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Moment Profiles BUFR message format

Our goal is a flexible format that will encompass vertical upper air profiles regardless of the type of instrumentation used to measure them, enabling future data processing systems to operate with a minimum of software development.

Also, in order to avoid time delays encountered due to data organization, we propose a single stationís measurements for a single time period in each individual message. Our single most heard complaint about current data delivery is that it isnít as timely as could be, especially for use in NWP.

This message format is a subset of the BUFR message format proposed by the proposed COST 716 standard BUFR code message format for the interchange of wind profiler and RASS data between member states, 1995.

Proposed BUFR definition for Moment Profiles:

Data Field	***Element Name***	***Table B Descrip***	***Scale (10**n)***	***Reference (-n)***	***Width (Bits)***	***Units***	***Comments***
1	WMO Block #	0 01 001	0	0	7	Numeric	(3 1 32) (3 1 1) MBM
2	WMO Station #	0 01 002	0	0	10	Numeric	(3 1 32)(3 1 1) MBM
3	Type of Station	0 02 001	0	0	2	Code Table	(3 1 32) 0 = automatic
4	Year	0 04 001	0	0	12	year	(3 1 32) (3 1 11)
5	Month	0 04 002	0	0	4	month	(3 1 32) (3 1 11)
6	Day	0 04 003	0	0	6	day	(3 1 32) (3 1 11)
7	Hour	0 04 004	0	0	5	hour	(3 1 32) (3 1 12)
8	Minute	0 04 005	0	0	6	minute	(3 1 32) (3 1 12)
9	Latitude (Low Accuracy)	0 05 002	2	-9000	15	Degrees	(3 1 32)(3 1 24)
10	Longitude (Low Accuracy)	0 06 002	2	-18000	16	Degrees	(3 1 32)(3 1 24)
11	Height of Station	0 07 001	0	-400	15	m	(3 1 32)(3 1 24)Elevation AS
12	Station short name	0 01 018			40	CCITT IA5	
13	Type of measuring equip	0 02 003	0	0	4	Code Table	6 = wind profiler
14	Change data width	2 01 132					4 bits added
15	Change data scale	2 02 130					10**2 scaling added
16	Mean frequency	0 02 121	(-6)	0	(11)	Hz	Profiler mean freq
17	Reset scale	2 02 000					
18	Reset width	2 01 000					
19	Time Significance	0 08 021	0	0	5		2 = Time Averaged
20	Averaging Time Period	0 04 026	0	-4096	13	Seconds	-360 or -3600 for NPN (note
21	Repeat 15 descriptors	1 15 000					Outer replication
22	Number of beams	0 31 001					Delayed replication
23	Antenna beam azimuth	0 02 134	2	0	16	Degree	
24	Antenna beam elevation	0 02 135	2	-9000	15	Degree	
25	Repeat 11 descriptors	1 11 000					Nested replication
26	# of samples this beam	0 31 001	0	0	8	Numeric	Delayed replication
27	Height above station	0 07 006	0	-1000	17	Meters	
28	Aggregate quality code	0 25 034	0	0	4	Flag Table	Quality assessment of all moments this height
29	Number in average	0 08 022	0	0	16	Numeric	Consensus number
30	0^{th} moment	0 21 091	0	0	8	dB	Signal power
31	Signal to Noise ratio	0 21 030	0	-32	8	dB	Signal to Noise Ratio
32	Change data scale	2 02 129					
33	Doppler radial velocity	0 21 014	(2)	-4096	13	$m.s^{-1}$	Radial velocity
34	Change data width	2 01 132					
35	Doppler spectral width	0 21 017	(2)	0	(12)	$m.s^{-1}$	2^{nd} moment
36	Reset width	2 01 000					

37	Reset scale	2 02 000					
38							

Legend: MBM = May Be Missing

Note 1: I believe this number should be negative to denote the fact we were averaging over the PREVIOUS n seconds.
Note 2: Delayed replication descriptors (0,31,1) and (0,31,2) are never counted in the outer ëloopí in which they are defined, when determining number of descriptors to replicate.

May 23, 2001 ñ Changed reference value for 0,21,17 to 0
Sep 19, 2001 ñ For profilers which have more than one distinct operating ëmodeí, in which a significantly different radar operating characteristics are used, an additional dataset will be contained in the message for each of these significant ëmodesí.

Note 3: First 11 descriptors are actually part of Table D descriptor 3,1,32

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