WORLD METEOROLOGICAL ORGANIZATION

COMMISSION FOR BASIC SYSTEMS

ABRIDGED FINAL REPORT
OF THE
EIGHTH SESSION

Geneva, 31 January - 11 February 1983

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NOTE

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C O N T E N T S

LIST OF PERSONS ATTENDING THE SESSION

1. Officers of the session

J. R. Neilon	president	
A. Vasiliev	vice-president	

2. Representatives of Members of WMO

M. Yermeche	principal delegate	Algeria
B. S. Benabdallah	delegate	
A. Hassaïne	delegate	
A. Kerbachi	delegate	
Mahboud Khadir	delegate	
S. Alaimo	principal delegate	Argentina
J. Wilkinson	delegate	
R. B. Crowder	principal delegate	Australia
K. W. Henderson	delegate	
H. Maier	principal delegate	Austria
H. Gmoser	delegate	
E. De Dycker	principal delegate	Belgium
G. Doumont	delegate	
Y. M. Souza	principal delegate	Brazil
R. Jansen Das Merces	delegate	
F. de Paula Soares Monhaes	delegate	
S. Milouchev	principal delegate	Bulgaria
J. Skuratovich	principal delegate	Byelorussian Soviet Socialist Republic
P. Aber	principal delegate	Canada
B. Attfield	delegate	
D. Colwell	delegate	
S. Gomes de Sousa Ramos (Mrs)	principal delegate	Cape Verde
Evora Magda (Mrs)	delegate	
Fang Qi	principal delegate	China
Jin Kui	delegate	
Ruan Zujung	delegate	
Wang Caifang	delegate	
Xunliang Zhang	delegate	
J. Gonzales Montoto	principal delegate	Cuba
J. Castellanos Rubial	delegate	

2. Representatives of Members of WMO (contd.)

A. Papež	principal delegate	Czechoslovakia
J. Kalavsky	delegate	
K. Mørch Jensen	principal delegate	Denmark
S. Levi	delegate	
H. Zhody	principal delegate	Egypt
J. Riissanen	principal delegate	Finland
P. Valkovuori	delegate	
F. Duvernet	principal delegate	France
P. Kerhervé	delegate	
J. Pailleux		
K. Richter	principal delegate	German Democratic Republic
T. Mohr	principal delegate	Germany, Federal Republic of
W. Bopp	delegate	
D. Fickel	delegate	
C. Lemensieck	observer	
P. Sham	principal delegate	Hong Kong
A. Kapovits	principal delegate	Hungary
F. Sigurdsson	principal delegate	Iceland
S. K. Das	principal delegate	India
J. M. Delaimi	principal delegate	Iraq
W. H. Wann	principal delegate	Ireland
S. Jaffe	principal delegate	Israel
R. Sorani	principal delegate	Italy
I. Shimizu	principal delegate	Japan
T. Aihara	delegate	
E. A. Mukolwe	principal delegate	Kenya
I. K. Sogomo	delegate	
N. Ward	principal delegate	Lebanon
M. A. Issa	principal delegate	Libyan Arab Jamahiriya
Zarrug Shafee	delegate	
S. Benarafa	principal delegate	Morocco
J. Kastelein	principal delegate	Netherlands
R. H. M. Comans	delegate	

2. Representatives of Members of WMO (contd.)

C. F. Reudink	principal delegate	Netherlands Antilles
A. A. Neale	principal delegate	New Zealand
M. Boulama	principal delegate	Niger
A. Kandine		
O. Haug	principal delegate	Norway
O. Bremnes	delegate	
M. Bonjoc	principal delegate	Philippines
G. Czempinski	principal delegate	Poland
J. M. Simoes Cristina	principal delegate	Portugal
N. Patoja (Miss)	delegate	Peru
R. Alkobaisi	principal delegate	Qatar
A. Henaidi	principal delegate	Saudi Arabia
N. Murshid	delegate	
A. B. Diop	principal delegate	Senegal
M. Perez Delgado	alternate	Spain
B. Orfila Estrada	delegate	
M. Sanz Vega	delegate	
J. Segovia	delegate	
P. Berggren	principal delegate	Sweden
K. Gerdin	delegate	
G. A. Gensler	principal delegate	Switzerland
Jabbour Samir	principal delegate	Syrian Arab Republic
B. Saragganda	principal delegate	Thailand
A. Ben Jemaa	principal delegate	Tunisia
S. Asfouri	delegate	
S. Sipahoglu	principal delegate	Turkey
E. Apakan	delegate	
V. Shumovitch (Mrs)	principal delegate	Ukrainian Soviet Socialist Republic
N. P. Kozlov	principal delegate	Union of Soviet Socialist Republics
A. Vasiliev	delegate	
V. Antonov	delegate	
I. Gamaiunov		
Y. Popov		

2. Representatives of Members of WMO (contd.)

F. H. Bushby	principal delegate	United Kingdom
M. Atkins (Miss)	delegate	
A. I. Johnson	delegate	
J. M. Nicholls	delegate	
J. Richards	delegate	
P. A. Mwingira	principal delegate	United Republic of Tanzania
E. W. Friday, Jr.	principal delegate	United States of America
J. R. Neilon	delegate	
G. D. Cartwright	delegate	
H. W. Yates	delegate	
B. Zavos	delegate	
F. Zbar	delegate	
R. Silva	principal delegate	Uruguay
D. N. Araujo Agudo	principal delegate	Venezuela
V. Jurčec (Mrs)	principal delegate	Yugoslavia

3. Observers from other international organizations

J. A. Lyons	Intergovernmental Oceanographic Commission (IOC)
T. Okabe	International Telecommunication Union (ITU)
T. Fox	International Civil Aviation Organization (ICAO)
F. D. Masson	International Maritime Organization (IMO)
P. Cohabe	Agency for Air Safety in Africa and Madagascar (ASECNA)
J. K. D. Söderman F. Delsol	European Centre for Medium-range Weather Forecasts (ECMWF)
M. Fea	European Space Agency (ESA)
P. E. Jones	International Organization for Standardization (ISO)

4. Other Observers

S. Kaddoura	Palestinian Liberation Organization

5. Lecturers

L. Bengtsson
J. Kuettner
I. Shimizu

6. WMO Secretariat

G. K. Weiss	Representative of the Secretary-General
H. A. Bari	
Y. I. Beliaev	
L. Rannaleet	
J. Giraytys	
J. van Egmond	
K. Yamaguchi	
J. M. Rainer	
M. E. Mlaki	
R. Chacun	
D. M. Feit	
J. Peeters	

A G E N D A

Agenda Item No.		Relevant documents	Res.	Rec.
1.	Opening of the session	PINK 1, REV. 1		
2.	Organization of the session	PINK 1, REV. 1		
2.1	Consideration of the report on credentials	PINK 1, REV. 1		
2.2	Adoption of the agenda	1, 2, PINK 1, REV. 1		
2.3	Establishment of committees	PINK 1, REV. 1		
2.4	Other organizational questions	PINK 1, REV. 1		
3.	Report by the president of the Commission	10, PINK 1, REV. 1 PINK 1, REV. 1, ADD. 1	1	
4.	Integrated WWW System Study	16, 16 CORR. 1, 21, 22, 24, 33, PINK 13	2, 3	1, 2
5.	Draft WWW Plan for the period 1984-1987	13, 21, 24, PINK 14		
6.	Observing System (including the GOS part of WWW and the report by the chairman of the Working Group on the GOS)	11, 18, 18 ADD. 1, 25, 25 ADD. 1, 34, 37, PINK 2	4	
7.	Data-processing system (including the GDPS part of WWW amd the report by the chairman of the Working Group on the GDPS)	8, 11, 19, 23, 19 ADD. 1, PINK 3, PINK 3 CORR. 1 (English only)	5	3, 4, 5
8.	Codes (including the report by the chairman of the Working Group on Codes)	5, 5 CORR. 1, 6, 8, 8 ADD. 1, 9, 20, 26, 27, 28, 29, 31, 32, 35, 38, 40, PINK 4	6	6, 7, 8, 9, 10, 11, 12, 13

