPERATURE	0.277450000000000E+003	K
24	RELATIVE HUMIDITY	0.870000000000000E+002	%
25	HEIGHT OF SENSOR ABOVE LOCAL GRO	0.480000000000000E+001	M
26	HORIZONTAL VISIBILITY	0.130000000000000E+005	M
27	HEIGHT OF SENSOR ABOVE LOCAL GRO	0.112000000000000E+001	M
28	TOTAL PRECIPITATION PAST 24 HOUR	MISSING	KG/M**2
29	HEIGHT OF SENSOR ABOVE LOCAL GRO	MISSING	M
30	CLOUD COVER (TOTAL)	0.130000000000000E+002	%
31	VERTICAL SIGNIFICANCE (SURFACE O	0.700000000000000E+001	CODE TABLE 8002
32	CLOUD AMOUNT	0.100000000000000E+001	CODE TABLE 20011
33	HEIGHT OF BASE OF CLOUD	0.990000000000000E+003	M
34	CLOUD TYPE	0.350000000000000E+002	CODE TABLE 20012
35	CLOUD TYPE	0.200000000000000E+002	CODE TABLE 20012
36	CLOUD TYPE	0.110000000000000E+002	CODE TABLE 20012
37	DELAYED DESCRIPTOR REPLICATION F	0.200000000000000E+001	NUMERIC
38	VERTICAL SIGNIFICANCE (SURFACE O	0.100000000000000E+001	CODE TABLE 8002
39	CLOUD AMOUNT	0.100000000000000E+001	CODE TABLE 20011
40	CLOUD TYPE	0.600000000000000E+001	CODE TABLE 20012
41	HEIGHT OF BASE OF CLOUD	0.990000000000000E+003	M
42	VERTICAL SIGNIFICANCE (SURFACE O	MISSING	CODE TABLE 8002
43	CLOUD AMOUNT	MISSING	CODE TABLE 20011
44	CLOUD TYPE	MISSING	CODE TABLE 20012
45	HEIGHT OF BASE OF CLOUD	MISSING	M
46	DELAYED DESCRIPTOR REPLICATION F	0.100000000000000E+001	NUMERIC
47	VERTICAL SIGNIFICANCE (SURFACE O	MISSING	CODE TABLE 8002
48	CLOUD AMOUNT	MISSING	CODE TABLE 20011
49	CLOUD TYPE	MISSING	CODE TABLE 20012
50	HEIGHT OF TOP OF CLOUD	MISSING	M
51	CLOUD TOP DESCRIPTION	MISSING	CODE TABLE 20017
52	VERTICAL SIGNIFICANCE (SURFACE O	0.700000000000000E+001	CODE TABLE 8002
53	TRUE DIRECTION FROM WHICH CLOUDS	MISSING	DEGREE TRUE
54	VERTICAL SIGNIFICANCE (SURFACE O	0.800000000000000E+001	CODE TABLE 8002
55	TRUE DIRECTION FROM WHICH CLOUDS	MISSING	DEGREE TRUE
56	VERTICAL SIGNIFICANCE (SURFACE O	0.900000000000000E+001	CODE TABLE 8002
57	TRUE DIRECTION FROM WHICH CLOUDS	MISSING	DEGREE TRUE
58	VERTICAL SIGNIFICANCE (SURFACE O	MISSING	CODE TABLE 8002
59	BEARING OR AZIMUTH	MISSING	DEGREE TRUE
60	ELEVATION (SEE NOTE 2)	MISSING	DEGREE
61	CLOUD TYPE	MISSING	CODE TABLE 20012
62	BEARING OR AZIMUTH	MISSING	DEGREE TRUE
63	ELEVATION (SEE NOTE 2)	MISSING	DEGREE
64	STATE OF THE GROUND (WITH OR WIT	MISSING	CODE TABLE 20062
65	TOTAL SNOW DEPTH	MISSING	M
66	GROUND MINIMUM TEMPERATURE, PAST	MISSING	K
67	PRESENT WEATHER (SEE NOTE 1)	0.508000000000000E+003	CODE TABLE 20003
68	TIME PERIOD OR DISPLACEMENT	-0.100000000000000E+001	HOUR
69	PAST WEATHER (1) (SEE NOTE 2)	0.100000000000000E+002	CODE TABLE 20004
70	PAST WEATHER (2) (SEE NOTE 2)	0.100000000000000E+002	CODE TABLE 20005
71	TIME PERIOD OR DISPLACEMENT	-0.100000000000000E+001	HOUR
72	TOTAL SUNSHINE	MISSING	MINUTE
73	TIME PERIOD OR DISPLACEMENT	-0.240000000000000E+002	HOUR
74	TOTAL SUNSHINE	MISSING	MINUTE
75	HEIGHT OF SENSOR ABOVE LOCAL GRO	0.112000000000000E+001	M
76	TIME PERIOD OR DISPLACEMENT	MISSING	HOUR
77	TOTAL PRECIPITATION/TOTAL WATER	MISSING	KG/M**2
78	TIME PERIOD OR DISPLACEMENT	-0.100000000000000E+001	HOUR
79	TOTAL PRECIPITATION/TOTAL WATER	0.000000000000000E+000	KG/M**2
80	HEIGHT OF SENSOR ABOVE LOCAL GRO	0.195000000000000E+001	M
81	TIME PERIOD OR DISPLACEMENT	-0.120000000000000E+002	HOUR
82	TIME PERIOD OR DISPLACEMENT	0.000000000000000E+000	HOUR
83	MAXIMUM TEMPERATURE, AT HEIGHT A	MISSING	K
84	TIME PERIOD OR DISPLACEMENT	-0.120000000000000E+002	HOUR
85	TIME PERIOD OR DISPLACEMENT	0.000000000000000E+000	HOUR
86	MINIMUM TEMPERATURE, AT HEIGHT A	MISSING	K
87	HEIGHT OF SENSOR ABOVE LOCAL GRO	0.102500000000000E+002	M
88	TYPE OF INSTRUMENTATION FOR WIND	0.800000000000000E+001	FLAG TABLE 2002
89	TIME SIGNIFICANCE	0.200000000000000E+001	CODE TABLE 8021
90	TIME PERIOD OR DISPLACEMENT	-0.100000000000000E+002	MINUTE
91	WIND DIRECTION	0.900000000000000E+002	DEGREE TRUE
92	WIND SPEED	0.400000000000000E+001	M/S
93	TIME SIGNIFICANCE	MISSING	CODE TABLE 8021
94	TIME PERIOD OR DISPLACEMENT	-0.100000000000000E+002	MINUTE
95	MAXIMUM WIND GUST DIRECTION	MISSING	DEGREE TRUE
96	MAXIMUM WIND GUST SPEED	MISSING	M/S
97	TIME PERIOD OR DISPLACEMENT	-0.600000000000000E+002	MINUTE
98	MAXIMUM WIND GUST DIRECTION	MISSING	DEGREE TRUE
99	MAXIMUM WIND GUST SPEED	MISSING	M/S
100	HEIGHT OF SENSOR ABOVE LOCAL GRO	MISSING	M
101	TIME PERIOD OR DISPLACEMENT	-0.240000000000000E+002	HOUR
102	TYPE OF INSTRUMENTATION FOR EVAP	MISSING	CODE TABLE 2004

103	EVAPORATION/EVAPOTRANSPIRATION		MISSING	KG/M**2
104	TIME PERIOD OR DISPLACEMENT	-0.100000000000000E+001	001	HOUR
105	LONG-WAVE RADIATION, INTEGRATED		MISSING	J/M**2
106	SHORT-WAVE RADIATION, INTEGRATED		MISSING	J/M**2
107	NET RADIATION, INTEGRATED OVER P		MISSING	J/M**2
108	GLOBAL SOLAR RADIATION (HIGH ACC		MISSING	J/M**2
109	DIFFUSE SOLAR RADIATION (HIGH AC		MISSING	J/M**2
110	DIRECT SOLAR RADIATION (HIGH ACC		MISSING	J/M**2
111	TIME PERIOD OR DISPLACEMENT	-0.240000000000000E+002	002	HOUR
112	LONG-WAVE RADIATION, INTEGRATED		MISSING	J/M**2
113	SHORT-WAVE RADIATION, INTEGRATED		MISSING	J/M**2
114	NET RADIATION, INTEGRATED OVER P		MISSING	J/M**2
115	GLOBAL SOLAR RADIATION (HIGH ACC		MISSING	J/M**2
116	DIFFUSE SOLAR RADIATION (HIGH AC		MISSING	J/M**2
117	DIRECT SOLAR RADIATION (HIGH ACC		MISSING	J/M**2
118	TIME PERIOD OR DISPLACEMENT		MISSING	HOUR
119	TIME PERIOD OR DISPLACEMENT		MISSING	HOUR
120	TEMPERATURE CHANGE OVER SPECIFIE		MISSING	K



## 6.3 WMO BUOY template

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ECMWF

BUFR DECODING SOFTWARE VERSION - 7.2
1 APRIL 2007.

Your path for bufr tables is :
/home/ma/maa/bigtmp/wmo_bufr_crex_000250/bufr_000360/bufrtables/
BUFR TABLES TO BE LOADED B0000000000000011000.TXT,D0000000000000011000.TXT

BUFR SECTION 0

LENGTH OF SECTION 0 (BYTES)          8
TOTAL LENGTH OF BUFR MESSAGE (BYTES) 380
BUFR EDITION NUMBER                  3

BUFR SECTION 1

LENGTH OF SECTION 1 (BYTES)          18
BUFR EDITION NUMBER                  3
ORIGINATING SUB-CENTRE               0
ORIGINATING CENTRE                   216
UPDATE SEQUENCE NUMBER               1
FLAG (PRESENCE OF SECTION 2)         0
BUFR MESSAGE TYPE                    1
BUFR MESSAGE SUBTYPE                 0
VERSION NUMBER OF LOCAL TABLE       0
YEAR                                 5
MONTH                                5
DAY                                  4
HOUR                                 5
MINUTE                              44
VERSION NUMBER OF MASTER TABLE      11
BUFR MASTER TABLE                   0

BUUKEY : KEY DEFINITION NOT KNOWN

PRTKEY : RDB KEY NOT DEFINED IN SECTION 2.

BUFR SECTION 3

LENGTH OF SECTION 3 (BYTES)          176
RESERVED                             0
NUMBER OF DATA SUBSETS               1
FLAG (DATA TYPE/DATA COMPRESSION)    128

DATA DESCRIPTORS (UNEXPANDED)

1 001003
2 001020
3 001005
4 002001
5 002036
6 002149
7 301011
8 301012
9 008021
10 301011
11 301012
12 008021
13 301021
14 027004
15 028004
16 007030
17 001051
18 002148
19 001012
20 001014
21 002040
22 033022
23 033023
24 033027
25 022063
26 302021
27 302022
28 302023
29 008081
30 025026
31 008081
32 025026
33 008081
34 025026
35 008081
36 002034
37 022060

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38 007070  
39 002190  
40 025086  
41 002035  
42 002168  
43 020031  
44 002038  
45 306004  
46 002030  
47 306005  
48 007031  
49 008081  
50 012064  
51 302001  
52 008081  
53 007032  
54 007033  
55 012101  
56 012103  
57 013003  
58 007032  
59 007033  
60 008082  
61 007033  
62 002169  
63 002002  
64 008021  
65 004025  
66 011001  
67 011002  
68 008021  
69 004025  
70 011043  
71 011041  
72 008082  
73 007033  
74 007032  
75 004024  
76 013011  
77 007032  
78 008021  
79 004024  
80 014021  
81 008021  
82 025028  
83 025028  
84 025028

## DATA DESCRIPTORS (EXPANDED)

1 001003 WMO REGION NUMBER/GEOGRAPHICAL AREA  
2 001020 WMO REGION SUB-AREA  
3 001005 BUOY/PLATFORM IDENTIFIER  
4 002001 TYPE OF STATION  
5 002036 BUOY TYPE  
6 002149 TYPE OF DATA BUOY  
7 004001 YEAR  
8 004002 MONTH  
9 004003 DAY  
10 004004 HOUR  
11 004005 MINUTE  
12 008021 TIME SIGNIFICANCE  
13 004001 YEAR  
14 004002 MONTH  
15 004003 DAY  
16 004004 HOUR  
17 004005 MINUTE  
18 008021 TIME SIGNIFICANCE  
19 005001 LATITUDE (HIGH ACCURACY)  
20 006001 LONGITUDE (HIGH ACCURACY)  
21 027004 ALTERNATE LATITUDE (HIGH ACCURACY)  
22 028004 ALTERNATE LONGITUDE (HIGH ACCURACY)  
23 007030 HEIGHT OF STATION GROUND ABOVE MEAN SEA LEVEL (SEE NOTE 3)  
24 001051 PLATFORM TRANSMITTER ID NUMBER  
25 002148 DATA COLLECTION AND/OR LOCATION SYSTEM  
26 001012 DIRECTION OF MOTION OF MOVING OBSERVING PLATFORM\*\*  
27 001014 PLATFORM DRIFT SPEED (HIGH PRECISION)  
28 002040 METHOD OF REMOVING VELOCITY AND MOTION OF PLATFORM FROM CURRENT  
29 033022 QUALITY OF BUOY SATELLITE TRANSMISSION  
30 033023 QUALITY OF BUOY LOCATION  
31 033027 LOCATION QUALITY CLASS (RANGE OF RADIUS OF 66 % CONFIDENCE)  
32 022063 TOTAL WATER DEPTH  
33 022001 DIRECTION OF WAVES  
34 022011 PERIOD OF WAVES  
35 022021 HEIGHT OF WAVES  
36 022002 DIRECTION OF WIND WAVES  
37 022012 PERIOD OF WIND WAVES  
38 022022 HEIGHT OF WIND WAVES  
39 022003 DIRECTION OF SWELL WAVES  
40 022013 PERIOD OF SWELL WAVES  
41 022023 HEIGHT OF SWELL WAVES  
42 008081 TYPE OF EQUIPMENT

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43 025026 BATTERY VOLTAGE (LARGE RANGE)
44 008081 TYPE OF EQUIPMENT
45 025026 BATTERY VOLTAGE (LARGE RANGE)
46 008081 TYPE OF EQUIPMENT
47 025026 BATTERY VOLTAGE (LARGE RANGE)
48 008081 TYPE OF EQUIPMENT
49 002034 DROGUE TYPE
50 022060 LAGRANGIAN DRIFTER DROGUE STATUS
51 007070 DROGUE DEPTH
52 002190 LAGRANGIAN DRIFTER SUBMERGENCE (% TIME SUBMERGED)
53 025086 DEPTH CORRECTION INDICATOR
54 002035 CABLE LENGTH
55 002168 HYDROSTATIC PRESSURE OF LOWER END OF CABLE (THERMISTOR STRING)
56 020031 ICE DEPOSIT (THICKNESS)
57 002038 METHOD OF WATER TEMPERATURE AND/OR SALINITY MEASUREMENT
58 002032 INDICATOR FOR DIGITIZATION
59 002033 METHOD OF SALINITY/DEPTH MEASUREMENT
60 031001 DELAYED DESCRIPTOR REPLICATION FACTOR
61 007062 DEPTH BELOW SEA/WATER SURFACE
62 022043 SEA/WATER TEMPERATURE
63 022062 SALINITY
64 007062 DEPTH BELOW SEA/WATER SURFACE
65 022043 SEA/WATER TEMPERATURE
66 022062 SALINITY
67 007062 DEPTH BELOW SEA/WATER SURFACE
68 022043 SEA/WATER TEMPERATURE
69 022062 SALINITY
70 007062 DEPTH BELOW SEA/WATER SURFACE
71 022043 SEA/WATER TEMPERATURE
72 022062 SALINITY
73 007062 DEPTH BELOW SEA/WATER SURFACE
74 022043 SEA/WATER TEMPERATURE
75 022062 SALINITY
76 007062 DEPTH BELOW SEA/WATER SURFACE
77 022043 SEA/WATER TEMPERATURE
78 022062 SALINITY
79 007062 DEPTH BELOW SEA/WATER SURFACE
80 022043 SEA/WATER TEMPERATURE
81 022062 SALINITY
82 002030 METHOD OF CURRENT MEASUREMENT
83 002031 DURATION AND TIME OF CURRENT MEASUREMENT
84 031001 DELAYED DESCRIPTOR REPLICATION FACTOR
85 007031 HEIGHT OF BAROMETER ABOVE MEAN SEA LEVEL (SEE NOTE 4)
86 008081 TYPE OF EQUIPMENT
87 012064 INSTRUMENT TEMPERATURE
88 010004 PRESSURE
89 010051 PRESSURE REDUCED TO MEAN SEA LEVEL
90 010061 3-HOUR PRESSURE CHANGE
91 010063 CHARACTERISTIC OF PRESSURE TENDENCY
92 008081 TYPE OF EQUIPMENT
93 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
94 007033 HEIGHT OF SENSOR ABOVE WATER SURFACE (SEE NOTE 6)
95 012101 TEMPERATURE/DRY-BULB TEMPERATURE
96 012103 DEW-POINT TEMPERATURE
97 013003 RELATIVE HUMIDITY
98 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
99 007033 HEIGHT OF SENSOR ABOVE WATER SURFACE (SEE NOTE 6)
100 008082 (CBS) ARTIFICIAL CORRECTION OF SENSOR HEIGHT TO ANOTHER VALUE
101 007033 HEIGHT OF SENSOR ABOVE WATER SURFACE (SEE NOTE 6)
102 002169 ANEMOMETER TYPE
103 002002 TYPE OF INSTRUMENTATION FOR WIND MEASUREMENT
104 008021 TIME SIGNIFICANCE
105 004025 TIME PERIOD OR DISPLACEMENT
106 011001 WIND DIRECTION
107 011002 WIND SPEED
108 008021 TIME SIGNIFICANCE
109 004025 TIME PERIOD OR DISPLACEMENT
110 011043 MAXIMUM WIND GUST DIRECTION
111 011041 MAXIMUM WIND GUST SPEED
112 008082 (CBS) ARTIFICIAL CORRECTION OF SENSOR HEIGHT TO ANOTHER VALUE
113 007033 HEIGHT OF SENSOR ABOVE WATER SURFACE (SEE NOTE 6)
114 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
115 004024 TIME PERIOD OR DISPLACEMENT
116 013011 TOTAL PRECIPITATION/TOTAL WATER EQUIVALENT
117 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
118 008021 TIME SIGNIFICANCE
119 004024 TIME PERIOD OR DISPLACEMENT
120 014021 GLOBAL SOLAR RADIATION, INTEGRATED OVER PERIOD SPECIFIED
121 008021 TIME SIGNIFICANCE
122 025028 OPERATOR OR MANUFACTURER DEFINED PARAMETER
123 025028 OPERATOR OR MANUFACTURER DEFINED PARAMETER
124 025028 OPERATOR OR MANUFACTURER DEFINED PARAMETER

