NCEP BUFR FILE STRUCTURE

Every BUFR file that is presented to the NCEP BUFRLIB software, either for input (reading/decoding) or output (writing/encoding) purposes, must have a BUFR tables (A, B, D) file associated with it. These tables may be defined within a separate ASCII text file (seeDescription and Format of BUFR Tables for more information) or, in the case of an existing BUFR file, may be embedded within the first few BUFR messages of the file itself. When an NCEP "flavored" BUFR file is created for the first time, the BUFR tables are usually read from an external ASCII text file (although it is also possible to read the tables from table messages that are embedded within another BUFR file). The tables will then be written into the first few BUFR messages at the top of the new file (using as many messages as needed to encode the complete set of tables). This "feature" allows all NCEP BUFR files to be self-describing, i.e., anyone using the NCEP BUFRLIB routines can read an NCEP BUFR file without the need for external files containing BUFR tables A, B, D.

This document describes in detail the content of these embedded BUFR messages containing the BUFR tables, as they appear in NCEP BUFR files. It then follows with a less-detailed summary of the contents of the actual BUFR data messages which follow. The example shown here is for the NCEP BUFR tables associated with Table A (message) type 2 [vertical soundings (other than satellite)] as it appeared on 04/01/2008 (although the basic layout of the BUFR table messages is the same for all Table A types). These tables are embedded in the top messages of the NCEP "adpupa" BUFR data dump file. This file contains upper-air profile data for rawinsonde, dropwinsonde, PIBAL, ozonesonde, wind and spectral moment profiler, NEXRAD VAD wind, and RASS temperature reports.

Click here to view the ASCII text file (called /nwprod/fix/bufrtab.002 on the NCEP CCS machines) which is read in by the BUFRLIB software.

This text file will require three 10,000 byte BUFR messages in order to hold all of its information. These will be the first three messages in the "adpupa" BUFR data dump file. The BUFR messages containing the tables A, B, D are in Table A (message) type 11.

BUFR TABLE IN MESSAGE #1

Section 0 - Indicator Section:

BYTES	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
1-4	"**BUFR**"	start of BUFR message
5-7	9950	total length of BUFR message (including Section 0) in bytes
8	3	BUFR edition number (3 or 4)

Section 1 - Identification Section for BUFR Edition 3:

BYTES	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
1-3	18	length of section in bytes
4	0	BUFR master table (zero if standard WMO FM 94 BUFR tables are used)
5	3 (NCEP Central Operations)	originating/generating sub-center: Code table 0-01-034
6	7 (US NWS, NCEP)	originating/generating center: Code table 0-01-033
7	0	update sequence number (zero for original BUFR messages; incremented for updates)
8, Bit 1	0	= 0 no optional section, = 1 optional section follows
8, Bits 2–8	0	set to zero (reserved)
9	11 (BUFR tables, complete replacement or update)	data category (Table A)
10	1	data sub-category [defined by local automatic data processing (ADP) centers, always 1 here]
11	12	version number of master table used
12	1	version number of local tables used to augment the master table in use, always 1 here
13	0	year of century most typical for the BUFR message contents
14	0	month most typical for the BUFR message contents
15	0	day most typical for the BUFR message contents
16	0	hour most typical for the BUFR message contents

17	0	minute most typical for the BUFR message contents
18	0	reserved for local use by ADP centers (NCEP: century most typical for the BUFR message contents)

Section 2 - Optional Section:

(none per Byte 8, Bit 1 of Section 1)

Section 3 - Data Description Section:

(Note: Light shaded cells are replicated, dark shaded cells are nested replication)

BYTES	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
1-3	38	length of section in bytes
4	0	set to zero (reserved)
5-6	1	number of data subsets
7, Bit 1	1	= 1 observed data, = 0 other data
7, Bit 2	0	= 1 compressed data, = 0 non-compressed data
7, Bits 3–8	0	set to zero (reserved)
8–37		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, each descriptor occupies 2 bytes and contains 3 parts: F: 2 bits X: 6 bits Y: 8 bits
8-9	F-X-Y value: 1-03-000	use delayed replication for the next three data descriptors
10-11	F-X-Y value: 0-31-001	8-bit delayed replication factor (number of lines in Table A section of ASCII text file, see [1] below)
12-13	F-X-Y value: 0-00-001	Table A: entry; 3-characters (parsed from columns 17-19 of each line in Table A section of ASCII text file)
14-15	F-X-Y value: 0-00-002	Table A: data category description, line 1; 32-characters (parsed from columns 3-10 and 22-45 of each line in Table A section of ASCII text file)

16-17	F-X-Y value: 0-00-003	Table A: data category description, line 2; 32-characters (parsed from columns 46-77 of each line in Table A section of ASCII text file)
18-19	F-X-Y value: 1-01-000	use delayed replication for the next one data descriptor
20-21	F-X-Y value: 0-31-001	8-bit delayed replication factor [number of lines in either Table B part 1 or Table B part 2 sections of ASCII text file (should be the same) plus 5 additional Table B entries which do not appear in the ASCII text file, see [1] below]
22-23	F-X-Y value: 3-00-004	sequence containing F, X, Y part descriptors, element name, units name, scale sign, scale, reference sign, reference value, data width (see [2] below)
24-25	F-X-Y value: 1-05-000	use delayed replication for the next five data descriptors
26-27	F-X-Y value: 0-31-001	8-bit delayed replication factor (number of lines in Table A plusTable D sections of ASCII text file plus 4 additional Table D entries which do not appear in the ASCII text file see [1] below)
28-29	F-X-Y value: 3-00-003	sequence containing F, X and Y part descriptors (see [4] below)
30-31	F-X-Y value: 2-05-064	insert 64 characters (parsed from columns 3-10 and 22-77 of each line in Table A or Table D section of ASCII text file)
32-33	F-X-Y value: 1-01-000	use delayed replication for the next one data descriptor
34-35	F-X-Y value: 0-31-001	8-bit delayed replication factor [number of constituent Table B, C and D descriptors in the defining sequence for each F-X-Y value defined in 3-00-003 above, parsed from mnemonic character strings in columns 14-78 of each line in Table D defining sequence section of ASCII text file (one more more blank characters separate the constituent Table B and C descriptors while pairs of parentheses, curly brackets, square brackets or angle brackets denote various constituent Table D descriptors, the mnemonic character sting in columns 3-10 (left justified) is used as a line continuation indicator and is also used to define the sequence based on the matching mnemonic character string in columns 3-10 (left justified) of the corresponding line in the Table A or Table D section of ASCII text file]
36-37	F-X-Y value: 0-00-030	descriptor defining sequence; 6 characters [each constituent Table B or C mnemonic character string or Table D indicator (pairs of parentheses, curly brackets, square brackets or angle brackets) parsed out of columns 14-78 of each line (or lines if there is acontinuation) in Table D defining sequence section of ASCII text file; the parsed mnemonic character sting is used to define the Table B or Table D element based on the matching mnemonic character string in columns 3-10 (left justified) of the corresponding line in Table B part 1 and part 2 or Table D section of ASCII text file]
38	0	reserved

[1] - Since the length of an NCEP BUFR message has an upper limit (the default being 10,000 bytes, as used in the "adpupa" BUFR data dump files, but with a maximum of 2.5 million bytes), this replication factor may be less than the actual number of lines in this section of the ASCII text file. In this case, the next BUFR message will resume at point left off in the replication

here, and it will continue the replication until all lines in this section of the ASCII text file have been parsed out.

[2] - Expansion of sequence descriptor 3-00-004 (element name, units name, scale sign, scale, reference sign, reference value, data width):

3-00-003 (Sequence containing F, X and Y part descriptors) (see [3] below)

0-00-013 (Element name, line 1; 32 characters) (parsed from columns 3-10 and 22-45 of each line in Table B, part 1 section of ASCII text file)

0-00-014 (Element name, line 2; 32 characters) (parsed from columns 46-77 of each line in Table B, part 1 section of ASCII text file)

0-00-015 (Units name; 24 characters) (parsed from columns 41-64 of each line in Table B, part 2 section of ASCII text file)

0-00-016 (Units scale sign "+" or "-"; 1 character) [parsed from column just before number parsed out of columns 15-17, right justified, of each line in Table B, part 2 section of ASCII text file, blank (" ") is interpreted as "+"]

0-00-017 (Units scale; 3 characters) (parsed from numbers in columns 15-17, right justified, of each line in Table B, part 2 section of ASCII text file)

0-00-018 (Units reference sign "+" or "-"; 1 character) [parsed from column just before number parsed out of columns 22-31, right justified, of each line in Table B, part 2 section of ASCII text file, blank (" ") is interpreted as "+"]

0-00-019 (Units reference value; 10 characters) (parsed from numbers in columns 22-31, right justified, of each line in Table B, part 2 section of ASCII text file)

0-00-020 (Element data width; 3 characters) (parsed from numbers in columns 35-37, right justified, of each line inTable B, part 2 section of ASCII text file)

[3] - Expansion of sequence descriptor 3-00-003 (F, X and Y part descriptors):

0-00-010 (F descriptor to be added or defined; 1 character) (parsed from character 14 of each line in Table B, part 1 section of ASCII text file)

0-00-011 (X descriptor to be added or defined; 2 characters) (parsed from columns 15-16 of each line in Table B, part 1 section of ASCII text file)

0-00-012 (Y descriptor to be added or defined; 3 characters) (parsed from columns 17-19 of each line in Table B, part 1 section of ASCII text file)

[4] - Expansion of sequence descriptor 3-00-003 (F, X and Y part descriptors):

0-00-010 (F descriptor to be added or defined; 1 character) (parsed from character 14 of each line in Table A or Table D section of ASCII text file, for Table A section, the character "**A**" is changed to "**3**")

0-00-011 (X descriptor to be added or defined; 2 characters) (parsed from columns 15-16 of each line in Table A or Table D section of ASCII text file)

0-00-012 (Y descriptor to be added or defined; 3 characters) (parsed from columns 17-19 of each line in Table A or Table D section of ASCII text file)

[5] - Multiple successive lines may be used in a continuation fashion by repeating, within columns 3-10 of each continuation line, the left-justified mnemonic being defined.

