TECHNICAL NOTES

BUFR User's Guide

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AUGUST 2008

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Contents

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 do 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^{th} 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^{th} 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:

Bssswwwwwxxxxxyyyzzz.TXT Cssswwwwwxxxxxyyyzzz.TXT Dssswwwwwxxxxxyyyzzz.TXT where

- sss - Master table number (zero for WMO meteorological tables)
- wwwww - 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 doeas 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,CNAMES,CUNITS,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.

- CNAMES - CHARACTER*64 array of KELEM words containing element names.
- CUNITS - CHARACTER*24 array of KELEM words containing element units.
- VALUES - REAL*8 array of KVALS words containing element values.
- CVALS - CHARACTER*80 array of KVALS containing CCITT IA No.5 element entries.
- KERR - 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 CNAMES and CUNITS 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

index * 1000 + 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:

index=i + (nsub-1)*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 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:

index=i +(nsub-1)*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  B0000000000098006001,D0000000000098006001
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
 IDENTIFER                     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 containingthe 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

```
BUEXS0   - Expands Section 0 of Bufr message

BUEXS1   - Expands Section 1 of Bufr message

BUEXS2   - 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 containingthe 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 sebset.

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

continued on next page

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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

continued on next page

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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 od 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 od 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 index=i + (KAPP - 1)*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:
index = i + (KAPP-1) * KLEN
The first raw, 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 when- ever 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 031031descriptor 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.

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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 loosing 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 correspond- ing 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 loosing 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.

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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 loosing 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
C**   INTERFACE.
C     ----------
C
C          NONE.
C
C     METHOD.
C     -------
C
C          NONE.
C
C
C     EXTERNALS.
C     ----------
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
C          NONE.
C
C     AUTHOR.
C     -------
C
C          M. DRAGOSAVAC    *ECMWF*       15/09/87.
C
C
C     MODIFICATIONS.
C     --------------
C
C          NONE.
C
C
      IMPLICIT LOGICAL(L,O,G), CHARACTER*8(C,H,Y)
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, JTMAX=10,JTCLAS=64,JTEL=255)
C
      PARAMETER (KELEM=80000)
      PARAMETER (KVALS=4096000)
C
      DIMENSION KBUFF(JBUFL)
      DIMENSION KBUFR(JBUFL)
      DIMENSION KSUP(JSUP)   ,KSEC0(JSEC0),KSEC1(JSEC1)
      DIMENSION KSEC2(JSEC2),KSEC3(JSEC3),KSEC4(JSEC4)
      DIMENSION KEY   (JKEY),KREQ(2)
      DIMENSION NREQUEST(2)
C
      REAL*8 VALUES(KVALS),VALUE(KVALS)
      DIMENSION KTDLST(JELEM),KTDEXP(JELEM),KRQ(KELEM)
      REAL*8 RQV(KELEM)
      DIMENSION KDATA(200),KBOXR(JELEM*4)
      REAL*8 VALS(KVALS)
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     ------------------------------------------------------------------
C*          1. INITIALIZE CONSTANTS AND VARIABLES.
C              -----------------------------------
 100  CONTINUE
C
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_bufr -i infile'
         STOP
      END IF
      IF(IO.EQ.0.and.IN.EQ.0) THEN
         PRINT*,'USAGE -- decode_bufr -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 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
      IF(IO.NE.0) THEN
         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

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
c     IERR=0
      CALL BUSRQ(KREQ,KRQL,KRQ,RQV,IERR)
C
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     ---------------------------------------------------------------
      IF(NCOM.NE.0) THEN
         KEL1=KVALS/NCOM
         IF(KEL1.GT.KELEM) KEL1=KELEM
      END IF
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
         IF(NPACK.NE.0) GO TO 600
         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
      IF(N.LT.NR) GO TO 300
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)
      IF(KEL.GT.KELEM) KEL=KELEM
C
      CALL BUFREX(KBUFL,KBUFF,KSUP,KSEC0 ,KSEC1,KSEC2 ,KSEC3 ,KSEC4,
     1            KEL,CNAMES,CUNITS,KVALS,VALUES,CVALS,IERR)
C
      IF(IERR.NE.0) THEN
         CALL EXIT(2)
      END IF
C
C
      IOBS=IOBS+KSEC3(3)
C
C
      ISUBSET=1
      CALL BUSEL2(ISUBSET,KEL,KTDLEN,KTDLST,KTDEXL,KTDEXP,CNAMES,
     1            CUNITS,IERR)
C     IF(IERR.NE.0) CALL EXIT(2)
C
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
      IF(.NOT.OPRT) GO TO 500
      IF(.NOT.OSEC3) GO TO 450
C
C*          4.2 PRINT SECTION ZERO OF BUFR MESSAGE.
C               -----------------------------------
 420  CONTINUE
C

      CALL BUPRS0(KSEC0)
C
C*          4.3 PRINT SECTION ONE OF BUFR MESSAGE.
C               -----------------------------------
 430  CONTINUE
C
      CALL BUPRS1(KSEC1)
C
C
```

```
C*          4.4 PRINT SECTION TWO OF BUFR MESSAGE.
C             ------------------------------------
 440  CONTINUE
C
C              AT ECMWF SECTION 2 CONTAINS RDB KEY.
C              SO UNPACK KEY
C
      CALL BUUKEY(KSEC1,KSEC2,KEY,KSUP,IERR)
C
C              PRINT KEY
C
      CALL BUPRS2(KSUP ,KEY)
C
C*          4.5 PRINT SECTION 3 OF BUFR MESSAGE.
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 completly different list of expanded
C     discriptors
C
      ISUBSET=1
      CALL BUSEL2(ISUBSET,KEL,KTDLEN,KTDLST,KTDEXL,KTDEXP,CNAMES,
     1            CUNITS,IERR)
      IF(IERR.NE.0) CALL EXIT(2)
C
C               PRINT  CONTENT
C
      IF(OSEC3) THEN
         CALL BUPRS3(KSEC3,KTDLEN,KTDLST,KTDEXL,KTDEXP,KEL,CNAMES)
      END IF
C
C*         4.6 PRINT SECTION 4 (DATA).
C             ------------------------
 460  CONTINUE
C
C           IN THE CASE OF MANY SUBSETS DEFINE RANGE OF SUBSETS
C
      IF(.NOT.OO) THEN
      WRITE(*,'(A,$)') ' STARTING SUBSET TO BE PRINTED : '
      READ(*,'(BN,I4)')   IST
      WRITE(*,'(A,$)') ' ENDING SUBSET TO BE PRINTED : '
      READ(*,'(BN,I4)')   IEND
      OO=.FALSE.
      END IF
C
C              PRINT DATA
C
      ICODE=0

C     IF(KSEC1(6).EQ.11) THEN
C
C        IST=1
C        IEND=KSEC3(3)
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              ---------------------------
 500  CONTINUE
C
C
      IF(.NOT.OENC) GO TO 300
C
      ISUBS=KSEC3(3)
      DO J=1,ISUBS
```

```
C
      NPACK=NPACK+1
C
C             FIRST GET DATA DESCRIPTORS
C
      CALL BUSEL2(J,KEL,KTDLEN,KTDLST,KTDEXL,KTDEXP,CNAMES,
     1            CUNITS,IERR)
      IF(IERR.NE.0) CALL EXIT(2)
C
      DO I=1,KTDEXL
      IO=I+(NPACK-1)*KEL1
      IN=I+(J-1)*KEL
C
      IF(CUNITS(I).EQ.'CCITTIA5') THEN
         IPOS =VALUES(IN)/1000.
         ICH=NINT(VALUES(IN)-IPOS*1000)
         KKK=KKK+1
         VALUE(IO)=KKK*1000+ICH
         CVAL(KKK)=CVALS(IPOS)
      ELSE
         VALUE(IO)=VALUES(IN)
      END IF
      IF(KTDEXP(I).EQ.31001.OR.KTDEXP(I).EQ.31002) THEN
          KK=KK+1
          KDATA(KK)=NINT(VALUE(IO))
       END IF
       IF(KTDEXP(I).EQ.004001) THEN
          IF(IYEAR.EQ.NVIND) THEN
             IYEAR=NINT(VALUE(IO))
          END IF
       END IF

       END DO
C
       KDLEN=KK
       IF(NPACK.EQ.NCOM) THEN


          KSEC3(3)=NPACK
          KSEC1(5)=0
          KSEC1(8)=1
          KSEC1(15)=12
          IF(KSEC0(3).LT.4) THEN
             KSEC1(17)=255
             KSEC1(18)=0
          END IF
          KSEC0(3)=4             ! EDITION 4 OF BUFR MESSAGE
          IF(KSEC0(3).GE.4) KSEC1(1)=22
          KSEC3(4)=0             ! NO COMPRESSION
          IF(KSEC1(9).LT.101) THEN
             KSEC1(9)=IYEAR
          END IF
