OPERATIONAL
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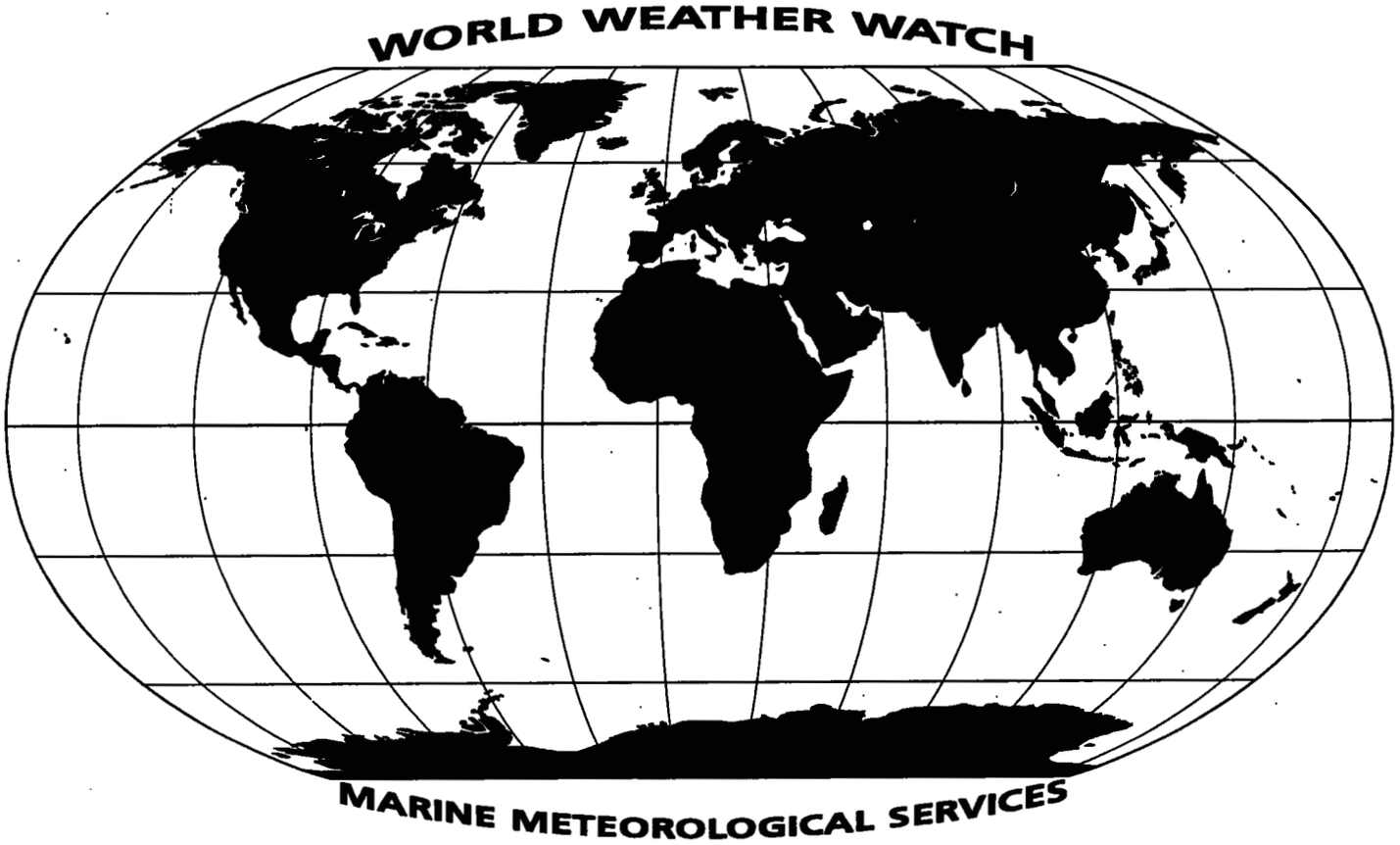

World Meteorological Organization
GENEVA

The WMO Secretariat would like to express its appreciation to all those who have contributed material to the "Operational Newsletter". ■

Foreword

As you are aware, all the information on changes to the operation of the World Weather Watch (WWW) and Marine Meteorological Services (MMS) is being assembled and distributed by the Secretariat on a monthly basis to facilitate updating and follow-up action. In this connection we have created the "OPERATIONAL *NEWSLETTER*" to provide you with the latest operational information on WWW and MMS.

The CBS Advisory Working Group recommended that a special table should be added to the "OPERATIONAL *NEWSLETTER*" to report changes of the present status of implementation of observing programmes of SYNOP, TEMP and PILOT reporting stations. You will note, therefore, that an item, 'Feed-back from Members to the Secretariat on any changes in the observing network' has been added to Annex I - *Global Observing System.*

Your co-operation in ensuring that the above information reaches the appropriate operational units of your service is greatly appreciated.

(G.O.P. Obasi)
Secretary-General

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Annex I

GLOBAL OBSERVING SYSTEM

C. INFORMATION ON OPERATIONAL STATUS OF ELEMENTS OF THE SURFACE-BASED SUB-SYSTEM

1. Publication No. 9, Volume A - Stations

1.1 New stations

Index No.	Name	Latitude	Longitude	Elevation HP	Elevation H/HA	Pressure Level	Surface observations 00	03	06	09	12	15	18	21	Obs. H Obs. S	Upper-air 00	06	12	18	Remarks
Region II - Former Union of Soviet Socialist Republics (effective 1 August 1994)																				
29570	Krasnojarsk Opytnoe Pole	56 ° 02 'N	92 °45 'E	276	-		X	X	X	X	X	X	X	X		.	.	.	.	
29572	Emel'Janovo	56 ° 11 'N	92 °37 'E	296	-		.	.	.	.	.	.	.	.		RW	.	RW	.	
29862	Hakasskaja	53 ° 46 'N	91 °19 'E	256	-		X	X	X	X	X	X	X	X		RW	.	RW	.	
31736	Habarovsk	48 ° 32 'N	135 °14 'E	72	-		.	.	.	.	.	.	.	.		RW	.	RW	.	
31977	Sad-Gorod	43 ° 16 'N	132 °03 'E	82	-		X	X	X	X	X	X	X	X		RW	.	RW	.	
32215	Severo-Kurilsk	50 ° 41 'N	156 °08 'E	23	-		X	X	X	X	X	X	X	X		RW	.	RW	.	
Region VI - Former Union of Soviet Socialist Republics (effective 1 August 1994)																				
27199	Kirov	58 ° 36 'N	49 °38 'E	158	-		X	X	X	X	X	X	X	X		RW	.	RW	.	
27459	Niznij Novgorod	56 ° 16 'N	44 °00 'E	157	-		X	X	X	X	X	X	X	X		RW	.	RW	.	
27730	Rjazan'	54 ° 38 'N	39 °42 'E	158	-		X	X	X	X	X	X	X	X		RW	.	RW	.	
27944	Tambov	52 ° 44 'N	41 °28 'E	161	-		X	X	X	X	X	X	X	X		RW	.	RW	.	
34106	Kursk	51 ° 44 'N	36 °16 'E	209	-		X	X	X	X	X	X	X	X		.	.	.	.	
34123	Voronez	51 ° 42 'N	39 °13 'E	149	-		X	X	X	X	X	X	X	X		.	.	.	.	
Region VI - Lebanon																				
40101	Houche al Oumara	33 ° 49 'N	35 °51 'E	920	-		.	.	X	X	X	X	X	.		.	.	.	.	
Stations in the Antarctic																				
89269	Bonaparte Park Point Univ. of Wisconsin ID 8912	64 ° 47 'S	63 °04 'W	8	-		X	X	X	X	X	X	X	X		.	.	.	.	AUT