Section 4 - Data Section:

BYTES	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
1-3	9882	length of section in bytes
4	0	set to zero (reserved)
5-9882	(see [1] below)	binary data as defined by sequence descriptors in Section 3 (repeated just once since there is one subset in the BUFR message)

[1] - contents of bytes 5-9882

EXPANDED F-X-Y DESCRIPTOR LIST (from Section 3)	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description	
0-31-001	17	number of replications of Table A information (entry itself, text description 1, text description 2)	
0-00-001	"**218**"	1st replication: Table A entry, 3 characters	
0-00-002	"**NC002001 MSG TYPE 002-001 RAWIN**"	1st replication: Table A: data category description, line 1; 32-characters	
0-00-003	"**SONDE - FIXED LAND** "	1st replication: Table A: data category description, line 2; 32-characters	
0-00-001	"**219**"	2nd replication: Table A entry, 3 characters	

0-00-002	"**NC002002 MSG TYPE 002-002 RAWIN**"	2nd replication: Table A: data category description, line 1; 32-characters	
0-00-003	"**SONDE - MOBIL LAND** "	2nd replication: Table A: data category description, line 2; 32-characters	
0-00-001	"**220**"	3rd replication: Table A entry, 3 characters	
0-00-002	"**NC002003 MSG TYPE 002-003 RAWIN**"	3rd replication: Table A: data category description, line 1; 32-characters	
0-00-003	"**SONDE - SHIP** "	3rd replication: Table A: data category description, line 2; 32-characters	
****** 4th through 14th replications follow in the same way ******			
0-00-001	"**208**"	15th replication: Table A entry, 3 characters	
0-00-002	"**NC002015 MSG TYPE 002-015 OZONE**"	15th replication: Table A: data category description, line 1; 32-characters	
0-00-003	"**SONDE (HIGH-RES) (FROM ASCII)** "	15th replication: Table A: data category description, line 2; 32-characters	
0-00-001	"**206**"	16th replication: Table A entry, 3 characters	

0-00-002	"**NC002016 MSG TYPE 002-016 EUROP**"	16th replication: Table A: data category description, line 1; 32-characters	
0-00-003	"**EAN PROFILER WINDS** "	16th replication: Table A: data category description, line 2; 32-characters	
0-00-001	"**235**"	17th replication: Table A entry, 3 characters	
0-00-002	"**NC004005 MESSAGE TYPE 004-005 R**"	17th replication: Table A: data category description, line 1; 32-characters	
0-00-003	"**ECCO - flight level** "	17th replication: Table A: data category description, line 2; 32-characters	
0-31-001	78	number of replications of Table B information (F, X, Y part descriptors, element name, units name, scale sign, scale, reference sign, reference value, data width)	
0-00-010	"**0**" (see [2] below)	1st replication: F descriptor to be added or defined; 1 character	
0-00-011	"**63**"	1st replication: X descriptor to be added or defined; 2 characters	
0-00-012	"**000**"	1st replication: Y descriptor to be added or defined; 3 characters	
0-00-013	"**BYTCNT** "	1st replication: Element name, line 1; 32 characters	

0-00-014	" "	1st replication: Element name, line 2; 32 characters	
0-00-015	"**BYTES** "	1st replication: Units name; 24 characters	
0-00-016	"**+**"	1st replication: Units scale sign; 1 character	
0-00-017	"**0** "	1st replication: Units scale; 3 characters	
0-00-018	"**+**"	1st replication: Units reference sign; 1 character	
0-00-019	"**0** "	1st replication: Units reference value; 10 characters	
0-00-020	"**16** "	1st replication: Element data width; 3 characters	
0-00-010	"**0**" (see [2] below)	2nd replication: F descriptor to be added or defined; 1 character	
0-00-011	"**63**"	2nd replication: X descriptor to be added or defined; 2 characters	
0-00-012	"**255**"	2nd replication: Y descriptor to be added or defined; 3 characters	
0-00-013	"**BITPAD** "	2nd replication: Element name, line 1; 32 characters	
0-00-014	" "	2nd replication: Element name, line 2; 32 characters	
0-00-015	"**NONE** "	2nd replication: Units name; 24 characters	

0-00-016	"**+**"	2nd replication: Units scale sign; 1 character	
0-00-017	"**0** "	2nd replication: Units scale; 3 characters	
0-00-018	"**+**"	2nd replication: Units reference sign; 1 character	
0-00-019	"**0** "	2nd replication: Units reference value; 10 characters	
0-00-020	"**1** "	2nd replication: Element data width; 3 characters	
0-00-010	"**0**" (see [2] below)	3rd replication: F descriptor to be added or defined; 1 character	
0-00-011	"**31**"	3rd replication: X descriptor to be added or defined; 2 characters	
0-00-012	"**000**"	3rd replication: Y descriptor to be added or defined; 3 characters	
0-00-013	"**DRF1BIT** "	3rd replication: Element name, line 1; 32 characters	
0-00-014	" "	3rd replication: Element name, line 2; 32 characters	
0-00-015	"**NUMERIC** "	3rd replication: Units name; 24 characters	
0-00-016	"**+**"	3rd replication: Units scale sign; 1 character	
0-00-017	"**0** "	3rd replication: Units scale; 3 characters	
0-00-018	"**+**"	3rd replication: Units reference sign; 1 character	
0-00-019	"**0** "	3rd replication: Units reference value; 10 characters	
0-00-020	"**1** "	3rd replication: Element data width; 3 characters	

0-00-010	"**0**" (see [2] below)	4th replication: F descriptor to be added or defined; 1 character	
0-00-011	"**31**"	4th replication: X descriptor to be added or defined; 2 characters	
0-00-012	"**001**"	4th replication: Y descriptor to be added or defined; 3 characters	
0-00-013	"**DRF8BIT** "	4th replication: Element name, line 1; 32 characters	
0-00-014	" "	4th replication: Element name, line 2; 32 characters	
0-00-015	"**NUMERIC** "	4th replication: Units name; 24 characters	
0-00-016	"**+**"	4th replication: Units scale sign; 1 character	
0-00-017	"**0** "	4th replication: Units scale; 3 characters	
0-00-018	"**+**"	4th replication: Units reference sign; 1 character	
0-00-019	"**0** "	4th replication: Units reference value; 10 characters	
0-00-020	"**8** "	4th replication: Element data width; 3 characters	
0-00-010	"**0**" (see [2] below)	5th replication: F descriptor to be added or defined; 1 character	
0-00-011	"**31**"	5th replication: X descriptor to be added or defined; 2 characters	
0-00-012	"**002**"	5th replication: Y descriptor to be added or defined; 3 characters	

0-00-013	"**DRF16BIT** "	5th replication: Element name, line 1; 32 characters	
0-00-014	" "	5th replication: Element name, line 2; 32 characters	
0-00-015	"**NUMERIC** "	5th replication: Units name; 24 characters	
0-00-016	"**+**"	5th replication: Units scale sign; 1 character	
0-00-017	"**0** "	5th replication: Units scale; 3 characters	
0-00-018	"**+**"	5th replication: Units reference sign; 1 character	
0-00-019	"**0** "	5th replication: Units reference value; 10 characters	
0-00-020	"**16** "	5th replication: Element data width; 3 characters	
0-00-010	"**0**"	6th replication: F descriptor to be added or defined; 1 character	
0-00-011	"**01**"	6th replication: X descriptor to be added or defined; 2 characters	
0-00-012	"**001**"	6th replication: Y descriptor to be added or defined; 3 characters	
0-00-013	"**WMOB WMO BLOCK NUMBER** "	6th replication: Element name, line 1; 32 characters	

0-00-014	" "	6th replication: Element name, line 2; 32 characters	
0-00-015	"**NUMERIC** "	6th replication: Units name; 24 characters	
0-00-016	"**+**"	6th replication: Units scale sign; 1 character	
0-00-017	"**0** "	6th replication: Units scale; 3 characters	
0-00-018	"**+**"	6th replication: Units reference sign; 1 character	
0-00-019	"**0** "	6th replication: Units reference value; 10 characters	
0-00-020	"**7** "	6th replication: Element data width; 3 characters	
0-00-010	"**0**"	7th replication: F descriptor to be added or defined; 1 character	
0-00-011	"**01**"	7th replication: X descriptor to be added or defined; 2 characters	
0-00-012	"**002**"	7th replication: Y descriptor to be added or defined; 3 characters	
0-00-013	"**WMOS WMO** **STATION** **NUMBER** "	7th replication: Element name, line 1; 32 characters	
0-00-014	" "	7th replication: Element name, line 2; 32 characters	
0-00-015	"**NUMERIC** "	7th replication: Units name; 24 characters	