          IF(OCOMP) KSEC3(4)=64  ! COMPRESSION
          KBUFL=JBUFL
          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
          ILEN=KBUFL*NBYTPW
C
          IERR=0
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
          KK=0
       END IF
C
       END DO
C
       GO TO 300
C     ---------------------------------------------------------------
C*          6. PACK BUFR MESSAGE BACK INTO BUFR.
C             ---------------------------------
 600  CONTINUE
C

       KSEC3(3)=NPACK
       KSEC1(8)=1
       KSEC1(15)=12
       KSEC0(3)=4             ! EDITION 4 OF BUFR MESSAGE
       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,D00000000000098006001
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
 IDENTIFER                   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
 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  B0000000000098012001,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-CATEGORU                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

 PRTKEY : 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
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
C     MODIFICATIONS.
C     --------------
C
C          NONE.
C
C
      IMPLICIT LOGICAL(L,O,G), CHARACTER*8(C,H,Y)
C
      PARAMETER(JSEC1=40,JSEC3=4)
      PARAMETER (KDLEN=200,KELEM=40000,KVALS=360000)
C
      DIMENSION KSEC1(JSEC1)     ! ,KSEC3(JSEC3)
C
      DIMENSION KTDLST(KELEM),KTDEXP(KELEM)
      DIMENSION KDATA(KDLEN)
C
      CHARACTER*64 CNAMES(KELEM)
      CHARACTER*24 CUNITS(KELEM)
C
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
      KDATA(2)=14
      KDATA(3)=2
      KDATA(4)=2
C
C     SET DATA DECSRIPTORS
C
      KTDLST(  1)=301001
      KTDLST(  2)=301011
      KTDLST(  3)=301012
      KTDLST(  4)=301021
      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 DECSRIPTORS
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
C     EXTERNALS.
C     ----------
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
      IMPLICIT LOGICAL(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,
#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
      PARAMETER (KDLEN=200,KELEM=4000)
      parameter (KVALS=4000,KVALS1=4000)
C
      DIMENSION KBUFR(JBUFL)
      DIMENSION KSUP(JSUP)   ,KSEC0(JSEC0),KSEC1(JSEC1)
      DIMENSION KSEC2(JSEC2),KSEC3(JSEC3),KSEC4(JSEC4)
      DIMENSION KEY  (JKEY)
      DIMENSION ISUP(JSUP)   ,ISEC0(JSEC0),ISEC1(JSEC1)
      DIMENSION ISEC2(JSEC2),ISEC3(JSEC3),ISEC4(JSEC4)
C
#ifndef 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 KTDLST(KELEM),KTDEXP(KELEM),KRQ(KELEM)
      DIMENSION ITDLST(KELEM),ITDEXP(KELEM)
      DIMENSION KDATA(KDLEN),IDATA(KDLEN)
C
      CHARACTER*8  CF
      CHARACTER*64 CNAMES(KELEM),CNAME(KELEM)
      CHARACTER*24 CUNITS(KELEM),CUNIT(KELEM)
      CHARACTER*80 CVALS(KVALS)
      CHARACTER*80 CVAL (KVALS1)
      CHARACTER*80 YENC
C
C
C     ------------------------------------------------------------------
C*          1. INITIALIZE CONSTANTS AND VARIABLES.
```

```
C              -----------------------------------
 100  CONTINUE
C
C
      RVIND=1.7D38
C

      CALL PBOPEN(IUNIT1,'synop.bufr','W',IRET)
      IF(IRET.EQ.-1) STOP 'OPEN FAILED ON synop.dat'
      IF(IRET.EQ.-2) STOP 'INVALID FILE NAME'
      IF(IRET.EQ.-3) STOP 'INVALID OPEN MODE SPECIFIED'
C

C
C     INITIALIZE DELAYED REPLICATION FACTORS OR REFERENCE VALUES ETD.
C
      DO 101 I=1,KDLEN
      KDATA(I)=0
      VALUES(I)=RVIND
 101  CONTINUE
C
      KDATA(1)=10
c
      KDLENG=3
C
C
C     SET DATA DECSRIPTORS
C


      ktdlst(    1)=  301001
      ktdlst(    2)=  001011
      ktdlst(    3)=  001003
      ktdlst(    4)=  002001
      ktdlst(    5)=  301011
      ktdlst(    6)=  301012
      ktdlst(    7)=  301021
      ktdlst(    8)=  007030
      ktdlst(    9)=  007031
      ktdlst(   10)=  302001
      ktdlst(   11)=  007004
      ktdlst(   12)=  010009
!               Temperature data
      ktdlst(   13)=  007032
      ktdlst(   14)=  012101
      ktdlst(   15)=  012103
      ktdlst(   16)=  013003
!               Visibility data
      ktdlst(   17)=  007032
      ktdlst(   18)=  020001
!               Precipitation past 24 hours
      ktdlst(   19)=  007032
      ktdlst(   20)=  013023
      ktdlst(   21)=  007032
!               Cloud data
      ktdlst(   22)=  302004
      ktdlst(   23)=  101004
      ktdlst(   24)=  302005
!               Clouds with bases below station level
      ktdlst(   25)=  105003
      ktdlst(   26)=  008002
      ktdlst(   27)=  020011
      ktdlst(   28)=  020012
      ktdlst(   29)=  020014
      ktdlst(   30)=  020017
!               State of ground, snow depth, ground minimum temperature
      ktdlst(   31)=  020062
      ktdlst(   32)=  013013
      ktdlst(   33)=  012113
!               Present weather
      ktdlst(   34)=  020003
      ktdlst(   35)=  004024
      ktdlst(   36)=  020004
      ktdlst(   37)=  020005
!               Evaporation measurements
      ktdlst(   38)=  004024
      ktdlst(   39)=  002004
      ktdlst(   40)=  013033
!               Sunshine data
      ktdlst(   41)=  004024
      ktdlst(   42)=  014031
!               Radiation data
      ktdlst(   43)=  004025
      ktdlst(   44)=  014002
      ktdlst(   45)=  014004
      ktdlst(   46)=  014016
      ktdlst(   47)=  014028
      ktdlst(   48)=  014029
      ktdlst(   49)=  014030
!               Precipitation measurements
      ktdlst(   50)=  007032
      ktdlst(   51)=  102002
      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    ! TOTTAL 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.
      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*JBPW/8
C
      IERR=0
      CALL PBWRITE(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

       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
C     EXTERNALS.
C     ----------
C
C     REFERENCE.
C     ----------
C
C          NONE.
C
C     AUTHOR.
C     -------
C
C          M. DRAGOSAVAC    *ECMWF*       15/07/2008.
C
C
C     MODIFICATIONS.
C     --------------
C
C          NONE.
C
C
      IMPLICIT LOGICAL(L,O,G), CHARACTER*8(C,H,Y)
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
      PARAMETER (KELEM=320000)
      PARAMETER (KVALS=4096000)
C
      DIMENSION KBUFF(JBUFL)
      DIMENSION KBUFR(JBUFL)
      DIMENSION KSUP(JSUP)  ,KSEC0(JSEC0),KSEC1(JSEC1)
      DIMENSION KSEC2(JSEC2),KSEC3(JSEC3),KSEC4(JSEC4)
C
      REAL*8 VALUES(KVALS),VALUES_IMG(500)
      DIMENSION IMAGE8(522500)
      DIMENSION KTDLST(KELEM),KTDEXP(KELEM)
      DIMENSION KTDEXP_IMG(KELEM)
C
      CHARACTER*256 CF,COUT,CARG(4),COUT1,COUT2,COUT3
      CHARACTER*64 CNAMES(KELEM),CNAMES_IMG(KELEM)
      CHARACTER*24 CUNITS(KELEM),CUNITS_IMG(KELEM)
      CHARACTER*80 CVALS(KELEM),CVALS_IMG(KELEM)
      REAL*8 RVIND
C
      EQUIVALENCE(IMAGE1,IMAGE2,IMAGE4)
C     ------------------------------------------------------------------
C*          1. INITIALIZE CONSTANTS AND VARIABLES.
C              -----------------------------------
 100  CONTINUE
C
C     MISSING VALUE INDICATOR
C
      NBYTPW=JBPW/8
      RVIND=1.7D38
      NVIND=2147483647
      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)
      IF(KEL.GT.KELEM) KEL=KELEM
C
      CALL BUFREX(KBUFL,KBUFF,KSUP,KSEC0 ,KSEC1,KSEC2 ,KSEC3 ,KSEC4,
     1            KEL,CNAMES,CUNITS,KVALS,VALUES,CVALS,IERR)
C
      IF(IERR.NE.0) THEN
         CALL EXIT(2)
      END IF
C
      IOBS=IOBS+KSEC3(3)
C
C
      ISUBSET=1
      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

      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     -------------------------------
      DO I=1,KTDEXL_IMG
      WRITE(IUNIT2,'(I6,1X,A64,1x,F20.8,1x,a24)') I,CNAMES_IMG(I),
     c                              VALUES_IMG(I),CUNITS_IMG(I)
      END DO

C
C     Write bufr section 1 into file
C     ------------------------------
      CALL BBUPRS1(IUNIT3,KSEC1)
      imx=KSIZE_IMG_BYTES
c     print*,'printing bytes=',imx
C
C     Write image ( pixel values ) into file
C     ----------------------------------------------------------------
      CALL PBWRITE(IUNIT1,IMAGE8,imx,IERR)
C
C
      GO TO 900
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)
      CALL PBCLOSE(IUNIT1,IRET)
      CLOSE(IUNIT2)
      CLOSE(IUNIT3)
 101  CONTINUE
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

 PRTKEY : 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  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  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 CCITTIA5                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 PRECIPI              MISSING M
 92 TIME SIGNIFICAN              MISSING CODE TABLE 8021
 93 TIME PERIOD OR     -0.1000000000E+02 MINUTE
 94 TYPE OF PRECIPI              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 RADI              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
```