Agenda Item No.		Relevant documents	Res.	Rec.
9.	Telecommunication system (including the GTS part of WWW and the report by the chairman of the Working Group on the GTS)	3, 3 ADD. 1, 3 ADD. 2, 7, 11, 12, 15, 15 CORR. 1, 30, 36, 39, PINK 5, PINK 5 CORR. 1, PINK 6, PINK 7, PINK 7 CORR. 1	7	14, 15, 16, 17, 18
10.	Monitoring of the operation of the WWW	11, 17, 17 ADD. 1, 17 ADD. 2, PINK 10		
11.	Education and training in the field of CBS	14, PINK 12		
12.	Nomination of members of working groups and nomination of rapporteurs			
13.	Review of previous resolutions and recommendations of the Commission and relevant Executive Committee resolutions	4, PINK 8	8	19
14.	Scientific lectures and discussions	PINK 11		
15.	Election of officers	PINK 9, PINK 15		
16.	Date and place of the ninth session			
17.	Closure of the session			

GENERAL SUMMARY OF THE WORK OF THE SESSION

1. OPENING OF THE SESSION (Agenda item 1)

1.1 The eighth session of the Commission for Basic Systems was held in Geneva, Switzerland, from 31 January to 11 February 1983. In view of the large number of participants at the session, all meetings were held at the "Centre international de conférences de Genève" (CICG). All the documents were provided in the four working languages of the Organization and simultaneous interpretation in these languages and in Chinese was provided at all plenary meetings and meetings of the working committees. The session was opened by the president of the Commission, Mr. J. R. Neilon, at 10 a.m. on 31 January 1983.

1.2 Mr. A. C. Wiin-Nielsen, Secretary-General of the World Meteorological Organization, extended a warm welcome to the participants as well as to the representatives of the international organizations. He mentioned that this session was particularly important since a number of far-reaching decisions of a technical nature would have to be taken concerning the basic programme of WMO, namely the World Weather Watch Programme, which might also have an impact on other WMO programmes. The upgrading and improvements of all aspects of the WWW should primarily serve to support the GOS, the GTS and the GDPS, but might also provide appropriate support for other WMO programmes which depended, at least to some extent, on the facilities of the WWW. Mr. Wiin-Nielsen mentioned that this session coincided with the twentieth anniversary of the WWW and recalled the very significant role played by Dr. Harry Wexler (U.S.A.) and Academician Victor Bugaev (U.S.S.R.) in formulating the basic concept of the WWW.

1.3 Mr. Wiin-Nielsen thought that the session should consider in more detail the state of implementation and the shortcomings in the present operation of the WWW, taking into account the results obtained from FGGE. He also mentioned that this session should consider, prior to its review by Ninth Congress, the further development of the WWW as described in the draft WWW plan for 1984-1987, taking into consideration the results available so far from the Integrated WWW System Study. In this connexion, Mr. Wiin-Nielsen recalled that EC-XXXIV had recognized the important role this session of CBS would play in formulating the WWW plan for this period, which should contain a realistic, scientific and technological outline of an implementation programme and Integrated WWW System Study programme for consideration by Ninth Congress. In conclusion, Mr. Wiin-Nielsen expressed his wishes for a successful session and wished the participants a pleasant stay in Geneva.

1.5 Mr. J. R. Neilon, president of CBS, reviewed in his opening address the Commission's activities since its extraordinary session in 1980. He mentioned the achievements made by the members of the Commission and the Members of WMO in general in the further development and implementation of the WWW. However, Mr. Neilon felt that the task set forth by CBS had not yet been completed and that further efforts were required to maintain and improve the operation of the WWW. In this connexion, he also mentioned the importance of the Integrated WWW System Study (ISS) which had already been started and would require all the resources of time and talent that could be summoned if it was

to be successful. He also recalled the recommendations which were formulated by the IPM on WWW Policy and Long-Term Development Strategy in this respect, which gave valuable guidance for the further development of the ISS.

1.5 Mr. Neilon felt that, in addition to the management of the ISS, at least three other important items should be considered by the session, namely:

- The proposed WWW plan for 1984-1987;
- The continuation of efforts to maintain and improve the operation of the WWW;
- The continuation of efforts in the transfer of knowledge and proven methodology to ensure that all Members could derive benefit from an improved WWW system.

In conclusion, Mr. Neilon was of the opinion that all members of CBS should be prepared to implement the results of the combined efforts as they became available, because only when the improved WWW system had been implemented could it be considered that the task was a success. He wished the participants a happy stay in Geneva and a fruitful session.

1.6 There were 121 participants at the eighth session. These included 111 representatives from 59 Members of WMO and 10 observers. A complete list of participants is given at the beginning of this report.

2. ORGANIZATION OF THE SESSION (Agenda item 2)

2.1 Consideration of the report on credentials (Agenda item 2.1)

At the first plenary meeting, the representative of the Secretary-General presented a list of countries, non-Member countries and international organizations represented at the eighth session, whose credentials were found to be valid. This list was accepted as the first report on credentials and further reports were submitted to the eighth session at ensuing plenary meetings. It was decided not to set up a Credentials Committee.

2.2 Adoption of the agenda (Agenda item 2.2)

The provisional agenda was adopted at the first plenary meeting without change. The final agenda is reproduced at the beginning of this report, together with an indication of the relevant documents and numbers of resolutions and recommendations.

2.3 Establishment of committees (Agenda item 2.3)

2.3.1 In accordance with Regulation 23 of the WMO Regulations, the Commission established the following committees for the duration of the session.

Nomination Committee

2.3.2 A Nomination Committee was established, composed of the principal delegates of Argentina, Czechoslovakia, Japan, Kenya, Netherlands Antilles and New Zealand.

Co-ordination Committee

2.3.3 In accordance with WMO General Regulation 27, a Co-ordination Committee was established, composed of the president and vice-president of CBS, the chairmen of the two working committees and the representative of the Secretary-General.

Working committees

2.3.4 The following two working committees were set up to examine in detail the various agenda items:

(a) Committee A to consider agenda items 6 and 8 and those parts of items 4, 5, 10, 11 and 13 relating to the GOS and code matters. Mr. R. B. Crowder (Australia) was elected chairman and Mr. J. Gonzales Montoto (Cuba) vice-chairman of the committee;

(b) Committee B to consider agenda items 7 and 9 and those parts of items 4, 5, 10, 11 and 13 relating to the GDPS and the GTS. Mr. A. K. Henaidi (Saudi Arabia) was elected chairman and Mr. A. B. Diop (Senegal) vice-chairman of the committee.

2.4 Other organizational questions (Agenda item 2.4)

Under this agenda item, the Commission agreed on the working hours for the duration of the session. The Commission was informed that, in accordance with WMO General Regulation 111, the president of the Commission would approve those minutes of plenary meetings which could not be approved during the session, after consultation with the participants.

3. REPORT BY THE PRESIDENT OF THE COMMISSION (Agenda item 3)

3.1 The Commission noted with appreciation the report submitted by its president on the activities of CBS since its extraordinary session in 1980. All items in this report requiring action by the Commission were considered under the relevant parts of the agenda.