0-00-016	"**+**"	7th replication: Units scale sign; 1 character	
0-00-017	"**0** "	7th replication: Units scale; 3 characters	
0-00-018	"**+**"	7th replication: Units reference sign; 1 character	
0-00-019	"**0** "	7th replication: Units reference value; 10 characters	
0-00-020	"**10** "	7th replication: Element data width; 3 characters	
****** 8th through 76th replications follow in the same way ******			
0-00-010	"**0**"	77th replication: F descriptor to be added or defined; 1 character	
0-00-011	"**12**"	77th replication: X descriptor to be added or defined; 2 characters	
0-00-012	"**107**"	77th replication: Y descriptor to be added or defined; 3 characters	
0-00-013	"**TMVR VIRT UAL TEMPERATURE** "	77th replication: Element name, line 1; 32 characters	
0-00-014	" "	77th replication: Element name, line 2; 32 characters	
0-00-015	"**DEGREES KELVIN** "	77th replication: Units name; 24 characters	
0-00-016	"**+**"	77th replication: Units scale sign; 1 character	
0-00-017	"**2** "	77th replication: Units scale; 3 characters	
0-00-018	"**+**"	77th replication: Units reference sign; 1 character	

0-00-019	"**0** "	77th replication: Units reference value; 10 characters	
0-00-020	"**16** "	77th replication: Element data width; 3 characters	
0-00-010	"**0**"	78th replication: F descriptor to be added or defined; 1 character	
0-00-011	"**13**"	78th replication: X descriptor to be added or defined; 2 characters	
0-00-012	"**003**"	78th replication: Y descriptor to be added or defined; 3 characters	
0-00-013	"**REHU RELA TIVE HUMIDITY** "	78th replication: Element name, line 1; 32 characters	
0-00-014	" "	78th replication: Element name, line 2; 32 characters	
0-00-015	"**%** "	78th replication: Units name; 24 characters	
0-00-016	"**+**"	78th replication: Units scale sign; 1 character	
0-00-017	"**0** "	78th replication: Units scale; 3 characters	
0-00-018	"**+**"	78th replication: Units reference sign; 1 character	
0-00-019	"**0** "	78th replication: Units reference value; 10 characters	
0-00-020	"**7** "	78th replication: Element data width; 3 characters	
0-31-001	0	number of replications of Table D information (F, X, Y part descriptors, text description, Table B and D descriptors defining sequence)	

[2] - Table B entries 0-63-000 (BYTCNT), 0-63-255 (BITPAD), 0-31-000 (DRF8BIT), 0-31-001 (DRF8BIT) and 0-31-002 (DRF16BIT) do not appear in any ASCII text files but are encoded into embedded BUFR messages containing BUFR tables B for all Table A (message)

types. They will later appear in special Table D entries used to define delayed replication for a single Table D sequence.

Section 5 - End Section:

BYTES	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
1-4	"**7777**"	end of BUFR message

BUFR TABLE IN MESSAGE #2

Section 0 - Indicator Section:

BYTES	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
1-4	"**BUFR**"	start of BUFR message
5-7	9924	total length of BUFR message (including Section 0) in bytes
8	3	BUFR edition number (3 or 4)

Section 1 - Identification Section for BUFR Edition 3:

Same as in BUFR Message #1

EXPANDED F-X-Y DESCRIPTOR LIST (from Section 3)	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
0-31-001	0	number of replications of Table A information (entry itself, text description 1, text description 2)
0-31-001	40	number of replications of Table B information (F, X, Y part descriptors, element name, units name, scale sign, scale, reference sign, reference value, data width)
0-00-010	"**0**"	1st replication: F descriptor to be added or defined; 1 character
0-00-011	"**13**"	1st replication: X descriptor to be added or defined; 2 characters
0-00-012	"**195**"	1st replication: Y descriptor to be added or defined; 3 characters
0-00-013	"**STBS5 MODIFIED SHOWALTER STAB**"	1st replication: Element name, line 1; 32 characters
0-00-014	"**ILITY INDEX** "	1st replication: Element name, line 2; 32 characters
0-00-015	"**NUMERIC** "	1st replication: Units name; 24 characters
0-00-016	"**+**"	1st replication: Units scale sign; 1 character
0-00-017	"**0** "	1st replication: Units scale; 3 characters
0-00-018	"**-**"	1st replication: Units reference sign; 1 character
0-00-019	"**40** "	1st replication: Units reference value; 10 characters
0-00-020	"**8** "	1st replication: Element data width; 3 characters

0-00-010	"**0**"	2nd replication: F descriptor to be added or defined; 1 character
0-00-011	"**15**"	2nd replication: X descriptor to be added or defined; 2 characters
0-00-012	"**003**"	2nd replication: Y descriptor to be added or defined; 3 characters
0-00-013	"**MOPP MEASURED OZONE PARTIAL** "	2nd replication: Element name, line 1; 32 characters
0-00-014	"**PRESSURE (SOUNDING)** "	2nd replication: Element name, line 2; 32 characters
0-00-015	"**PA** "	2nd replication: Units name; 24 characters
0-00-016	"**+**"	2nd replication: Units scale sign; 1 character
0-00-017	"**4** "	2nd replication: Units scale; 3 characters
0-00-018	"**+**"	2nd replication: Units reference sign; 1 character
0-00-019	"**0** "	2nd replication: Units reference value; 10 characters
0-00-020	"**9** "	2nd replication: Element data width; 3 characters
****** 3rd through 38th replications follow in the same way ******		
0-00-010	"**0**"	39th replication: F descriptor to be added or defined; 1 character
0-00-011	"**35**"	39th replication: X descriptor to be added or defined; 2 characters
0-00-012	"**195**"	39th replication: Y descriptor to be added or defined; 3 characters
0-00-013	"**SEQNUM CHANNEL SEQUENCE NUMBER**"	39th replication: Element name, line 1; 32 characters
0-00-014	" "	39th replication: Element name, line 2; 32 characters

0-00-015	"**CCITT IA5** "	39th replication: Units name; 24 characters
0-00-016	"**+**"	39th replication: Units scale sign; 1 character
0-00-017	"**0** "	39th replication: Units scale; 3 characters
0-00-018	"**+**"	39th replication: Units reference sign; 1 character
0-00-019	"**0** "	39th replication: Units reference value; 10 characters
0-00-020	"**32** "	39th replication: Element data width; 3 characters
0-00-010	"**0**"	40th replication: F descriptor to be added or defined; 1 character
0-00-011	"**58**"	40th replication: X descriptor to be added or defined; 2 characters
0-00-012	"**008**"	40th replication: Y descriptor to be added or defined; 3 characters
0-00-013	"**RRSTG RAW REPORT STRING** "	40th replication: Element name, line 1; 32 characters
0-00-014	" "	40th replication: Element name, line 2; 32 characters
0-00-015	"**CCITT IA5** "	40th replication: Units name; 24 characters
0-00-016	"**+**"	40th replication: Units scale sign; 1 character
0-00-017	"**0** "	40th replication: Units scale; 3 characters
0-00-018	"**+**"	40th replication: Units reference sign; 1 character
0-00-019	"**0** "	40th replication: Units reference value; 10 characters
0-00-020	"**64** "	40th replication: Element data width; 3 characters
0-31-001	43	number of replications of Table D information (F, X, Y part descriptors, text

		description, Table B and D descriptors defining sequence)
0-00-010	"**3**" (see [2] below)	1st outer replication: F descriptor to be added or defined; 1 character
0-00-011	"**60**"	1st outer replication: X descriptor to be added or defined; 2 characters
0-00-012	"**001**"	1st outer replication: Y descriptor to be added or defined; 3 characters
2-05-064	"**DRP16BIT** "// "	1st outer replication: insert 64 characters
0-31-001	2	1st outer replication: number of replications of descriptor defining sequence
0-00-030	"**101000**"	1st outer replication; 1st inner replication: descriptor defining sequence; 6 characters
0-00-030	"**031002**"	1st outer replication; 2nd inner replication: descriptor defining sequence; 6 characters
0-00-010	"**3**" (see [2] below)	2nd outer replication: F descriptor to be added or defined; 1 character
0-00-011	"**60**"	2nd outer replication: X descriptor to be added or defined; 2 characters
0-00-012	"**002**"	2nd outer replication: Y descriptor to be added or defined; 3 characters
2-05-064	"**DRP8BIT** "// "	2nd outer replication: insert 64 characters
0-31-001	2	2nd outer replication: number of replications

		of descriptor defining sequence
0-00-030	"**101000**"	2nd outer replication; 1st inner replication: descriptor defining sequence; 6 characters
0-00-030	"**031001**"	2nd outer replication; 2nd inner replication: descriptor defining sequence; 6 characters
0-00-010	"**3**" (see [2] below)	3rd outer replication: F descriptor to be added or defined; 1 character
0-00-011	"**60**"	3rd outer replication: X descriptor to be added or defined; 2 characters
0-00-012	"**003**"	3rd outer replication: Y descriptor to be added or defined; 3 characters
2-05-064	"**DRPSTAK** "// " "	3rd outer replication: insert 64 characters
0-31-001	2	3rd outer replication: number of replications of descriptor defining sequence
0-00-030	"**101000**"	3rd outer replication; 1st inner replication: descriptor defining sequence; 6 characters
0-00-030	"**031001**"	3rd outer replication; 2nd inner replication: descriptor defining sequence; 6 characters
0-00-010	"**3**" (see [2] below)	4th outer replication: F descriptor to be added or defined; 1 character
0-00-011	"**60**"	4th outer replication: X descriptor to be added or defined; 2 characters
0-00-012	"**004**"	4th outer replication: Y descriptor to be added or defined; 3 characters