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STARTING SUBSET TO BE PRINTED : 1
ENDING SUBSET TO BE PRINTED : 1

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1 WMO REGION NUMBER/GEOGRAPHICAL A 0.500000000000000E+001 CODE TABLE 1003
2 WMO REGION SUB-AREA 0.200000000000000E+001 NUMERIC
3 BUOY/PLATFORM IDENTIFIER 0.870000000000000E+002 NUMERIC
4 TYPE OF STATION 0.000000000000000E+000 CODE TABLE 2001
5 BUOY TYPE 0.100000000000000E+001 CODE TABLE 2036
6 TYPE OF DATA BUOY 0.220000000000000E+002 CODE TABLE 2149
7 YEAR 0.200500000000000E+004 YEAR

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8	MONTH	0.500000000000000E+001	MONTH	
9	DAY	0.400000000000000E+001	DAY	
10	HOURL	0.300000000000000E+001	HOURL	
11	MINUTE	0.000000000000000E+000	MINUTE	
12	TIME SIGNIFICANCE	0.260000000000000E+002	CODE TABLE 8021	
13	YEAR	0.200500000000000E+004	YEAR	
14	MONTH	0.500000000000000E+001	MONTH	
15	DAY	0.400000000000000E+001	DAY	
16	HOURL	0.200000000000000E+001	HOURL	
17	MINUTE	0.450000000000000E+002	MINUTE	
18	TIME SIGNIFICANCE		MISSING CODE TABLE 8021	
19	LATITUDE (HIGH ACCURACY)	0.764704000000000E+001	DEGREE	
20	LONGITUDE (HIGH ACCURACY)	0.136699940000000E+003	DEGREE	
21	ALTERNATE LATITUDE (HIGH ACCURAC	0.166040500000000E+002	DEGREE	
22	ALTERNATE LONGITUDE (HIGH ACCURA	0.968663000000000E+002	DEGREE	
23	HEIGHT OF STATION GROUND ABOVE M	0.000000000000000E+000	M	
24	PLATFORM TRANSMITTER ID NUMBER	0.101200000000000E+004	CCITTIA5	03595
25	DATA COLLECTION AND/OR LOCATION	0.100000000000000E+001	CODE TABLE 2148	
26	DIRECTION OF MOTION OF MOVING OB		MISSING DEGREE TRUE	
27	PLATFORM DRIFT SPEED (HIGH PRECI		MISSING M/S	
28	METHOD OF REMOVING VELOCITY AND		MISSING CODE TABLE 2040	
29	QUALITY OF BUOY SATELLITE TRANSM	0.000000000000000E+000	CODE TABLE 33022	
30	QUALITY OF BUOY LOCATION	0.000000000000000E+000	CODE TABLE 33023	
31	LOCATION QUALITY CLASS (RANGE OF	0.100000000000000E+001	CODE TABLE 33027	
32	TOTAL WATER DEPTH		MISSING M	
33	DIRECTION OF WAVES		MISSING DEGREE TRUE	
34	PERIOD OF WAVES		MISSING S	
35	HEIGHT OF WAVES		MISSING M	
36	DIRECTION OF WIND WAVES		MISSING DEGREE TRUE	
37	PERIOD OF WIND WAVES		MISSING S	
38	HEIGHT OF WIND WAVES		MISSING M	
39	DIRECTION OF SWELL WAVES		MISSING DEGREE TRUE	
40	PERIOD OF SWELL WAVES		MISSING S	
41	HEIGHT OF SWELL WAVES		MISSING M	
42	TYPE OF EQUIPMENT		MISSING CODE TABLE 8081	
43	BATTERY VOLTAGE (LARGE RANGE)		MISSING V	
44	TYPE OF EQUIPMENT		MISSING CODE TABLE 8081	
45	BATTERY VOLTAGE (LARGE RANGE)		MISSING V	
46	TYPE OF EQUIPMENT		MISSING CODE TABLE 8081	
47	BATTERY VOLTAGE (LARGE RANGE)		MISSING V	
48	TYPE OF EQUIPMENT		MISSING CODE TABLE 8081	
49	DROGUE TYPE		MISSING CODE TABLE 2034	
50	LAGRANGIAN DRIFTER DROGUE STATUS		MISSING CODE TABLE 22060	
51	DROGUE DEPTH		MISSING M	
52	LAGRANGIAN DRIFTER SUBMERGENCE (		MISSING %	
53	DEPTH CORRECTION INDICATOR	0.000000000000000E+000	CODE TABLE 25086	
54	CABLE LENGTH	0.000000000000000E+000	M	
55	HYDROSTATIC PRESSURE OF LOWER EN		MISSING PA	
56	ICE DEPOSIT (THICKNESS)		MISSING M	
57	METHOD OF WATER TEMPERATURE AND/		MISSING CODE TABLE 2038	
58	INDICATOR FOR DIGITIZATION		MISSING CODE TABLE 2032	
59	METHOD OF SALINITY/DEPTH MEASURE		MISSING CODE TABLE 2033	
60	DELAYED DESCRIPTOR REPLICATION F	0.700000000000000E+001	NUMERIC	
61	DEPTH BELOW SEA/WATER SURFACE	0.150000000000000E+001	M	
62	SEA/WATER TEMPERATURE	0.302420000000000E+003	K	
63	SALINITY	0.341400000000000E+002	PART PER THOUSAND	
64	DEPTH BELOW SEA/WATER SURFACE	0.250000000000000E+002	M	
65	SEA/WATER TEMPERATURE	0.302240000000000E+003	K	
66	SALINITY	0.342000000000000E+002	PART PER THOUSAND	
67	DEPTH BELOW SEA/WATER SURFACE	0.500000000000000E+002	M	
68	SEA/WATER TEMPERATURE	0.302230000000000E+003	K	
69	SALINITY	0.342200000000000E+002	PART PER THOUSAND	
70	DEPTH BELOW SEA/WATER SURFACE	0.750000000000000E+002	M	
71	SEA/WATER TEMPERATURE	0.299220000000000E+003	K	
72	SALINITY	0.345300000000000E+002	PART PER THOUSAND	
73	DEPTH BELOW SEA/WATER SURFACE	0.100000000000000E+003	M	
74	SEA/WATER TEMPERATURE	0.295760000000000E+003	K	
75	SALINITY	0.348200000000000E+002	PART PER THOUSAND	
76	DEPTH BELOW SEA/WATER SURFACE	0.300000000000000E+003	M	
77	SEA/WATER TEMPERATURE	0.282550000000000E+003	K	
78	SALINITY	0.345400000000000E+002	PART PER THOUSAND	
79	DEPTH BELOW SEA/WATER SURFACE	0.750000000000000E+003	M	
80	SEA/WATER TEMPERATURE	0.279620000000000E+003	K	
81	SALINITY	0.345300000000000E+002	PART PER THOUSAND	
82	METHOD OF CURRENT MEASUREMENT		MISSING CODE TABLE 2030	
83	DURATION AND TIME OF CURRENT MEA		MISSING CODE TABLE 2031	
84	DELAYED DESCRIPTOR REPLICATION F	0.000000000000000E+000	NUMERIC	
85	HEIGHT OF BAROMETER ABOVE MEAN S		MISSING M	
86	TYPE OF EQUIPMENT		MISSING CODE TABLE 8081	
87	INSTRUMENT TEMPERATURE		MISSING K	
88	PRESSURE		MISSING PA	
89	PRESSURE REDUCED TO MEAN SEA LEV		MISSING PA	
90	3-HOUR PRESSURE CHANGE		MISSING PA	
91	CHARACTERISTIC OF PRESSURE TENDE		MISSING CODE TABLE 10063	
92	TYPE OF EQUIPMENT		MISSING CODE TABLE 8081	
93	HEIGHT OF SENSOR ABOVE LOCAL GRO		MISSING M	
94	HEIGHT OF SENSOR ABOVE WATER SUR		MISSING M	
95	TEMPERATURE/DRY-BULB TEMPERATURE		MISSING K	
96	DEW-POINT TEMPERATURE		MISSING K	
97	RELATIVE HUMIDITY		MISSING %	
98	HEIGHT OF SENSOR ABOVE LOCAL GRO		MISSING M	
99	HEIGHT OF SENSOR ABOVE WATER SUR		MISSING M	
100	(CBS) ARTIFICIAL CORRECTION OF S		MISSING CODE TABLE 8082	

101 HEIGHT OF SENSOR ABOVE WATER SUR	MISSING M
102 ANEMOMETER TYPE	MISSING CODE TABLE 2169
103 TYPE OF INSTRUMENTATION FOR WIND	MISSING FLAG TABLE 2002
104 TIME SIGNIFICANCE	0.200000000000000000E+001 CODE TABLE 8021
105 TIME PERIOD OR DISPLACEMENT	MISSING MINUTE
106 WIND DIRECTION	MISSING DEGREE TRUE
107 WIND SPEED	MISSING M/S
108 TIME SIGNIFICANCE	MISSING CODE TABLE 8021
109 TIME PERIOD OR DISPLACEMENT	MISSING MINUTE
110 MAXIMUM WIND GUST DIRECTION	MISSING DEGREE TRUE
111 MAXIMUM WIND GUST SPEED	MISSING M/S
112 (CBS) ARTIFICIAL CORRECTION OF S	MISSING CODE TABLE 8082
113 HEIGHT OF SENSOR ABOVE WATER SUR	MISSING M
114 HEIGHT OF SENSOR ABOVE LOCAL GRO	MISSING M
115 TIME PERIOD OR DISPLACEMENT	MISSING HOUR
116 TOTAL PRECIPITATION/TOTAL WATER	MISSING KG/M**2
117 HEIGHT OF SENSOR ABOVE LOCAL GRO	MISSING M
118 TIME SIGNIFICANCE	0.300000000000000000E+001 CODE TABLE 8021
119 TIME PERIOD OR DISPLACEMENT	MISSING HOUR
120 GLOBAL SOLAR RADIATION, INTEGRAT	MISSING J/M**2
121 TIME SIGNIFICANCE	MISSING CODE TABLE 8021
122 OPERATOR OR MANUFACTURER DEFINED	MISSING NUMERIC
123 OPERATOR OR MANUFACTURER DEFINED	MISSING NUMERIC
124 OPERATOR OR MANUFACTURER DEFINED	MISSING NUMERIC

## 6.4 WMO CLIMATE SYNOP template

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ECMWF

BUFR DECODING SOFTWARE VERSION - 7.1
07 June 2005.

Your path for bufr tables is :
/bigtmp/wmo_bufr_crex_000250/bufr_000270/bufrtables/
BUFR TABLES TO BE LOADED B00000000000098012000,D00000000000098012000
1
    BUFR SECTION 0

LENGTH OF SECTION 0 (BYTES)          8
TOTAL LENGTH OF BUFR MESSAGE (BYTES) 492
BUFR EDITION NUMBER                   3
1
    BUFR SECTION 1

LENGTH OF SECTION 1 (BYTES)          24
BUFR EDITION NUMBER                   3
ORIGINATING SUB-CENTRE                0
ORIGINATING CENTRE                    89
UPDATE SEQUENCE NUMBER                0
FLAG (PRESENCE OF SECTION 2)          0
BUFR MESSAGE TYPE                     0
BUFR MESSAGE SUBTYPE                  0
VERSION NUMBER OF LOCAL TABLE        0
YEAR                                  3
MONTH                                 11
DAY                                   1
HOUR                                  0
MINUTE                                0
VERSION NUMBER OF MASTER TABLE       12
BUFR MASTER TABLE                    0

BUUKEY : KEY DEFINITION NOT KNOWN

PRTKEY : RDB KEY NOT DEFINED IN SECTION 2.
1
    BUFR SECTION 3

LENGTH OF SECTION 3 (BYTES)          214
RESERVED                              0
NUMBER OF DATA SUBSETS                1
FLAG (DATA TYPE/DATA COMPRESSION)     128

DATA DESCRIPTORS (UNEXPANDED)

1 301090
2 004023
3 008023
4 010004
5 010051
6 007004
7 010009
8 007032
9 012101
10 002051
11 004051
12 012118
13 004052
14 012119
15 013004
16 008023
17 012151
18 007032
19 102005
20 008050
21 008020
22 014032
23 014033
24 008050
25 008020
26 102018
27 008052
28 008022
29 007032
30 008053
31 004003
32 012152
33 008053
34 004003
35 012153
36 008053
37 004003
38 008023
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39 012101
40 008053
41 004003
42 008023
43 012101
44 008023
45 007032
46 002002
47 008053
48 004003
49 011046
50 008053
51 004003
52 004004
53 004023
54 007032
55 013060
56 013051
57 004053
58 008050
59 008020
60 102006
61 008052
62 008022
63 008053
64 004003
65 013052
66 007032
67 004001
68 004001
69 004002
70 004003
71 004004
72 004022
73 008023
74 010004
75 010051
76 007004
77 010009
78 007032
79 012101
80 002051
81 004051
82 012118
83 004052
84 012119
85 013004
86 012151
87 007032
88 014032
89 008023
90 004001
91 004001
92 004002
93 004003
94 004004
95 004022
96 007032
97 008023
98 013060
99 004053
100 008023
101 102006
102 008050
103 008020

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## DATA DESCRIPTORS (EXPANDED)

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1 001001 WMO BLOCK NUMBER
2 001002 WMO STATION NUMBER
3 001015 STATION OR SITE NAME
4 002001 TYPE OF STATION
5 004001 YEAR
6 004002 MONTH
7 004003 DAY
8 004004 HOUR
9 004005 MINUTE
10 005001 LATITUDE (HIGH ACCURACY)
11 006001 LONGITUDE (HIGH ACCURACY)
12 007030 HEIGHT OF STATION GROUND ABOVE MEAN SEA LEVEL (SEE NOTE 3)
13 007031 HEIGHT OF BAROMETER ABOVE MEAN SEA LEVEL (SEE NOTE 4)
14 004023 TIME PERIOD OR DISPLACEMENT
15 008023 FIRST ORDER STATISTICS
16 010004 PRESSURE
17 010051 PRESSURE REDUCED TO MEAN SEA LEVEL
18 007004 PRESSURE
19 010009 GEOPOTENTIAL HEIGHT
20 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
21 012101 TEMPERATURE/DRY-BULB TEMPERATURE
22 002051 INDICATOR TO SPECIFY OBSERVING METHOD FOR EXTREME TEMPERATURES
23 004051 PRINCIPAL TIME OF DAILY READING OF MAXIMUM TEMPERATURE
24 012118 MAXIMUM TEMPERATURE AT HEIGHT SPECIFIED, PAST 24 HOURS

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25 004052 PRINCIPAL TIME OF DAILY READING OF MINIMUM TEMPERATURE  
26 012119 MINIMUM TEMPERATURE AT HEIGHT SPECIFIED, PAST 24 HOURS  
27 013004 VAPOUR PRESSURE  
28 008023 FIRST ORDER STATISTICS  
29 012151 STANDARD DEVIATION OF DAILY MEAN TEMPERATURE  
30 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)  
31 008050 QUALIFIER FOR NUMBER OF MISSING VALUES IN CALCULATION OF STATIST  
32 008020 TOTAL NUMBER OF MISSING ENTITIES (WITH RESPECT TO ACCUMULATION O  
33 008050 QUALIFIER FOR NUMBER OF MISSING VALUES IN CALCULATION OF STATIST  
34 008020 TOTAL NUMBER OF MISSING ENTITIES (WITH RESPECT TO ACCUMULATION O  
35 008050 QUALIFIER FOR NUMBER OF MISSING VALUES IN CALCULATION OF STATIST  
36 008020 TOTAL NUMBER OF MISSING ENTITIES (WITH RESPECT TO ACCUMULATION O  
37 008050 QUALIFIER FOR NUMBER OF MISSING VALUES IN CALCULATION OF STATIST  
38 008020 TOTAL NUMBER OF MISSING ENTITIES (WITH RESPECT TO ACCUMULATION O  
39 008050 QUALIFIER FOR NUMBER OF MISSING VALUES IN CALCULATION OF STATIST  
40 008020 TOTAL NUMBER OF MISSING ENTITIES (WITH RESPECT TO ACCUMULATION O  
41 014032 TOTAL SUNSHINE  
42 014033 TOTAL SUNSHINE  
43 008050 QUALIFIER FOR NUMBER OF MISSING VALUES IN CALCULATION OF STATIST  
44 008020 TOTAL NUMBER OF MISSING ENTITIES (WITH RESPECT TO ACCUMULATION O  
45 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
46 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
47 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
48 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
49 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
50 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
51 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
52 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
53 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
54 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
55 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
56 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
57 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
58 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
59 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
60 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
61 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
62 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
63 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
64 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
65 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
66 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
67 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
68 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
69 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
70 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
71 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
72 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
73 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
74 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
75 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
76 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
77 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
78 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
79 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
80 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
81 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)  
82 008053 DAY OF OCCURRENCE QUALIFIER  
83 004003 DAY  
84 012152 HIGHEST DAILY MEAN TEMPERATURE  
85 008053 DAY OF OCCURRENCE QUALIFIER  
86 004003 DAY  
87 012153 LOWEST DAILY MEAN TEMPERATURE  
88 008053 DAY OF OCCURRENCE QUALIFIER  
89 004003 DAY  
90 008023 FIRST ORDER STATISTICS  
91 012101 TEMPERATURE/DRY-BULB TEMPERATURE  
92 008053 DAY OF OCCURRENCE QUALIFIER  
93 004003 DAY  
94 008023 FIRST ORDER STATISTICS  
95 012101 TEMPERATURE/DRY-BULB TEMPERATURE  
96 008023 FIRST ORDER STATISTICS  
97 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)  
98 002002 TYPE OF INSTRUMENTATION FOR WIND MEASUREMENT  
99 008053 DAY OF OCCURRENCE QUALIFIER  
100 004003 DAY  
101 011046 MAXIMUM INSTANTANEOUS WIND SPEED  
102 008053 DAY OF OCCURRENCE QUALIFIER  
103 004003 DAY  
104 004004 HOUR  
105 004023 TIME PERIOD OR DISPLACEMENT  
106 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)  
107 013060 TOTAL ACCUMULATED PRECIPITATION  
108 013051 FREQUENCY GROUP, PRECIPITATION  
109 004053 NUMBER OF DAYS WITH PRECIPITATION EQUAL TO OR MORE THAN 1 MM  
110 008050 QUALIFIER FOR NUMBER OF MISSING VALUES IN CALCULATION OF STATIST  
111 008020 TOTAL NUMBER OF MISSING ENTITIES (WITH RESPECT TO ACCUMULATION O  
112 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
113 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
114 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
115 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)  
116 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS  
117 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)