1.2 Deleted stations

Region	Index No.	Name
Region II - Former Union of Soviet Socialist Republics (effective 1 August 1994)	29574	Krasnojarsk (Emel'Yanovo)
	29865	Abakan
Region V - Detached Islands	93075	Little Barrier Island
	93123	Coromandel
	93167	Raglan

C. Information on operational status of elements of the surface-based sub-system *(continued)*

1. Publication No. 9, Volume A - Stations/ 1.2 Deleted stations *(continued)*

Region	Index No.	Name
Region V - New Zealand	93619	Okarito
	93704	Fox Glacier
	93733	The Hermitage
	93871	Ranfurly

1.3 Changes to existing stations

Index No.	Name	Surface observations 00	03	06	09	12	15	18	21	Obs.H Obs.S	Upper-air 00	06	12	18	Remarks
Region II - Former Union of Soviet Socialist Republics (effective 1 August 1994)															
28440	Ekaterinburg previously Ekaterinburg *(Verhnee Dubrovo)*	X	X	X	X	X	X	X	X			.		.	
28445	Verhnee Dubrovo previously Vysokaja Dubrava	X	X	X	X	X	X	X	X			.		.	
	Verhnee Dubrovo Upper-air station										RW	.	RW	.	
28900	Samara previously Samara (Bezenark)	X	X	X	X	X	X	X	X			.		.	
31735	Habarovsk	X	X	X	X	X	X	X	X			.		.	
31960	Vladivostok previously Vladivostok (Sad-Gorod)	X	X	X	X	X	X	X	X			.		.	
32217	Mys Vasil'eva previously Mys Vasil'eva (Severo-Kurilsk)	X	X	X	X	X	X	X	X			.		.	
32583	Petropavlovsk-Kamcatskij previously Petropavlovsk-Na-Kamcatke														
Region V - Australia (Lat. 25°S - 30°S)															
94403	Geraldton Airport	01	04	07	10	13	16	19	22		RW	W	W	W	
94430	Meekatharra Airport	01	04	07	10	13	16	19	22		W	W	W	W	
Region V - Australia (Lat. 30°S - 35°S)															
94637	Kalgoorlie Airport	01	04	07	10	13	16	19	22		RW	W	W	W	
94638	Esperance	01	04	07	10	13	16	19	22		RW	W	W	W	
94646	Forrest Airport	01	04	07	10	.	16	19	22		RW	W	W	W	
Region VI - Jordan															
40265	Mafraq	X	X	X	X	X	X	X	X		RW	P	RW	.	
Region VI - Lebanon															
40103	Tripoli	.	.	X	X	X	X	X	.		.	.	.	.	

C. Information on operational status of elements of the surface-based sub-system *(continued)*

1. Publication No. 9, Volume A - Stations / 1.3 Changes to existing stations *(continued)*

Index No.	Name	Surface observations 00	03	06	09	12	15	18	21	Obs.H Obs.S	Upper-air 00	06	12	18	Remarks
Region VI - Former Union of Soviet Socialist Republics (effective 1 August 1994)															
27196	Kirov	X	X	X	X	X	X	X	X			.		.	
27553	Niznij Novgorod	X	X	X	X	X	X	X	X			.		.	
27731	Rjazan'	X	X	X	X	X	X	X	X			.		.	
27947	Tambov	X	X	X	X	X	X	X	X			.		.	
27995	Bezencuk previously Bezencukskaja	X	X	X	X	X	X	X	X		RW	.	RW	.	
34122	Voronez (Upper-air station)										RW	.	RW	.	

4. Automatic Marine Stations

KEY - OBSERVED OR TECHNICAL PARAMETERS

Column	Parameters	Column	Parameters
1	Wind direction and speed	9	Subsurface temperatures
2	Air temperature	10	Relative humidity
3	Air pressure	11	Visibility
4	Pressure tendency		
5	Sea-surface temperature	-	Parameter not observed
6	Wave period and height	X	Buoy observes this parameter
7	Wave spectra	.	Data under evaluation, not reported
8	Peak wind gust		

4.3 United States of America

List of U.S.A. Ocean Data Acquisition System (ODAS) included in the **March 1994** Data Platform Status Report of the Data Buoy Centre of the National Oceanic and Atmospheric Administration (NOAA). Data from moored buoys and platforms are collected by geostationary meteorological satellites and reports are distributed on the GTS in SHIP code. Data from drifting buoys are collected by the ARGOS system and distributed on the GTS in DRIFTER code.

4.3.1 Moored Buoys

WMO buoy Identifier	ARGOS Identifier	Position: 10-17 March 94 Latitude	Longitude	Observed or technical parameters 1	2	3	4	5	6	7	8	9	10	11
32302		18.0S	85.1W	X	X	X	-	X	X	X	-	-	-	-
41001*		34.7N	72.7W	X	X	X	-	X	X	X	-	-	-	-

* Base funded station of National Weather Service (NWS); however, all stations report data to NWS

C. Information on operational status of elements of the surface-based sub-system *(continued)*

4. Automatic Marine Stations / 4.3 United States of America / 4.3.1 Moored Buoys *(continued)*

WMO buoy	ARGOS	Position: 10-17 March 94		Observed or technical parameters										
Identifier	Identifier	Latitude	Longitude	1	2	3	4	5	6	7	8	9	10	11
41004		32.5N	79.1W	+	+	X	-	+	X	X	-	-	-	-
41006*		29.3N	77.3W	X	X	X	-	X	X	X	-	-	-	-
41009		28.5N	80.2W	X	X	X	-	X	X	X	-	-	-	-
41010		28.9N	78.5W	X	X	X	-	X	X	X	-	-	-	-
41016		24.6N	76.5W	X	X	X	-	X	X	X	-	-	-	-
42001*		25.9N	89.7W	X	X	X	-	X	X	X	-	-	-	-
42002*		25.9N	93.6W	X	X	X	-	X	X	X	-	-	-	-
42003*		25.9N	85.9W	X	X	X	-	X	X	X	-	-	-	-
42007		30.1N	88.8W	X	X	X	-	X	.	.	-	-	-	-
42016		29.9N	88.0W	X	X	X	-	X	.	.	-	-	-	-
42019		27.9N	95.0W	X	X	X	-	X	X	X	-	-	-	-
42020		27.0N	96.5W	X	X	X	-	X	X	X	-	-	-	-
42025		24.9N	80.4W	.	X	.	-	X	X	X	-	-	-	-
42035		29.2N	94.4W	X	X	X	-	X	X	X	-	-	-	-
42036		28.5N	84.5W	X	X	X	-	X	X	X	-	-	-	-
44004*		38.5N	70.7W	X	X	X	-	X	X	X	-	-	-	-
44005*		42.6N	68.6W	X	X	X	-	X	X	X	-	-	-	-
44007		43.5N	70.1W	X	X	X	-	X	X	X	-	-	-	-
44008		40.5N	69.4W	+	X	X	-	X	X	X	-	-	-	-
44009		38.5N	74.7W	X	X	X	-	X	+	+	-	-	-	-
44011*		41.1N	66.6W	X	X	X	-	X	X	X	-	-	-	-
44013		42.4N	70.7W	X	X	X	-	X	X	X	-	-	-	-
44014		36.6N	74.8W	X	X	X	-	X	+	+	-	-	-	-
44025		40.3N	73.2W	X	X	X	-	X	X	X	-	-	-	-
45001*		48.0N	87.8W	X	X	X	-	X	X	X	-	-	-	-
45002*		45.3N	86.4W	X	X	X	-	X	X	X	-	-	-	-
45003*		45.3N	82.7W	X	X	X	-	X	X	X	-	-	-	-
45004*		47.5N	86.5W	X	X	X	-	X	X	X	-	-	-	-
45005*		41.7N	82.4W	X	X	X	-	X	X	X	-	-	-	-
45006*		47.3N	89.9W	X	X	X	-	X	X	X	-	-	-	-
45007*		42.7N	87.1W	X	X	X	-	X	X	X	-	-	-	-