2-05-064	"**DRP1BIT** "// " "	4th outer replication: insert 64 characters
0-31-001	2	4th outer replication: number of replications of descriptor defining sequence
0-00-030	"**101000**"	4th outer replication; 1st inner replication: descriptor defining sequence; 6 characters
0-00-030	"**031000**"	4th outer replication; 2nd inner replication: descriptor defining sequence; 6 characters
0-00-010	"**3**"	5th outer replication: F descriptor to be added or defined; 1 character
0-00-011	"**63**"	5th outer replication: X descriptor to be added or defined; 2 characters
0-00-012	"**218**"	5th outer replication: Y descriptor to be added or defined; 3 characters
2-05-064	"**NC002001 MSG TYPE 002-001 RAWIN**"// "**SONDE - FIXED LAND** "	5th outer replication: insert 64 characters
0-31-001	24	5th outer replication: number of replications of descriptor defining sequence
0-00-030	"**301011**"	5th outer replication; 1st inner replication: descriptor defining sequence; 6 characters
0-00-030	"**004004**"	5th outer replication; 2nd inner replication: descriptor defining sequence; 6 characters
0-00-030	"**360002**"	5th outer replication; 3rd inner replication: descriptor

		defining sequence; 6 characters
0-00-030	"**352003**"	5th outer replication; 4th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**360002**"	5th outer replication; 5th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**352001**"	5th outer replication; 6th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**361121**"	5th outer replication; 7th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**360002**"	5th outer replication; 8th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**361122**"	5th outer replication; 9th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**360002**"	5th outer replication; 10th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**361123**"	5th outer replication; 11th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**360004**"	5th outer replication; 12th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**361129**"	5th outer replication; 13th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**360002**"	5th outer replication; 14th inner replication: descriptor

		defining sequence; 6 characters
0-00-030	"**361131**"	5th outer replication; 15th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**360002**"	5th outer replication; 16th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**352002**"	5th outer replication; 17th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**360002**"	5th outer replication; 18th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**361128**"	5th outer replication; 19th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**360004**"	5th outer replication; 20th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**361130**"	5th outer replication; 21th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**001001**"	5th outer replication; 22nd inner replication: descriptor defining sequence; 6 characters
0-00-030	"**001002**"	5th outer replication; 23rd inner replication: descriptor defining sequence; 6 characters
0-00-030	"**001003**"	5th outer replication; 24th inner replication: descriptor defining sequence; 6 characters

0-00-010	"**3**"	6th outer replication: F descriptor to be added or defined; 1 character
0-00-011	"**63**"	6th outer replication: X descriptor to be added or defined; 2 characters
0-00-012	"**219**"	6th outer replication: Y descriptor to be added or defined; 3 characters
2-05-064	"**NC002002 MSG TYPE 002-002 RAWIN**"// "**SONDE – MOBIL LAND** "	6th outer replication: insert 64 characters
0-31-001	21	6th outer replication: number of replications of descriptor defining sequence
0-00-030	"**301011**"	6th outer replication; 1st inner replication: descriptor defining sequence; 6 characters
0-00-030	"**004004**"	6th outer replication; 2nd inner replication: descriptor defining sequence; 6 characters
0-00-030	"**360002**"	6th outer replication; 3rd inner replication: descriptor defining sequence; 6 characters
0-00-030	"**352003**"	6th outer replication; 4th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**360002**"	6th outer replication; 5th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**352001**"	6th outer replication; 6th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**361121**"	6th outer replication; 7th inner replication: descriptor

		defining sequence; 6 characters
0-00-030	"**360002**"	6th outer replication; 8th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**361122**"	6th outer replication; 9th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**360002**"	6th outer replication; 10th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**361123**"	6th outer replication; 11th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**360004**"	6th outer replication; 12th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**361129**"	6th outer replication; 13th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**360002**"	6th outer replication; 14th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**361131**"	6th outer replication; 15th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**360002**"	6th outer replication; 16th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**352002**"	6th outer replication; 17th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**360002**"	6th outer replication; 18th inner replication: descriptor

		defining sequence; 6 characters
0-00-030	"**361128**"	6th outer replication; 19th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**001197**"	6th outer replication; 20th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**033024**"	6th outer replication; 21st inner replication: descriptor defining sequence; 6 characters
****** 7th through 42nd outer replications follow in the same way ******		
0-00-010	"**3**"	43rd outer replication: F descriptor to be added or defined; 1 character
0-00-011	"**61**"	43rd outer replication: X descriptor to be added or defined; 2 characters
0-00-012	"**134**"	43rd outer replication: Y descriptor to be added or defined; 3 characters
2-05-064	"**UAGP10 RADIOSONDE CLASS 10 GEO**"// "**POTENTIAL DATA** "	43rd outer replication: insert 64 characters
0-31-001	1	43rd outer replication: number of replications of descriptor defining sequence
0-00-030	"**001008**"	43rd outer replication; 1st inner replication: descriptor defining sequence; 6 characters

Section 2 - Optional Section:

(none per Byte 8, Bit 1 of Section 1)

Section 3 - Data Description Section:

Same as in BUFR Message #1

Section 4 - Data Section:

BYTES	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
1-3	9856	length of section in bytes
4	0	set to zero (reserved)
5-9856	(see [1] below)	binary data as defined by sequence descriptors in Section 3 (repeated just once since there is one subset in the BUFR message)

[1] - contents of bytes 5-9856

[2] - Table D entries 3-60-001 (DRP16BIT), 3-60-002 (DRP8BIT), 3-60-003 (DRPSTAK) and 0-60-004 (DRP1BIT) do not explicitly appear in an any ASCII text files but are encoded into embedded BUFR messages containing BUFR tables D for all Table A (message) types. Within the ASCII tables, 3-60-001 is represented by parentheses, "**(**" and "**)**", spanning the single Table D sequence descriptor that is being replicated from between 0 and 65535 times; 3-60-002 is represented by curly brackets, "**{**" and "**}**", spanning the single Table D sequence descriptor that is being replicated from between 0 and 255 times; 3-60-003 is represented by square brackets, "**[**" and "**]**", spanning the single Table D sequence descriptor that is being replicated from between 0 and 255 times under a special "event" structure; and 3-60-004 is represented by angle brackets, "<" and ">", spanning the single Table D sequence descriptor that is being replicated either 0 or 1 time.

Section 5 - End Section:

BYTES	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
1-4	"**7777**"	end of BUFR message

BUFR TABLE IN MESSAGE #3

Section 0 - Indicator Section:

BYTES	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
1-4	"**BUFR**"	start of BUFR message
5-7	2090	total length of BUFR message (including Section 0) in bytes
8	3	BUFR edition number (3 or 4)

Section 1 - Identification Section for BUFR Edition 3:

Same as in BUFR Message #1

Section 2 - Optional Section:

(none per Byte 8, Bit 1 of Section 1)

Section 3 - Data Description Section:

Same as in BUFR Message #1

Section 4 - Data Section:

BYTES	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
1-3	2022	length of section in bytes
4	0	set to zero (reserved)
5-2022	(see [1] below)	binary data as defined by sequence descriptors in Section 3 (repeated just once since there is one subset in the BUFR message)

[1] - contents of bytes 5-2022

EXPANDED F-X-Y DESCRIPTOR LIST (from Section 3)	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
0-31-001	0	number of replications of Table A information (entry itself, text description 1, text description 2)

0-31-001	0	number of replications of Table B information (F, X, Y part descriptors, element name, units name, scale sign, scale, reference sign, reference value, data width)
0-31-001	19	number of replications of Table D information (F, X, Y part descriptors, text description, Table B and D descriptors defining sequence)
0-00-010	"**3**"	1st outer replication: F descriptor to be added or defined; 1 character
0-00-011	"**61**"	1st outer replication: X descriptor to be added or defined; 2 characters
0-00-012	"**162**"	1st outer replication: Y descriptor to be added or defined; 3 characters
2-05-064	"**PFLEV PROFILER REPORT LEVEL D**"// "**ATA** "	1st outer replication: insert 64 characters
0-31-001	8	1st outer replication: number of replications of descriptor defining sequence
0-00-030	"**007007**"	1st outer replication; 1st inner replication: descriptor defining sequence; 6 characters
0-00-030	"**025034**"	1st outer replication; 2nd inner replication: descriptor defining sequence; 6 characters
0-00-030	"**033195**"	1st outer replication; 3rd inner replication: descriptor defining sequence; 6 characters

0-00-030	"**011001**"	1st outer replication; 4th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**011002**"	1st outer replication; 5th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**011050**"	1st outer replication; 6th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**011006**"	1st outer replication; 7th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**011051**"	1st outer replication; 8th inner replication: descriptor defining sequence; 6 characters
****** 2nd through 18th outer replications follow in the same way ******		
0-00-010	"**3**"	19th outer replication: F descriptor to be added or defined; 1 character
0-00-011	"**62**"	19th outer replication: X descriptor to be added or defined; 2 characters
0-00-012	"**250**"	19th outer replication: Y descriptor to be added or defined; 3 characters
2-05-064	"**EPSEQ1 EUROPEAN WIND PROFILER**"// "**SEQUENCE 1** "	19th outer replication: insert 64 characters
0-31-001	8	19th outer replication: number of replications of descriptor defining sequence
0-00-030	"**007007**"	19th outer replication; 1st inner replication: descriptor defining sequence; 6 characters

0-00-030	"**033002**"	19th outer replication; 2nd inner replication: descriptor defining sequence; 6 characters
0-00-030	"**033195**"	19th outer replication; 3rd inner replication: descriptor defining sequence; 6 characters
0-00-030	"**011001**"	19th outer replication; 4th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**011002**"	19th outer replication; 5th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**011006**"	19th outer replication; 6th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**007007**"	19th outer replication; 7th inner replication: descriptor defining sequence; 6 characters
0-00-030	"**021030**"	19th outer replication; 8th inner replication: descriptor defining sequence; 6 characters

Section 5 - End Section:

BYTES	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
1-4	"**7777**"	end of BUFR message

Now the actual BUFR data messages ....