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118 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS
119 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)
120 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS
121 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)
122 008052 CONDITION FOR WHICH NUMBER OF DAYS OF OCCURRENCE FOLLOWS
123 008022 TOTAL NUMBER (WITH RESPECT TO ACCUMULATION OR AVERAGE)
124 008053 DAY OF OCCURRENCE QUALIFIER
125 004003 DAY
126 013052 HIGHEST DAILY AMOUNT OF PRECIPITATION
127 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
128 004001 YEAR
129 004001 YEAR
130 004002 MONTH
131 004003 DAY
132 004004 HOUR
133 004022 TIME PERIOD OR DISPLACEMENT
134 008023 FIRST ORDER STATISTICS
135 010004 PRESSURE
136 010051 PRESSURE REDUCED TO MEAN SEA LEVEL
137 007004 PRESSURE
138 010009 GEOPOTENTIAL HEIGHT
139 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
140 012101 TEMPERATURE/DRY-BULB TEMPERATURE
141 002051 INDICATOR TO SPECIFY OBSERVING METHOD FOR EXTREME TEMPERATURES
142 004051 PRINCIPAL TIME OF DAILY READING OF MAXIMUM TEMPERATURE
143 012118 MAXIMUM TEMPERATURE AT HEIGHT SPECIFIED, PAST 24 HOURS
144 004052 PRINCIPAL TIME OF DAILY READING OF MINIMUM TEMPERATURE
145 012119 MINIMUM TEMPERATURE AT HEIGHT SPECIFIED, PAST 24 HOURS
146 013004 VAPOUR PRESSURE
147 012151 STANDARD DEVIATION OF DAILY MEAN TEMPERATURE
148 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
149 014032 TOTAL SUNSHINE
150 008023 FIRST ORDER STATISTICS
151 004001 YEAR
152 004001 YEAR
153 004002 MONTH
154 004003 DAY
155 004004 HOUR
156 004022 TIME PERIOD OR DISPLACEMENT
157 007032 HEIGHT OF SENSOR ABOVE LOCAL GROUND (OR DECK OF MARINE PLATFORM)
158 008023 FIRST ORDER STATISTICS
159 013060 TOTAL ACCUMULATED PRECIPITATION
160 004053 NUMBER OF DAYS WITH PRECIPITATION EQUAL TO OR MORE THAN 1 MM
161 008023 FIRST ORDER STATISTICS
162 008050 QUALIFIER FOR NUMBER OF MISSING VALUES IN CALCULATION OF STATIST
163 008020 TOTAL NUMBER OF MISSING ENTITIES (WITH RESPECT TO ACCUMULATION O
164 008050 QUALIFIER FOR NUMBER OF MISSING VALUES IN CALCULATION OF STATIST
165 008020 TOTAL NUMBER OF MISSING ENTITIES (WITH RESPECT TO ACCUMULATION O
166 008050 QUALIFIER FOR NUMBER OF MISSING VALUES IN CALCULATION OF STATIST
167 008020 TOTAL NUMBER OF MISSING ENTITIES (WITH RESPECT TO ACCUMULATION O
168 008050 QUALIFIER FOR NUMBER OF MISSING VALUES IN CALCULATION OF STATIST
169 008020 TOTAL NUMBER OF MISSING ENTITIES (WITH RESPECT TO ACCUMULATION O
170 008050 QUALIFIER FOR NUMBER OF MISSING VALUES IN CALCULATION OF STATIST
171 008020 TOTAL NUMBER OF MISSING ENTITIES (WITH RESPECT TO ACCUMULATION O
172 008050 QUALIFIER FOR NUMBER OF MISSING VALUES IN CALCULATION OF STATIST
173 008020 TOTAL NUMBER OF MISSING ENTITIES (WITH RESPECT TO ACCUMULATION O

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STARTING SUBSET TO BE PRINTED : 1
ENDING SUBSET TO BE PRINTED : 1

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1 WMO BLOCK NUMBE      0.1100000000E+02 NUMERIC
2 WMO STATION NUM      0.5200000000E+03 NUMERIC
3 STATION OR SITE      0.1020000000E+04 CCITIA5          PRAHA-LIBUS
4 TYPE OF STATION      0.1000000000E+01 CODE TABLE 2001
5 YEAR                 0.2003000000E+04 YEAR
6 MONTH                0.1100000000E+02 MONTH
7 DAY                  0.1000000000E+01 DAY
8 HOUR                 0.0000000000E+00 HOUR
9 MINUTE                0.0000000000E+00 MINUTE
10 LATITUDE (HIGH)     0.5000833000E+02 DEGREE
11 LONGITUDE (HIGH)    0.1444806000E+02 DEGREE
12 HEIGHT OF STATI     0.3020000000E+03 M
13 HEIGHT OF BAROM      0.3034000000E+03 M
14 TIME PERIOD OR      0.3000000000E+02 DAY
15 FIRST ORDER STA     0.4000000000E+01 CODE TABLE 8023
16 PRESSURE             0.9829000000E+05 PA
17 PRESSURE REDUCE     0.1020000000E+06 PA
18 PRESSURE             MISSING PA
19 GEOPOTENTIAL HE     MISSING GPM
20 HEIGHT OF SENSO     0.2030000000E+01 M
21 TEMPERATURE/DRY     0.2778500000E+03 K
22 INDICATOR TO SP     0.2000000000E+01 CODE TABLE 2051
23 PRINCIPAL TIME      0.2000000000E+02 HOUR
24 MAXIMUM TEMPERA     0.2813500000E+03 K
25 PRINCIPAL TIME      0.2000000000E+02 HOUR
26 MINIMUM TEMPER      0.2745500000E+03 K
27 VAPOUR PRESSURE     0.7600000000E+03 PA
28 FIRST ORDER STA     MISSING CODE TABLE 8023
29 STANDARD DEVIAT     0.2800000000E+01 K
30 HEIGHT OF SENSO     MISSING M
31 QUALIFIER FOR N      0.1000000000E+01 CODE TABLE 8050
32 TOTAL NUMBER OF     0.0000000000E+00 NUMERIC
33 QUALIFIER FOR N      0.2000000000E+01 CODE TABLE 8050

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34	TOTAL NUMBER OF	0.0000000000E+00	NUMERIC
35	QUALIFIER FOR N	0.4000000000E+01	CODE TABLE 8050
36	TOTAL NUMBER OF	0.0000000000E+00	NUMERIC
37	QUALIFIER FOR N	0.7000000000E+01	CODE TABLE 8050
38	TOTAL NUMBER OF	0.0000000000E+00	NUMERIC
39	QUALIFIER FOR N	0.8000000000E+01	CODE TABLE 8050
40	TOTAL NUMBER OF	0.0000000000E+00	NUMERIC
41	TOTAL SUNSHINE	0.8400000000E+02	HOURL
42	TOTAL SUNSHINE	0.1590000000E+03	%
43	QUALIFIER FOR N	0.6000000000E+01	CODE TABLE 8050
44	TOTAL NUMBER OF	0.0000000000E+00	NUMERIC
45	CONDITION FOR W	0.0000000000E+00	CODE TABLE 8052
46	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
47	CONDITION FOR W	0.1000000000E+01	CODE TABLE 8052
48	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
49	CONDITION FOR W	0.2000000000E+01	CODE TABLE 8052
50	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
51	CONDITION FOR W	0.3000000000E+01	CODE TABLE 8052
52	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
53	CONDITION FOR W	0.4000000000E+01	CODE TABLE 8052
54	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
55	CONDITION FOR W	0.5000000000E+01	CODE TABLE 8052
56	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
57	CONDITION FOR W	0.6000000000E+01	CODE TABLE 8052
58	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
59	CONDITION FOR W	0.7000000000E+01	CODE TABLE 8052
60	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
61	CONDITION FOR W	0.8000000000E+01	CODE TABLE 8052
62	TOTAL NUMBER (W	0.1200000000E+02	NUMERIC
63	CONDITION FOR W	0.1600000000E+02	CODE TABLE 8052
64	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
65	CONDITION FOR W	0.1700000000E+02	CODE TABLE 8052
66	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
67	CONDITION FOR W	0.1800000000E+02	CODE TABLE 8052
68	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
69	CONDITION FOR W	0.1900000000E+02	CODE TABLE 8052
70	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
71	CONDITION FOR W	0.2000000000E+02	CODE TABLE 8052
72	TOTAL NUMBER (W	0.1000000000E+01	NUMERIC
73	CONDITION FOR W	0.2100000000E+02	CODE TABLE 8052
74	TOTAL NUMBER (W	0.8000000000E+01	NUMERIC
75	CONDITION FOR W	0.2200000000E+02	CODE TABLE 8052
76	TOTAL NUMBER (W	0.1000000000E+02	NUMERIC
77	CONDITION FOR W	0.2300000000E+02	CODE TABLE 8052
78	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
79	CONDITION FOR W	0.2400000000E+02	CODE TABLE 8052
80	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
81	HEIGHT OF SENSO	0.2030000000E+01	M
82	DAY OF OCCURREN	0.0000000000E+00	CODE TABLE 8053
83	DAY	0.1900000000E+02	DAY
84	HIGHEST DAILY M	0.2832500000E+03	K
85	DAY OF OCCURREN	0.0000000000E+00	CODE TABLE 8053
86	DAY	0.1300000000E+02	DAY
87	LOWEST DAILY ME	0.2726500000E+03	K
88	DAY OF OCCURREN	0.0000000000E+00	CODE TABLE 8053
89	DAY	0.4000000000E+01	DAY
90	FIRST ORDER STA	0.2000000000E+01	CODE TABLE 8023
91	TEMPERATURE/DRY	0.2872500000E+03	K
92	DAY OF OCCURREN	0.0000000000E+00	CODE TABLE 8053
93	DAY	0.1300000000E+02	DAY
94	FIRST ORDER STA	0.3000000000E+01	CODE TABLE 8023
95	TEMPERATURE/DRY	0.2674500000E+03	K
96	FIRST ORDER STA	MISSING	CODE TABLE 8023
97	HEIGHT OF SENSO	0.1021000000E+02	M
98	TYPE OF INSTRUM	0.8000000000E+01	FLAG TABLE 2002
99	DAY OF OCCURREN	0.1000000000E+01	CODE TABLE 8053
100	DAY	0.8000000000E+01	DAY
101	MAXIMUM INSTANT	0.1400000000E+02	M/S
102	DAY OF OCCURREN	MISSING	CODE TABLE 8053
103	DAY	0.1000000000E+01	DAY
104	HOUR	0.6000000000E+01	HOUR
105	TIME PERIOD OR	0.3000000000E+02	DAY
106	HEIGHT OF SENSO	0.8200000000E+00	M
107	TOTAL ACCUMULAT	0.6000000000E+01	KG/M**2
108	FREQUENCY GROUP	0.0000000000E+00	CODE TABLE 13051
109	NUMBER OF DAYS	0.2000000000E+01	NUMERIC
110	QUALIFIER FOR N	0.5000000000E+01	CODE TABLE 8050
111	TOTAL NUMBER OF	0.0000000000E+00	NUMERIC
112	CONDITION FOR W	0.1000000000E+02	CODE TABLE 8052
113	TOTAL NUMBER (W	0.2000000000E+01	NUMERIC
114	CONDITION FOR W	0.1100000000E+02	CODE TABLE 8052
115	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
116	CONDITION FOR W	0.1200000000E+02	CODE TABLE 8052
117	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
118	CONDITION FOR W	0.1300000000E+02	CODE TABLE 8052
119	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
120	CONDITION FOR W	0.1400000000E+02	CODE TABLE 8052
121	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
122	CONDITION FOR W	0.1500000000E+02	CODE TABLE 8052
123	TOTAL NUMBER (W	0.0000000000E+00	NUMERIC
124	DAY OF OCCURREN	0.0000000000E+00	CODE TABLE 8053
125	DAY	0.2900000000E+02	DAY
126	HIGHEST DAILY A	0.2800000000E+01	KG/M**2

```
127 HEIGHT OF SENSO          MISSING M
128 YEAR                     0.1971000000E+04 YEAR
129 YEAR                     0.2000000000E+04 YEAR
130 MONTH                    0.1100000000E+02 MONTH
131 DAY                      0.1000000000E+01 DAY
132 HOUR                     0.0000000000E+00 HOUR
133 TIME PERIOD OR           0.1000000000E+01 MONTH
134 FIRST ORDER STA          0.4000000000E+01 CODE TABLE 8023
135 PRESSURE                  0.9808000000E+05 PA
136 PRESSURE REDUCE          0.1018100000E+06 PA
137 PRESSURE                  MISSING PA
138 GEOPOTENTIAL HE          MISSING GPM
139 HEIGHT OF SENSO          0.2030000000E+01 M
140 TEMPERATURE/DRY          0.2767500000E+03 K
141 INDICATOR TO SP          0.2000000000E+01 CODE TABLE 2051
142 PRINCIPAL TIME           0.2000000000E+02 HOUR
143 MAXIMUM TEMPERA          0.2795500000E+03 K
144 PRINCIPAL TIME           0.2000000000E+02 HOUR
145 MINIMUM TEMPER           0.2741500000E+03 K
146 VAPOUR PRESSURE          0.6500000000E+03 PA
147 STANDARD DEVIAT          0.3400000000E+01 K
148 HEIGHT OF SENSO          MISSING M
149 TOTAL SUNSHINE           0.5300000000E+02 HOUR
150 FIRST ORDER STA          MISSING CODE TABLE 8023
151 YEAR                     0.1971000000E+04 YEAR
152 YEAR                     0.2000000000E+04 YEAR
153 MONTH                    0.1100000000E+02 MONTH
154 DAY                      0.1000000000E+01 DAY
155 HOUR                     0.6000000000E+01 HOUR
156 TIME PERIOD OR           0.1000000000E+01 MONTH
157 HEIGHT OF SENSO          0.8200000000E+00 M
158 FIRST ORDER STA          0.4000000000E+01 CODE TABLE 8023
159 TOTAL ACCUMULAT          0.3100000000E+02 KG/M**2
160 NUMBER OF DAYS           0.7000000000E+01 NUMERIC
161 FIRST ORDER STA          MISSING CODE TABLE 8023
162 QUALIFIER FOR N          0.1000000000E+01 CODE TABLE 8050
163 TOTAL NUMBER OF          0.0000000000E+00 NUMERIC
164 QUALIFIER FOR N          0.2000000000E+01 CODE TABLE 8050
165 TOTAL NUMBER OF          0.0000000000E+00 NUMERIC
166 QUALIFIER FOR N          0.3000000000E+01 CODE TABLE 8050
167 TOTAL NUMBER OF          0.0000000000E+00 NUMERIC
168 QUALIFIER FOR N          0.4000000000E+01 CODE TABLE 8050
169 TOTAL NUMBER OF          0.0000000000E+00 NUMERIC
170 QUALIFIER FOR N          0.5000000000E+01 CODE TABLE 8050
171 TOTAL NUMBER OF          0.0000000000E+00 NUMERIC
172 QUALIFIER FOR N          0.6000000000E+01 CODE TABLE 8050
173 TOTAL NUMBER OF          0.0000000000E+00 NUMERIC
```

## 6.5 WMO SAREP template

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ECMWF

BUFR DECODING SOFTWARE VERSION - 7.1
07 June 2005.