\+ Sensor/system failure
* Base funded station of National Weather Service (NWS); however, all stations report data to NWS

C. Information on operational status of elements of the surface-based sub-system *(continued)*

4. Automatic Marine Stations / 4.3 United States of America / 4.3.1 Moored Buoys *(continued)*

WMO buoy	ARGOS	Position: 10-17 March 94		Observed or technical parameters										
Identifier	Identifier	Latitude	Longitude	1	2	3	4	5	6	7	8	9	10	11
45008*		44.3N	82.4W	X	X	X	-	X	X	X	-	-	-	-
46001*		56.3N	148.2W	+	+	+	-	+	+	+	-	-	-	-
46002*		42.5N	130.3W	X	X	X	-	X	X	X	-	-	-	-
46003*		51.9N	155.9W	+	X	X	-	X	X	X	-	-	-	-
46005*		46.1N	131.0W	X	X	X	-	X	X	X	-	-	-	-
46006*		40.9N	137.5W	X	X	+	-	X	X	X	-	-	-	-
46012		37.4N	122.7W	X	X	X	-	X	X	X	-	-	-	-
46013		38.2N	123.3W	X	X	X	-	X	X	X	-	-	-	-
46014		39.2N	124.0W	X	X	X	-	X	X	X	-	-	-	-
46022		40.7N	124.5W	X	X	X	-	X	X	X	-	-	-	-
46023		34.3N	120.7W	X	X	X	-	X	X	X	-	-	-	-
46025		33.7N	119.1W	X	X	X	-	X	X	X	-	-	-	-
46026		37.7N	122.7W	X	X	X	-	X	X	X	-	-	-	-
46027		41.9N	124.4W	X	X	X	-	X	X	X	-	-	-	-
46028		35.8N	121.9W	+	+	+	-	+	+	+	-	-	-	-
46029		46.2N	124.2W	X	X	X	-	X	X	X	-	-	-	-
46030		40.4N	124.5W	X	X	X	-	+	X	X	-	-	-	-
46035		57.0N	177.7W	X	X	X	-	X	X	X	-	-	-	-
46041		47.4N	124.5W	X	X	X	-	X	X	X	-	-	-	-
46042		36.8N	122.4W	X	X	X	-	+	X	X	-	-	-	-
46045		33.8N	118.4W	X	X	X	-	X	X	X	-	-	-	-
46050		44.6N	124.5W	X	X	X	-	X	X	X	-	-	-	-
46051		34.5N	120.7W	X	X	X	-	X	+	+	-	-	-	-
46053		34.2N	119.8W	X	X	X	-	X	X	X	-	-	-	-
46054		34.3N	120.4W	X	X	X	-	X	X	X	-	-	-	-
51001		23.4N	162.3W	+	+	+	-	+	+	+	-	-	-	-
51002		17.2N	157.8W	X	X	X	-	X	X	X	-	-	-	-
51003		19.1N	160.8W	X	X	X	-	X	X	X	-	-	-	-
51004		17.4N	152.5W	X	X	X	-	X	X	X	-	-	-	-
51026		21.4N	157.0W	X	X	X	-	X	X	X	-	-	-	-
52009		13.7N	144.7E	X	+	X	-	+	X	X	-	-	-	-

* Base funded station of National Weather Service (NWS); however, all stations report data to NWS
\+ Sensor/system failure

C. Information on operational status of elements of the surface-based sub-system *(continued)*

4. Automatic Marine Stations / 4.3 United States of America *(continued)*

4.3.2 Drifting Buoys

WMO buoy	ARGOS	Position: 16-17 March 94		Observed or technical parameters										
Identifier	Identifier	Latitude	Longitude	1	2	3	4	5	6	7	8	9	10	11
17818	17175	42°S	001°E	.	X	X		X	.	.	.	-	-	-
17819	17174	49°S	013°W	.	X	X		X	.	.	.	-	-	-
17820	17173	57°S	010°W	.	X	X		X	.	.	.	-	-	-
17821	17176	46°S	012°W	.	X	X		X	.	.	.	-	-	-
32811	17170	38°S	091°W	.	+	X		X	.	.	.	-	-	-
32812	17171	24°S	121°W	.	X	X		X	.	.	.	-	-	-
32813	17172	31°S	103°W	.	+	X		X	.	.	.	-	-	-
32814	17161	30°S	100°W	.	+	X		X	.	.	.	-	-	-
33833	1974	32°S	013°W	.	X	X		X	.	.	.	-	-	-
33834	1979	33°S	005°E	.	X	X		X	.	.	.	-	-	-
33838	17163	34°S	013°W	.	+	X		X	.	.	.	-	-	-
33839	17164	38°S	022°W	.	+	X		X	.	.	.	-	-	-
33840	17165	42°S	011°W	.	+	X		X	.	.	.	-	-	-
33841	17166	36°S	008°W	.	+	X		X	.	.	.	-	-	-
33842	17167	48°S	032°E	.	+	X		X	.	.	.	-	-	-
53823	5131	08°S	114°E	.	+	X		+	.	.	.	-	-	-
54844	17168	33°S	118°W	.	+	X		X	.	.	.	-	-	-
56801	5130	35°S	046°E	.	X	X		X	.	.	.	-	-	-
56804	1977	44°S	115°E	.	X	X		X	.	.	.	-	-	-
56805	1990	50°S	139°E	.	X	X		X	.	.	.	-	-	-
56806	1984	32°S	090°E	.	X	X		X	.	.	.			
56807	20716	12°S	124°E	.	X	X		X	.	.	.			
74801	1982	63°S	066°E	.	X	X		X	.	.	.			