BUFR DATA IN MESSAGES #4 ON (TO END-OF_FILE)

Section 0 - Indicator Section:

BYTES	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
1-4	"**BUFR**"	start of BUFR message
5-7	(see [1] below)	total length of BUFR message (including Section 0) in bytes
8	3	BUFR edition number (3 or 4)

[1] - The total length of the BUFR message varies from message to message, but is always 54 (bytes) for "dummy" messages which contain zero subsets (see [3] under Section 1 below and [1]under Section 3 below).

Section 1 - Identification Section for BUFR Edition 3:

BYTES	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
1-3	18	length of section in bytes

4	0	BUFR master table (zero if standard WMO FM 94 BUFR tables are used)
5	3 (NCEP Central Operations)	originating/generating sub-center: Code table 0-01-034
6	7 (US NWS, NCEP)	originating/generating center: Code table 0-01-033
7	0	update sequence number (zero for original BUFR messages; incremented for updates)
8, Bit 1	0	= 0 no optional section, = 1 optional section follows
8, Bits 2–8	0	set to zero (reserved)
9	(see [1] below)	data category (Table A)
10	(see [2] below)	data sub-category [defined by local automatic data processing (ADP) centers]
11	12	version number of master table used
12	0	version number of local tables used to augment the master table in use, always 0 here
13	(see [3] below)	year of century most typical for the BUFR message contents
14	(see [3] below)	month most typical for the BUFR message contents
15	(see [3] below)	day most typical for the BUFR message contents
16	(see [3] below)	hour most typical for the BUFR message contents
17	(see [3] below)	minute most typical for the BUFR message contents
18	(see [3] below)	reserved for local use by ADP centers (NCEP: century most typical for the BUFR message contents)

[1] - The data category here is defined by the digital value stored in characters 3-5 of "Table A: data category description, line 1" in BUFR table message Section 4 (identified in BUFR table message Section 3 by descriptor 0-00-002 for the particular report type represented by the F-X-Y value stored in data message Section 3, bytes 10-11) **ONLY** when characters 3-8 in this value are all **digits**. This is the case for all BUFR data dump files, including "adpupa" where characters 1-5 are "NC002" and characters 6-8 are digits for all data types, thus the data category here is 2, defined in Table A as "vertical soundings (other than satellite)". For BUFR files where characters 3-8 of "Table A: data category description, line 1" are not all digits (e.g., PREPBUFR files), the data category here is defined by the digital value stored in the three-character "Table A: entry" in BUFR table message Section 4 (identified in BUFR table message Section 3 by descriptor 0-00-001).

[2] - The data sub-category here is defined by the digital value stored in characters 6-8 of "Table A: data category description, line 1" in BUFR table message Section 4 (identified in BUFR table message Section 3 by descriptor 0-00-002 for the particular report type represented by the F-X-Y value stored in data message Section 3, bytes 10-11) **ONLY**when characters 3-8 in this value are all **digits**. This is the case for all BUFR data dump files, including "adpupa" where for fixed land rawinsonde reports (F-X-Y value 3-63-218 in data message Section 3, bytes 10-

11) characters 1-8 are "NC002001", thus the data category here is 2, defined in Table A as "vertical soundings (other than satellite)" and the data sub-category here is 1, defined as fixed land rawinsonde for reports in data category 2. For BUFR files where characters 3-8 of "Table A: data category description, line 1" are not all digits (e.g., PREPBUFR files), the data sub-category here is hardwired to always be 0.

[3] - This holds the UTC date of the report time for all subsets (reports) contained in the message. Minute is always zero. Every subset in this message will have a UTC report time with the same century, year of century, month, day and hour as in Section 1, but the report minute can vary from 00.00 through 59.99. This allows reader codes to skip over messages that are outside a selected time window, without having to unpack and check the date of every subset in the message. There is an exception to this date rule. In some BUFR files (namely data dump files such as "adpupa"), the first two data messages immediately following the BUFR table messages (in this example messages 4 and 5) are "dummy" messages where the date in Section 1 is the century, year of century, month, day, hour and minute for the center dump time (UTC) in the first dummy message, and is the century, year of the century, month, day, hour and minute for the file creation time (UTC) in the second dummy message. Both of these dummy messages have zero subsets (i.e., Section 3 bytes 5-6 set to zero). This makes it easy for codes reading the dump file to perform a date check.

Section 2 - Optional Section:

(none per Byte 8, Bit 1 of Section 1)

Section 3 - Data Description Section:

(Note: Light shaded cells are replicated, dark shaded cells are nested replication)

BYTES	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
1-3	20	length of section in bytes
4	0	set to zero (reserved)

5-6	(see [1] below)	number of data subsets
7, Bit 1	1	= 1 observed data, = 0 other data
7, Bit 2	(see [2] below)	= 1 compressed data, = 0 non-compressed data
7, Bits 3–8	0	set to zero (reserved)
8–19		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, each descriptor occupies 2 bytes and contains 3 parts: F: 2 bits X: 6 bits Y: 8 bits
8-9	F-X-Y value: 0-63-000	byte count (points to the byte in Section 4 locating the beginning of the data subset; this allows the reader code to be faster and more efficient)
10-11	(see [3] below)	sequence descriptor representing Table B and Table D layout for the particular type of report in this message (see [3] below)
12-13	F-X-Y value: 1-02-000	use delayed replication for the next two data descriptors
14-15	F-X-Y value: 0-31-001	8-bit delayed replication factor
16-17	F-X-Y value: 2-06-001	the next descriptor is assigned the width of 1 bit
18-19	F-X-Y value: 0-63-255	bit pad (set to "on", 1; allows the data subset to end on a full machine word boundary, making the reader code faster and more efficient)
20	0	reserved

[1] - The number of data subsets varies from message to message, but is always zero for "dummy" messages (see [3] under Section 1 above).

[2] - Compression may occur for some types of data, however currently no types in the "adpupa" BUFR data dump file are compressed, so this value is always 0 here.

[3] - In the "adpupa" BUFR data dump file, the current list of possible report type sequences is:
F-X-Y value 3-63-218 : sequence containing fixed land rawinsonde reports (defined in Message # 2, Section 4, 5'th outer replication)
F-X-Y value 3-63-219 : sequence containing mobile land rawinsonde reports (defined in Message # 2, Section 4, 6'th outer replication)
F-X-Y value 3-63-220 : sequence containing rawinsonde ship reports (defined in Message # 2, Section 4, 7'th outer replication)
F-X-Y value 3-63-221 : sequence containing dropwinsonde reports (defined in Message # 2, Section 4, 8'th outer replication)
F-X-Y value 3-63-222 : sequence containing PIBAL reports (defined in Message # 2, Section 4, 9'th outer replication)
F-X-Y value 3-62-207 : sequence containing Met Office low-resolution ozonesonde reports arriving in BUFR (defined in Message # 2, Section 4, 10'th outer replication)
F-X-Y value 3-63-223 : sequence containing NOAA Profiler Network (NPN) wind reports (defined in Message # 2, Section 4, 11'th outer replication)
F-X-Y value 3-63-224 : sequence containing NeXRaD Vertical Azimuth Display (VAD)

wind reports (defined in Message # 2, Section 4, 12'th outer replication)

F-X-Y value 3-61-200 : sequence containing profiler wind reports arriving in PILOT (PIBAL) format (defined in Message # 2, Section 4, 13'th outer replication)

F-X-Y value 3-61-204 : sequence containing NOAA Profiler Network (NPN) and Cooperative Agency Profiler (CAP) profiler spectral moment reports (defined in Message # 2, Section 4, 14'th outer replication)

F-X-Y value 3-52-201 : sequence containing Cooperative Agency Profiler (CAP) wind reports (defined in Message # 2, Section 4, 15'th outer replication)

F-X-Y value 3-52-202 : sequence containing NOAA Profiler Network (NPN) and Cooperative Agency Profiler (CAP) Radar Acoustic Sounding System (RASS) temperature reports (defined in Message # 2, Section 4, 16'th outer replication)

F-X-Y value 3-52-203 : sequence containing Japanese Meteorological Agency (JMA) profiler wind reports (defined in Message # 2, Section 4, 17'th outer replication)

F-X-Y value 3-52-205 : sequence containing Hong Kong profiler wind reports (defined in Message # 2, Section 4, 18'th outer replication)

F-X-Y value 3-62-208 : sequence containing high-resolution ozonesonde reports arriving in ASCII format (defined in Message # 2, Section 4, 19'th outer replication)

F-X-Y value 3-52-206 : sequence containing European profiler wind reports (defined in Message # 2, Section 4, 20'th outer replication)

F-X-Y value 3-63-235 : sequence containing flight level reconnaissance aircraft reports (defined in Message # 2, Section 4, 21'st outer replication)

Note: In "dummy" messages (see [3] under Section 1 above) this is usually set to the F-X-Y value of the first report type in the BUFR message, in this case 3-63-218. Since there are zero subsets in the dummy messages (see [1] above) this is really meaningless.