3.2 The Commission discussed the amendments to the terms of reference of the technical commissions proposed by the Executive Committee Panel of Experts for the Review of the Scientific and Technical Structure of WMO, which were to be submitted to Members for consideration and approval at Ninth Congress. It was also noted that the proposed amendments would have a bearing on the work of the Commission and that it was necessary to ensure consistency between the terms of reference of CBS and those of its working groups. In addition a number of specific comments were made pertaining to the following questions:

(a) The need to include the formulation of user requirements for certain special applications in the terms of reference of CBS;

(b) The need for more consistent wording in formulating the responsibilities of the Commission in its major areas of work such as telecommunications, observations and data processing;

(c) The need to reconsider the internal structure of the Commission;

(d) The need for a clearer delineation of responsibilities between CBS and CCAM as regards applications and the data component of the WCP.

3.3 The Commission agreed that this discussion would provide some guidance to the president of CBS in the consideration of these problems at Ninth Congress.

Establishment of the CBS Advisory Working Group

3.4 The Commission confirmed the important role of the Advisory Working Group in co-ordinating the activities of the Commission and providing advice and assistance to the president of CBS.

3.5 The Commission stressed the following important tasks for the Commission for the inter-sessional period, i.e. 1983-1985.

(a) Preparation of the plan for the improved WWW to the year 2000;

(b) An implementation programme for the period 1986-1991 for components considered appropriate for inclusion into the WWW during this period.

The Commission supported the views expressed by the Informal Planning Meeting (IPM) on WWW Policy and Long-term Development Strategy, that the CBS Advisory Working Group should be strengthened for its role as steering committee for the ISS. The Commission therefore agreed with the IPM that the Advisory Working Group should be strengthened in its membership. The president of CBS should be authorized to invite additional experts on specific topics to participate in sessions of the group as required.

3.6 Furthermore, the Commission gave the Advisory Working Group the task of reviewing the internal structure and working methods of the Commission, in the light of the development of a truly integrated WWW. The Commission requested the president of CBS to submit a detailed report on this subject to the next session of the Commission. Resolution 1 (CBS-VIII) was adopted.

4. INTEGRATED WWW SYSTEM STUDY (Agenda item 4)

Consideration of the report of the IPM on WWW Policy and Long-term Development Strategy

4.1 The Commission noted that EC-XXXIV (1982) had stressed the urgent need for a preliminary outline of an overall policy and strategy for an improved WWW system, in particular for a long-term global meteorological satellite programme, and for the further and accelerated development of the ISS.

An Informal Planning Meeting on WWW Policy and Long-term Development Strategy, composed of invited, high-level experts had been held in Geneva from 6-10 December 1982. The conclusions and recommendations of this IPM, covering a wide range of policy and strategy issues for the improved WWW, had been submitted to CBS for consideration prior to their submission to Cg-IX.

4.2 The Commission endorsed in general the conclusions and recommendations of the IPM and took them into consideration when preparing the draft WWW Plan for 1984 to 1987 (see agenda item 5).

4.3 Furthermore, the Commission agreed with the recommendation of the IPM that, in spite of the complexity of the ISS and the large variety of individual studies to be conducted, the ISS should, by mid-1985, through an intensified planning effort, provide a plan for an improved WWW to the year 2000, including a detailed implementation programme for the period 1986 to 1991. It felt that the detailed implementation programme should also include a timetable of the action and resources required. The Commission endorsed in particular the recommendation of the IPM that in order for the ISS to proceed successfully within the time frame proposed by the IPM the following action within CBS was required:

(a) The CBS Advisory Working Group, in its role as steering committee for the ISS, should be enabled to meet at least twice yearly until completion of the study. The Advisory Working Group should establish detailed work plans and time schedules for the further conduct of the ISS and its individual studies. It should establish, in conjunction with the Secretariat, responsibilities and work programmes for special study groups, consultants, seconded experts or the Secretariat for study areas and individual studies according to established priorities and should, in due course, also gradually narrow the range of possible design proposals for inclusion in the plan for the improved WWW to the year 2000 and the implementation programme for 1986-1991;

(b) In view of the wide range of tasks and studies within the ISS, the CBS Advisory Working Group would also require the participation of a wide range of technical experts. The Advisory Working Group should therefore be augmented by individual experts for particular purposes in relation to specific studies or groups of studies;

(c) Members should be urged to assist actively the ISS planners by carrying out individual studies, evaluating study results, supplying information on cost estimates on capital investments, etc., as well as providing well-qualified seconded experts in various fields of specialization, all in order to achieve the prompt completion of high priority ISS studies;

(d) As proposed by the IPM, special ISS planning staff should be attached to the WWW Department of the Secretariat to undertake detailed planning, system design, technical studies and co-ordination activities in support of the accelerated phase of the ISS. The CBS Advisory Working Group would provide guidance. The Commission noted with approval the arrange-

ments made recently when bringing together staff for the ISS planning group from the WWW Department. Recognizing that this arrangement was temporary, the Commission expressed the firm opinion that more permanent arrangements should be considered by Ninth Congress so that the appropriate level of Secretariat support, commensurate with the critical nature of the studies, would be made available. In this regard, the Commission strongly urged that all efforts be made to obtain the best qualified staff with the appropriate scientific, technical and operational background as was done when organizing the GARP Joint Planning Staff;

(e) Resources should be provided for an extraordinary session of CBS in 1985 to consider the ISS report, the general plan to the year 2000, and the implementation of the WWW Programme for 1986 to 1991.

General principles for the further conduct of ISS

4.4 The Commission further expressed its opinion that the planning for ISS should focus on the real-time aspects of the WWW. The Commission felt that although highest priority was given to the improvement of GOS, GDPS and GTS components on a global scale, for the improvement of weather prediction up to several days ahead, special consideration should also be given to developing WWW sub-systems and components required for improved short-range forecasting of mesoscale features.

4.5 With regard to the implementation of new or improved elements of the WWW, the Commission stressed that the objective was to improve and build upon the present system and not to conceive a new WWW system. In this regard, the Commission reiterated the principle that proven existing systems should not be eliminated until the replacement systems themselves had been implemented and fully proven. It also wished to recall that a part of the system planning was provision for a mix of systems to ensure that a catastrophic failure of one system did not eliminate completely a set of data critical to forecast and service programmes.

4.6 The Commission reaffirmed the principle of free exchange of data and products among Members. The Commission noted, however, that Members were faced with increasing requests to support the WWW and to increase their activities in WWW application programmes, with the consequence that available national resources were tending to be overcommitted. In some instances, therefore, highly specialized users' requests had resulted in a substantial effort to prepare tailored products. In such cases, it had often been necessary for national Meteorological Services to establish charges to recover the costs for the preparation of these unique products. The Commission noted that as user demands became more sophisticated, recovery of costs for specialized services would become more widespread. The Commission understood that this matter would be discussed by Ninth Congress.

4.7 The Commission fully supported the principle of voluntary contributions from Members for the establishment and operation of WWW facilities and services. Note was taken, however, that in recent years the cost of the VCP had fallen on a decreasing number of Members. This trend had resulted in a substantially smaller programme than was required to achieve the established

WWW goals. It was noted that this trend was one of the reasons for a significant decrease in network implementation in some areas. A fuller degree of participation on the part of those Members able to do so was viewed as essential to the effective maintenance of the current system and absolutely critical to any co-ordinated programme for improvement. CBS invited Ninth Congress to consider this important matter with a view towards strengthening and broadening the VCP for meeting the WWW system requirements more adequately.