\+ Sensor/system failure

C. Information on operational status of elements of the surface-based sub-system *(continued)*

5. ARGOS service

5.1 ARGOS monthly status report

Date of statistics computation : 3 March 1994

•Reports handled by ARGOS Service (list of monthly collected ARGOS platforms sorted by type of platform)

Drifting Buoys	:	1118
Boats (<20knots)	:	-
Marine Stations	:	3
Moored Buoys	:	290
Terrestrial Animals	:	73
Marine Animals	:	78
Balloons	:	2
Birds	:	57
Fixed Stations	:	421
TOTAL	:	2042

•Reports for insertion into the GTS (list of monthly collected GTS platforms on every GTS site sorted by type of platform)

Transmission to RTH Paris:

Boat (less than 20 knots)	:	-
Drifting Buoys	:	115
Fixed Stations	:	7
Marine Stations	:	3
Moored Buoys	:	1
Synoptic PTT		1

Transmission to NWS Washington:

Drifting Buoys	:	517
Fixed Stations	:	5
High Speed	:	2
Moored Buoys	:	69

•GTS coding statistics of platforms reporting through ARGOS and distributed over the GTS

BATHY =	492
DRIFTER =	116877
SHIP =	877
SYNOP =	3859
TOTAL:	122105

C. Information on operational status of elements of the surface-based sub-system *(continued)*

8. Feed-back from Members to the Secretariat on any changes in the observing network

In view of the difficulties experienced at present in identifying non-implemented observing stations or implemented stations which are closed or suspended for a certain period, or stations making observations but not reaching their NMCs, the ninth session of the CBS Advisory Working Group recommended that a special table be added to the WWW monthly "OPERATIONAL *NEWSLETTER*" to serve as feed-back from Members to the Secretariat on any changes of the present state of implementation of observing programmes of SYNOP, TEMP and PILOT reporting stations.

The special table, accompanied by explanatory notes (see Appendix, pages 1 and 2) is attached at the end of this annex. Members are urged to fill in this appendix, as and when appropriate, and to return it to the Secretariat before the 1st of each month to enable changes to be included in the next "OPERATIONAL *NEWSLETTER*"

FEED-BACK FROM MEMBERS TO THE SECRETARIAT ON ANY CHANGES IN THE OBSERVING NETWORK

(Explanatory Notes overleaf)

Global Exchange / Regional Exchange *(delete as appropriate)* **Country:** _____

Station Index Number	Bulletin Identification TTAAii CCCC	Implementation of Observing Programme								Alternate Observing Station	Remarks
		00	03	06	09	12	15	18	21		
1. SYNOP											
2. TEMP											
3. PILOT											

FEED-BACK FROM MEMBERS TO THE SECRETARIAT ON ANY CHANGES IN THE OBSERVING NETWORK

Explanatory Notes

1. Separate tables should be prepared for global exchange and regional exchange respectively. These tables should contain information concerning any changes of the present state of implementation of observing programmes of SYNOP, TEMP and PILOT reporting stations given in Attachment I-4 of the *Manual on the GTS,* Volume I for global exchange and, as applicable, Attachments AF-I, AI-1, SA-1, NA-1, PS-1 and EU-1 of the *Manual on the GTS,* Volume II for regional exchange.

2. For entries in these tables, the following should be taken into account:

   (a) In the column *"Station index number"*, the index number (IIiii) of each station should be entered in case of any changes in the observing programmes of the stations;

   (b) In the column *"Bulletin identification"*, the TTAAii CCCC of the abbreviated heading of the meteorological bulletins which contains reports from the station should be inserted;

   (c) In the column *"Implementation of observing programme"*, "X" for implementation and "-" for non-implementation should be inserted as appropriate. In order to easily identify changes in the programme, this should be marked in red;

   (d) In the column *"Alternate observing station"*, the index number (IIiii) of an alternate observing station should be inserted in case another station is available with a view to filling gaps which are caused by suspension of observing programmes of the original station;

   (e) The required information concerning the observing programme of the alternate station should be inserted in the next horizontal line of the original station;

   (f) In the column *"Remarks"*, reasons of temporary suspension of observing programmes and an expected date of resumption of the programmes should be given as far as possible. Non-standard collection and/or distribution times should also be included.

3. These tables should be sent to the Secretariat **before the 1st of the month** for inclusion in the "OPERATIONAL *NEWSLETTER*", as appropriate.

B. INFORMATION ON OPERATIONAL STATUS OF GDPS INCLUDING CHANGES TO WMO PUBLICATION NO. 9 - VOLUME B

2. RSMC output products

2.3 Changes to products

- **Notification from ECMWF**

That they have introduced the Integrated Forecast System (IFS) as of 2 March 1994.

From a meteorological point of view, the change is transparent to the recipients of the Centre's GTS products.

Please note that the generating process identification number in Section 1 of the GRIB code was changed from 40 to 111 to identify the new model version.

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Annex III

GLOBAL TELECOMMUNICATION SYSTEM

C. INFORMATION ON THE OPERATION OF THE GTS

2. Transmission schedules (Publication No. 9, Volume C, Chapter II)

2.2 Deleted transmissions/broadcasts

• Notification from Japan

That the survey presented at the 10th session of the Regional Association II held in Tehran from 5-15 September 1992 showed that the RTT broadcast by RTH Tokyo was being received: only for back-up or in case of breakdown, by a few Members outside the zone of responsibility of RTH Tokyo. The Japan Meteorological Agency has therefore decided to discontinue the RTT broadcast effective 1 October 1994.

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Annex IV

CODES

B. MANUAL ON CODES

1. Global practices

1.3 Changes to codes

The President of the Commission for Basic Systems and then the President of WMO have approved the following Recommendation 15 (CBS-93) for use as from 2 November 1994:

RECOMMENDATION

Rec. 15 (CBS-93) Amendments To FM 92-IX Ext. GRIB and FM 94-IX Ext. BUFR and related tables

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Resolution 6 (CBS-X) - Working Group on Data Management,
(2) The abridged final report of CBS-X, general summary, paragraph 6.4.52,
(3) Report of the first session of the CBS Working Group on Data Management/Sub-group on Data Representation and Codes, (September 1993),

CONSIDERING that there is an urgent need to introduce changes and augmentation to the description of the GRIB and BUFR codes and related tables to meet new requirements reviewed and agreed to by the CBS Working Group on Data Management/Sub-group on Data Representation,

RECOMMENDS that the amendments to FM 92-IX Ext. GRIB and FM 94-IX Ext. BUFR and related tables given in the Annex to this recommendataion be adopted for use as from 2 November 1994;

INVITES the President of WMO to approve this recommendation as a matter of urgency, on behalf of the Executive Council;

REQUESTS the Secretary-General to arrange for the inclusion of these amendments in Volume I of the Manual on Codes.

ANNEX TO RECOMMENDATION

Notes on nomenclature:

(a)
- Changes and augmentations to the structure of the GRIB data representation shall be identified as different "GRIB edition numbers". The current number is 1.
- Changes to the content of any of the tables, including the grid definitions, shall be identified as different "versions". The previous Table was Version 1; the changes described in this edition will introduce "Table Version 2".
- Further GRIB editions and Table versions may be generated independently of one another in the future as requirements dictate.

(b)
- Changes and augmentations to the structure of the BUFR data representation shall be identified as different "BUFR edition numbers". The current edition number is 2.
- Changes to the content of the parameter Tables A, B, C and D shall be identified as different "Table versions". The previous tables was Version 2, the changes described in this edition will become "Tables A, B, C and D, Version 3".
- Further BUFR editions and table versions may be generated independently of one another in the future as requirements dictate.

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

ADDITIONS TO BUFR TABLES

This new set of additions or modifications will make Version 3 of the Tables.