Section 4 - Data Section:

BYTES	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
1-3	(see [1] below)	length of section in bytes
4	0	set to zero (reserved)
5-end of section (as defined in bytes 1-3)	(see [2] below)	binary data as defined by sequence descriptors in Section 3 (repeated based on the number of subsets in the BUFR message obtained from Section 3, bytes 5-6)

[1] - The length of Section 4 varies from message to message, but is always 4 (bytes) for "dummy" messages which contain zero subsets (see [1] under Section 3 above) (meaning there are no binary

data in Section 4 for the dummy messages).

[2] - Applies to non-"dummy" messages only: The binary data varies from message to message [it does not exist for "dummy" messages which contain zero subsets (see [1] under Section 3 above)].

Section 5 - End Section:

BYTES	CONTENT (bold face font inside of quotes indicates character, otherwise numeric)	Description
1-4	"**7777**"	end of BUFR message

Here is the NCEP BUFR tables A, B, D in ASCII format for BUFR Table A type 2 [vertical soundings (other than satellite)] as it appeared on the NCEP CCS machines on 04/01/2008.

/nwprod/fix/bufrtab.002

Lines containing Table A section in RED (these contain both Table A and Table D information)
Lines containing Table B, part 1 section in GREEN
Lines containing Table B, part 2 section in BROWN
Lines containing Table D section in BLUE
Lines containing Table D defining sequence section in PURPLE

```
.-------------------------------------------------------------------------.
| ------------   USER DEFINITIONS FOR TABLE-A TABLE-B TABLE D   ---------- |
|-------------------------------------------------------------------------|
| MNEMONIC | NUMBER | DESCRIPTION                                         |
|----------|--------|-----------------------------------------------------|
|          |        |                                                     |
```

NC002001	A63218	MSG TYPE 002-001 RAWINSONDE - FIXED LAND
NC002002	A63219	MSG TYPE 002-002 RAWINSONDE - MOBIL LAND
NC002003	A63220	MSG TYPE 002-003 RAWINSONDE - SHIP
NC002004	A63221	MSG TYPE 002-004 DROPWINSONDE
NC002005	A63222	MSG TYPE 002-005 PIBAL
NC002006	A62207	MSG TYPE 002-006 OZONESONDE (LOW-RES) (FROM METO BUFR)
NC002007	A63223	MSG TYPE 002-007 NOAA PROFILER NETWORK (NPN) WINDS
NC002008	A63224	MSG TYPE 002-008 NeXRaD VAD WINDS
NC002009	A61200	MSG TYPE 002-009 PROFILER WINDS IN PILOT(PIBAL) FORMAT
NC002010	A61204	MSG TYPE 002-010 NPN AND CAP PROFILER SPECTRAL MOMENTS
NC002011	A52201	MSG TYPE 002-011 COOP. AGENCY PROFILER (CAP) WINDS
NC002012	A52202	MSG TYPE 002-012 NPN AND CAP RASS TEMPERATURES
NC002013	A52203	MSG TYPE 002-013 JAPANESE MET AGENCY PROFILER WINDS
NC002014	A52205	MSG TYPE 002-014 HONG KONG PROFILER WINDS
NC002015	A62208	MSG TYPE 002-015 OZONESONDE (HIGH-RES) (FROM ASCII)
NC002016	A52206	MSG TYPE 002-016 EUROPEAN PROFILER WINDS
NC004005	A63235	MESSAGE TYPE 004-005 RECCO - flight level
WMOBLKST	301001	IDENTIFICATION - WMO BLOCK AND STATION NUMBER
YYMMDD	301011	DATE -- YEAR, MONTH, DAY
HHMM	301012	TIME -- HOUR, MINUTE
LALOLV	301024	LOCATION -- LATITUDE, LONGITUDE, ELEVATION
OZSNDFLT	309030	OZONESONDE FLIGHT DATA
BID	352001	BULLETIN ID DATA
RAWRPT	352002	RAW REPORT
RCPTIM	352003	REPORT RECEIPT TIME DATA
OZONELV1	361103	OZONESONDE REPORT LEVEL DATA #1
OZONELV2	361104	OZONESONDE REPORT LEVEL DATA #2
UASID	361121	RADIOSONDE/OZONESONDE STATION ID DATA
UARID	361122	RADIOSONDE REPORT ID DATA
UARLV	361123	RADIOSONDE REPORT LEVEL DATA
UATMP	361125	RADIOSONDE TEMPERATURE DATA
UAWND	361126	RADIOSONDE WIND DATA
UAWSH	361127	RADIOSONDE WIND SHEAR DATA
UACLD	361128	RADIOSONDE CLOUD DATA
UASDG	361129	RADIOSONDE SOUNDING SYSTEM DATA
UAADF	361130	RADIOSONDE 101AA "ADDITIONAL DATA" DATA
UARDCS	361131	RADIOSONDE REPORT DIAGNOSTIC DATA
UAGP07	361133	RADIOSONDE CLASS 7 GEOPOTENTIAL DATA
UAGP10	361134	RADIOSONDE CLASS 10 GEOPOTENTIAL DATA
PFLEV	361162	PROFILER REPORT LEVEL DATA
PFLID	361163	PROFILER REPORT ID DATA

NXVADD	361170	NEXRAD PART B WIND LEVEL DATA
NXRID	361172	NEXRAD REPORT ID DATA
RTID	361173	RASS TEMPERATURE ID DATA
RTSEQ1	361174	RASS TEMPERATURE SEQUENCE 1
AFRID	362030	AIRCRAFT REPORT ID DATA
AFTMP	362032	AIRCRAFT TEMPERATURE DATA
AFWND	362033	AIRCRAFT WIND DATA
AFMST	362034	AIRCRAFT MOISTURE DATA
AFICG	362035	AIRCRAFT ICING DATA
AFCLD	362036	AIRCRAFT CLOUD DATA
ARPHT	362039	RECCO MANDATORY LEVEL PRESSURE/HEIGHT DATA
ARSWD	362040	RECCO SURFACE WIND DATA
MPSEQ1	362241	MOMENT PROFILE ANTENNA SEQUENCE 1
MPSEQ2	362242	MOMENT PROFILE ANTENNA SEQUENCE 2
JPID	362243	JAPAN/HONG KONG WIND PROFILER ID DATA
JPSEQ1	362247	JAPAN/HONG KONG WIND PROFILER SEQUENCE 1
EPSEQ1	362250	EUROPEAN WIND PROFILER SEQUENCE 1
WMOB	001001	WMO BLOCK NUMBER
WMOS	001002	WMO STATION NUMBER
WMOR	001003	WMO REGION NUMBER
BPID	001005	BUOY/PLATFORM IDENTIFIER
SSTN	001018	SHORT STATION OR SITE NAME
UAPART	001192	RADIOSONDE PART NAME
RSML	001197	RADIOSONDE SHIP, DROP, OR MOBIL STATION ID
RPID	001198	REPORT IDENTIFIER
TOST	002001	TYPE OF STATION
TIWM	002002	TYPE OF INSTRUMENTATION FOR WIND MEASUREMENT
A4ME	002003	TYPE OF MEASURING EQUIPMENT USED
RATP	002011	RADIOSONDE TYPE
SIRC	002013	SOLAR AND INFRARED RADIATION CORRECTION
TTSS	002014	TRACKING TECHNIQUE/STATUS OF SYSTEM USED
ANTYP	002101	TYPE OF ANTENNA
BEAMW	002106	3-DB BEAMWIDTH
MEFR	002121	MEAN FREQUENCY
ANAZ	002134	ANTENNA BEAM AZIMUTH
ANEL	002135	ANTENNA BEAM ELEVATION
OISN	002142	OZONE INSTRUMENT SERIAL NUMBER/IDENTIFICATION
OITP	002143	OZONE INSTRUMENT TYPE
YEAR	004001	YEAR
MNTH	004002	MONTH
DAYS	004003	DAY