Your path for bufr tables is :
/home/ma/maa/bigtmp/wmo_bufr_crex_000250/bufr_000270/bufrtables
BUFR TABLES TO BE LOADED B0000000000098012000,D0000000000098012000
1
    BUFR SECTION 0

    LENGTH OF SECTION 0 (BYTES)                8
    TOTAL LENGTH OF BUFR MESSAGE (BYTES)       146
    BUFR EDITION NUMBER                        4
1
    BUFR SECTION 1

    LENGTH OF SECTION 1 (BYTES)                22
    BUFR MASTER TABLE                        0
    ORIGINATING CENTRE                       34
    ORIGINATING SUB-CENTRE                   0
    UPDATE SEQUENCE NUMBER                   0
    FLAG (PRESENCE OF SECTION 2)             0
    DATA CATEGORY                          12
    DATA SUB-CATEGORY                       7
    LOCAL DATA SUB-CATEGORU                 255
    VERSION NUMBER OF MASTER TABLE          12
    VERSION NUMBER OF LOCAL TABLE           255
    YEAR                                    2004
    MONTH                                    6
    DAY                                      16
    HOUR                                    0
    MINUTE                                   0
    SECOND                                   0

    BUUKEY : KEY DEFINITION NOT KNOWN

    PRYKEY : RDB KEY NOT DEFINED IN SECTION 2.
1
    BUFR SECTION 3

    LENGTH OF SECTION 3 (BYTES)                67
    RESERVED                                  0
    NUMBER OF DATA SUBSETS                   1
    FLAG (DATA TYPE/DATA COMPRESSION)         128

    DATA DESCRIPTORS (UNEXPANDED)

    1 301001
    2 301011
    3 301012
    4 001007
    5 001033
    6 025150
    7 122000
    8 031001
    9 001027
    10 019150
    11 019106
    12 008005
    13 005002
    14 006002
    15 008005
    16 019107
    17 019005
    18 019006
    19 019108
    20 019109
    21 019110
    22 019111
    23 019112
    24 019113
    25 019114
    26 019115
    27 019116
    28 019117
    29 019118
    30 019119

    DATA DESCRIPTORS (EXPANDED)

    1 001001 WMO BLOCK NUMBER
    2 001002 WMO STATION NUMBER
    3 004001 YEAR
```

```

4 004002 MONTH
5 004003 DAY
6 004004 HOUR
7 004005 MINUTE
8 001007 SATELLITE IDENTIFIER
9 001033 IDENTIFICATION OF ORIGINATING/GENERATING CENTRE
10 025150 SATELLITE INTENSITY ANALYSIS METHOD OF TROPICAL CYCLONE
11 031001 DELAYED DESCRIPTOR REPLICATION FACTOR
12 001027 WMO LONG STORM NAME
13 019150 TYPHOON INTERNATIONAL COMMON NUMBER (TYPHOON COMMITTEE)
14 019106 IDENTIFICATION NUMBER OF TROPICAL CYCLONE
15 008005 METEOROLOGICAL ATTRIBUTE SIGNIFICANCE
16 005002 LATITUDE (COARSE ACCURACY)
17 006002 LONGITUDE (COARSE ACCURACY)
18 008005 METEOROLOGICAL ATTRIBUTE SIGNIFICANCE
19 019107 TIME INTERVAL OF THE TROPICAL CYCLONE ANALYSIS
20 019005 DIRECTION OF MOTION OF FEATURE
21 019006 SPEED OF MOTION OF FEATURE
22 019108 ACCURACY OF GEOGRAPHICAL POSITION OF THE TROPICAL CYCLONE
23 019109 MEAN DIAMETER OF THE OVERCAST CLOUD OF THE TROPICAL CYCLONE
24 019110 APPARENT 24-HOUR CHANGE IN INTENSITY OF TROPICAL CYCLONE
25 019111 CURRENT INTENSITY (CI) NUMBER OF THE TROPICAL CYCLONE
26 019112 DATA TROPICAL (DT) NUMBER OF TROPICAL CYCLONES
27 019113 CLOUD PATTERN TYPE OF DT-NUMBER
28 019114 MODEL EXPECTED TROPICAL CYCLONE (MET) number of THE TROPICAL CYC
29 019115 TREND OF PAST 24-HOUR CHANGE (+: DEVELOPED,-:WEAKENED)
30 019116 PATTERN PROPICAL (PT) NUMBER OF THE TROPICAL CYCLONE
31 019117 CLOUDE PICTURE TYPE OF THE PT-NUMBER
32 019118 FINAL TROPICAL (T) NUMBER OF THE TROPICAL CYCLONE
33 019119 TYPE OF THE FINAL T-NUMBER