4.8 It was the firm opinion of the Commission that special emphasis should be placed on the operational needs, Members' requirements and implementation difficulties existing in many developing countries especially in tropical regions, when designing and implementing the improved WWW system. It was considered to be of utmost importance that the conduct of studies or the design and planning of new facilities or procedures should take into account the existing differences in social and economic conditions between Regions or parts thereof. The participation of experts from developing countries in the work of ISS and in the planning of the improved WWW system was considered to be essential and of help in assuring the successful introduction of appropriate means and facilities, in accordance with Members' abilities to implement and operate such facilities. In this respect, the organized and co-ordinated transfer of knowledge, methodologies, means and experience through the proposed WWW Implementation Support Activity to Members was considered to be a prerequisite for the orderly implementation of the improved WWW system. Training activities and courses, specially designed and focused on WWW operational activities, should be given very high priority.

4.9 The Commission noted that both the surface-based and the space-based observing systems would continue to constitute the composite Global Observing System. It emphasized that, for the WWW system to be maintained and further developed, the continued operation of meteorological satellites, both polar-orbiting and geostationary, in their observational, data-collection and -dissemination roles, was essential and should be assured. For the planning and programming of WWW facilities and components throughout the 1980s and 1990s, it was felt essential to obtain firm commitments, at least on a medium-term basis (e.g. 10 years), for the continuation of the space-based sub-system (a minimum of two polar-orbiting and five geostationary satellites).

Early implementation activities

4.10 The development of an operational drifting buoy programme was considered to be urgent and essential and should be promoted further in close co-operation with IOC. The Commission noted that operational technology was available and several systems had been operationally tested over a considerable period of time. It was therefore urged that a meeting between current and potential operators of drifting buoys should be arranged to develop common operational procedures. Such a technical/operational meeting should be followed by an inter-governmental conference to consider possible multinational arrangements for implementing an international operational drifting-buoy programme.

4.11 The Commission welcomed with appreciation the information submitted by Canada on the Automated Shipboard Aerological Programme (ASAP) in the North Pacific. The technical feasibility of this real-time operational upper-air programme from mobile ships was clearly demonstrated. Also demonstrated were the low staff and operational costs, particularly in comparison with fixed

ocean weather ship programmes. The details of ship owners' co-operation and staffing arrangements had been explored and the groundwork laid for the possible development of an operational programme. The Commission viewed with great interest the technological and economic potential of this programme and urged the representatives of Canada, Japan and U.S.A. to submit more detailed study results to CBS members and to ISS planners in order to obtain the financial support for further development of a multinational programme. The Commission believed that a draft implementation plan for the system would be valuable as guidance for such planning. It was the opinion of the Commission that this programme should be considered with regard to the possible formation of a consortium to fund the final phases of development and the early stages of implementation as in the case of ASDAR. The representative of Saudi Arabia declared his country's great interest in supporting such a programme. Recommendation 1 (CBS-VIII) was adopted.

4.12 The Commission viewed with appreciation the report of Mr. A. K. M. Henaidi (Saudi Arabia), the vice-chairman of the Consortium on ASDAR Development (CAD), on the status of the CAD programme. It was noted that the CAD, which comprised eight Members of WMO, had taken on the responsibility to complete the development of the operational ASDAR flight unit which should be available for deployment by mid-1985. The Commission noted the CAD and WMO invitation to Members to join this extremely important programme and urged Members to participate to the extent possible. Concern was expressed, however, with respect to the financial situation of the ASDAR programme. While CAD had been highly successful in assembling the funds needed to move forward with a basic system, funds were not yet available to cover development of a system suitable for all of the existing wide-bodied aircraft. Further, in order to ensure a smooth and early implementation (1985), firm procurement orders for operational flight units were necessary. The eight WMO Members comprising CAD had subscribed to the procurement fund but additional support from a broader base of Members was urgently required. This additional support could include CAD membership, procurement of flight units, and related services. Such support need not be limited to WMO Members.

4.13 The Commission also noted with interest the work done by the Interim Committee of ASDAR Participants (ICAP). It was the opinion of the Commission that ASDAR was one of the important new systems which could provide vital upper-air data especially over ocean areas, initially through UHF satellite communication and later also by HF or VHF communication modes. A further important aspect was the ability to obtain vertical profiles of wind and temperature during landing and take-off. The Committee urged the full development and implementation of the operational ASDAR system. It expressed the strong desire that the work proposed by ICAP be undertaken and the ICAP recommendations implemented as soon as possible to achieve a timely operation of the ASDAR system. Recommendation 2 (CBS-VIII) was adopted.

Intensified study efforts

4.14 It was the firm opinion of the Commission that the work programme in Study Area 5 - Output products and user interface - should be intensified. The study programme should be aimed at a more satisfactory provision of products and data to Members. The preparation of products for the tropics should receive high priority, which might require consideration of co-operative efforts for the development of improved weather forecasting in the tropics. The Commission noted that within the CBS structure the responsi-

bility for Study Areas 5 and 6 was with the CBS Advisory Working Group and that expertise, preferably from developing countries, should be called upon when required to study specific topics.

4.15 The Commission concurred with the IPM that ISS, together with the active participation of experts from the Regions concerned, should study the ways and means of formulating plans to raise the WWW in the Regions concerned to an adequate level, whereby all Members would be able to reap benefits from the system. This might require the formulation of proposals covering the following fields:

(a) Co-operative and co-ordinated assistance activities and projects;

(b) Intensified education and training activities of scientific personnel to enable Members to make best use of the transfer of technology;

(c) Arrangements, possibly by pooling resources, for the establishment of a tropical research and prediction centre with strong training and numerical prediction development sections.

4.16 The Commission further stressed that specific cost-benefit studies, as included in the overall improved study plan, should be conducted in parallel with individual technical studies and that the results of cost-benefit studies on new systems and components should be included in the WWW implementation programme for 1986-1991. Arrangements for such studies should be of high priority. The CBS Advisory Working Group was urged to take early action to complete these studies.

Further development of the ISS

4.17 The Commission noted the valuable information provided in the document "Main Trends in the Development of the WWW" which was considered as general guidance for the development of the ISS. It noted also that the main substance of that document was included in Part IV - Integrated WWW System Study - of the draft WWW plan for the period 1984 to 1987.

4.18 When reviewing the achievements of the ISS thus far, the Commission noted that additional study efforts were needed for the development of new and standardized exchange formats and on the application of improved forecasting methods and required technology for operational use in the WWW. The Commission therefore decided to nominate rapporteurs for these two fields. Resolutions 2 and 3 (CBS-VIII) were adopted.

4.19 The Commission noted with appreciation the proposed list of contributions for the Integrated WWW System Study by CIMO. It welcomed the initiative of this commission since ISS is not just the concern of CBS. Due to the very specific nature of the proposed contributions the list of CIMO studies was referred to the CBS Working Group on GOS for its consideration and recommendations.

Information Service on ISS

4.20 The Commission further decided that information on the progress of ISS should be given to Members through the WWW Monthly Operational Letter. Planning reports based on the results of studies should be published, when appropriate, and issued in the original language of the report with a summary in the other WMO official languages.

5. DRAFT WWW PLAN FOR THE PERIOD 1984-1987 (Agenda item 5)

5.1 The Commission noted the request of the Executive Committee that it should prepare the draft text of the WWW plan for the period 1984 to 1987 which would be submitted to Ninth Congress by the President of WMO on behalf of the Executive Committee. The examination of the draft plan was based on documents submitted by the Secretary-General.

5.2 In the preparation of the draft WWW plan, the Commission took into consideration the conclusions and recommendations of the IPM on WWW Policy and Long-term Development Strategy (Geneva, 6-10 December 1982). The IPM's recommendations were particularly relevant to Part IV, a new part of the draft plan giving the main directives and objectives of the Integrated WWW System Study (see items 4.1 to 4.9).