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  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 CCITTIA5               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
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 10 LATITUDE (HIGH ACCURACY)           0.49669440000000E+002 DEGREE
 11 LONGITUDE (HIGH ACCURACY)          0.12677780000000E+002 DEGREE
 12 HEIGHT OF STATION GROUND ABOVE M   0.74220000000000E+003 M
 13 HEIGHT OF BAROMETER ABOVE MEAN S   0.74700000000000E+003 M
 14 PRESSURE                           0.93770000000000E+005 PA
 15 PRESSURE REDUCED TO MEAN SEA LEV               MISSING PA
 16 3-HOUR PRESSURE CHANGE             0.90000000000000E+002 PA
 17 CHARACTERISTIC OF PRESSURE TENDE   0.20000000000000E+001 CODE TABLE 10063
 18 24-HOUR PRESSURE CHANGE                        MISSING PA
 19 PRESSURE                           0.92500000000000E+005 PA
 20 GEOPOTENTIAL HEIGHT                0.86000000000000E+003 GPM
 21 HEIGHT OF SENSOR ABOVE LOCAL GRO   0.19500000000000E+001 M
 22 TEMPERATURE/DRY-BULB TEMPERATURE   0.27945000000000E+003 K
 23 DEW-POINT TEMPERATURE              0.27745000000000E+003 K
 24 RELATIVE HUMIDITY                  0.87000000000000E+002 %
 25 HEIGHT OF SENSOR ABOVE LOCAL GRO   0.48000000000000E+001 M
 26 HORIZONTAL VISIBILITY              0.13000000000000E+005 M
 27 HEIGHT OF SENSOR ABOVE LOCAL GRO   0.11200000000000E+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)                0.13000000000000E+002 %
 31 VERTICAL SIGNIFICANCE (SURFACE O   0.70000000000000E+001 CODE TABLE 8002
 32 CLOUD AMOUNT                       0.10000000000000E+001 CODE TABLE 20011
 33 HEIGHT OF BASE OF CLOUD            0.99000000000000E+003 M
 34 CLOUD TYPE                         0.35000000000000E+002 CODE TABLE 20012
 35 CLOUD TYPE                         0.20000000000000E+002 CODE TABLE 20012
 36 CLOUD TYPE                         0.11000000000000E+002 CODE TABLE 20012
 37 DELAYED DESCRIPTOR REPLICATION F   0.20000000000000E+001 NUMERIC
 38 VERTICAL SIGNIFICANCE (SURFACE O   0.10000000000000E+001 CODE TABLE 8002
 39 CLOUD AMOUNT                       0.10000000000000E+001 CODE TABLE 20011
 40 CLOUD TYPE                         0.60000000000000E+001 CODE TABLE 20012
 41 HEIGHT OF BASE OF CLOUD            0.99000000000000E+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   0.10000000000000E+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   0.70000000000000E+001 CODE TABLE 8002
 53 TRUE DIRECTION FROM WHICH CLOUDS               MISSING DEGREE TRUE
 54 VERTICAL SIGNIFICANCE (SURFACE O   0.80000000000000E+001 CODE TABLE 8002
 55 TRUE DIRECTION FROM WHICH CLOUDS               MISSING DEGREE TRUE
 56 VERTICAL SIGNIFICANCE (SURFACE O   0.90000000000000E+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)       0.50800000000000E+003 CODE TABLE 20003
 68 TIME PERIOD OR DISPLACEMENT       -0.10000000000000E+001 HOUR
 69 PAST WEATHER (1) (SEE NOTE 2)      0.10000000000000E+002 CODE TABLE 20004
 70 PAST WEATHER (2) (SEE NOTE 2)      0.10000000000000E+002 CODE TABLE 20005
 71 TIME PERIOD OR DISPLACEMENT       -0.10000000000000E+001 HOUR
 72 TOTAL SUNSHINE                                 MISSING MINUTE
 73 TIME PERIOD OR DISPLACEMENT       -0.24000000000000E+002 HOUR
 74 TOTAL SUNSHINE                                 MISSING MINUTE
 75 HEIGHT OF SENSOR ABOVE LOCAL GRO   0.11200000000000E+001 M
 76 TIME PERIOD OR DISPLACEMENT                    MISSING HOUR
 77 TOTAL PRECIPITATION/TOTAL WATER                MISSING KG/M**2
 78 TIME PERIOD OR DISPLACEMENT       -0.10000000000000E+001 HOUR
 79 TOTAL PRECIPITATION/TOTAL WATER    0.00000000000000E+000 KG/M**2
 80 HEIGHT OF SENSOR ABOVE LOCAL GRO   0.19500000000000E+001 M
 81 TIME PERIOD OR DISPLACEMENT       -0.12000000000000E+002 HOUR
 82 TIME PERIOD OR DISPLACEMENT        0.00000000000000E+000 HOUR
 83 MAXIMUM TEMPERATURE, AT HEIGHT A               MISSING K
 84 TIME PERIOD OR DISPLACEMENT       -0.12000000000000E+002 HOUR
 85 TIME PERIOD OR DISPLACEMENT        0.00000000000000E+000 HOUR
 86 MINIMUM TEMPERATURE, AT HEIGHT A               MISSING K
 87 HEIGHT OF SENSOR ABOVE LOCAL GRO   0.10250000000000E+002 M
 88 TYPE OF INSTRUMENTATION FOR WIND   0.80000000000000E+001 FLAG TABLE 2002
 89 TIME SIGNIFICANCE                  0.20000000000000E+001 CODE TABLE 8021
 90 TIME PERIOD OR DISPLACEMENT       -0.10000000000000E+002 MINUTE
 91 WIND DIRECTION                     0.90000000000000E+002 DEGREE TRUE
 92 WIND SPEED                         0.40000000000000E+001 M/S
 93 TIME SIGNIFICANCE                              MISSING CODE TABLE 8021
 94 TIME PERIOD OR DISPLACEMENT       -0.10000000000000E+002 MINUTE
 95 MAXIMUM WIND GUST DIRECTION                    MISSING DEGREE TRUE
 96 MAXIMUM WIND GUST SPEED                        MISSING M/S
 97 TIME PERIOD OR DISPLACEMENT       -0.60000000000000E+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       -0.24000000000000E+002 HOUR
102 TYPE OF INSTRUMENTATION FOR EVAP               MISSING CODE TABLE 2004
```

```
103 EVAPORATION/EVAPOTRANSPIRATION                  MISSING KG/M**2
104 TIME PERIOD OR DISPLACEMENT       -0.10000000000000E+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       -0.24000000000000E+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

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

    1 WMO REGION NUMBER/GEOGRAPHICAL A   0.50000000000000E+001 CODE TABLE 1003
    2 WMO REGION SUB-AREA                0.20000000000000E+001 NUMERIC
    3 BUOY/PLATFORM IDENTIFIER           0.87000000000000E+002 NUMERIC
    4 TYPE OF STATION                    0.00000000000000E+000 CODE TABLE 2001
    5 BUOY TYPE                          0.10000000000000E+001 CODE TABLE 2036
    6 TYPE OF DATA BUOY                  0.22000000000000E+002 CODE TABLE 2149
    7 YEAR                               0.20050000000000E+004 YEAR
```

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  8 MONTH                              0.50000000000000E+001 MONTH
  9 DAY                                0.40000000000000E+001 DAY
 10 HOUR                               0.30000000000000E+001 HOUR
 11 MINUTE                             0.00000000000000E+000 MINUTE
 12 TIME SIGNIFICANCE                  0.26000000000000E+002 CODE TABLE 8021
 13 YEAR                               0.20050000000000E+004 YEAR
 14 MONTH                              0.50000000000000E+001 MONTH
 15 DAY                                0.40000000000000E+001 DAY
 16 HOUR                               0.20000000000000E+001 HOUR
 17 MINUTE                             0.45000000000000E+002 MINUTE
 18 TIME SIGNIFICANCE                                MISSING CODE TABLE 8021
 19 LATITUDE (HIGH ACCURACY)           0.76470400000000E+001 DEGREE
 20 LONGITUDE (HIGH ACCURACY)          0.13669994000000E+003 DEGREE
 21 ALTERNATE LATITUDE (HIGH ACCURAC   0.16604050000000E+002 DEGREE
 22 ALTERNATE LONGITUDE (HIGH ACCURA   0.96866300000000E+002 DEGREE
 23 HEIGHT OF STATION GROUND ABOVE M   0.00000000000000E+000 M
 24 PLATFORM TRANSMITTER ID NUMBER     0.10120000000000E+004 CCITTIA5                03595
 25 DATA COLLECTION AND/OR LOCATION    0.10000000000000E+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   0.00000000000000E+000 CODE TABLE 33022
 30 QUALITY OF BUOY LOCATION           0.00000000000000E+000 CODE TABLE 33023
 31 LOCATION QUALITY CLASS (RANGE OF   0.10000000000000E+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         0.00000000000000E+000 CODE TABLE 25086
 54 CABLE LENGTH                       0.00000000000000E+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   0.70000000000000E+001 NUMERIC
 61 DEPTH BELOW SEA/WATER SURFACE      0.15000000000000E+001 M
 62 SEA/WATER TEMPERATURE              0.30242000000000E+003 K
 63 SALINITY                           0.34140000000000E+002 PART PER THOUSAND
 64 DEPTH BELOW SEA/WATER SURFACE      0.25000000000000E+002 M
 65 SEA/WATER TEMPERATURE              0.30224000000000E+003 K
 66 SALINITY                           0.34200000000000E+002 PART PER THOUSAND
 67 DEPTH BELOW SEA/WATER SURFACE      0.50000000000000E+002 M
 68 SEA/WATER TEMPERATURE              0.30223000000000E+003 K
 69 SALINITY                           0.34220000000000E+002 PART PER THOUSAND
 70 DEPTH BELOW SEA/WATER SURFACE      0.75000000000000E+002 M
 71 SEA/WATER TEMPERATURE              0.29922000000000E+003 K
 72 SALINITY                           0.34530000000000E+002 PART PER THOUSAND
 73 DEPTH BELOW SEA/WATER SURFACE      0.10000000000000E+003 M
 74 SEA/WATER TEMPERATURE              0.29576000000000E+003 K
 75 SALINITY                           0.34820000000000E+002 PART PER THOUSAND
 76 DEPTH BELOW SEA/WATER SURFACE      0.30000000000000E+003 M
 77 SEA/WATER TEMPERATURE              0.28255000000000E+003 K
 78 SALINITY                           0.34540000000000E+002 PART PER THOUSAND
 79 DEPTH BELOW SEA/WATER SURFACE      0.75000000000000E+003 M
 80 SEA/WATER TEMPERATURE              0.27962000000000E+003 K
 81 SALINITY                           0.34530000000000E+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   0.00000000000000E+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
```