•Page **I—Bi—51** change in octet No. 11 contents: previously "currently 2" to "currently 3"

The first set of proposals arises more or less out of the ACARS program and an ongoing effort to convert various conventional observation formats to BUFR: there are new descriptors and/or table entries to accommodate new observations or retain some piece of information carried in the current observation reporting systems. It also includes some clarification and corrections of misprints, typos, and errors in the existing tables:

•Page **I—Bi—56** change and replace: 102-253

BUFR Table A — *Data category*

Code Figure	Meaning
102-239	Reserved
240- 254	For experimental use
255	Indicator for local use, with sub-category.

Add the following note to Table A:
(1) In data category 255, the local BUFR message type may be described by BUFR, Section 1, octet 10.

•Page **I—Bi—59:** Change data width in descriptor 0 00 030 to 48 bits (not 40).

•Page **I—Bi—60:** Descriptor 0 01 006: Delete the word "identifier" and insert "Flight Number" as the element name.

•Page **I—Bi—122:** Descriptor Code Table 0 01 007: In Note (1) add the following:

Code Figure	Satellite
204	NOAA 12
240	DMSP 7
241	DMSP 8
242	DMSP 9
243	DMSP 10
244	DMSP 11
252	GOES 8
253	GOES 9
254	GOES 10
255	GOES 11
256	GOES 12

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

•Page I—Bi—60 add the following new descriptors:

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	01	009	Type of Commercial aircraft	CCITT IA5	0	0	64
0	01	010	Stationary buoy platform identifier e.g., C-MAN buoys	CCITT IA5	0	0	64
0	01	031	Generating Centre	Code Table	0	0	16

[Comment: There is a table for 0 01 031 but no descriptor, until now. The table is referenced for Octets 5-6 of Section 1. But the USA need the descriptor as well. It could be useful in "collectives" where a regional centre has gathered up data from a number of sources and is putting them all together in one BUFR message. One might want to know where the individual measurements (or sub-collectives) came from.]

•Page I—Bi—123 add entries:
Descriptor Code Table 0 01 031:

Code Figure	
34	Japan Meteorological Agency (Tokyo)
52	National Hurricane Centre, Miami, FL USA; an RSMC.
59	The NOAA Forecast Systems Laboratory, Boulder, CO, USA

The data width for descriptor 0 02 001 is not consistent with the number of entries in the corresponding table. The data width is kept at 2 and the following changes are made to the Table:

•Page I—Bi—123 descriptor Code Table 0 02 001 change the content of the table to:

Code Figure	
0	Automatic
1	Manned
2	Hybrid: Both Manned and Automatic
3	Missing value

[Comment: Obviously, some stations have "mixed" observing systems. Dropping "reserved" allows to keep the data width at two bits, as noted above.]

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

•Page I—Bi—125
Descriptor Code Table 0 02 011: the (parenthetical) manufacturer of RAOB types 43, 44, and 45 should be USA, not UK.
Add new radiosonde types:

Code Figure	
10	VIZ type A Pressure-commutated (USA)
11	VIZ type B Time-commutated (USA)
14	VIZ Mark I MICROSONDE (USA)
21	VIZ/Jin Yang Mark I MICROSONDE (South Korea)
31	VIZ/Valcom Type A Pressure-commutated (Canada)
38	VIZ LOCATE Loran-C (USA)
46	AIR - IS - 4A - 403 (USA)
47	Meisei RS2-91 (Japan)
48	VALCOM (Canada)
49	VIZ MARK II (USA)
50	GRAW DFM-90 (Germany)
64	Orbital Sciences Corporation, Space Data Division, transponder radiosonde, type 909-11-XX, where xx corespond to the model of the instrument
65	VIZ transponder radiosonde, model number 1499-520 and change the following reserved ranges:
51-59	Reserved for allocation of radiosondes
66-89	Reserved for additional automated sounding systems

Add two notes to the Table:
(1) References to countries in brackets indicate the manufacturing location, rather than the country using the instrument.
(2) Some of the radiosondes listed are no longer in use but are retained for archives purposes.

These changes are being made in concert with the Character Code Table.

•Page I—Bi—132
In Descriptor Code Table 0 02 061 "navigator" should be changed to "navigation".

•Page I—Bi—133
Descriptor Code Table 0 02 070: replace code figure 10-14 by the following

10	Actual location in tenths of a minute
11	Referenced to checkpoint in tenths of a minute
12-14	Reserved

•Page I—Bi—137
Descriptor Code Table 0 08 012: Change code figure 2 from "Reserved" to "Coastal".

•Page I—Bi—68 add another footnote to Class 08:
A previously defined significance may be canceled by transmitting a "missing" from the appropriate code or flag table.

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

New descriptors:

•Page I—Bi—67 add the following new descriptors:

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	07	007	Height	m	0	-1000	17
0	07	008	Geopotential	m^2s^{-2}	0	-10000	20

•Page I—Bi—69 add the following new descriptors:

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	10	007	Height	m	0	-1000	17
0	10	008	Geopotential	m^2s^{-2}	0	-10000	20

•Page I—Bi—70 add the following new descriptors:

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	11	043	Maximum wind gust direction	degrees true	0	0	9
0	11	049	Standard deviation of wind direction	degrees	0	0	9

•Page I—Bi—70
Descriptor 0 11 050: Insert the word "horizontal" before "wind speed"

•Page I—Bi—70 add the following new descriptors:

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	11	051	Standard deviation vertical wind speed	m/s	1	0	8

•Page I—Bi—70
The element name for 0 11 036 should read "Maximum derived equivalent vertical GUST SPEED".

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

•Page I—Bi—159
Descriptor Code Table 0 20 034: does not have values for all the possible code figure values - 5 bits worth, according to the descriptor definition.
The last line could be changed to: 15-30 Reserved
and a new line reading: 31 Missing

•Page I—Bi—76
The data width for descriptor 0 20 038 is larger than it needs to be. 9 bits would be sufficient as for all the other "degrees true" quantities. It is proposed to add a footnote indicating the original error and why it is wrong.

•Page I—Bi—77
Descriptor 0 21 017: the reference value should be 0.

PROFILER DESCRIPTORS

[Comment: The following are the rest of the new descriptors that are now in use in the US profiler program: *(The WWW letter of March 1993 contains additional information)*].

•Page I—Bi—81
Add the following new descriptors:

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	25	032	Wind Profiler mode information(1)	code table	0	0	2
0	25	033	Wind Profiler submode info(1)	code table	0	0	2
0	25	034	Wind Profiler quality control test results(1)	flag table	0	0	4

(1) The meaning of these quantities may be obtained from the originator of the data.