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STARTING SUBSET TO BE PRINTED : 1
ENDING SUBSET TO BE PRINTED : 1

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1 WMO BLOCK NUMBE      0.4700000000E+02 NUMERIC
2 WMO STATION NUM      0.6440000000E+03 NUMERIC
3 YEAR                 0.2004000000E+04 YEAR
4 MONTH                0.6000000000E+01 MONTH
5 DAY                  0.1600000000E+02 DAY
6 HOUR                 0.0000000000E+00 HOUR
7 MINUTE               0.0000000000E+00 MINUTE
8 SATELLITE IDENT      0.2530000000E+03 CODE TABLE 1007
9 IDENTIFICATION        0.3400000000E+02 CODE TABLE 1033
10 SATELLITE INTEN      0.2000000000E+01 CODE TABLE
11 DELAYED DESCRIP      0.1000000000E+01 NUMERIC
12 WMO LONG STORM       0.1010000000E+04 CCITTIA5          dianmu
13 TYPHOON INTERNA      0.2004000000E+04 CCITTIA5          0406
14 IDENTIFICATION        0.9000000000E+01 NUMERIC
15 METEOROLOGICAL        0.1000000000E+01 CODE TABLE 8005
16 LATITUDE (COARS      0.1430000000E+02 DEGREE
17 LONGITUDE (COAR      0.1364600000E+03 DEGREE
18 METEOROLOGICAL        MISSING CODE TABLE 8005
19 TIME INTERVAL O      0.4000000000E+01 CODE TABLE
20 DIRECTION OF MO      0.3390000000E+03 DEGREE TRUE
21 SPEED OF MOTION       0.4120000000E+01 M/S
22 ACCURACY OF GEO      0.1000000000E+01 CODE TABLE
23 MEAN DIAMETER O      0.3000000000E+01 CODE TABLE
24 APPARENT 24-HOU      0.4000000000E+01 CODE TABLE
25 CURRENT INTENSI      0.7000000000E+01 NUMERIC
26 DATA TROPICAL (      0.7000000000E+01 NUMERIC
27 CLOUD PATTERN T      0.3000000000E+01 CODE TABLE
28 MODEL EXPECTED        0.6000000000E+01 NUMERIC
29 TREND OF PAST 2       0.1500000000E+01 NUMERIC
30 PATTERN PROPICA      0.7000000000E+01 NUMERIC
31 CLOUDE PICTURE        0.1000000000E+01 CODE TABLE
32 FINAL TROPICAL        0.7000000000E+01 NUMERIC
33 TYPE OF THE FIN      0.1000000000E+01 CODE TABLE

```

## 6.6 WMO TEMP template

BUFR TABLES TO BE LOADED B0000000000000012000.TXT,D0000000000000012000.TXT

1

BUFR SECTION 0

LENGTH OF SECTION 0 (BYTES)	8
TOTAL LENGTH OF BUFR MESSAGE (BYTES)	1792
BUFR EDITION NUMBER	3

1

BUFR SECTION 1

LENGTH OF SECTION 1 (BYTES)	18
BUFR EDITION NUMBER	3
ORIGINATING SUB-CENTRE	0
ORIGINATING CENTRE	89
UPDATE SEQUENCE NUMBER	0
FLAG (PRESENCE OF SECTION 2)	0
BUFR MESSAGE TYPE	2
BUFR MESSAGE SUBTYPE	0
VERSION NUMBER OF LOCAL TABLE	0
YEAR	7
MONTH	11
DAY	7
HOURL	6
MINUTE	0
VERSION NUMBER OF MASTER TABLE	12
BUFR MASTER TABLE	0

BUUKEY : KEY DEFINITION NOT KNOWN

PRTKEY : RDB KEY NOT DEFINED IN SECTION 2.

1

BUFR SECTION 3

LENGTH OF SECTION 3 (BYTES)	10
RESERVED	0
NUMBER OF DATA SUBSETS	1
FLAG (DATA TYPE/DATA COMPRESSION)	128

DATA DESCRIPTORS (UNEXPANDED)

1 309052

DATA DESCRIPTORS (EXPANDED)

1	001001	WMO BLOCK NUMBER
2	001002	WMO STATION NUMBER
3	001011	SHIP OR MOBILE LAND STATION IDENTIFIER
4	002011	RADIOSONDE TYPE
5	002013	SOLAR AND INFRARED RADIATION CORRECTION
6	002014	TRACKING TECHNIQUE/STATUS OF SYSTEM USED
7	002003	TYPE OF MEASURING EQUIPMENT USED
8	008021	TIME SIGNIFICANCE
9	004001	YEAR
10	004002	MONTH
11	004003	DAY
12	004004	HOURL
13	004005	MINUTE
14	004006	SECOND
15	005001	LATITUDE (HIGH ACCURACY)
16	006001	LONGITUDE (HIGH ACCURACY)
17	007030	HEIGHT OF STATION GROUND ABOVE MEAN SEA LEVEL (SEE NOTE 3)
18	007031	HEIGHT OF BAROMETER ABOVE MEAN SEA LEVEL (SEE NOTE 4)
19	007007	HEIGHT
20	033024	STATION ELEVATION QUALITY MARK (FOR MOBILE STATIONS)
21	008002	VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
22	020011	CLOUD AMOUNT
23	020013	HEIGHT OF BASE OF CLOUD
24	020012	CLOUD TYPE
25	020012	CLOUD TYPE
26	020012	CLOUD TYPE
27	008002	VERTICAL SIGNIFICANCE (SURFACE OBSERVATIONS)
28	022043	SEA/WATER TEMPERATURE
29	031002	EXTENDED DELAYED DESCRIPTOR REPLICATION FACTOR
30	004086	LONG TIME PERIOD OR DISPLACEMENT
31	008042	EXTENDED VERTICAL SOUNDING SIGNIFICANCE
32	007004	PRESSURE
33	010009	GEOPOTENTIAL HEIGHT
34	005015	LATITUDE DISPLACEMENT (HIGH ACCURACY)
35	006015	LONGITUDE DISPLACEMENT (HIGH ACCURACY)
36	012101	TEMPERATURE/DRY-BULB TEMPERATURE
37	012103	DEW-POINT TEMPERATURE
38	011001	WIND DIRECTION
39	011002	WIND SPEED
40	004086	LONG TIME PERIOD OR DISPLACEMENT
41	008042	EXTENDED VERTICAL SOUNDING SIGNIFICANCE

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42 007004 PRESSURE
43 010009 GEOPOTENTIAL HEIGHT
44 005015 LATITUDE DISPLACEMENT (HIGH ACCURACY)
45 006015 LONGITUDE DISPLACEMENT (HIGH ACCURACY)
46 012101 TEMPERATURE/DRY-BULB TEMPERATURE
47 012103 DEW-POINT TEMPERATURE
48 011001 WIND DIRECTION
49 011002 WIND SPEED
50 004086 LONG TIME PERIOD OR DISPLACEMENT
51 008042 EXTENDED VERTICAL SOUNDING SIGNIFICANCE
52 007004 PRESSURE
53 010009 GEOPOTENTIAL HEIGHT
54 005015 LATITUDE DISPLACEMENT (HIGH ACCURACY)
55 006015 LONGITUDE DISPLACEMENT (HIGH ACCURACY)
56 012101 TEMPERATURE/DRY-BULB TEMPERATURE
57 012103 DEW-POINT TEMPERATURE
58 011001 WIND DIRECTION
59 011002 WIND SPEED
60 004086 LONG TIME PERIOD OR DISPLACEMENT
61 008042 EXTENDED VERTICAL SOUNDING SIGNIFICANCE
62 007004 PRESSURE
63 010009 GEOPOTENTIAL HEIGHT
64 005015 LATITUDE DISPLACEMENT (HIGH ACCURACY)
65 006015 LONGITUDE DISPLACEMENT (HIGH ACCURACY)
66 012101 TEMPERATURE/DRY-BULB TEMPERATURE
67 012103 DEW-POINT TEMPERATURE
68 011001 WIND DIRECTION
69 011002 WIND SPEED
70 004086 LONG TIME PERIOD OR DISPLACEMENT
71 008042 EXTENDED VERTICAL SOUNDING SIGNIFICANCE
72 007004 PRESSURE
73 010009 GEOPOTENTIAL HEIGHT
74 005015 LATITUDE DISPLACEMENT (HIGH ACCURACY)
75 006015 LONGITUDE DISPLACEMENT (HIGH ACCURACY)
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591 008042 EXTENDED VERTICAL SOUNDING SIGNIFICANCE
592 007004 PRESSURE
593 010009 GEOPOTENTIAL HEIGHT
594 005015 LATITUDE DISPLACEMENT (HIGH ACCURACY)
595 006015 LONGITUDE DISPLACEMENT (HIGH ACCURACY)
596 012101 TEMPERATURE/DRY-BULB TEMPERATURE
597 012103 DEW-POINT TEMPERATURE
598 011001 WIND DIRECTION
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816 012101 TEMPERATURE/DRY-BULB TEMPERATURE
817 012103 DEW-POINT TEMPERATURE
818 011001 WIND DIRECTION
819 011002 WIND SPEED
820 031001 DELAYED DESCRIPTOR REPLICATION FACTOR
821 004086 LONG TIME PERIOD OR DISPLACEMENT
822 008042 EXTENDED VERTICAL SOUNDING SIGNIFICANCE
823 007004 PRESSURE
824 005015 LATITUDE DISPLACEMENT (HIGH ACCURACY)
825 006015 LONGITUDE DISPLACEMENT (HIGH ACCURACY)
826 011061 ABSOLUTE WIND SHEAR IN 1 KM LAYER BELOW
827 011062 ABSOLUTE WIND SHEAR IN 1 KM LAYER ABOVE
828 004086 LONG TIME PERIOD OR DISPLACEMENT
829 008042 EXTENDED VERTICAL SOUNDING SIGNIFICANCE
830 007004 PRESSURE
831 005015 LATITUDE DISPLACEMENT (HIGH ACCURACY)
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837 007004 PRESSURE
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840 011061 ABSOLUTE WIND SHEAR IN 1 KM LAYER BELOW
841 011062 ABSOLUTE WIND SHEAR IN 1 KM LAYER ABOVE

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BUFR SECTION 4 (DATA), SUBSET 1

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1 WMO BLOCK NUMBER 0.110000000000000E+002 NUMERIC
2 WMO STATION NUMBER 0.520000000000000E+003 NUMERIC
3 SHIP OR MOBILE LAND STATION IDEN 0.100900000000000E+004 CCITIA5
4 RADIOSONDE TYPE 0.800000000000000E+002 CODE TABLE 2011
5 SOLAR AND INFRARED RADIATION COR 0.400000000000000E+001 CODE TABLE 2013
6 TRACKING TECHNIQUE/STATUS OF SYS 0.600000000000000E+001 CODE TABLE 2014
7 TYPE OF MEASURING EQUIPMENT USED 0.500000000000000E+001 CODE TABLE 2003
8 TIME SIGNIFICANCE 0.180000000000000E+002 CODE TABLE 8021
9 YEAR 0.200700000000000E+004 YEAR
10 MONTH 0.110000000000000E+002 MONTH
11 DAY 0.700000000000000E+001 DAY
12 HOUR 0.500000000000000E+001 HOUR
13 MINUTE 0.300000000000000E+002 MINUTE
14 SECOND 0.000000000000000E+000 SECOND
15 LATITUDE (HIGH ACCURACY) 0.500083300000000E+002 DEGREE
16 LONGITUDE (HIGH ACCURACY) 0.144480600000000E+002 DEGREE
17 HEIGHT OF STATION GROUND ABOVE M 0.302000000000000E+003 M
18 HEIGHT OF BAROMETER ABOVE MEAN S 0.303400000000000E+003 M
19 HEIGHT 0.304000000000000E+003 M
20 STATION ELEVATION QUALITY MARK ( MISSING CODE TABLE 33024
21 VERTICAL SIGNIFICANCE (SURFACE O 0.700000000000000E+001 CODE TABLE 8002
22 CLOUD AMOUNT 0.700000000000000E+001 CODE TABLE 20011
23 HEIGHT OF BASE OF CLOUD 0.125000000000000E+004 M
24 CLOUD TYPE 0.350000000000000E+002 CODE TABLE 20012
25 CLOUD TYPE 0.200000000000000E+002 CODE TABLE 20012
26 CLOUD TYPE 0.100000000000000E+002 CODE TABLE 20012
27 VERTICAL SIGNIFICANCE (SURFACE O MISSING CODE TABLE 8002
28 SEA/WATER TEMPERATURE MISSING K
29 EXTENDED DELAYED DESCRIPTOR REPL 0.790000000000000E+002 NUMERIC
30 LONG TIME PERIOD OR DISPLACEMENT 0.000000000000000E+000 SECOND
31 EXTENDED VERTICAL SOUNDING SIGNI 0.655360000000000E+005 FLAG TABLE 8042
32 PRESSURE 0.100000000000000E+006 PA
33 GEOPOTENTIAL HEIGHT 0.177000000000000E+003 GPM
34 LATITUDE DISPLACEMENT (HIGH ACCU 0.000000000000000E+000 DEGREE

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35	LONGITUDE DISPLACEMENT (HIGH ACC	0.00000000000000E+000	DEGREE
36	TEMPERATURE/DRY-BULB TEMPERATURE	MISSING	K
37	DEW-POINT TEMPERATURE	MISSING	K
38	WIND DIRECTION	MISSING	DEGREE TRUE
39	WIND SPEED	MISSING	M/S
40	LONG TIME PERIOD OR DISPLACEMENT	0.00000000000000E+000	SECOND
41	EXTENDED VERTICAL SOUNDING SIGNI	0.14540800000000E+006	FLAG TABLE 8042
42	PRESSURE	0.98440000000000E+005	PA
43	GEOPOTENTIAL HEIGHT	0.30400000000000E+003	GPM
44	LATITUDE DISPLACEMENT (HIGH ACCU	0.10000000000000E-001	DEGREE
45	LONGITUDE DISPLACEMENT (HIGH ACC	0.10000000000000E-001	DEGREE
46	TEMPERATURE/DRY-BULB TEMPERATURE	0.27660000000000E+003	K
47	DEW-POINT TEMPERATURE	0.27440000000000E+003	K
48	WIND DIRECTION	0.26800000000000E+003	DEGREE TRUE
49	WIND SPEED	0.29000000000000E+001	M/S
50	LONG TIME PERIOD OR DISPLACEMENT	0.30000000000000E+002	SECOND
51	EXTENDED VERTICAL SOUNDING SIGNI	0.20480000000000E+004	FLAG TABLE 8042
52	PRESSURE	0.96130000000000E+005	PA
53	GEOPOTENTIAL HEIGHT	0.49600000000000E+003	GPM
54	LATITUDE DISPLACEMENT (HIGH ACCU	0.10000000000000E-001	DEGREE
55	LONGITUDE DISPLACEMENT (HIGH ACC	0.10000000000000E-001	DEGREE
56	TEMPERATURE/DRY-BULB TEMPERATURE	0.27480000000000E+003	K
57	DEW-POINT TEMPERATURE	0.27340000000000E+003	K
58	WIND DIRECTION	0.26000000000000E+003	DEGREE TRUE
59	WIND SPEED	0.12000000000000E+002	M/S
60	LONG TIME PERIOD OR DISPLACEMENT	0.84000000000000E+002	SECOND
61	EXTENDED VERTICAL SOUNDING SIGNI	0.65536000000000E+005	FLAG TABLE 8042
62	PRESSURE	0.92500000000000E+005	PA
63	GEOPOTENTIAL HEIGHT	0.80600000000000E+003	GPM
64	LATITUDE DISPLACEMENT (HIGH ACCU	0.10000000000000E-001	DEGREE
65	LONGITUDE DISPLACEMENT (HIGH ACC	0.20000000000000E-001	DEGREE
66	TEMPERATURE/DRY-BULB TEMPERATURE	0.27300000000000E+003	K
67	DEW-POINT TEMPERATURE	0.27200000000000E+003	K
68	WIND DIRECTION	0.27400000000000E+003	DEGREE TRUE
69	WIND SPEED	0.14000000000000E+002	M/S
70	LONG TIME PERIOD OR DISPLACEMENT	0.95000000000000E+002	SECOND
71	EXTENDED VERTICAL SOUNDING SIGNI	0.20480000000000E+004	FLAG TABLE 8042
72	PRESSURE	0.91840000000000E+005	PA
73	GEOPOTENTIAL HEIGHT	0.86200000000000E+003	GPM
74	LATITUDE DISPLACEMENT (HIGH ACCU	0.10000000000000E-001	DEGREE
75	LONGITUDE DISPLACEMENT (HIGH ACC	0.20000000000000E-001	DEGREE
76	TEMPERATURE/DRY-BULB TEMPERATURE	0.27280000000000E+003	K
77	DEW-POINT TEMPERATURE	0.27170000000000E+003	K
78	WIND DIRECTION	0.27800000000000E+003	DEGREE TRUE
79	WIND SPEED	0.14200000000000E+002	M/S
80	LONG TIME PERIOD OR DISPLACEMENT	0.19500000000000E+003	SECOND
81	EXTENDED VERTICAL SOUNDING SIGNI	0.20480000000000E+004	FLAG TABLE 8042
82	PRESSURE	0.85840000000000E+005	PA
83	GEOPOTENTIAL HEIGHT	0.14000000000000E+004	GPM
84	LATITUDE DISPLACEMENT (HIGH ACCU	0.00000000000000E+000	DEGREE
85	LONGITUDE DISPLACEMENT (HIGH ACC	0.40000000000000E-001	DEGREE
86	TEMPERATURE/DRY-BULB TEMPERATURE	0.26950000000000E+003	K
87	DEW-POINT TEMPERATURE	0.26660000000000E+003	K
88	WIND DIRECTION	0.31300000000000E+003	DEGREE TRUE
89	WIND SPEED	0.11800000000000E+002	M/S
90	LONG TIME PERIOD OR DISPLACEMENT	0.21100000000000E+003	SECOND
91	EXTENDED VERTICAL SOUNDING SIGNI	0.65536000000000E+005	FLAG TABLE 8042
92	PRESSURE	0.85000000000000E+005	PA
93	GEOPOTENTIAL HEIGHT	0.14780000000000E+004	GPM
94	LATITUDE DISPLACEMENT (HIGH ACCU	0.00000000000000E+000	DEGREE
95	LONGITUDE DISPLACEMENT (HIGH ACC	0.40000000000000E-001	DEGREE
96	TEMPERATURE/DRY-BULB TEMPERATURE	0.26900000000000E+003	K
97	DEW-POINT TEMPERATURE	0.26580000000000E+003	K
98	WIND DIRECTION	0.31300000000000E+003	DEGREE TRUE
99	WIND SPEED	0.12600000000000E+002	M/S
100	LONG TIME PERIOD OR DISPLACEMENT	0.38000000000000E+003	SECOND
101	EXTENDED VERTICAL SOUNDING SIGNI	0.12288000000000E+005	FLAG TABLE 8042
102	PRESSURE	0.75580000000000E+005	PA
103	GEOPOTENTIAL HEIGHT	0.23920000000000E+004	GPM
104	LATITUDE DISPLACEMENT (HIGH ACCU	-0.10000000000000E-001	DEGREE
105	LONGITUDE DISPLACEMENT (HIGH ACC	0.60000000000000E-001	DEGREE
106	TEMPERATURE/DRY-BULB TEMPERATURE	0.26180000000000E+003	K
107	DEW-POINT TEMPERATURE	0.25810000000000E+003	K
108	WIND DIRECTION	0.32400000000000E+003	DEGREE TRUE
109	WIND SPEED	0.15300000000000E+002	M/S
110	LONG TIME PERIOD OR DISPLACEMENT	0.39000000000000E+003	SECOND
111	EXTENDED VERTICAL SOUNDING SIGNI	0.40960000000000E+004	FLAG TABLE 8042
112	PRESSURE	0.74970000000000E+005	PA
113	GEOPOTENTIAL HEIGHT	0.24540000000000E+004	GPM
114	LATITUDE DISPLACEMENT (HIGH ACCU	-0.20000000000000E-001	DEGREE
115	LONGITUDE DISPLACEMENT (HIGH ACC	0.60000000000000E-001	DEGREE
116	TEMPERATURE/DRY-BULB TEMPERATURE	0.26250000000000E+003	K
117	DEW-POINT TEMPERATURE	0.25050000000000E+003	K
118	WIND DIRECTION	0.32700000000000E+003	DEGREE TRUE
119	WIND SPEED	0.15600000000000E+002	M/S
120	LONG TIME PERIOD OR DISPLACEMENT	0.43000000000000E+003	SECOND
121	EXTENDED VERTICAL SOUNDING SIGNI	0.12288000000000E+005	FLAG TABLE 8042
122	PRESSURE	0.72650000000000E+005	PA