5.3 The Commission also included the "WWW Implementation Support Activity" as a new WWW support element in the draft plan. The main objectives of this activity would be to support Members in their design, establishment and operation of WWW facilities through co-ordinated exchange of knowledge, proven methodology and means. Intensified training activities, focused on the improvement of WWW operations, would form an essential part of this new co-ordinated WWW support element.

5.4 The Commission agreed to include in the draft WWW plan decisions taken at its eighth session, in particular the inclusion of the RTHs Dakar, Jeddah and Sofia into the Main Telecommunication Network. Furthermore, it was felt that material already included in the Manuals on the GOS, GDPS, Codes and GTS need not be repeated in the WWW plan.

5.5 The Commission agreed to the draft WWW plan for 1984-1987, which is reproduced as Annex I to this report. The Commission invited the president of CBS to submit the text of the draft plan to the President of WMO for presentation to Cg-IX.

6. OBSERVING SYSTEM (INCLUDING THE GOS PART OF WWW AND THE REPORT BY THE CHAIRMAN OF THE WORKING GROUP ON THE GOS) (Agenda item 6)

Report by the chairman of the Working Group on the GOS

6.1 The Commission noted with appreciation the report by the chairman of the Working Group on the Global Observing System, Dr. T. Mohr (Germany, Federal Republic of). The details of the chairman's report were discussed under the various agenda items, as appropriate. It also noted the work

accomplished by the working group since the extraordinary session (1980) of CBS and the action taken on the report of the third session of the working group which formed the general basis of the discussions on this agenda item.

Manual on the Global Observing System

6.2 The Commission noted that following its recommendation a new edition of the Manual on the Global Observing System had been published in 1981 and that this new edition, constituting Annex V to the WMO Technical Regulations, contained most of the regulations pertaining to the Global Observing System so far included in the body of the Technical Regulations. It noted that the Manual was composed of seven chapters and of a definitions section.

6.3 As far as the definitions section was concerned, the Commission agreed that a number of definitions contained in this section needed refinement and that a number of others involving other WMO technical commissions needed reformulation. It noted in this regard that the Working Group on the Global Observing System was revising the terms "weather" and "weather radar" and developing a definition of the term "related environmental observation".

6.4 The Commission also noted that the terms "accuracy" and "resolution" as used in Attachments II-2 and II-3 to the Manual should be defined and that this question had been referred to the Working Group on the Global Data-processing System for study. It took note of the fact that the development of the required definitions was under way.

6.5 The Commission noted that a number of terms defined in the International Meteorological Vocabulary needed to be revised and that this question had been referred to the Commission for Atmospheric Sciences by the Executive Committee. It learned that the new edition of the International Meteorological Vocabulary had reached the final stage of preparation and would be available to the various WMO technical commissions for comments and corrections. The Commission agreed that the definitions concerned had become too vague with regard to the recent evolution of observing techniques such as automatic weather stations and space-based observing platforms. The Commission consequently asked the president of CBS to ensure that the terminology used for World Weather Watch components was correct.

6.6 The Commission was of the opinion that the information contained in the Manual was incomplete and that a number of sections needed to be expanded so as to include more detailed information on certain types of meteorological observing station. This information would include the elements to be observed by these stations, the time and the frequency of these observations and the supervision required. It agreed that the Manual should include a section on equipment and methods of observation for upper-air observations as well as for those made by meteorological reconnaissance aircraft stations and by aircraft meteorological stations. It recommended in this connexion that a minimum of overlap should exist with the new Guide on Meteorological Instruments and Methods of Observations.

6.7 The Commission also agreed that, in order to facilitate the use of the Manual, an attachment should be prepared to include references to the relevant paragraphs dealing with the activities associated with each particular type of station.

6.8 The Commission considered that the observational requirements contained in Chapter II of the Manual mainly concerned the numerical weather prediction of global-scale features. Requirements for spatial and temporal resolution and accuracy of data from the regional and national observational networks and for other applications should be incorporated.

6.9 The Commission noted that the Executive Committee had approved a recommendation of CIMO on the frequency of radiometer comparisons and agreed that the contents of this recommendation should be incorporated into the Manual on the Global Observing System.

6.10 The Commission was informed that both the Commission for Agricultural Meteorology and the Commission for Instruments and Methods of Observation had recommended amendments to the Manual on the Global Observing System within their respective fields of activity and that the Executive Committee, to which these recommendations had been addressed, had decided to approve them and to request the Secretary-General to incorporate the proposed amendments in the consolidated document on the Technical Regulations to be submitted to Ninth Congress. Having considered the proposed amendments to the Manual on the Global Observing System, the Commission saw no difficulty in including them in the Manual after approval by Ninth Congress.

Guide on the Global Observing System

6.11 The Commission noted that the Guide on the Global Observing System had been published in 1978 and that it was composed of eight chapters, one of which dealt with monitoring the operation of the World Weather Watch. It also took note of the fact that, with the publication of the 1981 edition of the Manual, it had become necessary to rewrite the Guide almost completely as most of its contents had been transferred to the Manual. The Commission reiterated the view that the primary objective of the Guide on the GOS was to provide users with practical information on observational matters, supplementing the regulations contained in the Manual. Thus, the Guide would enable Members to prepare national instructions to meet their own particular needs within the overall concept of procedures and methods of observation.

6.12 The Commission agreed that the organization and distribution of material in the Guide should follow very closely the layout of the Manual and that additional chapters should be placed after the existing chapters corresponding to the layout of the Manual. It consequently agreed on the layout of the Guide which is given in Annex II. The Commission considered that the draft of the new version of the Guide should be submitted to the next session of the Commission with a view to its publication. In this connexion, the Commission strongly recommended that the preparation of the Guide on the Global Observing System should be adjusted to the new Guide to Meteorological Instruments and Methods of Observation through appropriate co-ordination with the Commission for Instruments and Methods of Observation (CIMO) so that duplication could be avoided. It requested the President of CBS to consult with the President of CIMO and the Secretary-General with a view ensuring that the requested co-ordination would be effected between the commissions.

Technical assistance, training and maintenance of equipment in developing countries

6.13 The Commission noted with appreciation the report by the Rapporteur of the Working Group on the GOS on Technical Assistance, Training and Maintenance of Equipment in Developing Countries, Mr. P. Toubbé (Cameroon). This report, which contained a considerable amount of information, should be the basis for further consideration of these problems within the Working Group on the GOS. The Commission agreed with the rapporteur that the need for maintenance and operational training represented a high priority item if the GOS was to continue to meet the observational requirements of the World Weather Watch. It was strongly felt that all potential resources should be investigated to ensure that the training needs were met. Further discussion on this matter is dealt with under agenda item 11.

Interaction with CIMO

6.14 In discussing the report of the chairman of the Working Group on the GOS, note was made by the chairman and several members of the working group that close co-operation with CIMO was essential. A CIMO member had served effectively on the Working Group on the GOS and a member of the Working Group on the GOS had served on the CIMO working groups concerned with surface and upper-air data. In particular, note was made that several items proposed for the new Working Group on the GOS related directly to action by these CIMO working groups, namely:

(a) Reduction of level-I data from automatic weather stations;

(b) Functional specifications of software requirements for automatic weather stations;

(c) Availability of information on equipment in the specialized field of electronics;

(d) Technical assistance, training, and maintenance of equipment in developing countries.

6.15 In reviewing the material presented by the President of CIMO regarding requirements, the Commission noted that the definitive statements on requirements of the GOS were contained in the Manual on the GOS. At present, these requirements were broad in nature and lacked detail. One example cited was that requirements were stated for wind speed but not for wind direction. The CIMO Guide contained substantial details, but these were not regulatory and referred principally to the performance capabilities of systems. A task for CBS was to prepare a statement based on the functional needs of the users. Obtaining these requirements from the other commissions was the first step in a process which would require close interaction between these commissions. Once in receipt of these requirements, an analysis should be made to determine the minimum requirements to be included in any regulatory material.