•Page I—Bi—171
Add the following code tables:

0 25 032
Wind profiler mode information

Value	Meaning
0	Reserved
1	Data from low mode
2	Data from High mode
3	Missing

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

0 25 033
NOAA Wind Profiler Submode Information

Value	Meaning
0	Wind profiler operating in Submode A
1	Wind profiler operating in Submode B
2	Reserved
3	Missing

Add the following flag table:

0 25 034
NOAA Wind Profiler Quality Control Results

Bit No.	Meaning (1=true; 0=false)
1	Test A performed and failed
2	Test B performed and failed
3	Test results inconclusive
4	Reserved
all=1	Missing

•Page **I—Bi—81** the Centres who measure wind using satellite based CO2 tracer measurements indicated that they need the following:

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	25	040	CO2 Wind product derivation	Code table	0	0	4

And the associated Code table
•Page **I—Bi—171**

0 25 040
CO2 Wind Product Derivation

Code Figure	Meaning
0	Non-specific mode
1	First guess data
2	Cloud data
3	Average vector data
4	Primary data
5	Guess data
6	Vector data
7	Tracer data; this image
8	Tracer data to next image
9 - 14	Reserved
15	Missing

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

STORM SURGE AND TIDE INFORMATION

•**Page I—Bi—62** add

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	02	037	Method of Tidal Observation	Code table	0	0	3

•**Page I—Bi—78** add

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	22	037	Tidal elevation with respect to national land datum	m	3	-10000	15
0	22	038	Tidal elevation with respect to local chart datum	m	3	-10000	15
0	22	039	Meteorological residual tidal elevation (surge or offset)	m	3	-5000	12

•**Page I—Bi—132** insert the new table:

0 02 037
Method of tidal observation

Code Figure	Meaning
0	Reserved
1	Manual reading from vertical tide staff
2	Manual reading from single automatic recorder at station
3	Manual reading from multiple automatic recorders at station
4	Automatic reading from single automatic recorder at station without level reference check
5	Automatic reading from single automatic recorder at station with level reference check, or from multiple automatic recorders
6	Reserved
7	Missing

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

TROPICAL STORM MESSAGES

The rather extensive discussions and development of tropical storm messages, largely in cooperation with Dr. Kashiwagi and the Japanese Met. Agency, resulted in the following new descriptors and tables. They are all in use now and were publicised in the WWW Monthly letter, August 1991.

•Page I—Bi—60 add

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	01	025	Storm identifier	CCITT IA5	0	0	24
0	01	026	WMO storm name	CCITT IA5	0	0	64

•Page I—Bi—68 add

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	08	005	Surface synoptic feature significance	Code table	0	0	4

•Page I—Bi—75 add

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	19	005	Direction of motion of feature	deg. true	0	0	9
0	19	006	Speed of motion of feature	m/s	2	0	14
0	19	007	Effective radius of feature	m	-3	0	12
0	19	008	Vertical extent of circulation	Code table	0	0	3
0	19	009	Effective radius with respect to wind speeds above threshold (large storms)	m	-3	0	12

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

•Page **I—Bi—60** add the following notes to Class 1

(1) The storm identifier (descriptor 0 01 025) has the following meaning: The first two characters shall be a numeric sequence number assigned by the originator of the message; the third character is a letter indicating the ocean basin where the storm is located, as follows:

W NW Pacific Ocean
E NE Pacific Ocean to 140E
C NE Pacific Ocean 140E-180E
L N Atlantic Ocean, including Caribbean and Gulf of Mexico
A N Arabian Sea
B Bay of Bengal
S S Indian Ocean
P S Pacific Ocean
U Australia
O South China Sea
T East China Sea

There is no requirement that differing observers coordinate sequence numbers even though they both may be reporting the same storm.

(2) WMO Storm name (descriptor 0 01 026): the storm name "NAMELESS" shall be used in those cases where an identifiable tropical disturbance has not reached Tropical Storm strength and has not been assigned an official name.

New Code Tables

(we identified the first table as 0 09 005 in the WWW Letter it should have read 0 08 005):

•Page **I—Bi—136**

0 08 005

Surface synoptic feature significance

Code Figure	Meaning
0	Reserved
1	Storm Centre
2	Outer limit or edge of storm
3	Location of maximum wind
4-14	Reserved
15	Missing

•Page **I—Bi—141**

0 19 008

Vertical extent of circulation

Code Figure	Meaning
0	Reserved
1	Shallow (top of circulation
	Below 700 hPa level)
2	Medium (top Between 700 hPa and 400 hPa level)
3	Deep (top above 400 hPa level)
4-6	Reserved
7	Missing

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

•Page I—Bi—68

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	08	013	Day/Night Qualifier	Code table	0	0	2

•Page I—Bi—137

0 08 013
Day/Night qualifier

Code Figure	Meaning
0	Night
1	Day
2	Reserved
3	Missing

•Page I—Bi—74 add

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	14	019	Surface Albedo	%	0	0	7
0	14	042	Bi-directional reflectance	%	0	0	7

•Page I—Bi—78 add

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	22	041	Sea surface temperature(15-day running mean)	K	1	0	12

•Page I—Bi—81 add

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	25	030	Running mean sea surface temperature usage	code table	0	0	2

•Page I—Bi—171 add

0 25 030
Running mean sea surface temperature usage

Code Figure	Meaning
0	Running mean sea temp not used because usage criteria not met.
1	Running mean sea temp not used because data not available
2	Running mean sea temp used as predictor
3	Missing

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

•Page **I—Bi—82** add

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	27	021	Satellite sub-location dimension	numeric	0	0	16

Add another Note to **Class 27:**
(3) The satellite sub-location dimension is calculated as:
dimension = minibox dimension + box dimension
where: minibox dimension = lines*1000 + spots*100
box dimension = lines*10 + spots

RADAR

And finally, RADAR in BUFR. There is from Meteo-France a request for a relatively small number of new descriptors and table augmentations:

›Page **I—Bi—172**
Code table **0 29 001** add a new projection type:

Code Figure	
4	Scanning Cone (Radar) *

* Note: Projection type 4 indicates a Cartesian grid placed directly on the scanning cone defined by the azimuthal sweep of the radar.

›Page **I—Bi—172**
Code table **0 30 031** add two more picture types:

Code Figure	
9	Map of ground occultation
10	Map of radar beam height

›Page **I—Bi—62** add:

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	02	100	Radar Constant*	dB	1	0	12
0	02	136	Range processed by range attenuation correction	m	-3	0	16

*Note: This constant is defined as follows:
Z = P + radar constant
where Z= the reflectivity of target in beam direction (dBZ)
P= the input receiver power above 1 mw (dB)

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

•Page I—Bi—83 add:

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	30	002	Pixel value (8 bits)	numeric	0	0	8
0	30	004	Pixel value (16 bits)	numeric	0	0	16

The following are some editorial suggestions for word changes or additions to the text in the Manual:

•Page I—Bi—44
In note 5, section number 3, contents change "type of BUFR message" to "data category".

•Page I—Bi—47 add a new regulation:
94.5.3.8
If a BUFR message is made up of more than one subset, each subset shall be treated as though it was the first subset encountered.

•Page I—Bi—47
Delete entry for Class 00 under 94.5.3.3

•Page I—Bi—51
Octets 9 & 10, contents: change "BUFR message type" to "Data category".

•Page I—Bi—53
Add a new Note (7):
(7) "Other data", as identified in octet 7, could, for example, be forecast information generated from a numerical model.

•Page I—Bi—55
Note (4): add text:
R^o [R superscript o] uses bit length from Table B;
A^o [A superscript o] uses bit length from descriptor 2 04 YYY
and delete the text in "()":"(number of bits as Table B)"

•Page I—Bi—56
Correct typo in Code figure column: change "102-253" to "102-255"

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

•Page I—Bi—58
Add a new note after existing note (6) (and renumber accordingly):
(7) The use of local descriptors, as defined in Notes 5 & 6, in messages intended for non-local or international exchange is strongly discouraged. They should be kept to the barest minimum possible and must also be by-passed by the use of descriptor 2 06 YYY.

•Page I—Bi—85
Note 1 should read at the end: "defined until canceled or until the end of the data subset."