123	GEOPOTENTIAL HEIGHT	0.26950000000000E+004	GPM
124	LATITUDE DISPLACEMENT (HIGH ACCU	-0.20000000000000E-001	DEGREE
125	LONGITUDE DISPLACEMENT (HIGH ACC	0.70000000000000E-001	DEGREE
126	TEMPERATURE/DRY-BULB TEMPERATURE	0.26240000000000E+003	K
127	DEW-POINT TEMPERATURE	0.25630000000000E+003	K



128 WIND DIRECTION	0.338000000000000E+003	DEGREE TRUE
129 WIND SPEED	0.167000000000000E+002	M/S
130 LONG TIME PERIOD OR DISPLACEMENT	0.450000000000000E+003	SECOND
131 EXTENDED VERTICAL SOUNDING SIGNI	0.204800000000000E+004	FLAG TABLE 8042
132 PRESSURE	0.715100000000000E+005	PA
133 GEOPOTENTIAL HEIGHT	0.281700000000000E+004	GPM
134 LATITUDE DISPLACEMENT (HIGH ACCU	-0.200000000000000E-001	DEGREE
135 LONGITUDE DISPLACEMENT (HIGH ACC	0.700000000000000E-001	DEGREE
136 TEMPERATURE/DRY-BULB TEMPERATURE	0.262200000000000E+003	K
137 DEW-POINT TEMPERATURE	0.255900000000000E+003	K
138 WIND DIRECTION	0.341000000000000E+003	DEGREE TRUE
139 WIND SPEED	0.172000000000000E+002	M/S
140 LONG TIME PERIOD OR DISPLACEMENT	0.477000000000000E+003	SECOND
141 EXTENDED VERTICAL SOUNDING SIGNI	0.655360000000000E+005	FLAG TABLE 8042
142 PRESSURE	0.700000000000000E+005	PA
143 GEOPOTENTIAL HEIGHT	0.298000000000000E+004	GPM
144 LATITUDE DISPLACEMENT (HIGH ACCU	-0.300000000000000E-001	DEGREE
145 LONGITUDE DISPLACEMENT (HIGH ACC	0.700000000000000E-001	DEGREE
146 TEMPERATURE/DRY-BULB TEMPERATURE	0.261400000000000E+003	K
147 DEW-POINT TEMPERATURE	0.256200000000000E+003	K
148 WIND DIRECTION	0.340000000000000E+003	DEGREE TRUE
149 WIND SPEED	0.175000000000000E+002	M/S
150 LONG TIME PERIOD OR DISPLACEMENT	0.600000000000000E+003	SECOND
151 EXTENDED VERTICAL SOUNDING SIGNI	0.409600000000000E+004	FLAG TABLE 8042
152 PRESSURE	0.632500000000000E+005	PA
153 GEOPOTENTIAL HEIGHT	0.375100000000000E+004	GPM
154 LATITUDE DISPLACEMENT (HIGH ACCU	-0.500000000000000E-001	DEGREE
155 LONGITUDE DISPLACEMENT (HIGH ACC	0.800000000000000E-001	DEGREE
156 TEMPERATURE/DRY-BULB TEMPERATURE	0.257300000000000E+003	K
157 DEW-POINT TEMPERATURE	0.256300000000000E+003	K
158 WIND DIRECTION	0.336000000000000E+003	DEGREE TRUE
159 WIND SPEED	0.214000000000000E+002	M/S
160 LONG TIME PERIOD OR DISPLACEMENT	0.805000000000000E+003	SECOND
161 EXTENDED VERTICAL SOUNDING SIGNI	0.204800000000000E+004	FLAG TABLE 8042
162 PRESSURE	0.536000000000000E+005	PA
163 GEOPOTENTIAL HEIGHT	0.498200000000000E+004	GPM
164 LATITUDE DISPLACEMENT (HIGH ACCU	-0.900000000000000E-001	DEGREE
165 LONGITUDE DISPLACEMENT (HIGH ACC	0.110000000000000E+000	DEGREE
166 TEMPERATURE/DRY-BULB TEMPERATURE	0.250100000000000E+003	K
167 DEW-POINT TEMPERATURE	0.247800000000000E+003	K
168 WIND DIRECTION	0.343000000000000E+003	DEGREE TRUE
169 WIND SPEED	0.245000000000000E+002	M/S
170 LONG TIME PERIOD OR DISPLACEMENT	0.880000000000000E+003	SECOND
171 EXTENDED VERTICAL SOUNDING SIGNI	0.122880000000000E+005	FLAG TABLE 8042
172 PRESSURE	0.502200000000000E+005	PA
173 GEOPOTENTIAL HEIGHT	0.545700000000000E+004	GPM
174 LATITUDE DISPLACEMENT (HIGH ACCU	-0.100000000000000E+000	DEGREE
175 LONGITUDE DISPLACEMENT (HIGH ACC	0.120000000000000E+000	DEGREE
176 TEMPERATURE/DRY-BULB TEMPERATURE	0.247600000000000E+003	K
177 DEW-POINT TEMPERATURE	0.245500000000000E+003	K
178 WIND DIRECTION	0.339000000000000E+003	DEGREE TRUE
179 WIND SPEED	0.313000000000000E+002	M/S
180 LONG TIME PERIOD OR DISPLACEMENT	0.885000000000000E+003	SECOND
181 EXTENDED VERTICAL SOUNDING SIGNI	0.655360000000000E+005	FLAG TABLE 8042
182 PRESSURE	0.500100000000000E+005	PA
183 GEOPOTENTIAL HEIGHT	0.548700000000000E+004	GPM
184 LATITUDE DISPLACEMENT (HIGH ACCU	-0.100000000000000E+000	DEGREE
185 LONGITUDE DISPLACEMENT (HIGH ACC	0.120000000000000E+000	DEGREE
186 TEMPERATURE/DRY-BULB TEMPERATURE	0.247700000000000E+003	K
187 DEW-POINT TEMPERATURE	0.245800000000000E+003	K
188 WIND DIRECTION	0.339000000000000E+003	DEGREE TRUE
189 WIND SPEED	0.317000000000000E+002	M/S
190 LONG TIME PERIOD OR DISPLACEMENT	0.895000000000000E+003	SECOND
191 EXTENDED VERTICAL SOUNDING SIGNI	0.819200000000000E+004	FLAG TABLE 8042
192 PRESSURE	0.495100000000000E+005	PA
193 GEOPOTENTIAL HEIGHT	0.556000000000000E+004	GPM
194 LATITUDE DISPLACEMENT (HIGH ACCU	-0.110000000000000E+000	DEGREE
195 LONGITUDE DISPLACEMENT (HIGH ACC	0.120000000000000E+000	DEGREE
196 TEMPERATURE/DRY-BULB TEMPERATURE	0.247700000000000E+003	K
197 DEW-POINT TEMPERATURE	0.245800000000000E+003	K
198 WIND DIRECTION	0.339000000000000E+003	DEGREE TRUE
199 WIND SPEED	0.325000000000000E+002	M/S
200 LONG TIME PERIOD OR DISPLACEMENT	0.910000000000000E+003	SECOND
201 EXTENDED VERTICAL SOUNDING SIGNI	0.211200000000000E+004	FLAG TABLE 8042
202 PRESSURE	0.488300000000000E+005	PA
203 GEOPOTENTIAL HEIGHT	0.565900000000000E+004	GPM
204 LATITUDE DISPLACEMENT (HIGH ACCU	-0.110000000000000E+000	DEGREE
205 LONGITUDE DISPLACEMENT (HIGH ACC	0.130000000000000E+000	DEGREE
206 TEMPERATURE/DRY-BULB TEMPERATURE	0.247000000000000E+003	K
207 DEW-POINT TEMPERATURE	0.245100000000000E+003	K
208 WIND DIRECTION	0.339000000000000E+003	DEGREE TRUE
209 WIND SPEED	0.334000000000000E+002	M/S
210 LONG TIME PERIOD OR DISPLACEMENT	0.112500000000000E+004	SECOND
211 EXTENDED VERTICAL SOUNDING SIGNI	0.655360000000000E+005	FLAG TABLE 8042
212 PRESSURE	0.400000000000000E+005	PA
213 GEOPOTENTIAL HEIGHT	0.707300000000000E+004	GPM
214 LATITUDE DISPLACEMENT (HIGH ACCU	MISSING	DEGREE
215 LONGITUDE DISPLACEMENT (HIGH ACC	MISSING	DEGREE
216 TEMPERATURE/DRY-BULB TEMPERATURE	0.236900000000000E+003	K
217 DEW-POINT TEMPERATURE	0.233800000000000E+003	K
218 WIND DIRECTION	MISSING	DEGREE TRUE
219 WIND SPEED	MISSING	M/S
220 LONG TIME PERIOD OR DISPLACEMENT	0.126000000000000E+004	SECOND

221	EXTENDED VERTICAL SOUNDING SIGNI	0.204800000000000E+004	FLAG TABLE 8042
222	PRESSURE	0.352000000000000E+005	PA
223	GEOPOTENTIAL HEIGHT	0.794500000000000E+004	GPM
224	LATITUDE DISPLACEMENT (HIGH ACCU	MISSING	DEGREE
225	LONGITUDE DISPLACEMENT (HIGH ACC	MISSING	DEGREE
226	TEMPERATURE/DRY-BULB TEMPERATURE	0.229200000000000E+003	K
227	DEW-POINT TEMPERATURE	0.225200000000000E+003	K
228	WIND DIRECTION	MISSING	DEGREE TRUE
229	WIND SPEED	MISSING	M/S
230	LONG TIME PERIOD OR DISPLACEMENT	0.127500000000000E+004	SECOND
231	EXTENDED VERTICAL SOUNDING SIGNI	0.819200000000000E+004	FLAG TABLE 8042
232	PRESSURE	0.347100000000000E+005	PA
233	GEOPOTENTIAL HEIGHT	0.804000000000000E+004	GPM
234	LATITUDE DISPLACEMENT (HIGH ACCU	MISSING	DEGREE
235	LONGITUDE DISPLACEMENT (HIGH ACC	MISSING	DEGREE
236	TEMPERATURE/DRY-BULB TEMPERATURE	0.228400000000000E+003	K
237	DEW-POINT TEMPERATURE	0.224400000000000E+003	K
238	WIND DIRECTION	MISSING	DEGREE TRUE
239	WIND SPEED	MISSING	M/S
240	LONG TIME PERIOD OR DISPLACEMENT	0.135500000000000E+004	SECOND
241	EXTENDED VERTICAL SOUNDING SIGNI	0.122880000000000E+005	FLAG TABLE 8042
242	PRESSURE	0.319300000000000E+005	PA
243	GEOPOTENTIAL HEIGHT	0.859600000000000E+004	GPM
244	LATITUDE DISPLACEMENT (HIGH ACCU	MISSING	DEGREE
245	LONGITUDE DISPLACEMENT (HIGH ACC	MISSING	DEGREE
246	TEMPERATURE/DRY-BULB TEMPERATURE	0.226900000000000E+003	K
247	DEW-POINT TEMPERATURE	0.222300000000000E+003	K
248	WIND DIRECTION	MISSING	DEGREE TRUE
249	WIND SPEED	MISSING	M/S
250	LONG TIME PERIOD OR DISPLACEMENT	0.142000000000000E+004	SECOND
251	EXTENDED VERTICAL SOUNDING SIGNI	0.655360000000000E+005	FLAG TABLE 8042
252	PRESSURE	0.300000000000000E+005	PA
253	GEOPOTENTIAL HEIGHT	0.900600000000000E+004	GPM
254	LATITUDE DISPLACEMENT (HIGH ACCU	MISSING	DEGREE
255	LONGITUDE DISPLACEMENT (HIGH ACC	MISSING	DEGREE
256	TEMPERATURE/DRY-BULB TEMPERATURE	0.223200000000000E+003	K
257	DEW-POINT TEMPERATURE	0.218600000000000E+003	K
258	WIND DIRECTION	MISSING	DEGREE TRUE
259	WIND SPEED	MISSING	M/S
260	LONG TIME PERIOD OR DISPLACEMENT	0.149000000000000E+004	SECOND
261	EXTENDED VERTICAL SOUNDING SIGNI	0.450560000000000E+005	FLAG TABLE 8042
262	PRESSURE	0.278300000000000E+005	PA
263	GEOPOTENTIAL HEIGHT	0.949200000000000E+004	GPM
264	LATITUDE DISPLACEMENT (HIGH ACCU	MISSING	DEGREE
265	LONGITUDE DISPLACEMENT (HIGH ACC	MISSING	DEGREE
266	TEMPERATURE/DRY-BULB TEMPERATURE	0.219700000000000E+003	K
267	DEW-POINT TEMPERATURE	0.215100000000000E+003	K
268	WIND DIRECTION	MISSING	DEGREE TRUE
269	WIND SPEED	MISSING	M/S
270	LONG TIME PERIOD OR DISPLACEMENT	0.158200000000000E+004	SECOND
271	EXTENDED VERTICAL SOUNDING SIGNI	0.655360000000000E+005	FLAG TABLE 8042
272	PRESSURE	0.250000000000000E+005	PA
273	GEOPOTENTIAL HEIGHT	0.101820000000000E+005	GPM
274	LATITUDE DISPLACEMENT (HIGH ACCU	MISSING	DEGREE
275	LONGITUDE DISPLACEMENT (HIGH ACC	MISSING	DEGREE
276	TEMPERATURE/DRY-BULB TEMPERATURE	0.220300000000000E+003	K
277	DEW-POINT TEMPERATURE	0.206300000000000E+003	K
278	WIND DIRECTION	MISSING	DEGREE TRUE
279	WIND SPEED	MISSING	M/S
280	LONG TIME PERIOD OR DISPLACEMENT	0.159500000000000E+004	SECOND
281	EXTENDED VERTICAL SOUNDING SIGNI	0.409600000000000E+004	FLAG TABLE 8042
282	PRESSURE	0.246600000000000E+005	PA
283	GEOPOTENTIAL HEIGHT	0.102700000000000E+005	GPM
284	LATITUDE DISPLACEMENT (HIGH ACCU	MISSING	DEGREE
285	LONGITUDE DISPLACEMENT (HIGH ACC	MISSING	DEGREE
286	TEMPERATURE/DRY-BULB TEMPERATURE	0.219800000000000E+003	K
287	DEW-POINT TEMPERATURE	0.204200000000000E+003	K
288	WIND DIRECTION	MISSING	DEGREE TRUE
289	WIND SPEED	MISSING	M/S
290	LONG TIME PERIOD OR DISPLACEMENT	0.161500000000000E+004	SECOND
291	EXTENDED VERTICAL SOUNDING SIGNI	0.208000000000000E+004	FLAG TABLE 8042
292	PRESSURE	0.241800000000000E+005	PA
293	GEOPOTENTIAL HEIGHT	0.103980000000000E+005	GPM
294	LATITUDE DISPLACEMENT (HIGH ACCU	-0.360000000000000E+000	DEGREE
295	LONGITUDE DISPLACEMENT (HIGH ACC	0.260000000000000E+000	DEGREE
296	TEMPERATURE/DRY-BULB TEMPERATURE	0.219700000000000E+003	K
297	DEW-POINT TEMPERATURE	0.202500000000000E+003	K
298	WIND DIRECTION	0.341000000000000E+003	DEGREE TRUE
299	WIND SPEED	0.509000000000000E+002	M/S
300	LONG TIME PERIOD OR DISPLACEMENT	0.179000000000000E+004	SECOND
301	EXTENDED VERTICAL SOUNDING SIGNI	0.204800000000000E+004	FLAG TABLE 8042
302	PRESSURE	0.206200000000000E+005	PA
303	GEOPOTENTIAL HEIGHT	0.114340000000000E+005	GPM
304	LATITUDE DISPLACEMENT (HIGH ACCU	-0.430000000000000E+000	DEGREE
305	LONGITUDE DISPLACEMENT (HIGH ACC	0.300000000000000E+000	DEGREE
306	TEMPERATURE/DRY-BULB TEMPERATURE	0.223200000000000E+003	K
307	DEW-POINT TEMPERATURE	0.193000000000000E+003	K
308	WIND DIRECTION	0.333000000000000E+003	DEGREE TRUE
309	WIND SPEED	0.322000000000000E+002	M/S
310	LONG TIME PERIOD OR DISPLACEMENT	0.180500000000000E+004	SECOND
311	EXTENDED VERTICAL SOUNDING SIGNI	0.819200000000000E+004	FLAG TABLE 8042
312	PRESSURE	0.203200000000000E+005	PA
313	GEOPOTENTIAL HEIGHT	0.115270000000000E+005	GPM

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314 LATITUDE DISPLACEMENT (HIGH ACCU -0.43000000000000E+000 DEGREE
315 LONGITUDE DISPLACEMENT (HIGH ACC 0.30000000000000E+000 DEGREE
316 TEMPERATURE/DRY-BULB TEMPERATURE 0.22360000000000E+003 K
317 DEW-POINT TEMPERATURE 0.19260000000000E+003 K
318 WIND DIRECTION 0.33300000000000E+003 DEGREE TRUE
319 WIND SPEED 0.32600000000000E+002 M/S
320 LONG TIME PERIOD OR DISPLACEMENT 0.18210000000000E+004 SECOND
321 EXTENDED VERTICAL SOUNDING SIGNI 0.65536000000000E+005 FLAG TABLE 8042
322 PRESSURE 0.20000000000000E+005 PA
323 GEOPOTENTIAL HEIGHT 0.11632000000000E+005 GPM
324 LATITUDE DISPLACEMENT (HIGH ACCU -0.43000000000000E+000 DEGREE
325 LONGITUDE DISPLACEMENT (HIGH ACC 0.30000000000000E+000 DEGREE
326 TEMPERATURE/DRY-BULB TEMPERATURE 0.22330000000000E+003 K
327 DEW-POINT TEMPERATURE 0.18950000000000E+003 K
328 WIND DIRECTION 0.33300000000000E+003 DEGREE TRUE
329 WIND SPEED 0.33700000000000E+002 M/S
330 LONG TIME PERIOD OR DISPLACEMENT 0.18550000000000E+004 SECOND
331 EXTENDED VERTICAL SOUNDING SIGNI 0.18432000000000E+005 FLAG TABLE 8042
332 PRESSURE 0.19260000000000E+005 PA
333 GEOPOTENTIAL HEIGHT 0.11876000000000E+005 GPM
334 LATITUDE DISPLACEMENT (HIGH ACCU -0.44000000000000E+000 DEGREE
335 LONGITUDE DISPLACEMENT (HIGH ACC 0.31000000000000E+000 DEGREE
336 TEMPERATURE/DRY-BULB TEMPERATURE 0.22160000000000E+003 K
337 DEW-POINT TEMPERATURE 0.19010000000000E+003 K
338 WIND DIRECTION 0.33400000000000E+003 DEGREE TRUE
339 WIND SPEED 0.35800000000000E+002 M/S
340 LONG TIME PERIOD OR DISPLACEMENT 0.18750000000000E+004 SECOND
341 EXTENDED VERTICAL SOUNDING SIGNI 0.81920000000000E+004 FLAG TABLE 8042
342 PRESSURE 0.18850000000000E+005 PA
343 GEOPOTENTIAL HEIGHT 0.12018000000000E+005 GPM
344 LATITUDE DISPLACEMENT (HIGH ACCU -0.45000000000000E+000 DEGREE
345 LONGITUDE DISPLACEMENT (HIGH ACC 0.31000000000000E+000 DEGREE
346 TEMPERATURE/DRY-BULB TEMPERATURE 0.22060000000000E+003 K
347 DEW-POINT TEMPERATURE 0.18970000000000E+003 K
348 WIND DIRECTION 0.33600000000000E+003 DEGREE TRUE
349 WIND SPEED 0.34000000000000E+002 M/S
350 LONG TIME PERIOD OR DISPLACEMENT 0.19200000000000E+004 SECOND
351 EXTENDED VERTICAL SOUNDING SIGNI 0.81920000000000E+004 FLAG TABLE 8042
352 PRESSURE 0.17810000000000E+005 PA
353 GEOPOTENTIAL HEIGHT 0.12386000000000E+005 GPM
354 LATITUDE DISPLACEMENT (HIGH ACCU -0.46000000000000E+000 DEGREE
355 LONGITUDE DISPLACEMENT (HIGH ACC 0.32000000000000E+000 DEGREE
356 TEMPERATURE/DRY-BULB TEMPERATURE 0.22250000000000E+003 K
357 DEW-POINT TEMPERATURE 0.18950000000000E+003 K
358 WIND DIRECTION 0.34000000000000E+003 DEGREE TRUE
359 WIND SPEED 0.25300000000000E+002 M/S
360 LONG TIME PERIOD OR DISPLACEMENT 0.19250000000000E+004 SECOND
361 EXTENDED VERTICAL SOUNDING SIGNI 0.20480000000000E+004 FLAG TABLE 8042
362 PRESSURE 0.17690000000000E+005 PA
363 GEOPOTENTIAL HEIGHT 0.12430000000000E+005 GPM
364 LATITUDE DISPLACEMENT (HIGH ACCU -0.46000000000000E+000 DEGREE
365 LONGITUDE DISPLACEMENT (HIGH ACC 0.32000000000000E+000 DEGREE
366 TEMPERATURE/DRY-BULB TEMPERATURE 0.22210000000000E+003 K
367 DEW-POINT TEMPERATURE 0.18910000000000E+003 K