6.16 In this regard, the Commission heard a report summarizing the work of the CIMO Working Groups on Upper-Air Data Basic to User Needs and Surface Data. Both working groups had prepared comprehensive summaries of existing system-performance characteristics and had made preliminary assessments of the

suitability of these systems to meet stated requirements. The preliminary nature of these tables was stressed. The Commission agreed that such tables should be reviewed by the Working Group on the GOS with a view to joining with the appropiate CIMO working group to refine or otherwise expand this work.

6.17 The Commission was also informed of the work being done by CIMO on algorithms for processing sensor signals into level-I and then level-II data. It was noted that current design techniques were tending to produce "black boxes" in which the sensing/data-processing functions were contained. An atmospheric signal entered the box and a properly coded report emerged. This trend was occurring in both rawinsonde and surface automatic weather stations. The result was that the algorithms for data processing were not known to the meteorologist or the quality-control expert. Often the algorithms became the property of to the company paying for their development.

6.18 The Commission agreed that such trends presented problems both to those trying to establish standardized data-handling procedures and to those monitoring quality-assurance programmes. Agreement was reached that efforts should be made jointly between CIMO and CBS to establish standards for data-processing algorithms - the former from the standpoint of equipment design and performance and the latter from that of data users.

6.19 As part of this item, the Commission took note of the material transmitted from the president of CIMO regarding the specification of parameters. These three issues were:

(a) Specification of whether upper-air temperature, wind and humidity values were required at specific levels or for averages over layers;

(b) The use of the terms "precision" and "accuracy";

(c) The meaning of the limits (e.g. ±1°C) on statements of data quality.

6.20 The Commission agreed that, for the global scale and for numerical weather prediction purposes, layers were intended. The Commission decided to refer the latter two items (see paragraph 6.19 (b) and (c) above) to the Working Group on the GOS.

6.21 In concluding this part of the discussion the Commission noted that, with respect to the GOS, a close relationship between CBS and CIMO at both the management and working levels was essential. In this way subjects of interest could be freely explored both singly and jointly to make maximum use of the respective expertise of the two commissions. It was especially important to exchange representatives on the Working Group on the GOS and the two previously mentioned CIMO working groups.

6.22 In this regard, the Commission noted the increasing interdependence of observing systems, such as the need for surface and upper-air data for use as "ground truth" for satellite data retrievals. Such interdependence carried with it the need to ensure consistency in the several sets of data as well as acceptable quality, timeliness and representativeness. This could best be done by developing appropriate standards and regulatory material to be followed by all Members. The Commission was of the opinion that the develop-

ment of such material would require broad-based co-ordination between CBS and CIMO to ensure that appropriate methods of observation and standards were specified by CIMO and that the proper procedures for the operation of observing networks were specified by CBS. As a consequence, the Commission agreed to include in the terms of reference for the Working Group on the GOS the need to update the requirements in the GOS Manual. As a matter of priority, the Commission felt that the minimum requirements of the other Commissions should be determined and transmitted to the Working Group on the GOS. The president of CBS was asked to take the necessary action with the presidents of other commissions to develop a consolidated list of requirements.

Use of new automated aircraft meteorological observation methods and techniques

6.23 The Commission noted that the decision had been made to publish the report of Dr. H. M. de Jong (Netherlands) on automatic aircraft weather reporting systems. It also noted that an updated version of his report had been submitted to the first session of the Interim Committee of ASDAR Participants (ICAP) held in Geneva in December 1982 and that part had been incorporated into the final report of that session. As the situation in this field was evolving rapidly, the Commission invited Dr. de Jong to revise his report in the light of recent developments and to send it to the Secretariat as soon as feasible for publication in the WWW series of publications.

Status Report on the Implementation of the WWW (GOS aspects)

6.24 The Commission noted that the Eleventh Status Report on the Implementation of the World Weather Watch had been published and that it would be submitted to Ninth Congress for consideration. It noted with concern that the implementation of the surface and upper-air observing stations constituting the regional basic synoptic networks showed stagnation if not a decrease. It was of the opinion that this situation had resulted from an over-optimistic assessment of Members' capabilities when adopting the various regional basic synoptic networks and also from the prevailing world economic situation.

6.25 The Commission expressed its concern over the increasing trend towards the elimination of proven elements of the GOS before alternative systems had been proven. One example was the continued erosion of the network of ocean weather stations. Satellite observations had proved to be extremely valuable, especially over ocean areas. At the same time, however, OSE case studies had demonstrated an important impact of ocean weather station data on forecasts in certain critical situations. At least for the next financial period and possibly longer, there was the need to have rawinsonde data to calibrate sounding retrievals from satellites. It was noted that ocean weather stations provided an important contribution to the upper-air data needed for such satellite retrieval programmes. Further, the Commission noted that satellite systems, while highly efficient and reliable, did fail and that these failures could be catastrophic if total reliance was placed on them. As a consequence, a mix of systems was essential not only to obtain a comprehensive set of observations of quality, but also to provide a minimum capability until any failed element of the mix could be replaced.

6.26 With further regard to the ocean weather stations and particularly the ones in the NAOS scheme, the Commission urged that the NAOS scheme be continued as a matter of priority. It recognized, however, that some partici-

pants in this scheme were having difficulties in continuing their support and that critical decisions might have to be made as early as 1985. The Commission strongly recommended that immediate steps be taken to resolve these difficulties and agreed that alternative systems might need to be proposed to ensure that vital meteorological data continued to be made available to forecasting centres. Such alternative systems might include buoys, NAVAID wind-finding equipment and satellite soundings. The Commission iterated its concern that any existing system, such as NAOS, should not be removed until such time as a replacement had been implemented and fully proven.

Establishment of the Working Group on the Global Observing System

6.27 To cope with the substantial work programme to be accomplished in the area of the GOS, the Commission decided to establish a Working Group on the Global Observing System and adopted Resolution 4 (CBS-VIII).

Main tasks of the Working Group on the Global Observing System for the period 1983-1986

6.28 The Commission considered in detail the work of the Working Group on the Global Observing System for the period 1983-1986 and agreed that it should include the following main tasks in the order of priority shown below:

(a) Study Area 1 - Optimized Observing System in the framework of the Integrated WWW System Study;

(b) Monitoring the operation of the WWW (GOS aspects);

(c) Technical assistance and training of personnel for the maintenance and operation of observing networks;

(d) Review of the Manual on and the Guide to the GOS;

(e) Functional specifications of software requirements in automatic observing systems.

6.29 When establishing the above work programme, the Commission considered that the availability of information on equipment in the specialized field of electronics was falling more in the field of activity of the Commission for Instruments and Methods of Observation than in that of the Global Observing System and decided not to include this task in its work programme. In this regard, the member representing CBS on the CIMO Working Group on Surface Data noted the report of that group which outlined the situation relating to the use of microprocessors. This field was developing extremely rapidly and even the experts had difficulty remaining up to date in microprocessor technology. The CIMO group suggested that important work could be done on specifying data-processing algorithms, but that definitive statements on microprocessors were premature. Nevertheless, the Commission felt that close collaboration between CIMO and CBS should be established in that respect so that CBS would be more aware of the situation and requested the president of CBS to arrange with the president of CIMO, in consultation with the Secretary-General, for the required co-ordination.