HOUR	004004	HOUR
MINU	004005	MINUTE
TIMI	004015	TIME INCREMENT (SINCE LAUNCH TIME) IN MINUTES
TPMI	004025	TIME PERIOD OR DISPLACEMENT
TPSE	004026	TIME PERIOD OR DISPLACEMENT
DAYW	004193	DAY OF THE WEEK
RCYR	004200	YEAR - TIME OF RECEIPT
RCMO	004201	MONTH - TIME OF RECEIPT
RCDY	004202	DAY - TIME OF RECEIPT
RCHR	004203	HOUR - TIME OF RECEIPT
RCMI	004204	MINUTE - TIME OF RECEIPT
UALNHR	004210	RADIOSONDE LAUNCH HOUR
UALNMN	004211	RADIOSONDE LAUNCH MINUTE
CLAT	005002	LATITUDE (COARSE ACCURACY)
CLON	006002	LONGITUDE (COARSE ACCURACY)
SELV	007001	HEIGHT OF STATION
PRLC	007004	PRESSURE
HEIT	007007	HEIGHT
GP07	007008	GEOPOTENTIAL
XMPRLC	007195	EXTRAPOLATED MANDATORY LEVEL PRESSURE
PSAL	007196	PRESSURE ALTITUDE RELATIVE TO MEAN SEA LEVEL
FLVL	007197	FLIGHT LEVEL
VSIG	008001	VERTICAL SOUNDING SIGNIFICANCE
OVSS	008006	OZONE VERTICAL SOUNDING SIGNIFICANCE
TSIG	008021	TIME SIGNIFICANCE
ACAV	008022	TOTAL NUMBER W/ RESPECT TO ACCUM. OR AVERAGE
RCTS	008202	RECEIPT TIME SIGNIFICANCE
GP10	010008	GEOPOTENTIAL
PMSL	010051	PRESSURE AT MEAN SEA LEVEL
XMGP10	010196	EXTRAPOLATED MANDATORY LEVEL GEOPOTENTIAL
WDIR	011001	WIND DIRECTION
WSPD	011002	WIND SPEED
WCMP	011006	W COMPONENT
DGOT	011031	DEGREE OF TURBULENCE
MWDL	011044	MEAN WIND DIRECTION FOR SURFACE-1500M LAYER
MWSL	011045	MEAN WIND SPEED FOR SURFACE-1500M LAYER
SDHS	011050	STANDARD DEVIATION HORIZONTAL WIND SPEED
SDVS	011051	STANDARD DEVIATION VERTICAL WIND SPEED
AWSB	011061	ABSOLUTE WIND SHEAR IN 1 KM LAYER BELOW
AWSA	011062	ABSOLUTE WIND SHEAR IN 1 KM LAYER ABOVE
WDIR1	011200	SURFACE WIND DIRECTION
WSPD1	011201	SURFACE WIND SPEED
RMSW	011210	ROOT MEAN SQUARE VECTOR WIND ERROR

MWDH	011221	MEAN WIND DIRECTION FOR 1500M-3000M LAYER
MWSH	011222	MEAN WIND SPEED FOR 1500M-3000M LAYER
TMDB	012101	TEMPERATURE/DRY BULB TEMPERATURE
TMDP	012103	DEW POINT TEMPERATURE
TMVR	012107	VIRTUAL TEMPERATURE
REHU	013003	RELATIVE HUMIDITY
STBS5	013195	MODIFIED SHOWALTER STABILITY INDEX
MOPP	015003	MEASURED OZONE PARTIAL PRESSURE (SOUNDING)
OSCF	015004	OZONE SOUNDING CORRECTION FACTOR
OZOP	015005	OZONE P
OZMR	015192	OZONE MIXING RATIO
HOVI	020001	HORIZONTAL VISIBILITY
PRWE	020003	PRESENT WEATHER
CLAM	020011	CLOUD AMOUNT
CLTP	020012	CLOUD TYPE
HOCB	020013	HEIGHT OF BASE OF CLOUD
HOCT	020014	HEIGHT OF TOP OF CLOUD
AFIC	020041	AIRFRAME ICING
HBOI	020194	HEIGHT OF BASE OF ICING
HTOI	020195	HEIGHT OF TOP OF ICING
HBLCS	020201	HEIGHT ABOVE SURFACE OF BASE OF LOWEST CLOUD SEEN
DMVR	021014	DOPPLER MEAN VELOCITY (RADIAL)
DVSW	021017	DOPPLER VELOCITY SPECTRAL WIDTH
STNR	021030	SIGNAL TO NOISE RATIO
SPP0	021091	RADAR SIGNAL DOPPLER SPECTRUM 0TH MOMENT
SST1	022043	SEA TEMPERATURE
RAGL	025001	RANGE-GATE LENGTH
MSPE	025020	MEAN SPEED ESTIMATION
WICE	025021	WIND COMPUTATION ENHANCEMENT
NPQC	025034	NOAA WIND PROFILER Q/C TEST RESULTS
QMRK	033002	QUALITY INFORMATION
QCEVR	033024	STATION ELEVATION QUALITY MARK (FOR MOBIL STATIONS)
QMGP	033192	SDMEDIT QUALITY MARK FOR GEOPOTENTIAL
QMAT	033193	SDMEDIT QUALITY MARK FOR TEMPERATURE
QMDD	033194	SDMEDIT QUALITY MARK FOR MOISTURE
QMWN	033195	SDMEDIT QUALITY MARK FOR WIND
UARDC	033202	RADIOSONDE REPORT DIAGNOSTIC CODE
QMPR	033207	SDMEDIT QUALITY MARK FOR PRESSURE
CORN	033215	CORRECTED REPORT INDICATOR
QMST	033218	SDMEDIT QUALITY MARK FOR SEA SURFACE TEMPERATURE

BUHD	035021	BULLETIN BEING MONITORED (TTAAii)
BULTIM	035022	BULLETIN BEING MONITORED (YYGGgg)
BORG	035023	BULLETIN BEING MONITORED (CCCC)
BBB	035194	BULLETIN BEING MONITORED (BBB)
SEQNUM	035195	CHANNEL SEQUENCE NUMBER
RRSTG	058008	RAW REPORT STRING

MNEMONIC	SEQUENCE
NC002001	YYMMDD HOUR {RCPTIM} {BID} UASID {UARID}
NC002001	{UARLV} <UASDG> {UARDCS} {RAWRPT}
NC002001	{UACLD} <UAADF>
NC002001	WMOB WMOS WMOR
NC002002	YYMMDD HOUR {RCPTIM} {BID} UASID {UARID}
NC002002	{UARLV} <UASDG> {UARDCS} {RAWRPT}
NC002002	{UACLD}
NC002002	RSML QCEVR
NC002003	YYMMDD HOUR {RCPTIM} {BID} UASID {UARID}
NC002003	{UARLV} <UASDG> {UARDCS} {RAWRPT}
NC002003	{UACLD} <UAADF>
NC002003	RSML WMOR
NC002004	YYMMDD HOUR {RCPTIM} {BID} UASID {UARID}
NC002004	{UARLV} <UASDG> {UARDCS} {RAWRPT}
NC002004	<UAADF>
NC002004	RSML WMOR
NC002005	YYMMDD HOUR {RCPTIM} {BID} UASID {UARID}
NC002005	{UARLV} <UASDG> {UARDCS} {RAWRPT}
NC002005	{UACLD} <UAADF>
NC002005	RSML QCEVR WMOB WMOS WMOR
NC002006	WMOBLKST BPID LALOLV TSIG YYMMDD HHMM
NC002006	RATP OITP OISN OZSNDFLT
NC002007	YYMMDD HHMM RCPTIM BID PFLID
NC002007	TSIG TPSE {PFLEV}
NC002008	YYMMDD HHMM RCPTIM BID NXRID {NXVADD} {RAWRPT}
NC002009	YYMMDD HOUR {RCPTIM} {BID} UASID {UARID}
NC002009	{UARLV} <UASDG> {UARDCS} {RAWRPT}
NC002009	{UACLD} <UAADF>
NC002009	RSML QCEVR WMOB WMOS WMOR