368 WIND DIRECTION 0.34000000000000E+003 DEGREE TRUE
369 WIND SPEED 0.24500000000000E+002 M/S
370 LONG TIME PERIOD OR DISPLACEMENT 0.19650000000000E+004 SECOND
371 EXTENDED VERTICAL SOUNDING SIGNI 0.20480000000000E+004 FLAG TABLE 8042
372 PRESSURE 0.17010000000000E+005 PA
373 GEOPOTENTIAL HEIGHT 0.12684000000000E+005 GPM
374 LATITUDE DISPLACEMENT (HIGH ACCU -0.47000000000000E+000 DEGREE
375 LONGITUDE DISPLACEMENT (HIGH ACC 0.33000000000000E+000 DEGREE
376 TEMPERATURE/DRY-BULB TEMPERATURE 0.22100000000000E+003 K
377 DEW-POINT TEMPERATURE 0.18790000000000E+003 K
378 WIND DIRECTION 0.33100000000000E+003 DEGREE TRUE
379 WIND SPEED 0.21700000000000E+002 M/S
380 LONG TIME PERIOD OR DISPLACEMENT 0.20200000000000E+004 SECOND
381 EXTENDED VERTICAL SOUNDING SIGNI 0.20480000000000E+004 FLAG TABLE 8042
382 PRESSURE 0.16140000000000E+005 PA
383 GEOPOTENTIAL HEIGHT 0.13022000000000E+005 GPM
384 LATITUDE DISPLACEMENT (HIGH ACCU -0.48000000000000E+000 DEGREE
385 LONGITUDE DISPLACEMENT (HIGH ACC 0.34000000000000E+000 DEGREE
386 TEMPERATURE/DRY-BULB TEMPERATURE 0.22130000000000E+003 K
387 DEW-POINT TEMPERATURE 0.18810000000000E+003 K
388 WIND DIRECTION 0.32000000000000E+003 DEGREE TRUE
389 WIND SPEED 0.24400000000000E+002 M/S
390 LONG TIME PERIOD OR DISPLACEMENT 0.20850000000000E+004 SECOND
391 EXTENDED VERTICAL SOUNDING SIGNI 0.81920000000000E+004 FLAG TABLE 8042
392 PRESSURE 0.15270000000000E+005 PA
393 GEOPOTENTIAL HEIGHT 0.13382000000000E+005 GPM
394 LATITUDE DISPLACEMENT (HIGH ACCU -0.49000000000000E+000 DEGREE
395 LONGITUDE DISPLACEMENT (HIGH ACC 0.35000000000000E+000 DEGREE
396 TEMPERATURE/DRY-BULB TEMPERATURE 0.22180000000000E+003 K
397 DEW-POINT TEMPERATURE 0.18840000000000E+003 K
398 WIND DIRECTION 0.32700000000000E+003 DEGREE TRUE
399 WIND SPEED 0.30300000000000E+002 M/S
400 LONG TIME PERIOD OR DISPLACEMENT 0.21050000000000E+004 SECOND
401 EXTENDED VERTICAL SOUNDING SIGNI 0.65536000000000E+005 FLAG TABLE 8042
402 PRESSURE 0.15000000000000E+005 PA
403 GEOPOTENTIAL HEIGHT 0.13498000000000E+005 GPM
404 LATITUDE DISPLACEMENT (HIGH ACCU -0.50000000000000E+000 DEGREE
405 LONGITUDE DISPLACEMENT (HIGH ACC 0.35000000000000E+000 DEGREE
406 TEMPERATURE/DRY-BULB TEMPERATURE 0.22140000000000E+003 K

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407 DEW-POINT TEMPERATURE	0.18810000000000E+003 K
408 WIND DIRECTION	0.33100000000000E+003 DEGREE TRUE
409 WIND SPEED	0.31600000000000E+002 M/S
410 LONG TIME PERIOD OR DISPLACEMENT	0.21450000000000E+004 SECOND
411 EXTENDED VERTICAL SOUNDING SIGNI	0.20480000000000E+004 FLAG TABLE 8042
412 PRESSURE	0.14510000000000E+005 PA
413 GEOPOTENTIAL HEIGHT	0.13711000000000E+005 GPM
414 LATITUDE DISPLACEMENT (HIGH ACCU	-0.51000000000000E+000 DEGREE
415 LONGITUDE DISPLACEMENT (HIGH ACC	0.36000000000000E+000 DEGREE
416 TEMPERATURE/DRY-BULB TEMPERATURE	0.22020000000000E+003 K
417 DEW-POINT TEMPERATURE	0.18730000000000E+003 K
418 WIND DIRECTION	0.33500000000000E+003 DEGREE TRUE
419 WIND SPEED	0.30800000000000E+002 M/S
420 LONG TIME PERIOD OR DISPLACEMENT	0.22750000000000E+004 SECOND
421 EXTENDED VERTICAL SOUNDING SIGNI	0.81920000000000E+004 FLAG TABLE 8042
422 PRESSURE	0.12800000000000E+005 PA
423 GEOPOTENTIAL HEIGHT	0.14510000000000E+005 GPM
424 LATITUDE DISPLACEMENT (HIGH ACCU	-0.54000000000000E+000 DEGREE
425 LONGITUDE DISPLACEMENT (HIGH ACC	0.40000000000000E+000 DEGREE
426 TEMPERATURE/DRY-BULB TEMPERATURE	0.21550000000000E+003 K
427 DEW-POINT TEMPERATURE	0.18400000000000E+003 K
428 WIND DIRECTION	0.31700000000000E+003 DEGREE TRUE
429 WIND SPEED	0.38000000000000E+002 M/S
430 LONG TIME PERIOD OR DISPLACEMENT	0.22800000000000E+004 SECOND
431 EXTENDED VERTICAL SOUNDING SIGNI	0.18432000000000E+005 FLAG TABLE 8042
432 PRESSURE	0.12750000000000E+005 PA
433 GEOPOTENTIAL HEIGHT	0.14538000000000E+005 GPM
434 LATITUDE DISPLACEMENT (HIGH ACCU	-0.54000000000000E+000 DEGREE
435 LONGITUDE DISPLACEMENT (HIGH ACC	0.40000000000000E+000 DEGREE
436 TEMPERATURE/DRY-BULB TEMPERATURE	0.21560000000000E+003 K
437 DEW-POINT TEMPERATURE	0.18400000000000E+003 K
438 WIND DIRECTION	0.31700000000000E+003 DEGREE TRUE
439 WIND SPEED	0.38000000000000E+002 M/S
440 LONG TIME PERIOD OR DISPLACEMENT	0.23400000000000E+004 SECOND
441 EXTENDED VERTICAL SOUNDING SIGNI	0.81920000000000E+004 FLAG TABLE 8042
442 PRESSURE	0.12040000000000E+005 PA
443 GEOPOTENTIAL HEIGHT	0.14901000000000E+005 GPM
444 LATITUDE DISPLACEMENT (HIGH ACCU	-0.55000000000000E+000 DEGREE
445 LONGITUDE DISPLACEMENT (HIGH ACC	0.41000000000000E+000 DEGREE
446 TEMPERATURE/DRY-BULB TEMPERATURE	0.21770000000000E+003 K
447 DEW-POINT TEMPERATURE	0.18580000000000E+003 K
448 WIND DIRECTION	0.32500000000000E+003 DEGREE TRUE
449 WIND SPEED	0.28400000000000E+002 M/S
450 LONG TIME PERIOD OR DISPLACEMENT	0.24300000000000E+004 SECOND
451 EXTENDED VERTICAL SOUNDING SIGNI	0.20480000000000E+004 FLAG TABLE 8042
452 PRESSURE	0.11090000000000E+005 PA
453 GEOPOTENTIAL HEIGHT	0.15421000000000E+005 GPM
454 LATITUDE DISPLACEMENT (HIGH ACCU	-0.57000000000000E+000 DEGREE
455 LONGITUDE DISPLACEMENT (HIGH ACC	0.43000000000000E+000 DEGREE
456 TEMPERATURE/DRY-BULB TEMPERATURE	0.21490000000000E+003 K
457 DEW-POINT TEMPERATURE	0.18360000000000E+003 K
458 WIND DIRECTION	0.33200000000000E+003 DEGREE TRUE
459 WIND SPEED	0.21600000000000E+002 M/S
460 LONG TIME PERIOD OR DISPLACEMENT	0.25450000000000E+004 SECOND
461 EXTENDED VERTICAL SOUNDING SIGNI	0.79872000000000E+005 FLAG TABLE 8042
462 PRESSURE	0.10000000000000E+005 PA
463 GEOPOTENTIAL HEIGHT	0.16066000000000E+005 GPM
464 LATITUDE DISPLACEMENT (HIGH ACCU	-0.59000000000000E+000 DEGREE
465 LONGITUDE DISPLACEMENT (HIGH ACC	0.45000000000000E+000 DEGREE
466 TEMPERATURE/DRY-BULB TEMPERATURE	0.21100000000000E+003 K
467 DEW-POINT TEMPERATURE	0.18300000000000E+003 K
468 WIND DIRECTION	0.31900000000000E+003 DEGREE TRUE
469 WIND SPEED	0.22500000000000E+002 M/S
470 LONG TIME PERIOD OR DISPLACEMENT	0.26150000000000E+004 SECOND
471 EXTENDED VERTICAL SOUNDING SIGNI	0.40960000000000E+005 FLAG TABLE 8042
472 PRESSURE	0.94400000000000E+004 PA
473 GEOPOTENTIAL HEIGHT	0.16421000000000E+005 GPM
474 LATITUDE DISPLACEMENT (HIGH ACCU	-0.60000000000000E+000 DEGREE
475 LONGITUDE DISPLACEMENT (HIGH ACC	0.46000000000000E+000 DEGREE
476 TEMPERATURE/DRY-BULB TEMPERATURE	0.20990000000000E+003 K
477 DEW-POINT TEMPERATURE	0.18280000000000E+003 K
478 WIND DIRECTION	0.31600000000000E+003 DEGREE TRUE
479 WIND SPEED	0.20100000000000E+002 M/S
480 LONG TIME PERIOD OR DISPLACEMENT	0.26300000000000E+004 SECOND
481 EXTENDED VERTICAL SOUNDING SIGNI	0.81920000000000E+004 FLAG TABLE 8042
482 PRESSURE	0.93100000000000E+004 PA
483 GEOPOTENTIAL HEIGHT	0.16507000000000E+005 GPM
484 LATITUDE DISPLACEMENT (HIGH ACCU	-0.60000000000000E+000 DEGREE
485 LONGITUDE DISPLACEMENT (HIGH ACC	0.47000000000000E+000 DEGREE
486 TEMPERATURE/DRY-BULB TEMPERATURE	0.21080000000000E+003 K
487 DEW-POINT TEMPERATURE	0.18330000000000E+003 K
488 WIND DIRECTION	0.31300000000000E+003 DEGREE TRUE
489 WIND SPEED	0.19000000000000E+002 M/S
490 LONG TIME PERIOD OR DISPLACEMENT	0.26550000000000E+004 SECOND
491 EXTENDED VERTICAL SOUNDING SIGNI	0.20480000000000E+004 FLAG TABLE 8042
492 PRESSURE	0.90900000000000E+004 PA
493 GEOPOTENTIAL HEIGHT	0.16650000000000E+005 GPM
494 LATITUDE DISPLACEMENT (HIGH ACCU	-0.60000000000000E+000 DEGREE
495 LONGITUDE DISPLACEMENT (HIGH ACC	0.47000000000000E+000 DEGREE
496 TEMPERATURE/DRY-BULB TEMPERATURE	0.21020000000000E+003 K
497 DEW-POINT TEMPERATURE	0.18320000000000E+003 K
498 WIND DIRECTION	0.30800000000000E+003 DEGREE TRUE
499 WIND SPEED	0.17700000000000E+002 M/S

500	LONG TIME PERIOD OR DISPLACEMENT	0.279000000000000E+004	SECOND
501	EXTENDED VERTICAL SOUNDING SIGNI	0.204800000000000E+004	FLAG TABLE 8042
502	PRESSURE	0.803000000000000E+004	PA
503	GEOPOTENTIAL HEIGHT	0.174140000000000E+005	GPM
504	LATITUDE DISPLACEMENT (HIGH ACCU	-0.620000000000000E+000	DEGREE
505	LONGITUDE DISPLACEMENT (HIGH ACC	0.500000000000000E+000	DEGREE
506	TEMPERATURE/DRY-BULB TEMPERATURE	0.210100000000000E+003	K
507	DEW-POINT TEMPERATURE	0.183100000000000E+003	K
508	WIND DIRECTION	0.322000000000000E+003	DEGREE TRUE
509	WIND SPEED	0.245000000000000E+002	M/S
510	LONG TIME PERIOD OR DISPLACEMENT	0.292000000000000E+004	SECOND
511	EXTENDED VERTICAL SOUNDING SIGNI	0.204800000000000E+004	FLAG TABLE 8042
512	PRESSURE	0.704000000000000E+004	PA
513	GEOPOTENTIAL HEIGHT	0.182160000000000E+005	GPM
514	LATITUDE DISPLACEMENT (HIGH ACCU	-0.640000000000000E+000	DEGREE
515	LONGITUDE DISPLACEMENT (HIGH ACC	0.520000000000000E+000	DEGREE
516	TEMPERATURE/DRY-BULB TEMPERATURE	0.207300000000000E+003	K
517	DEW-POINT TEMPERATURE	0.180500000000000E+003	K
518	WIND DIRECTION	0.338000000000000E+003	DEGREE TRUE
519	WIND SPEED	0.169000000000000E+002	M/S
520	LONG TIME PERIOD OR DISPLACEMENT	0.292600000000000E+004	SECOND
521	EXTENDED VERTICAL SOUNDING SIGNI	0.655360000000000E+005	FLAG TABLE 8042
522	PRESSURE	0.700000000000000E+004	PA
523	GEOPOTENTIAL HEIGHT	0.182520000000000E+005	GPM
524	LATITUDE DISPLACEMENT (HIGH ACCU	-0.640000000000000E+000	DEGREE
525	LONGITUDE DISPLACEMENT (HIGH ACC	0.520000000000000E+000	DEGREE
526	TEMPERATURE/DRY-BULB TEMPERATURE	0.207100000000000E+003	K
527	DEW-POINT TEMPERATURE	0.181800000000000E+003	K
528	WIND DIRECTION	0.338000000000000E+003	DEGREE TRUE
529	WIND SPEED	0.167000000000000E+002	M/S
530	LONG TIME PERIOD OR DISPLACEMENT	0.297000000000000E+004	SECOND
531	EXTENDED VERTICAL SOUNDING SIGNI	0.819200000000000E+004	FLAG TABLE 8042
532	PRESSURE	0.671000000000000E+004	PA
533	GEOPOTENTIAL HEIGHT	0.185060000000000E+005	GPM
534	LATITUDE DISPLACEMENT (HIGH ACCU	-0.650000000000000E+000	DEGREE
535	LONGITUDE DISPLACEMENT (HIGH ACC	0.520000000000000E+000	DEGREE
536	TEMPERATURE/DRY-BULB TEMPERATURE	0.205300000000000E+003	K
537	DEW-POINT TEMPERATURE	0.179300000000000E+003	K
538	WIND DIRECTION	0.332000000000000E+003	DEGREE TRUE
539	WIND SPEED	0.191000000000000E+002	M/S
540	LONG TIME PERIOD OR DISPLACEMENT	0.302500000000000E+004	SECOND
541	EXTENDED VERTICAL SOUNDING SIGNI	0.204800000000000E+004	FLAG TABLE 8042
542	PRESSURE	0.638000000000000E+004	PA
543	GEOPOTENTIAL HEIGHT	0.188130000000000E+005	GPM
544	LATITUDE DISPLACEMENT (HIGH ACCU	-0.660000000000000E+000	DEGREE
545	LONGITUDE DISPLACEMENT (HIGH ACC	0.530000000000000E+000	DEGREE
546	TEMPERATURE/DRY-BULB TEMPERATURE	0.205800000000000E+003	K
547	DEW-POINT TEMPERATURE	0.179800000000000E+003	K
548	WIND DIRECTION	0.331000000000000E+003	DEGREE TRUE
549	WIND SPEED	0.233000000000000E+002	M/S
550	LONG TIME PERIOD OR DISPLACEMENT	0.316000000000000E+004	SECOND
551	EXTENDED VERTICAL SOUNDING SIGNI	0.204800000000000E+004	FLAG TABLE 8042
552	PRESSURE	0.550000000000000E+004	PA
553	GEOPOTENTIAL HEIGHT	0.197040000000000E+005	GPM
554	LATITUDE DISPLACEMENT (HIGH ACCU	-0.680000000000000E+000	DEGREE
555	LONGITUDE DISPLACEMENT (HIGH ACC	0.550000000000000E+000	DEGREE
556	TEMPERATURE/DRY-BULB TEMPERATURE	0.207100000000000E+003	K
557	DEW-POINT TEMPERATURE	0.180600000000000E+003	K
558	WIND DIRECTION	0.330000000000000E+003	DEGREE TRUE
559	WIND SPEED	0.184000000000000E+002	M/S
560	LONG TIME PERIOD OR DISPLACEMENT	0.324700000000000E+004	SECOND
561	EXTENDED VERTICAL SOUNDING SIGNI	0.655360000000000E+005	FLAG TABLE 8042
562	PRESSURE	0.500000000000000E+004	PA
563	GEOPOTENTIAL HEIGHT	0.202860000000000E+005	GPM
564	LATITUDE DISPLACEMENT (HIGH ACCU	-0.690000000000000E+000	DEGREE
565	LONGITUDE DISPLACEMENT (HIGH ACC	0.560000000000000E+000	DEGREE
566	TEMPERATURE/DRY-BULB TEMPERATURE	0.206600000000000E+003	K
567	DEW-POINT TEMPERATURE	0.180000000000000E+003	K
568	WIND DIRECTION	0.301000000000000E+003	DEGREE TRUE
569	WIND SPEED	0.123000000000000E+002	M/S
570	LONG TIME PERIOD OR DISPLACEMENT	0.326500000000000E+004	SECOND
571	EXTENDED VERTICAL SOUNDING SIGNI	0.204800000000000E+004	FLAG TABLE 8042
572	PRESSURE	0.489000000000000E+004	PA
573	GEOPOTENTIAL HEIGHT	0.204170000000000E+005	GPM
574	LATITUDE DISPLACEMENT (HIGH ACCU	-0.690000000000000E+000	DEGREE
575	LONGITUDE DISPLACEMENT (HIGH ACC	0.560000000000000E+000	DEGREE
576	TEMPERATURE/DRY-BULB TEMPERATURE	0.206700000000000E+003	K
577	DEW-POINT TEMPERATURE	0.179500000000000E+003	K
578	WIND DIRECTION	0.295000000000000E+003	DEGREE TRUE
579	WIND SPEED	0.136000000000000E+002	M/S
580	LONG TIME PERIOD OR DISPLACEMENT	0.338500000000000E+004	SECOND
581	EXTENDED VERTICAL SOUNDING SIGNI	0.204800000000000E+004	FLAG TABLE 8042
582	PRESSURE	0.442000000000000E+004	PA
583	GEOPOTENTIAL HEIGHT	0.210380000000000E+005	GPM
584	LATITUDE DISPLACEMENT (HIGH ACCU	-0.700000000000000E+000	DEGREE
585	LONGITUDE DISPLACEMENT (HIGH ACC	0.580000000000000E+000	DEGREE
586	TEMPERATURE/DRY-BULB TEMPERATURE	0.207700000000000E+003	K
587	DEW-POINT TEMPERATURE	0.180000000000000E+003	K
588	WIND DIRECTION	0.317000000000000E+003	DEGREE TRUE
589	WIND SPEED	0.101000000000000E+002	M/S
590	LONG TIME PERIOD OR DISPLACEMENT	0.341500000000000E+004	SECOND
591	EXTENDED VERTICAL SOUNDING SIGNI	0.204800000000000E+004	FLAG TABLE 8042
592	PRESSURE	0.429000000000000E+004	PA

593	GEOPOTENTIAL HEIGHT	0.212230000000000E+005	GPM
594	LATITUDE DISPLACEMENT (HIGH ACCU	-0.700000000000000E+000	DEGREE
595	LONGITUDE DISPLACEMENT (HIGH ACC	0.580000000000000E+000	DEGREE
596	TEMPERATURE/DRY-BULB TEMPERATURE	0.208000000000000E+003	K
597	DEW-POINT TEMPERATURE	0.180100000000000E+003	K
598	WIND DIRECTION	0.305000000000000E+003	DEGREE TRUE
599	WIND SPEED	0.910000000000000E+001	M/S
600	LONG TIME PERIOD OR DISPLACEMENT	0.346500000000000E+004	SECOND
601	EXTENDED VERTICAL SOUNDING SIGNI	0.819200000000000E+004	FLAG TABLE 8042
602	PRESSURE	0.405000000000000E+004	PA
603	GEOPOTENTIAL HEIGHT	0.215740000000000E+005	GPM
604	LATITUDE DISPLACEMENT (HIGH ACCU	-0.700000000000000E+000	DEGREE
605	LONGITUDE DISPLACEMENT (HIGH ACC	0.590000000000000E+000	DEGREE