•Page I—Bi—86
Add another Note after existing Note (7) and renumber accordingly:
(8) Once an associated field has been established and given meaning, the meaning may be changed by a re-application of descriptor 0 31 021. The associated field need not be canceled in order to change the meaning. Further, if an associated field is canceled, and then reestablished, it must be given a meaning by a proper application of the 0 31 021 descriptor, as described in Notes 4-7, i.e., a previous assignment of meaning does not remain in force when the associated field is canceled.

Here are a set typos or left out items:

•Page I—Bi—122

0 01 007	Code figure	1 - 99	Allocated to Eur...
0 01 007	Code figure	0	Reserved

•Page I—Bi—125

0 02 011	Code figure	0,1	Reserved

•Page I—Bi—126

0 02 011	Code figure	90	Reserved

•Page I—Bi—127

0 02 015	Code figure	0	Reserved

•Page I—Bi—164

0 23 001	Code figure	0	Reserved

•Page I—Bi—164

0 23 002	Code figure	0	Reserved

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

•Page **I—Bi—113** (line 5):
1 02 032 to be replaced by 2 02 126 for change scale

Related to run length encoding, the Subgroup agreed to propose the following CORRECTION and ADDITION to the Manual, page **I—Bi—116**. The two separate sequences, one for a row and then for all rows, is slightly more space consuming than one sequence for the complete 2D array, but does allow a different starting coordinate for each row (i.e. a la quasi-regular GRIB):

•Page **I—Bi—116**
Correct Sequence 3 13 041 to read:

	(Run-length encoded row for Pixel value (4 bits))	
3 13 041	0 06 002	First longitude location minus one increment
	1 10 000	Delayed replication of 10 descriptors
	0 31 001	Replication factor
	1 04 000	Delayed replication of 4 descriptors
	0 31 001	Replication factor
	0 06 012	Longitude increment
	1 01 000	Delayed replication of 1 descriptor
	0 31 012	Repetition factor
	0 30 001	Pixel value (4 bits)
	0 06 012	Longitude increment
	1 01 000	Delayed replication of 1 descriptor
	0 31 001	Replication factor
	0 30 001	Pixel value (4 bits)

•Page **I—Bi—116**
Add Sequence 3 13 043:

	(Run-length encoded picture data for Pixel value (4 bits), regular grid)	
3 13 043	0 06 002	First longitude location minus one increment
	0 05 002	First latitude location minus one increment
	0 05 012	Latitude increment
	1 12 000	Delayed replication of 12 descriptors
	0 31 001	Replication factor
	1 10 000	Delayed replication of 10 descriptors
	0 31 001	Replication factor
	1 04 000	Delayed replication of 4 descriptors
	0 31 001	Replication factor
	0 06 012	Longitude increment
	1 01 000	Delayed replication of 1 descriptor
	0 31 011	Repetition factor
	0 30 001	Pixel value (4 bits)
	1 01 000	Delayed replication of 1 descriptor
	0 31 001	Replication factor
	0 30 001	Pixel value (4 bits)

Representation of newly reportable information embodied in code tables 3850 and 3855, both scheduled for implementation in November 1994, as part of some extensions to FM 13-IX SHIP

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

Additional BUFR descriptors and associated tables designed to accommodate the additional reporting information in two new character code tables 3850 and 3855, both of which are scheduled for November 1994. They are additions to FM 13-IX EXT. SHIP. Table 3850 allows for the reporting of the method of measurement of the sea surface temperature, while table 3855 conveys information on the method of measurement of the wet bulb temperature. Both tables are also used to report the sign of the temperature - the latter is not needed for BUFR. Since both seem to be related to instrumentation in an oceanographic setting, they can be put as follows (noting that 0 02 037 is already spoken for in earlier proposals):

•Page I—Bi—62

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	02	038	method of sea surface temperature measurement	code table	0	0	4
0	02	039	method of wet bulb temperature measurement	code table	0	0	3

•Page I—Bi—132

0 02 038

Method of sea surface temperature measurement

Code Figure	Meaning
0	Ship intake
1	Bucket
2	Hull contact sensor
3	Reversing thermometer
4	STD/CTD sensor
5	Mechanical BT
6	Expendable BT
7	Digital BT
8	Thermistor chain
9	Infra-red scanner
10	Micro-wave scanner
11-14	Reserved
15	Missing

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

•Page I—Bi—132

0 02 039
Method of wet bulb temperature measurement

Code Figure	Meaning
0	Measured wet bulb
1	Iced bulb measured wet bulb
2	Computed wet bulb
3	Iced bulb computed wet bulb
4-6	Reserved
7	Missing

REPRESENTATION OF REPORTS OF SHIP SPEED AND DIRECTION IN BUFR

Where it is considered important to designate the reporting method originally used in association with the values coded for descriptors 0 01 013 and 0 01 014 use may be made of the following new descriptors:

•Page I—Bi—81

Table Reference			Element Name	Unit	Scale	Reference Value	Data width (bits)
F	X	Y					
0	25	041	Moving platform direction reporting method	Code table	0	0	2
0	25	042	Moving platform speed reporting method	Code table	0	0	2

•Page I—Bi—171

0 25 041

Code Figure	Meaning
0	Direction originally reported in true degrees
1	Direction originally reported using Code Table 0700, FM 13
2	Reserved
3	Missing

Note: Where the original reporting method is as indicated by code figure 1, the following conversion is recommended to obtain a suitable data value corresponding to descriptor 0 01 013:

Reported value	Data value	Reported value	Data value
0	0	5	225
1	45	6	270
2	90	7	315
3	135	8	360
4	180	9	511

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

•Page I—Bi—171

0 25 042

Code Figure	Meaning
0	Speed originally reported in m/s
1	Speed originally reported using Code Cable 4451, FM 13
2	Reserved
3	Missing

Note: Where the original reporting method is as indicated by code figure 1, the following conversion is recommended to obtain a suitable data value corresponding to description 0 01 014:

Reported value	Data value
0	0
1	1
2	4
3	7
4	9
5	12

Reported value	Data value
6	14
7	17
8	19
9	21
/	1023

ADDITIONS OR MODIFICATIONS TO THE GRIB PARAMETERS

The first change is that the table version number found in the PDS, Octet 4, be expanded in meaning to apply to all the tables. A change to any of the tables will count as a version change for all the tables.

•Page I—Bi—3
Note (1): change "GRID" to GRIB"
Note (3): section number 1: change "session" to "section"

•Page I—Bi—4
Insert a new Note (4) (and renumber the following ones)
(4) Although the Grid Description Section is indicated as optional, it is strongly urged that it be included in all GRIB messages.

•Page I—Bi—9
Add a new Note (5):
(5) If a Grid Description Section (GDS) is not included, then any u or v components of vector quantities in the message are to be resolved relative to the specified grid in the direction of increasing x and y (or i and j) co-ordinates respectively.

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

If a GRID Description section is included in the message, which is the preferred option, then Octet 17 of the GDS, and Table 7, will contain component resolution information.

•Page I—Bi—13
Note (7): The references to pages I-A should be to I-Bi.

•Page I—Bi—14
Note (4): The references to pages I-A should be to I-Bi.

•Page I—Bi—15
Note (5): This should read
(5) Octet 27 (projection centre flag)
Bit 1 set to 0 if North ...
Bit 1 set to 1 if South ...
(to be set up as flag table)

[Comment: this is now consistent with Note (5) on Page **I—Bi—17**]
Note (7): The reference to page I-A should be to I-Bi.