7. DATA-PROCESSING SYSTEM (INCLUDING THE GDPS PART OF WWW AND THE REPORT BY THE CHAIRMAN OF THE WORKING GROUP ON THE GDPS) (Agenda item 7)

Report by the chairman of the Working Group on the GDPS

7.1 The Commission noted with appreciation the report by the chairman of the Working Group on the GDPS, Mr. F. Duvernet (France). The details of the chairman's report were discussed under the various paragraphs of the agenda items, as appropriate. It also noted the work accomplished by the working group and its study groups since the extraordinary session of CBS (1980). The discussions on this agenda item were based mainly on these reports and on the activities of the study groups.

Implementation of new data-processing centres

7.2 The Commission was informed of the establishment of RMC Jeddah in accordance with Recommendation 1 (VII-RA II) and its subsequent approval by Resolution 1 (EC-XXXIII). The Commission expressed satisfaction at the active steps taken by Saudi Arabia to implement the programme of RMC Jeddah.

Guide on Automation of Data-Processing Centres

7.3 The Commission was informed that, following its previous decision on a need for a WMO Guide on Automation of Data-processing Centres, describing all aspects of setting up such a centre, a text had been drafted by Mr. N. J. Kirschner (Germany, Federal Republic of) and was later edited by Mr. M. Stubbs (United Kingdom). The edited text was reviewed by the second session of the Study Group on the Guide on the GDPS (November 1982). The study group in general accepted the text with some editorial comments and suggestions for re-arranging the contents of one chapter. The Commission noted with satisfaction that arrangements were in hand to complete the task and expressed its appreciation to all those who had contributed to the accomplished work. The Commission authorized the president of the Commission to approve the final text and requested the Secretary-General to arrange for the completion of the task and for wide distribution of the Guide for the benefit of Members, in particular developing countries.

Guide on the GDPS

7.4 The Commission noted with appreciation that the available parts of the new one-volume Guide on the GDPS had been printed and distributed in December 1982. It noted that a large part of Chapter 4 - Methods used in the manual processing of data for analysis and forecasting - and a chapter on quality control had been reviewed by the second session of the Study Group on the Guide on the GDPS and would be included therein. The Commission noted that arrangements were in hand to complete the remaining task early in 1983. The Commission authorized the president of the Commission to approve the remaining two chapters and requested the Secretary-General to arrange for their issue as a supplement to the one-volume Guide on the GDPS upon completion.

7.5. The Commission agreed that the Guide on the GDPS should be kept under review and updated from time to time to keep abreast of developments in science and technology. The Commission considered proposals of the second

session of the Study Group on the Guide on the GDPS on its future tasks and agreed that the following items be given priority by its Working Group on the GDPS.

- Interpretation of numerical weather prediction products (highest priority);
- More extensive use of satellite information in analysis;
- Organization of data base;
- Medium- to long-range forecasting methods;
- Very short-range forecasting methods;
- Operational verification of forecasts in a more systematic and uniform way.

Amendments to the Manual on the GDPS

7.6 The Commission noted amendments already made to Volume I of the Manual on the GDPS in accordance with decisions of the extraordinary session of CBS (1980) and those made to Volume II of the Manual in accordance with resolutions of regional associations and the EC Working Group on Antarctic Meteorology. The Commission considered a proposal for further amendments to the Manual on the GDPS, Volume I, arising from a request of the conjoint session of WMO CAeM/ICAO Communications/Meteorology Divisional Meeting (1982) for the inclusion in the Manual on the GDPS of scale 1 : 25×10^6 among approved alternate scales of meteorological charts and other consequential amendments to Attachments II-2 and III-2 arising from amendments already adopted for the Manual on the GTS and decisions of Eighth Congress and EC-XXXIII. Recommendation 3 (CBS-VIII) was adopted.

7.7. The Commission considered and endorsed a recommendation by the first session of the Study Group on Non-real-time Functions of WWW Centres, that Part III of the Manual on the GDPS be reviewed:

(a) To bring it into line with the current capabilities of Members;

(b) To take into account the World Climate Programme (WCP) and other research and application programmes of storage of data at a WWW centre.

The Commission agreed that the future work programme of the Working Group on the GDPS should include the revision of Part III of the Manual on the GDPS.

International Cloud Atlas

7.8 The Commission was informed of progress made in updating and re-issuing Volume II of the International Cloud Atlas in accordance with the decision of CBS-VII. It noted that an Informal Planning Meeting on Volume II of the International Cloud Atlas recommended changes which should be included in the revised version of the atlas and that the re-editing would be completed by early 1983.

International exchange tape format

7.9. The Commission noted with appreciation the work accomplished by the Study Group on Non-real-time Functions of WWW Centres (November 1981) in

developing basic principles on the structure of international tape exchange formats, and that these principles had generally been accepted by the Working Group on the GDPS. It noted further that these recommendations would be considered further within the context of the Integrated WWW System Study in the study of the design of international tape exchange formats. The Commission endorsed these basic principles as given in Annex III.

Non-real-time functions of GDPS centres

7.10 The Commission recalled its discussion at CBS-Ext.(80) to the effect that the non-real-time functions of WMCs and RMCs needed further development and updating and noted that the Advisory Working Group (September 1982) had suggested non-real-time functions of data-processing centres. The Commission reviewed these suggested functions and adopted them in order to replace the existing non-real-time functions contained in Part III, Section I of the Manual on the GDPS. Recommendation 4 (CBS-VIII) was adopted.

Catalogue of Computer Programs in Meteorology (WMO-No. 409)

7.11 The Commission noted that more data-processing activities were being done by computer and that new computers were being installed by Members. The Commission agreed that the expansion and updating of the Catalogue of Computer Programs, would increase its usefulness as a reference volume. The Commission agreed that this task be included in the future work programme of the Working Group on the GDPS.

Proposed amendments to the Technical Regulations (WMO-No. 49)

7.12 The Commission considered and agreed to a proposal by the conjoint session of ICAO Communication/Meteorology Divisional Meeting and the seventh session of CAeM (April/May 1982) to replace the term "tropical revolving storm" used in the Technical Regulations (WMO-No. 49) by the term "tropical cyclone" in accordance with the standard terminology of the International Meteorological Vocabulary (WMO-No. 182). Recommendation 5 (CBS-VIII) was adopted.

Review of the Eleventh Status Report on Implementation of the WWW

7.13 The Commission reviewed the GDPS part of the Eleventh Status Report on the Implementation of the WWW and endorsed the report. It noted that some terms currently used in GDPS activities needed to be defined precisely in the Manual on the GDPS. In this connexion, the terms "very short-range (less than 12 hours), short-range (less than three days), medium-range (less than 10 days) and long-range (more than 10 days)" were mentioned with regard to weather forecasting. The Commission further requested that the Commission for Atmospheric Sciences be invited to give a definition of "four-dimensional assimilation".

Implementation of the Global Data-processing System (GDPS)

7.14 The Commission noted with appreciation that the three WMCs continued to develop new analyses and prognoses with a view to meeting the requirements of Members and other users. One of the important aspects in developments of the GDPS was that WMCs prognosis products extended for longer periods, such as 72 hours, 96 hours and further ahead. It further noted that

the 26 RMCs issued more than 1 600 prognoses and analyses at present. The validity of forecasts extended to 72 hours or more. More than 20 NMCs were preparing analyses and prognoses available for transmission to other countries or territories in accordance with local agreements. The Commission was in agreement that one of the important recent developments in the GDPS centres was the introduction by many Members of automated GDPS functions, including the use of computers for numerical weather prediction, conversion of GRID values to products in pictorial form and use of asynoptic data in analyses.

AIREP format

7.15 The Commission considered a problem raised by one Member concerning difficulties encountered in processing AIREP information due to the lack of standard reporting procedures when temperature and/or wind data were reported for more than one position in an air report. The Commission noted that a variety of procedures were used by airlines, leading to confusion and misinterpretation of AIREP data. The Commission agreed that ICAO should be invited to review the aircraft reporting practice with a view to developing procedures which would permit the inclusion of temperature and/or wind data for more than one geographical position in air/ground reports from pilots to air-traffic services units. The Commission further considered that CAeM, in consultation with the Working Group on Codes, should consider possible standardization of the format used for the exchange of aircraft reports on the GTS.