606	TEMPERATURE/DRY-BULB TEMPERATURE	0.209800000000000E+003	K
607	DEW-POINT TEMPERATURE	0.180500000000000E+003	K
608	WIND DIRECTION	0.267000000000000E+003	DEGREE TRUE
609	WIND SPEED	0.105000000000000E+002	M/S
610	LONG TIME PERIOD OR DISPLACEMENT	0.349000000000000E+004	SECOND
611	EXTENDED VERTICAL SOUNDING SIGNI	0.204800000000000E+004	FLAG TABLE 8042
612	PRESSURE	0.393000000000000E+004	PA
613	GEOPOTENTIAL HEIGHT	0.217560000000000E+005	GPM
614	LATITUDE DISPLACEMENT (HIGH ACCU	-0.700000000000000E+000	DEGREE
615	LONGITUDE DISPLACEMENT (HIGH ACC	0.590000000000000E+000	DEGREE
616	TEMPERATURE/DRY-BULB TEMPERATURE	0.208400000000000E+003	K
617	DEW-POINT TEMPERATURE	0.179900000000000E+003	K
618	WIND DIRECTION	0.253000000000000E+003	DEGREE TRUE
619	WIND SPEED	0.118000000000000E+002	M/S
620	LONG TIME PERIOD OR DISPLACEMENT	0.360000000000000E+004	SECOND
621	EXTENDED VERTICAL SOUNDING SIGNI	0.409600000000000E+005	FLAG TABLE 8042
622	PRESSURE	0.350000000000000E+004	PA
623	GEOPOTENTIAL HEIGHT	0.224600000000000E+005	GPM
624	LATITUDE DISPLACEMENT (HIGH ACCU	-0.700000000000000E+000	DEGREE
625	LONGITUDE DISPLACEMENT (HIGH ACC	0.620000000000000E+000	DEGREE
626	TEMPERATURE/DRY-BULB TEMPERATURE	0.204800000000000E+003	K
627	DEW-POINT TEMPERATURE	0.177900000000000E+003	K
628	WIND DIRECTION	0.275000000000000E+003	DEGREE TRUE
629	WIND SPEED	0.192000000000000E+002	M/S
630	LONG TIME PERIOD OR DISPLACEMENT	0.369500000000000E+004	SECOND
631	EXTENDED VERTICAL SOUNDING SIGNI	0.204800000000000E+004	FLAG TABLE 8042
632	PRESSURE	0.318000000000000E+004	PA
633	GEOPOTENTIAL HEIGHT	0.230230000000000E+005	GPM
634	LATITUDE DISPLACEMENT (HIGH ACCU	-0.700000000000000E+000	DEGREE
635	LONGITUDE DISPLACEMENT (HIGH ACC	0.640000000000000E+000	DEGREE
636	TEMPERATURE/DRY-BULB TEMPERATURE	0.207300000000000E+003	K
637	DEW-POINT TEMPERATURE	0.179000000000000E+003	K
638	WIND DIRECTION	0.295000000000000E+003	DEGREE TRUE
639	WIND SPEED	0.203000000000000E+002	M/S
640	LONG TIME PERIOD OR DISPLACEMENT	0.375200000000000E+004	SECOND
641	EXTENDED VERTICAL SOUNDING SIGNI	0.655360000000000E+005	FLAG TABLE 8042
642	PRESSURE	0.300000000000000E+004	PA
643	GEOPOTENTIAL HEIGHT	0.233840000000000E+005	GPM
644	LATITUDE DISPLACEMENT (HIGH ACCU	-0.710000000000000E+000	DEGREE
645	LONGITUDE DISPLACEMENT (HIGH ACC	0.660000000000000E+000	DEGREE
646	TEMPERATURE/DRY-BULB TEMPERATURE	0.208300000000000E+003	K
647	DEW-POINT TEMPERATURE	0.178800000000000E+003	K
648	WIND DIRECTION	0.291000000000000E+003	DEGREE TRUE
649	WIND SPEED	0.175000000000000E+002	M/S
650	LONG TIME PERIOD OR DISPLACEMENT	0.382000000000000E+004	SECOND
651	EXTENDED VERTICAL SOUNDING SIGNI	0.204800000000000E+004	FLAG TABLE 8042
652	PRESSURE	0.280000000000000E+004	PA
653	GEOPOTENTIAL HEIGHT	0.238130000000000E+005	GPM
654	LATITUDE DISPLACEMENT (HIGH ACCU	-0.710000000000000E+000	DEGREE
655	LONGITUDE DISPLACEMENT (HIGH ACC	0.680000000000000E+000	DEGREE
656	TEMPERATURE/DRY-BULB TEMPERATURE	0.209300000000000E+003	K
657	DEW-POINT TEMPERATURE	0.180000000000000E+003	K
658	WIND DIRECTION	0.280000000000000E+003	DEGREE TRUE
659	WIND SPEED	0.248000000000000E+002	M/S
660	LONG TIME PERIOD OR DISPLACEMENT	0.385500000000000E+004	SECOND
661	EXTENDED VERTICAL SOUNDING SIGNI	0.819200000000000E+004	FLAG TABLE 8042
662	PRESSURE	0.271000000000000E+004	PA
663	GEOPOTENTIAL HEIGHT	0.240150000000000E+005	GPM
664	LATITUDE DISPLACEMENT (HIGH ACCU	-0.710000000000000E+000	DEGREE
665	LONGITUDE DISPLACEMENT (HIGH ACC	0.690000000000000E+000	DEGREE
666	TEMPERATURE/DRY-BULB TEMPERATURE	0.210400000000000E+003	K
667	DEW-POINT TEMPERATURE	0.180400000000000E+003	K
668	WIND DIRECTION	0.287000000000000E+003	DEGREE TRUE
669	WIND SPEED	0.222000000000000E+002	M/S
670	LONG TIME PERIOD OR DISPLACEMENT	0.390500000000000E+004	SECOND
671	EXTENDED VERTICAL SOUNDING SIGNI	0.204800000000000E+004	FLAG TABLE 8042
672	PRESSURE	0.257000000000000E+004	PA
673	GEOPOTENTIAL HEIGHT	0.243240000000000E+005	GPM
674	LATITUDE DISPLACEMENT (HIGH ACCU	-0.720000000000000E+000	DEGREE
675	LONGITUDE DISPLACEMENT (HIGH ACC	0.700000000000000E+000	DEGREE
676	TEMPERATURE/DRY-BULB TEMPERATURE	0.210000000000000E+003	K
677	DEW-POINT TEMPERATURE	0.180000000000000E+003	K
678	WIND DIRECTION	0.297000000000000E+003	DEGREE TRUE
679	WIND SPEED	0.188000000000000E+002	M/S
680	LONG TIME PERIOD OR DISPLACEMENT	0.395500000000000E+004	SECOND
681	EXTENDED VERTICAL SOUNDING SIGNI	0.819200000000000E+004	FLAG TABLE 8042
682	PRESSURE	0.243000000000000E+004	PA
683	GEOPOTENTIAL HEIGHT	0.246690000000000E+005	GPM
684	LATITUDE DISPLACEMENT (HIGH ACCU	-0.720000000000000E+000	DEGREE
685	LONGITUDE DISPLACEMENT (HIGH ACC	0.710000000000000E+000	DEGREE

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686 TEMPERATURE/DRY-BULB TEMPERATURE 0.20860000000000E+003 K
687 DEW-POINT TEMPERATURE 0.17950000000000E+003 K
688 WIND DIRECTION 0.28600000000000E+003 DEGREE TRUE
689 WIND SPEED 0.20300000000000E+002 M/S
690 LONG TIME PERIOD OR DISPLACEMENT 0.40650000000000E+004 SECOND
691 EXTENDED VERTICAL SOUNDING SIGNI 0.20480000000000E+004 FLAG TABLE 8042
692 PRESSURE 0.21600000000000E+004 PA
693 GEOPOTENTIAL HEIGHT 0.25414000000000E+005 GPM
694 LATITUDE DISPLACEMENT (HIGH ACCU -0.72000000000000E+000 DEGREE
695 LONGITUDE DISPLACEMENT (HIGH ACC 0.74000000000000E+000 DEGREE
696 TEMPERATURE/DRY-BULB TEMPERATURE 0.21040000000000E+003 K
697 DEW-POINT TEMPERATURE 0.18030000000000E+003 K
698 WIND DIRECTION 0.26600000000000E+003 DEGREE TRUE
699 WIND SPEED 0.16000000000000E+002 M/S
700 LONG TIME PERIOD OR DISPLACEMENT 0.41000000000000E+004 SECOND
701 EXTENDED VERTICAL SOUNDING SIGNI 0.81920000000000E+004 FLAG TABLE 8042
702 PRESSURE 0.20700000000000E+004 PA
703 GEOPOTENTIAL HEIGHT 0.25648000000000E+005 GPM
704 LATITUDE DISPLACEMENT (HIGH ACCU -0.72000000000000E+000 DEGREE
705 LONGITUDE DISPLACEMENT (HIGH ACC 0.75000000000000E+000 DEGREE
706 TEMPERATURE/DRY-BULB TEMPERATURE 0.21100000000000E+003 K
707 DEW-POINT TEMPERATURE 0.18080000000000E+003 K
708 WIND DIRECTION 0.25400000000000E+003 DEGREE TRUE
709 WIND SPEED 0.16400000000000E+002 M/S
710 LONG TIME PERIOD OR DISPLACEMENT 0.41350000000000E+004 SECOND
711 EXTENDED VERTICAL SOUNDING SIGNI 0.65536000000000E+005 FLAG TABLE 8042
712 PRESSURE 0.20000000000000E+004 PA
713 GEOPOTENTIAL HEIGHT 0.25873000000000E+005 GPM
714 LATITUDE DISPLACEMENT (HIGH ACCU -0.72000000000000E+000 DEGREE
715 LONGITUDE DISPLACEMENT (HIGH ACC 0.76000000000000E+000 DEGREE
716 TEMPERATURE/DRY-BULB TEMPERATURE 0.20960000000000E+003 K
717 DEW-POINT TEMPERATURE 0.18030000000000E+003 K
718 WIND DIRECTION 0.24200000000000E+003 DEGREE TRUE
719 WIND SPEED 0.17400000000000E+002 M/S
720 LONG TIME PERIOD OR DISPLACEMENT 0.41600000000000E+004 SECOND
721 EXTENDED VERTICAL SOUNDING SIGNI 0.20480000000000E+004 FLAG TABLE 8042
722 PRESSURE 0.19500000000000E+004 PA
723 GEOPOTENTIAL HEIGHT 0.26029000000000E+005 GPM
724 LATITUDE DISPLACEMENT (HIGH ACCU -0.72000000000000E+000 DEGREE
725 LONGITUDE DISPLACEMENT (HIGH ACC 0.76000000000000E+000 DEGREE
726 TEMPERATURE/DRY-BULB TEMPERATURE 0.20870000000000E+003 K
727 DEW-POINT TEMPERATURE 0.17980000000000E+003 K
728 WIND DIRECTION 0.23600000000000E+003 DEGREE TRUE
729 WIND SPEED 0.18000000000000E+002 M/S
730 LONG TIME PERIOD OR DISPLACEMENT 0.42400000000000E+004 SECOND
731 EXTENDED VERTICAL SOUNDING SIGNI 0.40960000000000E+005 FLAG TABLE 8042
732 PRESSURE 0.17900000000000E+004 PA
733 GEOPOTENTIAL HEIGHT 0.26534000000000E+005 GPM
734 LATITUDE DISPLACEMENT (HIGH ACCU -0.71000000000000E+000 DEGREE
735 LONGITUDE DISPLACEMENT (HIGH ACC 0.78000000000000E+000 DEGREE
736 TEMPERATURE/DRY-BULB TEMPERATURE 0.20700000000000E+003 K
737 DEW-POINT TEMPERATURE 0.17900000000000E+003 K
738 WIND DIRECTION 0.24500000000000E+003 DEGREE TRUE
739 WIND SPEED 0.21000000000000E+002 M/S
740 LONG TIME PERIOD OR DISPLACEMENT 0.43750000000000E+004 SECOND
741 EXTENDED VERTICAL SOUNDING SIGNI 0.20480000000000E+004 FLAG TABLE 8042
742 PRESSURE 0.15800000000000E+004 PA
743 GEOPOTENTIAL HEIGHT 0.27312000000000E+005 GPM
744 LATITUDE DISPLACEMENT (HIGH ACCU -0.70000000000000E+000 DEGREE
745 LONGITUDE DISPLACEMENT (HIGH ACC 0.82000000000000E+000 DEGREE
746 TEMPERATURE/DRY-BULB TEMPERATURE 0.20970000000000E+003 K
747 DEW-POINT TEMPERATURE 0.18060000000000E+003 K
748 WIND DIRECTION 0.26500000000000E+003 DEGREE TRUE
749 WIND SPEED 0.23400000000000E+002 M/S
750 LONG TIME PERIOD OR DISPLACEMENT 0.45800000000000E+004 SECOND
751 EXTENDED VERTICAL SOUNDING SIGNI 0.81920000000000E+004 FLAG TABLE 8042
752 PRESSURE 0.12600000000000E+004 PA
753 GEOPOTENTIAL HEIGHT 0.28722000000000E+005 GPM
754 LATITUDE DISPLACEMENT (HIGH ACCU -0.69000000000000E+000 DEGREE
755 LONGITUDE DISPLACEMENT (HIGH ACC 0.90000000000000E+000 DEGREE
756 TEMPERATURE/DRY-BULB TEMPERATURE 0.21220000000000E+003 K
757 DEW-POINT TEMPERATURE 0.18220000000000E+003 K
758 WIND DIRECTION 0.26400000000000E+003 DEGREE TRUE
759 WIND SPEED 0.34400000000000E+002 M/S
760 LONG TIME PERIOD OR DISPLACEMENT 0.46450000000000E+004 SECOND
761 EXTENDED VERTICAL SOUNDING SIGNI 0.81920000000000E+004 FLAG TABLE 8042
762 PRESSURE 0.11700000000000E+004 PA
763 GEOPOTENTIAL HEIGHT 0.29140000000000E+005 GPM
764 LATITUDE DISPLACEMENT (HIGH ACCU -0.69000000000000E+000 DEGREE
765 LONGITUDE DISPLACEMENT (HIGH ACC 0.93000000000000E+000 DEGREE
766 TEMPERATURE/DRY-BULB TEMPERATURE 0.21090000000000E+003 K
767 DEW-POINT TEMPERATURE 0.18220000000000E+003 K
768 WIND DIRECTION 0.26800000000000E+003 DEGREE TRUE
769 WIND SPEED 0.37800000000000E+002 M/S
770 LONG TIME PERIOD OR DISPLACEMENT 0.47050000000000E+004 SECOND
771 EXTENDED VERTICAL SOUNDING SIGNI 0.81920000000000E+004 FLAG TABLE 8042
772 PRESSURE 0.10900000000000E+004 PA
773 GEOPOTENTIAL HEIGHT 0.29588000000000E+005 GPM
774 LATITUDE DISPLACEMENT (HIGH ACCU -0.69000000000000E+000 DEGREE
775 LONGITUDE DISPLACEMENT (HIGH ACC 0.96000000000000E+000 DEGREE
776 TEMPERATURE/DRY-BULB TEMPERATURE 0.21650000000000E+003 K
777 DEW-POINT TEMPERATURE 0.18470000000000E+003 K
778 WIND DIRECTION 0.26300000000000E+003 DEGREE TRUE
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779	WIND SPEED	0.392000000000000E+002	M/S
780	LONG TIME PERIOD OR DISPLACEMENT	0.478300000000000E+004	SECOND
781	EXTENDED VERTICAL SOUNDING SIGNI	0.655360000000000E+005	FLAG TABLE 8042
782	PRESSURE	0.100000000000000E+004	PA
783	GEOPOTENTIAL HEIGHT	0.301540000000000E+005	GPM
784	LATITUDE DISPLACEMENT (HIGH ACCU	-0.690000000000000E+000	DEGREE
785	LONGITUDE DISPLACEMENT (HIGH ACC	0.101000000000000E+001	DEGREE
786	TEMPERATURE/DRY-BULB TEMPERATURE	0.215500000000000E+003	K
787	DEW-POINT TEMPERATURE	0.184000000000000E+003	K
788	WIND DIRECTION	0.256000000000000E+003	DEGREE TRUE
789	WIND SPEED	0.430000000000000E+002	M/S
790	LONG TIME PERIOD OR DISPLACEMENT	0.482500000000000E+004	SECOND
791	EXTENDED VERTICAL SOUNDING SIGNI	0.184320000000000E+005	FLAG TABLE 8042
792	PRESSURE	0.960000000000000E+003	PA
793	GEOPOTENTIAL HEIGHT	0.304260000000000E+005	GPM
794	LATITUDE DISPLACEMENT (HIGH ACCU	-0.680000000000000E+000	DEGREE
795	LONGITUDE DISPLACEMENT (HIGH ACC	0.103000000000000E+001	DEGREE
796	TEMPERATURE/DRY-BULB TEMPERATURE	0.216400000000000E+003	K
797	DEW-POINT TEMPERATURE	0.185600000000000E+003	K
798	WIND DIRECTION	0.261000000000000E+003	DEGREE TRUE
799	WIND SPEED	0.437000000000000E+002	M/S
800	LONG TIME PERIOD OR DISPLACEMENT	0.496000000000000E+004	SECOND
801	EXTENDED VERTICAL SOUNDING SIGNI	0.211200000000000E+004	FLAG TABLE 8042
802	PRESSURE	0.810000000000000E+003	PA
803	GEOPOTENTIAL HEIGHT	0.315100000000000E+005	GPM
804	LATITUDE DISPLACEMENT (HIGH ACCU	-0.680000000000000E+000	DEGREE
805	LONGITUDE DISPLACEMENT (HIGH ACC	0.111000000000000E+001	DEGREE
806	TEMPERATURE/DRY-BULB TEMPERATURE	0.216400000000000E+003	K
807	DEW-POINT TEMPERATURE	0.186200000000000E+003	K
808	WIND DIRECTION	0.256000000000000E+003	DEGREE TRUE
809	WIND SPEED	0.392000000000000E+002	M/S
810	LONG TIME PERIOD OR DISPLACEMENT	0.498000000000000E+004	SECOND
811	EXTENDED VERTICAL SOUNDING SIGNI	0.122880000000000E+005	FLAG TABLE 8042
812	PRESSURE	0.780000000000000E+003	PA
813	GEOPOTENTIAL HEIGHT	0.317080000000000E+005	GPM
814	LATITUDE DISPLACEMENT (HIGH ACCU		MISSING DEGREE
815	LONGITUDE DISPLACEMENT (HIGH ACC		MISSING DEGREE
816	TEMPERATURE/DRY-BULB TEMPERATURE	0.216800000000000E+003	K
817	DEW-POINT TEMPERATURE	0.186300000000000E+003	K
818	WIND DIRECTION		MISSING DEGREE TRUE
819	WIND SPEED		MISSING M/S
820	DELAYED DESCRIPTOR REPLICATION F	0.300000000000000E+001	NUMERIC
821	LONG TIME PERIOD OR DISPLACEMENT	0.185500000000000E+004	SECOND
822	EXTENDED VERTICAL SOUNDING SIGNI	0.184320000000000E+005	FLAG TABLE 8042
823	PRESSURE	0.192600000000000E+005	PA
824	LATITUDE DISPLACEMENT (HIGH ACCU	-0.440000000000000E+000	DEGREE
825	LONGITUDE DISPLACEMENT (HIGH ACC	0.310000000000000E+000	DEGREE
826	ABSOLUTE WIND SHEAR IN 1 KM LAYE	0.111000000000000E+002	M/S
827	ABSOLUTE WIND SHEAR IN 1 KM LAYE	0.143000000000000E+002	M/S
828	LONG TIME PERIOD OR DISPLACEMENT	0.228000000000000E+004	SECOND
829	EXTENDED VERTICAL SOUNDING SIGNI	0.184320000000000E+005	FLAG TABLE 8042
830	PRESSURE	0.127500000000000E+005	PA
831	LATITUDE DISPLACEMENT (HIGH ACCU	-0.540000000000000E+000	DEGREE
832	LONGITUDE DISPLACEMENT (HIGH ACC	0.400000000000000E+000	DEGREE
833	ABSOLUTE WIND SHEAR IN 1 KM LAYE	0.110000000000000E+002	M/S
834	ABSOLUTE WIND SHEAR IN 1 KM LAYE	0.176000000000000E+002	M/S
835	LONG TIME PERIOD OR DISPLACEMENT	0.482500000000000E+004	SECOND
836	EXTENDED VERTICAL SOUNDING SIGNI	0.184320000000000E+005	FLAG TABLE 8042
837	PRESSURE	0.960000000000000E+003	PA
838	LATITUDE DISPLACEMENT (HIGH ACCU	-0.680000000000000E+000	DEGREE
839	LONGITUDE DISPLACEMENT (HIGH ACC	0.103000000000000E+001	DEGREE
840	ABSOLUTE WIND SHEAR IN 1 KM LAYE	0.580000000000000E+001	M/S
841	ABSOLUTE WIND SHEAR IN 1 KM LAYE	0.580000000000000E+001	M/S