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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                  0.20000000000000E+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                  0.30000000000000E+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  B0000000000098012000,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


     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  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

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

     1 WMO BLOCK NUMBE     0.1100000000E+02 NUMERIC
     2 WMO STATION NUM     0.5200000000E+03 NUMERIC
     3 STATION OR SITE     0.1020000000E+04 CCITTIA5                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 HOUR
 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
```

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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

```
                  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

 PRTKEY : 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

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

     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
 HOUR                              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  HOUR
    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
```

```
 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
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564  005015  LATITUDE DISPLACEMENT (HIGH ACCURACY)
565  006015  LONGITUDE DISPLACEMENT (HIGH ACCURACY)
566  012101  TEMPERATURE/DRY-BULB TEMPERATURE
567  012103  DEW-POINT TEMPERATURE
568  011001  WIND DIRECTION
569  011002  WIND SPEED
570  004086  LONG TIME PERIOD OR DISPLACEMENT
571  008042  EXTENDED VERTICAL SOUNDING SIGNIFICANCE
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691  008042  EXTENDED VERTICAL SOUNDING SIGNIFICANCE
692  007004  PRESSURE
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781  008042  EXTENDED VERTICAL SOUNDING SIGNIFICANCE
782  007004  PRESSURE
783  010009  GEOPOTENTIAL HEIGHT
784  005015  LATITUDE DISPLACEMENT (HIGH ACCURACY)
785  006015  LONGITUDE DISPLACEMENT (HIGH ACCURACY)
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786  012101  TEMPERATURE/DRY-BULB TEMPERATURE
787  012103  DEW-POINT TEMPERATURE
788  011001  WIND DIRECTION
789  011002  WIND SPEED
790  004086  LONG TIME PERIOD OR DISPLACEMENT
791  008042  EXTENDED VERTICAL SOUNDING SIGNIFICANCE
792  007004  PRESSURE
793  010009  GEOPOTENTIAL HEIGHT
794  005015  LATITUDE DISPLACEMENT (HIGH ACCURACY)
795  006015  LONGITUDE DISPLACEMENT (HIGH ACCURACY)
796  012101  TEMPERATURE/DRY-BULB TEMPERATURE
797  012103  DEW-POINT TEMPERATURE
798  011001  WIND DIRECTION
799  011002  WIND SPEED
800  004086  LONG TIME PERIOD OR DISPLACEMENT
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807  012103  DEW-POINT TEMPERATURE
808  011001  WIND DIRECTION
809  011002  WIND SPEED
810  004086  LONG TIME PERIOD OR DISPLACEMENT
811  008042  EXTENDED VERTICAL SOUNDING SIGNIFICANCE
812  007004  PRESSURE
813  010009  GEOPOTENTIAL HEIGHT
814  005015  LATITUDE DISPLACEMENT (HIGH ACCURACY)
815  006015  LONGITUDE DISPLACEMENT (HIGH ACCURACY)
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)
832  006015  LONGITUDE DISPLACEMENT (HIGH ACCURACY)
833  011061  ABSOLUTE WIND SHEAR IN 1 KM LAYER BELOW
834  011062  ABSOLUTE WIND SHEAR IN 1 KM LAYER ABOVE
835  004086  LONG TIME PERIOD OR DISPLACEMENT
836  008042  EXTENDED VERTICAL SOUNDING SIGNIFICANCE
837  007004  PRESSURE
838  005015  LATITUDE DISPLACEMENT (HIGH ACCURACY)
839  006015  LONGITUDE DISPLACEMENT (HIGH ACCURACY)
840  011061  ABSOLUTE WIND SHEAR IN 1 KM LAYER BELOW
841  011062  ABSOLUTE WIND SHEAR IN 1 KM LAYER ABOVE