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|          |                                                                    |
| NC002010 | YYMMDD   HHMM     RCPTIM   BID      PFLID                          |
| NC002010 | TSIG     TPSE     {MPSEQ1}                                         |
|          |                                                                    |
| NC002011 | YYMMDD   HHMM     RCPTIM   BID      PFLID                          |
| NC002011 | TSIG     TPSE     {PFLEV}                                          |
|          |                                                                    |
| NC002012 | YYMMDD   HHMM     RCPTIM   BID      RTID                           |
| NC002012 | TSIG     TPSE     {RTSEQ1}                                         |
|          |                                                                    |
| NC002013 | YYMMDD   HHMM     RCPTIM   BID      JPID                           |
| NC002013 | TSIG     TPMI     {JPSEQ1}                                         |
|          |                                                                    |
| NC002014 | YYMMDD   HHMM     RCPTIM   BID      JPID                           |
| NC002014 | TSIG     TPMI     {JPSEQ1}                                         |
|          |                                                                    |
| NC002015 | TSIG  YYMMDD   HHMM  UASID  (OZONELV2)                              |
|          |                                                                    |
| NC002016 | YYMMDD  HHMM   RCPTIM   BID  CORN   WMOBLKST   LALOLV              |
| NC002016 | 201130          BEAMW         201000                               |
| NC002016 | 201133  202129  RAGL  202000  201000                               |
| NC002016 | 201149  202135  MEFR  202000  201000                               |
| NC002016 | TOST  A4ME  ANTYP  MSPE   WICE   TSIG    TPMI   {EPSEQ1}           |
|          |                                                                    |
| NC004005 | YYMMDD   HHMM     RCPTIM  BID  AFRID  {RAWRPT}  AFTMP  AFWND       |
| NC004005 | {AFCLD}  <AFICG>  AFMST  <ARSWD>  ARPHT                            |
| NC004005 | DGOT  PRWE  HOVI  PMSL  QMST  SST1  DAYW                           |
|          |                                                                    |
| BID      | SEQNUM  BUHD  BORG  BULTIM  BBB                                    |
|          |                                                                    |
| RAWRPT   | RRSTG                                                              |
|          |                                                                    |
| RCPTIM   | RCTS  RCYR  RCMO  RCDY  RCHR  RCMI                                 |
|          |                                                                    |
| UASID    | RPID  CLAT  CLON  SELV                                             |
|          |                                                                    |
| UARID    | RATP  A4ME  CORN  UAPART  TIWM                                     |
|          |                                                                    |
| UARLV    | VSIG  QMPR  PRLC  QMGP  <UAGP07>  <UAGP10>                         |
| UARLV    | <UATMP>  <UAWND>  <UAWSH>                                          |
|          |                                                                    |
| UAGP07   | GP07                                                               |
|          |                                                                    |
| UAGP10   | GP10                                                               |
|          |                                                                    |
| UATMP    | QMAT  TMDB  QMDD  TMDP                                             |
|          |                                                                    |
| UAWND    | QMWN  WDIR  WSPD                                                   |
|          |                                                                    |
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| UAWSH    | AWSB  AWSA                                                    |
|          |                                                               |
| UACLD    | CLTP  CLAM  HBLCS                                             |
|          |                                                               |
| UASDG    | QMST  SST1  SIRC  TTSS  UALNHR  UALNMN                        |
|          |                                                               |
| UAADF    | MWDL  MWSL  MWDH  MWSH  STBS5  XMPRLC  XMGP10                 |
|          |                                                               |
| UARDCS   | UARDC                                                         |
|          |                                                               |
| PFLID    | WMOB  WMOS  RPID  TOST  SSTN  A4ME                            |
| PFLID    | 201132  202130  MEFR  202000  201000                          |
| PFLID    | CLAT  CLON  SELV  CORN                                        |
|          |                                                               |
| PFLEV    | HEIT  NPQC                                                    |
| PFLEV    | QMWN  WDIR  WSPD  SDHS                                        |
| PFLEV    | WCMP  SDVS                                                    |
|          |                                                               |
| NXVADD   | HEIT  QMWN  WDIR  WSPD  RMSW                                  |
|          |                                                               |
| NXRID    | RPID  CORN  CLAT  CLON  SELV                                  |
|          |                                                               |
| AFRID    | RPID  CORN  CLAT  CLON  FLVL  PSAL                            |
|          |                                                               |
| AFICG    | AFIC  HBOI  HTOI                                              |
|          |                                                               |
| AFCLD    | CLAM  CLTP  HOCB  HOCT                                        |
|          |                                                               |
| AFTMP    | QMAT  TMDB                                                    |
|          |                                                               |
| AFWND    | QMWN  WDIR  WSPD                                              |
|          |                                                               |
| AFMST    | QMDD  TMDP  REHU                                              |
|          |                                                               |
| ARPHT    | VSIG  PRLC  GP10                                              |
|          |                                                               |
| ARSWD    | WDIR1  WSPD1                                                  |
|          |                                                               |
| MPSEQ1   | ANAZ     ANEL     {MPSEQ2}                                    |
|          |                                                               |
| MPSEQ2   | HEIT     NPQC     ACAV     SPP0     STNR    202129   DMVR   |
| MPSEQ2   | 201132   DVSW     201000   202000                             |
|          |                                                               |
| RTID     | WMOB  WMOS  RPID  TOST  SSTN  A4ME                            |
| RTID     | CLAT  CLON  SELV  CORN                                        |
|          |                                                               |
| RTSEQ1   | HEIT  QMAT  TMVR  NPQC                                        |
|          |                                                               |
| JPID     | WMOB  WMOS  RPID  A4ME                                        |
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JPID	CLAT CLON SELV CORN
JPSEQ1	HEIT QMRK QMWN WDIR WSPD WCMP STNR
EPSEQ1	HEIT QMRK QMWN WDIR WSPD QMRK WCMP STNR
OZSNDFLT	OSCF OZOP {OZONELV1}
WMOBLKST	WMOB WMOS
YYMMDD	YEAR MNTH DAYS
HHMM	HOUR MINU
LALOLV	CLAT CLON SELV
OZONELV1	TIMI OVSS PRLC MOPP
OZONELV2	201131 202130 TPMI 202000 202129 PRLC 202000 201000
OZONELV2	HEIT TMDB 201132 202129 REHU 202000 201000
OZONELV2	201133 202130 MOPP 202000 201000 OZMR WDIR WSPD GP07

MNEMONIC	SCAL	REFERENCE	BIT	UNITS
WMOB	0	0	7	NUMERIC
WMOS	0	0	10	NUMERIC
WMOR	0	0	3	CODE TABLE
BPID	0	0	17	NUMERIC
SSTN	0	0	40	CCITT IA5
UAPART	0	0	32	CCITT IA5
BUHD	0	0	48	CCITT IA5
RSML	0	0	64	CCITT IA5
RPID	0	0	64	CCITT IA5
TOST	0	0	2	CODE TABLE
A4ME	0	0	4	CODE TABLE
RATP	0	0	8	CODE TABLE
SIRC	0	0	4	CODE TABLE
TTSS	0	0	7	CODE TABLE
ANTYP	0	0	4	CODE TABLE
BEAMW	1	0	6	DEGREES
MEFR	-8	0	7	HZ
ANAZ	2	0	16	DEGREE
ANEL	2	-9000	15	DEGREE
OISN	0	0	32	CCITT IA5
OITP	0	0	7	CODE TABLE
SEQNUM	0	0	32	CCITT IA5
BORG	0	0	32	CCITT IA5

TIWM	0	0	4	FLAG TABLE
YEAR	0	0	12	YEAR
MNTH	0	0	4	MONTH
DAYS	0	0	6	DAY
HOUR	0	0	5	HOUR
MINU	0	0	6	MINUTE
TIMI	0	-2048	12	MINUTES
TPMI	0	-2048	12	MINUTES
TPSE	0	-4096	13	SECONDS
DAYW	0	0	3	CODE TABLE
RCYR	0	0	12	YEAR
RCMO	0	0	4	MONTH
RCDY	0	0	6	DAY
RCHR	0	0	5	HOUR
RCMI	0	0	6	MINUTE
UALNHR	0	0	5	HOUR
UALNMN	0	0	6	MINUTE
CLAT	2	-9000	15	DEGREES
CLON	2	-18000	16	DEGREES
SELV	0	-400	15	METERS
PRLC	-1	0	14	PASCALS
HEIT	0	-1000	17	METERS
GP07	0	-10000	20	(METERS/SECOND)**2
XMPRLC	-1	0	14	PASCALS
PSAL	1	-4000	20	METERS
FLVL	1	-4000	20	METERS
VSIG	0	0	7	FLAG TABLE
OVSS	0	0	9	FLAG TABLE
TSIG	0	0	5	CODE TABLE
ACAV	0	0	16	NUMERIC
RCTS	0	0	6	CODE TABLE
GP10	0	-10000	20	(METERS/SECOND)**2
PMSL	-1	0	14	PASCALS
XMGP10	0	-10000	20	(METERS/SECOND)**2
WDIR	0	0	9	DEGREES TRUE
WSPD	1	0	12	METERS/SECOND
DGOT	0	0	4	CODE TABLE
WCMP	2	-4096	13	METERS/SECOND
MWDL	0	0	9	DEGREES TRUE
MWSL	1	0	12	METERS/SECOND
SDHS	1	0	12	METERS/SECOND
SDVS	1	0	8	METERS/SECOND
AWSB	1	0	12	METERS/SECOND
AWSA	1	0	12	METERS/SECOND
WDIR1	0	0	9	DEGREES TRUE
WSPD1	1	0	12	METERS/SECOND
RMSW	1	0	12	METERS/SECOND
MWDH	0	0	9	DEGREES TRUE
MWSH	1	0	12	METERS/SECOND

TMDB	2	0	16	DEGREES KELVIN	
TMDP	2	0	16	DEGREES KELVIN	
TMVR	2	0	16	DEGREES KELVIN	
REHU	0	0	7	%	
STBS5	0	-40	8	NUMERIC	
MOPP	4	0	9	PA	
OSCF	3	0	11	NUMERIC	
OZOP	0	0	10	DU	
OZMR	4	0	17	CM**3/M**3	
HOVI	-1	0	13	METERS	
PRWE	0	0	9	CODE TABLE	
CLAM	0	0	4	CODE TABLE	
CLTP	0	0	6	CODE TABLE	
HOCB	-1	-40	11	METERS	
HOCT	-1	-40	11	METERS	
HBLCS	0	0	4	CODE TABLE	
AFIC	0	0	4	CODE TABLE	
HBOI	-1	-40	16	METERS	
HTOI	-1	-40	16	METERS	
DMVR	1	-4096	13	M/S	
DVSW	1	0	8	M/S	
SPP0	0	-100	8	DB	
STNR	0	-32	8	DB	
SST1	2	0	15	DEGREES KELVIN	
RAGL	-1	0	6	METERS	
MSPE	0	0	2	CODE TABLE	
WICE	0	0	8	FLAG TABLE	
NPQC	0	0	4	FLAG TABLE	
QCEVR	0	0	4	CODE TABLE	
QMGP	0	0	4	CODE TABLE	
QMAT	0	0	4	CODE TABLE	
QMDD	0	0	4	CODE TABLE	
QMWN	0	0	4	CODE TABLE	
UARDC	0	0	8	CODE TABLE	
QMPR	0	0	4	CODE TABLE	
QMRK	0	0	2	CODE TABLE	
QMST	0	0	4	CODE TABLE	
CORN	0	0	3	CODE TABLE	
BULTIM	0	0	48	CCITT IA5	
BBB	0	0	48	CCITT IA5	
RRSTG	0	0	64	CCITT IA5	