•Page I—Bi—17
In the Octet No. column, "40-42" should read "41-42"
Note (2): Strike out the words "60-degree" and replace with the words "secant cone intersection"

•Page I—Bi—17 add:

Grid Definition — Space View perspective or orthographic

Octet Number	Contents
7-8	Nx - number of points along x axis (columns)
9-10	Ny - number of points along y axis (rows or lines)
11-13	Lap - latitude of sub-satellite point
14-16	Lop - longitude of sub-satellite point
17	Resolution and component flags (Table 7)
18-20	Dx - apparent diameter of earth in grid lengths, in x direction
21-23	Dy - apparent diameter of earth in grid lengths, in y direction
24-25	Xp - X-coordinate of sub satellite point
26-27	Yp - Y-coordinate of sub-satellite point
28	Scanning Mode (Table 8)
29-31	the orientation of the grid; i.e., the angle in millidegrees between the increasing y axis and the meridian of the sub-satellite point in the direction of increasing latitude (see Note 3).
32-34	Nr - the altitude of the camera from the earth's centre, measured in units of the earth's (equatorial) radius (See Note 4).
35-36	Xo - X coordinate of origin of Sector Image
37-38	Yo - Y coordinate of origin of Sector Image
39-44	Reserved

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

Notes:

(1) It is assumed that the satellite is at its nominal position, i.e., it is looking directly at its sub-satellite point.

(2) Octet 32-34 shall be set to all ones (missing) to indicate the orthographic view (from infinite distance).

(3) It is the angle between increasing y axis and the meridian 180 degrees east if the sub-satellite point is the North pole; or the meridian 0 degrees, if the sub-satellite point is the south pole.

(4) The apparent angular size of the earth will be given by 2 * asin (1/Nr).

(5) The horizontal and vertical angular resolutions of he sensor (Rx and Ry), needed for navigation equations, can be calculated from the following:

$$Rx = 2 * \text{asin}(1/Nr) / dx$$
$$Ry = 2 * \text{asin}(1/Nr) / dy$$

•Page **I—Bi—9** insert:

33-44 Extensions of grid definition for space view perspective projection

[Comment: The following is proposed to clarify a misunderstanding on the part of readers of the Manual who were not privy to our discussions of the development of the second order packing. The changes do not change the meaning or the algorithm of the packing, only the explanation.

•Page **I—Bi—21**

Note (3): Change the second line of the note [the UPPER CASE words are the Chairman's additions] so that it reads: "bits the location WHERE THE USE of the first order packed values BEGINS with reference to the defined"

Note (5): Change the fourth line to read: "point at which THE USE OF a subsequent first-order packed value BEGINS, AS DEFINED BY THE SECONDARY BIT MAP; the unpacked"
Delete "is located"

Note (6): Add a sentence:
"This is a form of run-length encoding in which a string of identical values is represented by one value; the replication count for that value is, implicitly, in the secondary bit map."

[Comment: The following reflect the changes in BUFR Table 0 01 031]:

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

•Page I—Bi—23
Remove the brackets from the Table 0 as printed and adjust the printing so that the following entries are printed as shown here. Some are new entries:

7	US Weather Service - National Meteorological Centre (NMC)
8	US National Weather Service Telecommunications Gateway (NWSTG)
34	Tokyo RSMC, Japan Meteorological Agency
52	Miami RSMC, National Hurricane Centre
56	Reserved
57	U.S. Air Force - Air Force Global Weather Central
58	Fleet Numerical Oceanography Centre, Monterey, CA
59	The NOAA Forecast Systems Laboratory, Boulder, CO, USA
68	Reserved
74	UK Meteorological Office - Bracknell
77	Reserved
85	Toulouse
96	Athens
97	European Space Agency (ESA)
98	ECMWF, RSMC
99	De Bilt
128 - 254	National use
255	Missing value

•Page I—Bi—27: Table 2: new entries

009	Standard deviation of height	m
020	Visibility	m
037	Montgomery stream function	$m^2 sec^{-2}$
058	Cloud Ice	$kg\ m^{-2}$
078	Convective snow	$kg\ m^{-2}$
079	Large scale snow	$kg\ m^{-2}$
080	Water Temperature	K
081	Land cover (1=land, 0=sea)	proportion
090	Water run-off	$kg\ m^{-2}$
091	Ice Cover (1=ice, 0=no ice)	proportion

[Comment: The change to 081 and 091 replaces "1,0" with "proportion" as the unit, thus allowing for a range of coverage. It is up to the user to employ the D scaling (power of 10) to assure that the desired precision is in the GRIB entity.]

097	Ice Growth rate	m/sec
099	Snow melt	$kg\ m^{-2}$
124	Momentum flux, u component	$N\ m^{-2}$
125	Momentum flux, v component	$N\ m^{-2}$
126	Wind mixing energy	J

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

•Page **I—Bi—31**

Clarification to Code Table 3 (not actual changes); (added words are in UPPER CASE):

00	RESERVED
01	Ground OR WATER surface
05	Level of adiabatic condensation LIFTED FROM THE SURFACE
08	Nominal top of atmosphere
09	Sea bottom

For code figures 103 and 104 add the words "above mean sea level" after "altitude(s)" in the "meaning" column.

200	Entire atmosphere (considered as a single layer)
201	Entire ocean (considered as a single layer)

•Page **I—Bi—32** addition to Table 3, for the isentropic modellers:

Code Figure	Meaning	Contents	
113	isentropic (theta) level	Potential Temp. degrees K (2 octets)	
114	layer between two isentropic levels	475K minus theta of top in Deg. K	475K minus theta of bottom in deg. K
125	Specified Height Level above ground (high precision)	Height in centimetres	

•Page **I—Bi—33** add a note to table 3:

(1) For reserved values, or if not defined, octets 11 and 12 shall contain zero.

•Page **I—Bi—34** add a new Code Table 5 entry:

Code Figure	Meaning
118	Temporal variance, or covariance, of N initialized analyses; each product has forecast period P1=0; products have reference times at intervals of P2, beginning at the given reference time.

•Page **I—Bi—38** add (minor item) to Table 7:

6-8	reserved, set = 0

B. Manual On Codes *(continued)*

1. Global practices / 1.3 Changes to codes *(continued)*

•Page **I—Bi—40** for clarity, insert the following text between the entries for bits 4 and 5:

The following gives the meaning of the bits in octet 14 ONLY if bit 4 is set to 1. Otherwise octet 14 contains regular binary data.

The ECMWF has started trying to encode 2D wave spectra into GRIB (matrix of values at each point), and come up with the following difficulty:-

Code table 12 indicates how coefficients C1 and C2 shall be used within a set of functional forms; unfortunately, the coefficients (see page **I—Bi—19**) have been defined as integers. This is unrealistic, and too restrictive - they need to be represented with greater precision. As a result the specifications for matrix of values are not usable at the present time. Therefore the Sub-group recommended that:

1. The description of the matrix of values specification system on pages **I—Bi—18-20** be deleted from the manual;
2. Delete Code Tables 12 and 13;
3. Add an additional note to Table 11:

Note (4) The indicated meaning of bit 6 shall be retained in anticipation of the future re-introduction of a system to define a matrix of values at each grid point.

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