       BUFR SECTION 4 (DATA), SUBSET 1

  1 WMO BLOCK NUMBER                  0.11000000000000E+002 NUMERIC
  2 WMO STATION NUMBER                0.52000000000000E+003 NUMERIC
  3 SHIP OR MOBILE LAND STATION IDEN  0.10090000000000E+004 CCITTIA5
  4 RADIOSONDE TYPE                   0.80000000000000E+002 CODE TABLE 2011
  5 SOLAR AND INFRARED RADIATION COR  0.40000000000000E+001 CODE TABLE 2013
  6 TRACKING TECHNIQUE/STATUS OF SYS  0.60000000000000E+001 CODE TABLE 2014
  7 TYPE OF MEASURING EQUIPMENT USED  0.50000000000000E+001 CODE TABLE 2003
  8 TIME SIGNIFICANCE                 0.18000000000000E+002 CODE TABLE 8021
  9 YEAR                              0.20070000000000E+004 YEAR
 10 MONTH                             0.11000000000000E+002 MONTH
 11 DAY                               0.70000000000000E+001 DAY
 12 HOUR                              0.50000000000000E+001 HOUR
 13 MINUTE                            0.30000000000000E+002 MINUTE
 14 SECOND                            0.00000000000000E+000 SECOND
 15 LATITUDE (HIGH ACCURACY)          0.50008330000000E+002 DEGREE
 16 LONGITUDE (HIGH ACCURACY)         0.14448060000000E+002 DEGREE
 17 HEIGHT OF STATION GROUND ABOVE M  0.30200000000000E+003 M
 18 HEIGHT OF BAROMETER ABOVE MEAN S  0.30340000000000E+003 M
 19 HEIGHT                            0.30400000000000E+003 M
 20 STATION ELEVATION QUALITY MARK (              MISSING CODE TABLE 33024
 21 VERTICAL SIGNIFICANCE (SURFACE O  0.70000000000000E+001 CODE TABLE 8002
 22 CLOUD AMOUNT                      0.70000000000000E+001 CODE TABLE 20011
 23 HEIGHT OF BASE OF CLOUD           0.12500000000000E+004 M
 24 CLOUD TYPE                        0.35000000000000E+002 CODE TABLE 20012
 25 CLOUD TYPE                        0.20000000000000E+002 CODE TABLE 20012
 26 CLOUD TYPE                        0.10000000000000E+002 CODE TABLE 20012
 27 VERTICAL SIGNIFICANCE (SURFACE O              MISSING CODE TABLE 8002
 28 SEA/WATER TEMPERATURE                         MISSING K
 29 EXTENDED DELAYED DESCRIPTOR REPL  0.79000000000000E+002 NUMERIC
 30 LONG TIME PERIOD OR DISPLACEMENT  0.00000000000000E+000 SECOND
 31 EXTENDED VERTICAL SOUNDING SIGNI  0.65536000000000E+005 FLAG TABLE 8042
 32 PRESSURE                          0.10000000000000E+006 PA
 33 GEOPOTENTIAL HEIGHT               0.17700000000000E+003 GPM
 34 LATITUDE DISPLACEMENT (HIGH ACCU  0.00000000000000E+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
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128 WIND DIRECTION                     0.33800000000000E+003 DEGREE TRUE
129 WIND SPEED                         0.16700000000000E+002 M/S
130 LONG TIME PERIOD OR DISPLACEMENT   0.45000000000000E+003 SECOND
131 EXTENDED VERTICAL SOUNDING SIGNI   0.20480000000000E+004 FLAG TABLE 8042
132 PRESSURE                           0.71510000000000E+005 PA
133 GEOPOTENTIAL HEIGHT                0.28170000000000E+004 GPM
134 LATITUDE DISPLACEMENT (HIGH ACCU  -0.20000000000000E-001 DEGREE
135 LONGITUDE DISPLACEMENT (HIGH ACC   0.70000000000000E-001 DEGREE
136 TEMPERATURE/DRY-BULB TEMPERATURE   0.26220000000000E+003 K
137 DEW-POINT TEMPERATURE              0.25590000000000E+003 K
138 WIND DIRECTION                     0.34100000000000E+003 DEGREE TRUE
139 WIND SPEED                         0.17200000000000E+002 M/S
140 LONG TIME PERIOD OR DISPLACEMENT   0.47700000000000E+003 SECOND
141 EXTENDED VERTICAL SOUNDING SIGNI   0.65536000000000E+005 FLAG TABLE 8042
142 PRESSURE                           0.70000000000000E+005 PA
143 GEOPOTENTIAL HEIGHT                0.29800000000000E+004 GPM
144 LATITUDE DISPLACEMENT (HIGH ACCU  -0.30000000000000E-001 DEGREE
145 LONGITUDE DISPLACEMENT (HIGH ACC   0.70000000000000E-001 DEGREE
146 TEMPERATURE/DRY-BULB TEMPERATURE   0.26140000000000E+003 K
147 DEW-POINT TEMPERATURE              0.25620000000000E+003 K
148 WIND DIRECTION                     0.34000000000000E+003 DEGREE TRUE
149 WIND SPEED                         0.17500000000000E+002 M/S
150 LONG TIME PERIOD OR DISPLACEMENT   0.60000000000000E+003 SECOND
151 EXTENDED VERTICAL SOUNDING SIGNI   0.40960000000000E+004 FLAG TABLE 8042
152 PRESSURE                           0.63250000000000E+005 PA
153 GEOPOTENTIAL HEIGHT                0.37510000000000E+004 GPM
154 LATITUDE DISPLACEMENT (HIGH ACCU  -0.50000000000000E-001 DEGREE
155 LONGITUDE DISPLACEMENT (HIGH ACC   0.80000000000000E-001 DEGREE
156 TEMPERATURE/DRY-BULB TEMPERATURE   0.25730000000000E+003 K
157 DEW-POINT TEMPERATURE              0.25630000000000E+003 K
158 WIND DIRECTION                     0.33600000000000E+003 DEGREE TRUE
159 WIND SPEED                         0.21400000000000E+002 M/S
160 LONG TIME PERIOD OR DISPLACEMENT   0.80500000000000E+003 SECOND
161 EXTENDED VERTICAL SOUNDING SIGNI   0.20480000000000E+004 FLAG TABLE 8042
162 PRESSURE                           0.53600000000000E+005 PA
163 GEOPOTENTIAL HEIGHT                0.49820000000000E+004 GPM
164 LATITUDE DISPLACEMENT (HIGH ACCU  -0.90000000000000E-001 DEGREE
165 LONGITUDE DISPLACEMENT (HIGH ACC   0.11000000000000E+000 DEGREE
166 TEMPERATURE/DRY-BULB TEMPERATURE   0.25010000000000E+003 K
167 DEW-POINT TEMPERATURE              0.24780000000000E+003 K
168 WIND DIRECTION                     0.34300000000000E+003 DEGREE TRUE
169 WIND SPEED                         0.24500000000000E+002 M/S
170 LONG TIME PERIOD OR DISPLACEMENT   0.88000000000000E+003 SECOND
171 EXTENDED VERTICAL SOUNDING SIGNI   0.12288000000000E+005 FLAG TABLE 8042
172 PRESSURE                           0.50220000000000E+005 PA
173 GEOPOTENTIAL HEIGHT                0.54570000000000E+004 GPM
174 LATITUDE DISPLACEMENT (HIGH ACCU  -0.10000000000000E+000 DEGREE
175 LONGITUDE DISPLACEMENT (HIGH ACC   0.12000000000000E+000 DEGREE
176 TEMPERATURE/DRY-BULB TEMPERATURE   0.24760000000000E+003 K
177 DEW-POINT TEMPERATURE              0.24550000000000E+003 K
178 WIND DIRECTION                     0.33900000000000E+003 DEGREE TRUE
179 WIND SPEED                         0.31300000000000E+002 M/S
180 LONG TIME PERIOD OR DISPLACEMENT   0.88500000000000E+003 SECOND
181 EXTENDED VERTICAL SOUNDING SIGNI   0.65536000000000E+005 FLAG TABLE 8042
182 PRESSURE                           0.50010000000000E+005 PA
183 GEOPOTENTIAL HEIGHT                0.54870000000000E+004 GPM
184 LATITUDE DISPLACEMENT (HIGH ACCU  -0.10000000000000E+000 DEGREE
185 LONGITUDE DISPLACEMENT (HIGH ACC   0.12000000000000E+000 DEGREE
186 TEMPERATURE/DRY-BULB TEMPERATURE   0.24770000000000E+003 K
187 DEW-POINT TEMPERATURE              0.24580000000000E+003 K
188 WIND DIRECTION                     0.33900000000000E+003 DEGREE TRUE
189 WIND SPEED                         0.31700000000000E+002 M/S
190 LONG TIME PERIOD OR DISPLACEMENT   0.89500000000000E+003 SECOND
191 EXTENDED VERTICAL SOUNDING SIGNI   0.81920000000000E+004 FLAG TABLE 8042
192 PRESSURE                           0.49510000000000E+005 PA
193 GEOPOTENTIAL HEIGHT                0.55600000000000E+004 GPM
194 LATITUDE DISPLACEMENT (HIGH ACCU  -0.11000000000000E+000 DEGREE
195 LONGITUDE DISPLACEMENT (HIGH ACC   0.12000000000000E+000 DEGREE
196 TEMPERATURE/DRY-BULB TEMPERATURE   0.24770000000000E+003 K
197 DEW-POINT TEMPERATURE              0.24580000000000E+003 K
198 WIND DIRECTION                     0.33900000000000E+003 DEGREE TRUE
199 WIND SPEED                         0.32500000000000E+002 M/S
200 LONG TIME PERIOD OR DISPLACEMENT   0.91000000000000E+003 SECOND
201 EXTENDED VERTICAL SOUNDING SIGNI   0.21120000000000E+004 FLAG TABLE 8042
202 PRESSURE                           0.48830000000000E+005 PA
203 GEOPOTENTIAL HEIGHT                0.56590000000000E+004 GPM
204 LATITUDE DISPLACEMENT (HIGH ACCU  -0.11000000000000E+000 DEGREE
205 LONGITUDE DISPLACEMENT (HIGH ACC   0.13000000000000E+000 DEGREE
206 TEMPERATURE/DRY-BULB TEMPERATURE   0.24700000000000E+003 K
207 DEW-POINT TEMPERATURE              0.24510000000000E+003 K
208 WIND DIRECTION                     0.33900000000000E+003 DEGREE TRUE
209 WIND SPEED                         0.33400000000000E+002 M/S
210 LONG TIME PERIOD OR DISPLACEMENT   0.11250000000000E+004 SECOND
211 EXTENDED VERTICAL SOUNDING SIGNI   0.65536000000000E+005 FLAG TABLE 8042
212 PRESSURE                           0.40000000000000E+005 PA
213 GEOPOTENTIAL HEIGHT                0.70730000000000E+004 GPM
214 LATITUDE DISPLACEMENT (HIGH ACCU                 MISSING DEGREE
215 LONGITUDE DISPLACEMENT (HIGH ACC                 MISSING DEGREE
216 TEMPERATURE/DRY-BULB TEMPERATURE   0.23690000000000E+003 K
217 DEW-POINT TEMPERATURE              0.23380000000000E+003 K
218 WIND DIRECTION                                   MISSING DEGREE TRUE
219 WIND SPEED                                       MISSING M/S
220 LONG TIME PERIOD OR DISPLACEMENT   0.12600000000000E+004 SECOND
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221 EXTENDED VERTICAL SOUNDING SIGNI   0.20480000000000E+004 FLAG TABLE 8042
222 PRESSURE                           0.35200000000000E+005 PA
223 GEOPOTENTIAL HEIGHT                0.79450000000000E+004 GPM
224 LATITUDE DISPLACEMENT (HIGH ACCU                 MISSING DEGREE
225 LONGITUDE DISPLACEMENT (HIGH ACC                 MISSING DEGREE
226 TEMPERATURE/DRY-BULB TEMPERATURE   0.22920000000000E+003 K
227 DEW-POINT TEMPERATURE              0.22520000000000E+003 K
228 WIND DIRECTION                                   MISSING DEGREE TRUE
229 WIND SPEED                                       MISSING M/S
230 LONG TIME PERIOD OR DISPLACEMENT   0.12750000000000E+004 SECOND
231 EXTENDED VERTICAL SOUNDING SIGNI   0.81920000000000E+004 FLAG TABLE 8042
232 PRESSURE                           0.34710000000000E+005 PA
233 GEOPOTENTIAL HEIGHT                0.80400000000000E+004 GPM
234 LATITUDE DISPLACEMENT (HIGH ACCU                 MISSING DEGREE
235 LONGITUDE DISPLACEMENT (HIGH ACC                 MISSING DEGREE
236 TEMPERATURE/DRY-BULB TEMPERATURE   0.22840000000000E+003 K
237 DEW-POINT TEMPERATURE              0.22440000000000E+003 K
238 WIND DIRECTION                                   MISSING DEGREE TRUE
239 WIND SPEED                                       MISSING M/S
240 LONG TIME PERIOD OR DISPLACEMENT   0.13550000000000E+004 SECOND
241 EXTENDED VERTICAL SOUNDING SIGNI   0.12288000000000E+005 FLAG TABLE 8042
242 PRESSURE                           0.31930000000000E+005 PA
243 GEOPOTENTIAL HEIGHT                0.85960000000000E+004 GPM
244 LATITUDE DISPLACEMENT (HIGH ACCU                 MISSING DEGREE
245 LONGITUDE DISPLACEMENT (HIGH ACC                 MISSING DEGREE
246 TEMPERATURE/DRY-BULB TEMPERATURE   0.22690000000000E+003 K
247 DEW-POINT TEMPERATURE              0.22230000000000E+003 K
248 WIND DIRECTION                                   MISSING DEGREE TRUE
249 WIND SPEED                                       MISSING M/S
250 LONG TIME PERIOD OR DISPLACEMENT   0.14200000000000E+004 SECOND
251 EXTENDED VERTICAL SOUNDING SIGNI   0.65536000000000E+005 FLAG TABLE 8042
252 PRESSURE                           0.30000000000000E+005 PA
253 GEOPOTENTIAL HEIGHT                0.90060000000000E+004 GPM
254 LATITUDE DISPLACEMENT (HIGH ACCU                 MISSING DEGREE
255 LONGITUDE DISPLACEMENT (HIGH ACC                 MISSING DEGREE
256 TEMPERATURE/DRY-BULB TEMPERATURE   0.22320000000000E+003 K
257 DEW-POINT TEMPERATURE              0.21860000000000E+003 K
258 WIND DIRECTION                                   MISSING DEGREE TRUE
259 WIND SPEED                                       MISSING M/S
260 LONG TIME PERIOD OR DISPLACEMENT   0.14900000000000E+004 SECOND
261 EXTENDED VERTICAL SOUNDING SIGNI   0.45056000000000E+005 FLAG TABLE 8042
262 PRESSURE                           0.27830000000000E+005 PA
263 GEOPOTENTIAL HEIGHT                0.94920000000000E+004 GPM
264 LATITUDE DISPLACEMENT (HIGH ACCU                 MISSING DEGREE
265 LONGITUDE DISPLACEMENT (HIGH ACC                 MISSING DEGREE
266 TEMPERATURE/DRY-BULB TEMPERATURE   0.21970000000000E+003 K
267 DEW-POINT TEMPERATURE              0.21510000000000E+003 K
268 WIND DIRECTION                                   MISSING DEGREE TRUE
269 WIND SPEED                                       MISSING M/S
270 LONG TIME PERIOD OR DISPLACEMENT   0.15820000000000E+004 SECOND
271 EXTENDED VERTICAL SOUNDING SIGNI   0.65536000000000E+005 FLAG TABLE 8042
272 PRESSURE                           0.25000000000000E+005 PA
273 GEOPOTENTIAL HEIGHT                0.10182000000000E+005 GPM
274 LATITUDE DISPLACEMENT (HIGH ACCU                 MISSING DEGREE
275 LONGITUDE DISPLACEMENT (HIGH ACC                 MISSING DEGREE
276 TEMPERATURE/DRY-BULB TEMPERATURE   0.22030000000000E+003 K
277 DEW-POINT TEMPERATURE              0.20630000000000E+003 K
278 WIND DIRECTION                                   MISSING DEGREE TRUE
279 WIND SPEED                                       MISSING M/S
280 LONG TIME PERIOD OR DISPLACEMENT   0.15950000000000E+004 SECOND
281 EXTENDED VERTICAL SOUNDING SIGNI   0.40960000000000E+004 FLAG TABLE 8042
282 PRESSURE                           0.24660000000000E+005 PA
283 GEOPOTENTIAL HEIGHT                0.10270000000000E+005 GPM
284 LATITUDE DISPLACEMENT (HIGH ACCU                 MISSING DEGREE
285 LONGITUDE DISPLACEMENT (HIGH ACC                 MISSING DEGREE
286 TEMPERATURE/DRY-BULB TEMPERATURE   0.21980000000000E+003 K
287 DEW-POINT TEMPERATURE              0.20420000000000E+003 K
288 WIND DIRECTION                                   MISSING DEGREE TRUE
289 WIND SPEED                                       MISSING M/S
290 LONG TIME PERIOD OR DISPLACEMENT   0.16150000000000E+004 SECOND
291 EXTENDED VERTICAL SOUNDING SIGNI   0.20800000000000E+004 FLAG TABLE 8042
292 PRESSURE                           0.24180000000000E+005 PA
293 GEOPOTENTIAL HEIGHT                0.10398000000000E+005 GPM
294 LATITUDE DISPLACEMENT (HIGH ACCU  -0.36000000000000E+000 DEGREE
295 LONGITUDE DISPLACEMENT (HIGH ACC   0.26000000000000E+000 DEGREE
296 TEMPERATURE/DRY-BULB TEMPERATURE   0.21970000000000E+003 K
297 DEW-POINT TEMPERATURE              0.20250000000000E+003 K
298 WIND DIRECTION                     0.34100000000000E+003 DEGREE TRUE
299 WIND SPEED                         0.50900000000000E+002 M/S
300 LONG TIME PERIOD OR DISPLACEMENT   0.17900000000000E+004 SECOND
301 EXTENDED VERTICAL SOUNDING SIGNI   0.20480000000000E+004 FLAG TABLE 8042
302 PRESSURE                           0.20620000000000E+005 PA
303 GEOPOTENTIAL HEIGHT                0.11434000000000E+005 GPM
304 LATITUDE DISPLACEMENT (HIGH ACCU  -0.43000000000000E+000 DEGREE
305 LONGITUDE DISPLACEMENT (HIGH ACC   0.30000000000000E+000 DEGREE
306 TEMPERATURE/DRY-BULB TEMPERATURE   0.22320000000000E+003 K
307 DEW-POINT TEMPERATURE              0.19300000000000E+003 K
308 WIND DIRECTION                     0.33300000000000E+003 DEGREE TRUE
309 WIND SPEED                         0.32200000000000E+002 M/S
310 LONG TIME PERIOD OR DISPLACEMENT   0.18050000000000E+004 SECOND
311 EXTENDED VERTICAL SOUNDING SIGNI   0.81920000000000E+004 FLAG TABLE 8042
312 PRESSURE                           0.20320000000000E+005 PA
313 GEOPOTENTIAL HEIGHT                0.11527000000000E+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
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500 LONG TIME PERIOD OR DISPLACEMENT   0.27900000000000E+004 SECOND
501 EXTENDED VERTICAL SOUNDING SIGNI   0.20480000000000E+004 FLAG TABLE 8042
502 PRESSURE                           0.80300000000000E+004 PA
503 GEOPOTENTIAL HEIGHT                0.17414000000000E+005 GPM
504 LATITUDE DISPLACEMENT (HIGH ACCU  -0.62000000000000E+000 DEGREE
505 LONGITUDE DISPLACEMENT (HIGH ACC   0.50000000000000E+000 DEGREE
506 TEMPERATURE/DRY-BULB TEMPERATURE   0.21010000000000E+003 K
507 DEW-POINT TEMPERATURE              0.18310000000000E+003 K
508 WIND DIRECTION                     0.32200000000000E+003 DEGREE TRUE
509 WIND SPEED                         0.24500000000000E+002 M/S
510 LONG TIME PERIOD OR DISPLACEMENT   0.29200000000000E+004 SECOND
511 EXTENDED VERTICAL SOUNDING SIGNI   0.20480000000000E+004 FLAG TABLE 8042
512 PRESSURE                           0.70400000000000E+004 PA
513 GEOPOTENTIAL HEIGHT                0.18216000000000E+005 GPM
514 LATITUDE DISPLACEMENT (HIGH ACCU  -0.64000000000000E+000 DEGREE
515 LONGITUDE DISPLACEMENT (HIGH ACC   0.52000000000000E+000 DEGREE
516 TEMPERATURE/DRY-BULB TEMPERATURE   0.20730000000000E+003 K
517 DEW-POINT TEMPERATURE              0.18050000000000E+003 K
518 WIND DIRECTION                     0.33800000000000E+003 DEGREE TRUE
519 WIND SPEED                         0.16900000000000E+002 M/S
520 LONG TIME PERIOD OR DISPLACEMENT   0.29260000000000E+004 SECOND
521 EXTENDED VERTICAL SOUNDING SIGNI   0.65536000000000E+005 FLAG TABLE 8042
522 PRESSURE                           0.70000000000000E+004 PA
523 GEOPOTENTIAL HEIGHT                0.18252000000000E+005 GPM
524 LATITUDE DISPLACEMENT (HIGH ACCU  -0.64000000000000E+000 DEGREE
525 LONGITUDE DISPLACEMENT (HIGH ACC   0.52000000000000E+000 DEGREE
526 TEMPERATURE/DRY-BULB TEMPERATURE   0.20710000000000E+003 K
527 DEW-POINT TEMPERATURE              0.18180000000000E+003 K
528 WIND DIRECTION                     0.33800000000000E+003 DEGREE TRUE
529 WIND SPEED                         0.16700000000000E+002 M/S
530 LONG TIME PERIOD OR DISPLACEMENT   0.29700000000000E+004 SECOND
531 EXTENDED VERTICAL SOUNDING SIGNI   0.81920000000000E+004 FLAG TABLE 8042
532 PRESSURE                           0.67100000000000E+004 PA
533 GEOPOTENTIAL HEIGHT                0.18506000000000E+005 GPM
534 LATITUDE DISPLACEMENT (HIGH ACCU  -0.65000000000000E+000 DEGREE
535 LONGITUDE DISPLACEMENT (HIGH ACC   0.52000000000000E+000 DEGREE
536 TEMPERATURE/DRY-BULB TEMPERATURE   0.20530000000000E+003 K
537 DEW-POINT TEMPERATURE              0.17930000000000E+003 K
538 WIND DIRECTION                     0.33200000000000E+003 DEGREE TRUE
539 WIND SPEED                         0.19100000000000E+002 M/S
540 LONG TIME PERIOD OR DISPLACEMENT   0.30250000000000E+004 SECOND
541 EXTENDED VERTICAL SOUNDING SIGNI   0.20480000000000E+004 FLAG TABLE 8042
542 PRESSURE                           0.63800000000000E+004 PA
543 GEOPOTENTIAL HEIGHT                0.18813000000000E+005 GPM
544 LATITUDE DISPLACEMENT (HIGH ACCU  -0.66000000000000E+000 DEGREE
545 LONGITUDE DISPLACEMENT (HIGH ACC   0.53000000000000E+000 DEGREE
546 TEMPERATURE/DRY-BULB TEMPERATURE   0.20580000000000E+003 K
547 DEW-POINT TEMPERATURE              0.17980000000000E+003 K
548 WIND DIRECTION                     0.33100000000000E+003 DEGREE TRUE
549 WIND SPEED                         0.23300000000000E+002 M/S
550 LONG TIME PERIOD OR DISPLACEMENT   0.31600000000000E+004 SECOND
551 EXTENDED VERTICAL SOUNDING SIGNI   0.20480000000000E+004 FLAG TABLE 8042
552 PRESSURE                           0.55000000000000E+004 PA
553 GEOPOTENTIAL HEIGHT                0.19704000000000E+005 GPM
554 LATITUDE DISPLACEMENT (HIGH ACCU  -0.68000000000000E+000 DEGREE
555 LONGITUDE DISPLACEMENT (HIGH ACC   0.55000000000000E+000 DEGREE
556 TEMPERATURE/DRY-BULB TEMPERATURE   0.20710000000000E+003 K
557 DEW-POINT TEMPERATURE              0.18060000000000E+003 K
558 WIND DIRECTION                     0.33000000000000E+003 DEGREE TRUE
559 WIND SPEED                         0.18400000000000E+002 M/S
560 LONG TIME PERIOD OR DISPLACEMENT   0.32470000000000E+004 SECOND
561 EXTENDED VERTICAL SOUNDING SIGNI   0.65536000000000E+005 FLAG TABLE 8042
562 PRESSURE                           0.50000000000000E+004 PA
563 GEOPOTENTIAL HEIGHT                0.20286000000000E+005 GPM
564 LATITUDE DISPLACEMENT (HIGH ACCU  -0.69000000000000E+000 DEGREE
565 LONGITUDE DISPLACEMENT (HIGH ACC   0.56000000000000E+000 DEGREE
566 TEMPERATURE/DRY-BULB TEMPERATURE   0.20660000000000E+003 K
567 DEW-POINT TEMPERATURE              0.18000000000000E+003 K
568 WIND DIRECTION                     0.30100000000000E+003 DEGREE TRUE
569 WIND SPEED                         0.12300000000000E+002 M/S
570 LONG TIME PERIOD OR DISPLACEMENT   0.32650000000000E+004 SECOND
571 EXTENDED VERTICAL SOUNDING SIGNI   0.20480000000000E+004 FLAG TABLE 8042
572 PRESSURE                           0.48900000000000E+004 PA
573 GEOPOTENTIAL HEIGHT                0.20417000000000E+005 GPM
574 LATITUDE DISPLACEMENT (HIGH ACCU  -0.69000000000000E+000 DEGREE
575 LONGITUDE DISPLACEMENT (HIGH ACC   0.56000000000000E+000 DEGREE
576 TEMPERATURE/DRY-BULB TEMPERATURE   0.20670000000000E+003 K
577 DEW-POINT TEMPERATURE              0.17950000000000E+003 K
578 WIND DIRECTION                     0.29500000000000E+003 DEGREE TRUE
579 WIND SPEED                         0.13600000000000E+002 M/S
580 LONG TIME PERIOD OR DISPLACEMENT   0.33850000000000E+004 SECOND
581 EXTENDED VERTICAL SOUNDING SIGNI   0.20480000000000E+004 FLAG TABLE 8042
582 PRESSURE                           0.44200000000000E+004 PA
583 GEOPOTENTIAL HEIGHT                0.21038000000000E+005 GPM
584 LATITUDE DISPLACEMENT (HIGH ACCU  -0.70000000000000E+000 DEGREE
585 LONGITUDE DISPLACEMENT (HIGH ACC   0.58000000000000E+000 DEGREE
586 TEMPERATURE/DRY-BULB TEMPERATURE   0.20770000000000E+003 K
587 DEW-POINT TEMPERATURE              0.18000000000000E+003 K
588 WIND DIRECTION                     0.31700000000000E+003 DEGREE TRUE
589 WIND SPEED                         0.10100000000000E+002 M/S
590 LONG TIME PERIOD OR DISPLACEMENT   0.34150000000000E+004 SECOND
591 EXTENDED VERTICAL SOUNDING SIGNI   0.20480000000000E+004 FLAG TABLE 8042
592 PRESSURE                           0.42900000000000E+004 PA
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593 GEOPOTENTIAL HEIGHT                0.21223000000000E+005 GPM
594 LATITUDE DISPLACEMENT (HIGH ACCU  -0.70000000000000E+000 DEGREE
595 LONGITUDE DISPLACEMENT (HIGH ACC   0.58000000000000E+000 DEGREE
596 TEMPERATURE/DRY-BULB TEMPERATURE   0.20800000000000E+003 K
597 DEW-POINT TEMPERATURE              0.18010000000000E+003 K
598 WIND DIRECTION                     0.30500000000000E+003 DEGREE TRUE
599 WIND SPEED                         0.91000000000000E+001 M/S
600 LONG TIME PERIOD OR DISPLACEMENT   0.34650000000000E+004 SECOND
601 EXTENDED VERTICAL SOUNDING SIGNI   0.81920000000000E+004 FLAG TABLE 8042
602 PRESSURE                           0.40500000000000E+004 PA
603 GEOPOTENTIAL HEIGHT                0.21574000000000E+005 GPM
604 LATITUDE DISPLACEMENT (HIGH ACCU  -0.70000000000000E+000 DEGREE
605 LONGITUDE DISPLACEMENT (HIGH ACC   0.59000000000000E+000 DEGREE
606 TEMPERATURE/DRY-BULB TEMPERATURE   0.20980000000000E+003 K
607 DEW-POINT TEMPERATURE              0.18050000000000E+003 K
608 WIND DIRECTION                     0.26700000000000E+003 DEGREE TRUE
609 WIND SPEED                         0.10500000000000E+002 M/S
610 LONG TIME PERIOD OR DISPLACEMENT   0.34900000000000E+004 SECOND
611 EXTENDED VERTICAL SOUNDING SIGNI   0.20480000000000E+004 FLAG TABLE 8042
612 PRESSURE                           0.39300000000000E+004 PA
613 GEOPOTENTIAL HEIGHT                0.21756000000000E+005 GPM
614 LATITUDE DISPLACEMENT (HIGH ACCU  -0.70000000000000E+000 DEGREE
615 LONGITUDE DISPLACEMENT (HIGH ACC   0.59000000000000E+000 DEGREE
616 TEMPERATURE/DRY-BULB TEMPERATURE   0.20840000000000E+003 K
617 DEW-POINT TEMPERATURE              0.17990000000000E+003 K
618 WIND DIRECTION                     0.25300000000000E+003 DEGREE TRUE
619 WIND SPEED                         0.11800000000000E+002 M/S
620 LONG TIME PERIOD OR DISPLACEMENT   0.36000000000000E+004 SECOND
621 EXTENDED VERTICAL SOUNDING SIGNI   0.40960000000000E+005 FLAG TABLE 8042
622 PRESSURE                           0.35000000000000E+004 PA
623 GEOPOTENTIAL HEIGHT                0.22460000000000E+005 GPM
624 LATITUDE DISPLACEMENT (HIGH ACCU  -0.70000000000000E+000 DEGREE
625 LONGITUDE DISPLACEMENT (HIGH ACC   0.62000000000000E+000 DEGREE
626 TEMPERATURE/DRY-BULB TEMPERATURE   0.20480000000000E+003 K
627 DEW-POINT TEMPERATURE              0.17790000000000E+003 K
628 WIND DIRECTION                     0.27500000000000E+003 DEGREE TRUE
629 WIND SPEED                         0.19200000000000E+002 M/S
630 LONG TIME PERIOD OR DISPLACEMENT   0.36950000000000E+004 SECOND
631 EXTENDED VERTICAL SOUNDING SIGNI   0.20480000000000E+004 FLAG TABLE 8042
632 PRESSURE                           0.31800000000000E+004 PA
633 GEOPOTENTIAL HEIGHT                0.23023000000000E+005 GPM
634 LATITUDE DISPLACEMENT (HIGH ACCU  -0.70000000000000E+000 DEGREE
635 LONGITUDE DISPLACEMENT (HIGH ACC   0.64000000000000E+000 DEGREE
636 TEMPERATURE/DRY-BULB TEMPERATURE   0.20730000000000E+003 K
637 DEW-POINT TEMPERATURE              0.17900000000000E+003 K
638 WIND DIRECTION                     0.29500000000000E+003 DEGREE TRUE
639 WIND SPEED                         0.20300000000000E+002 M/S
640 LONG TIME PERIOD OR DISPLACEMENT   0.37520000000000E+004 SECOND
641 EXTENDED VERTICAL SOUNDING SIGNI   0.65536000000000E+005 FLAG TABLE 8042
642 PRESSURE                           0.30000000000000E+004 PA
643 GEOPOTENTIAL HEIGHT                0.23384000000000E+005 GPM
644 LATITUDE DISPLACEMENT (HIGH ACCU  -0.71000000000000E+000 DEGREE
645 LONGITUDE DISPLACEMENT (HIGH ACC   0.66000000000000E+000 DEGREE
646 TEMPERATURE/DRY-BULB TEMPERATURE   0.20830000000000E+003 K
647 DEW-POINT TEMPERATURE              0.17880000000000E+003 K
648 WIND DIRECTION                     0.29100000000000E+003 DEGREE TRUE
649 WIND SPEED                         0.17500000000000E+002 M/S
650 LONG TIME PERIOD OR DISPLACEMENT   0.38200000000000E+004 SECOND
651 EXTENDED VERTICAL SOUNDING SIGNI   0.20480000000000E+004 FLAG TABLE 8042
652 PRESSURE                           0.28000000000000E+004 PA
653 GEOPOTENTIAL HEIGHT                0.23813000000000E+005 GPM
654 LATITUDE DISPLACEMENT (HIGH ACCU  -0.71000000000000E+000 DEGREE
655 LONGITUDE DISPLACEMENT (HIGH ACC   0.68000000000000E+000 DEGREE
656 TEMPERATURE/DRY-BULB TEMPERATURE   0.20930000000000E+003 K
657 DEW-POINT TEMPERATURE              0.18000000000000E+003 K
658 WIND DIRECTION                     0.28000000000000E+003 DEGREE TRUE
659 WIND SPEED                         0.24800000000000E+002 M/S
660 LONG TIME PERIOD OR DISPLACEMENT   0.38550000000000E+004 SECOND
661 EXTENDED VERTICAL SOUNDING SIGNI   0.81920000000000E+004 FLAG TABLE 8042
662 PRESSURE                           0.27100000000000E+004 PA
663 GEOPOTENTIAL HEIGHT                0.24015000000000E+005 GPM
664 LATITUDE DISPLACEMENT (HIGH ACCU  -0.71000000000000E+000 DEGREE
665 LONGITUDE DISPLACEMENT (HIGH ACC   0.69000000000000E+000 DEGREE
666 TEMPERATURE/DRY-BULB TEMPERATURE   0.21040000000000E+003 K
667 DEW-POINT TEMPERATURE              0.18040000000000E+003 K
668 WIND DIRECTION                     0.28700000000000E+003 DEGREE TRUE
669 WIND SPEED                         0.22200000000000E+002 M/S
670 LONG TIME PERIOD OR DISPLACEMENT   0.39050000000000E+004 SECOND
671 EXTENDED VERTICAL SOUNDING SIGNI   0.20480000000000E+004 FLAG TABLE 8042
672 PRESSURE                           0.25700000000000E+004 PA
673 GEOPOTENTIAL HEIGHT                0.24324000000000E+005 GPM
674 LATITUDE DISPLACEMENT (HIGH ACCU  -0.72000000000000E+000 DEGREE
675 LONGITUDE DISPLACEMENT (HIGH ACC   0.70000000000000E+000 DEGREE
676 TEMPERATURE/DRY-BULB TEMPERATURE   0.21000000000000E+003 K
677 DEW-POINT TEMPERATURE              0.18000000000000E+003 K
678 WIND DIRECTION                     0.29700000000000E+003 DEGREE TRUE
679 WIND SPEED                         0.18800000000000E+002 M/S
680 LONG TIME PERIOD OR DISPLACEMENT   0.39550000000000E+004 SECOND
681 EXTENDED VERTICAL SOUNDING SIGNI   0.81920000000000E+004 FLAG TABLE 8042
682 PRESSURE                           0.24300000000000E+004 PA
683 GEOPOTENTIAL HEIGHT                0.24669000000000E+005 GPM
684 LATITUDE DISPLACEMENT (HIGH ACCU  -0.72000000000000E+000 DEGREE
685 LONGITUDE DISPLACEMENT (HIGH ACC   0.71000000000000E+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                          0.39200000000000E+002 M/S
780 LONG TIME PERIOD OR DISPLACEMENT    0.47830000000000E+004 SECOND
781 EXTENDED VERTICAL SOUNDING SIGNI    0.65536000000000E+005 FLAG TABLE 8042
782 PRESSURE                            0.10000000000000E+004 PA
783 GEOPOTENTIAL HEIGHT                 0.30154000000000E+005 GPM
784 LATITUDE DISPLACEMENT (HIGH ACCU   -0.69000000000000E+000 DEGREE
785 LONGITUDE DISPLACEMENT (HIGH ACC    0.10100000000000E+001 DEGREE
786 TEMPERATURE/DRY-BULB TEMPERATURE    0.21550000000000E+003 K
787 DEW-POINT TEMPERATURE               0.18400000000000E+003 K
788 WIND DIRECTION                      0.25600000000000E+003 DEGREE TRUE
789 WIND SPEED                          0.43000000000000E+002 M/S
790 LONG TIME PERIOD OR DISPLACEMENT    0.48250000000000E+004 SECOND
791 EXTENDED VERTICAL SOUNDING SIGNI    0.18432000000000E+005 FLAG TABLE 8042
792 PRESSURE                            0.96000000000000E+003 PA
793 GEOPOTENTIAL HEIGHT                 0.30426000000000E+005 GPM
794 LATITUDE DISPLACEMENT (HIGH ACCU   -0.68000000000000E+000 DEGREE
795 LONGITUDE DISPLACEMENT (HIGH ACC    0.10300000000000E+001 DEGREE
796 TEMPERATURE/DRY-BULB TEMPERATURE    0.21640000000000E+003 K
797 DEW-POINT TEMPERATURE               0.18560000000000E+003 K
798 WIND DIRECTION                      0.26100000000000E+003 DEGREE TRUE
799 WIND SPEED                          0.43700000000000E+002 M/S
800 LONG TIME PERIOD OR DISPLACEMENT    0.49600000000000E+004 SECOND
801 EXTENDED VERTICAL SOUNDING SIGNI    0.21120000000000E+004 FLAG TABLE 8042
802 PRESSURE                            0.81000000000000E+003 PA
803 GEOPOTENTIAL HEIGHT                 0.31510000000000E+005 GPM
804 LATITUDE DISPLACEMENT (HIGH ACCU   -0.68000000000000E+000 DEGREE
805 LONGITUDE DISPLACEMENT (HIGH ACC    0.11100000000000E+001 DEGREE
806 TEMPERATURE/DRY-BULB TEMPERATURE    0.21640000000000E+003 K
807 DEW-POINT TEMPERATURE               0.18620000000000E+003 K
808 WIND DIRECTION                      0.25600000000000E+003 DEGREE TRUE
809 WIND SPEED                          0.39200000000000E+002 M/S
810 LONG TIME PERIOD OR DISPLACEMENT    0.49800000000000E+004 SECOND
811 EXTENDED VERTICAL SOUNDING SIGNI    0.12288000000000E+005 FLAG TABLE 8042
812 PRESSURE                            0.78000000000000E+003 PA
813 GEOPOTENTIAL HEIGHT                 0.31708000000000E+005 GPM
814 LATITUDE DISPLACEMENT (HIGH ACCU                MISSING DEGREE
815 LONGITUDE DISPLACEMENT (HIGH ACC                MISSING DEGREE
816 TEMPERATURE/DRY-BULB TEMPERATURE    0.21680000000000E+003 K
817 DEW-POINT TEMPERATURE               0.18630000000000E+003 K
818 WIND DIRECTION                                  MISSING DEGREE TRUE
819 WIND SPEED                                      MISSING M/S
820 DELAYED DESCRIPTOR REPLICATION F    0.30000000000000E+001 NUMERIC
821 LONG TIME PERIOD OR DISPLACEMENT    0.18550000000000E+004 SECOND
822 EXTENDED VERTICAL SOUNDING SIGNI    0.18432000000000E+005 FLAG TABLE 8042
823 PRESSURE                            0.19260000000000E+005 PA
824 LATITUDE DISPLACEMENT (HIGH ACCU   -0.44000000000000E+000 DEGREE
825 LONGITUDE DISPLACEMENT (HIGH ACC    0.31000000000000E+000 DEGREE
826 ABSOLUTE WIND SHEAR IN 1 KM LAYE    0.11100000000000E+002 M/S
827 ABSOLUTE WIND SHEAR IN 1 KM LAYE    0.14300000000000E+002 M/S
828 LONG TIME PERIOD OR DISPLACEMENT    0.22800000000000E+004 SECOND
829 EXTENDED VERTICAL SOUNDING SIGNI    0.18432000000000E+005 FLAG TABLE 8042
830 PRESSURE                            0.12750000000000E+005 PA
831 LATITUDE DISPLACEMENT (HIGH ACCU   -0.54000000000000E+000 DEGREE
832 LONGITUDE DISPLACEMENT (HIGH ACC    0.40000000000000E+000 DEGREE
833 ABSOLUTE WIND SHEAR IN 1 KM LAYE    0.11000000000000E+002 M/S
834 ABSOLUTE WIND SHEAR IN 1 KM LAYE    0.17600000000000E+002 M/S
835 LONG TIME PERIOD OR DISPLACEMENT    0.48250000000000E+004 SECOND
836 EXTENDED VERTICAL SOUNDING SIGNI    0.18432000000000E+005 FLAG TABLE 8042
837 PRESSURE                            0.96000000000000E+003 PA
838 LATITUDE DISPLACEMENT (HIGH ACCU   -0.68000000000000E+000 DEGREE
839 LONGITUDE DISPLACEMENT (HIGH ACC    0.10300000000000E+001 DEGREE
840 ABSOLUTE WIND SHEAR IN 1 KM LAYE    0.58000000000000E+001 M/S
841 ABSOLUTE WIND SHEAR IN 1 KM LAYE    0.58000000000000E+001 M/S
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