Establishment of the CBS Working Group on the GDPS

7.16 In view of the substantial work programme in the area of data processing to be accomplished by the Commission during the next four years, the Commission agreed to establish a Working Group on the GDPS. Resolution 5 (CBS-VIII) was adopted.

Main tasks of the Working Group on the GDPS for the period 1983 - 1986

7.17 The Commission considered the work programme of the Working Group on the Global Data-processing System for the period 1983-1986 and agreed that the following main tasks should be given priority:

(a) Study Area 2/4 in the framework of the Integrated WWW System Study;

(b) Updating and development of the Manual and Guide on the GDPS;

(c) Introduction of advanced weather forecasting techniques into the WWW and verification of forecasts, including warnings of dangerous weather phenomena;

(d) Development of procedures for quality control, jointly with the Working Group on the GOS;

(e) Development of non-real-time data processing and WWW support to the WCP.

8. CODES (INCLUDING THE REPORT BY THE CHAIRMAN OF THE WORKING GROUP ON CODES) (Agenda item 8)

Report by the chairman of the Working Group on Codes

8.1 The Commission noted with appreciation the report by the chairman of the Working Group on Codes, Mr. G. Doumont (Belgium). The Commission expressed its great satisfaction with the important work carried out by the group at its sixth session and by members of the group who participated in roving seminar programmes for the introduction of the new common surface code (1981) and those accomplished by correspondence since CBS-Ext.(80). The matters covered by the chairman in his report are discussed in detail in the documentation for the session. Details of action taken by the Commission on these matters are given in the paragraphs which follow.

Common surface synoptic code

8.2 The Commission expressed satisfaction with the implementation of the new SYNOP/SHIP code as from 1 January 1982. It noted that success had been achieved because of the efforts of Members and the effectiveness of the roving seminars. The Commission expressed its appreciation to those who participated in the preparations for the successful introduction of the code and to the Secretary-General for organizing the seminars. The Commission, after a detailed discussion on possible improvements to the new code, considered that frequent changes to the new code forms would involve re-training of observers, including observers on ships, leading to a deterioration in the quality and quantity of surface observations, re-issuing of national code manuals, observation registers and changes to computer software at data-processing centres. The Commission, therefore, agreed that for the time being no changes of a substantial nature should be made to the new SYNOP/SHIP code.

Minor improvements to FM 12-VII SYNOP and FM 13-VII SHIP

8.3 The Commission considered proposed minor improvements recommended by the sixth session of the Working Group on Codes and agreed that there was a need for the proposed improvements in the regulations, notes and specifications, provided such revisions did not involve the re-training of observers or changes in computer software of data-processing centres. Recommendation 6 (CBS-VIII) was adopted.

Specifications for present weather in Code table 4677

8.4 The Commission considered proposed revised specifications for present weather Code table 4677 and noted that the specifications currently in force did not completely conform to the definitions in the International Cloud Atlas, Volume I. The Commission nevertheless considered that the current code table wording did not cause any operational problems. It noted that the future work programme of the working group included fundamental revision of Code table 4677 and felt, therefore, that the proposed revised specifications should be considered by CBS at a later date, together with the envisaged fundamental revision of the code table, taking into account new requirements including those submitted by Members at the session.

Editorial revision of the Manual on Codes, Volume I

8.5 The Commission recalled its Recommendation 11 (CBS-VII) on editorial revision of the structure of the Manual on Codes, Volume I and agreed that there was a need for further improvements of the existing text of the Manual on Codes, Volume I. The Commission considered a proposal by a Member to speed up the general editorial revision of the Manual on Codes, Volume I, by the use of a group of consultants in 1983. The Commission, however, recognized that these activities should remain within the framework of the activities of the Working Group on Codes or such study groups of the Working Group on Codes as the group might deem necessary. The Commission noted the proposed working group's plan for revision of the Manual in three steps. As regards part 1 of step 1 of the plan, concerning inclusion of definitions of words or phrases, the Commission agreed that the inclusion of such definitions would be very useful to users of the Manual. In this connexion, the Commission, noting that the proposed definitions as presented to the session, were the current definitions in the International Meteorological Vocabulary and that this publication was currently being revised by CAS, agreed that the final version of the definitions to be included in the Manual should be the revised definitions of the new edition of the International Meteorological Vocabulary.

8.6 The Commission considered the proposed part 2, step 1 plan concerning the inclusion of a number of minor changes to make the Manual clearer and therefore more useful. The Commission considered these proposed editorial revisions and adopted them with minor improvements. Recommendation 7 (CBS-VIII) was adopted.

Revision of the structure of the Manual on Codes, Volume I

8.7 The Commission noted that the proposed revision plan at steps 2 and 3 involved the adoption of a new system of code-form identification to be carried out during the next seven years, followed by the combination of similar codes and the selection of new code names, which task should be accomplished by 1990. The Commission noted that the SATOB code might have been wrongly classified. The Commission also noted that the proposed revision would involve aeronautical codes and therefore stressed the need to coordinate relevant aspects with CAeM and ICAO. The Commission agreed that the future work programme of the Working Group on Codes should include the proposed programme of revision of the structure of the Manual on Codes, Volume I. Recommendation 8 (CBS-VIII) was adopted.

Modification to code FM 63-V BATHY, FM 64-V TESAC and DRIBU

8.8 The Commission considered proposed modifications by the seventh session of the Working Group on Codes to code forms FM 63-V BATHY, FM 64-V TESAC and DRIBU to meet requirements stated by the Joint WMO/IOC meeting on IGOSS Code Requirements and Exchange Formats (1982). It also considered a proposal by a Member to modify the DRIBU code by addition of an optional pressure tendency group (5appp). The Commission noted that the proposed modifications would not require any change in national procedures. The Commission agreed to the modifications and that they would come into force on 1 July 1983. The Commission noted the present status of the DRIBU code as a code form for international use during the first GARP Global Experiment. It con-

sidered that there was a requirement to maintain the code for reporting drifting-buoy observations. The Commission, therefore, agreed that the status of the DRIBU code be elevated to a standard code form and named FM 14-VIII - DRIBU. Recommendation 9 (CBS-VIII) was adopted.

Date for introduction of code changes

8.9 The Commission considered a request by the thirty-fourth session of the Executive Committee to change the current principle whereby 1 January is the date of introduction of all code changes. The Commission agreed that 1 January, being a public holiday in most countries, was not the best date for introduction of such changes. The Commission considered proposals submitted by the Secretariat and one Member, and concluded that it would be difficult to fix a date for all cases. The Commission therefore agreed that in future the Commission would recommend a date of introduction for each proposed change depending on its nature and impact. The Commission agreed that the statement of principle contained in the introduction to the Manual on Codes, whereby all code changes are introduced on 1 January, except when special or urgent requirements justify a departure from this principle, be deleted. Recommendation 10 (CBS-VIII) was adopted.

Inclusion of wind indicator in individual SYNOP reports

8.10 The Commission considered various proposals submitted by Members and its Working Group on Codes to include the wind indicator i_w in individual SYNOP reports in the light of difficulties experienced by some centres in compiling bulletins. The Commission recalled its decision not to change the SYNOP code substantially for the time being and decided that the matter should be studied further by its Working Group on Codes, taking into account proposals submitted at the session.

Reporting of low-level data in Part A of TEMP and TEMP SHIP

8.11 The Commission considered a proposal by the eighth session of Regional Association VI to report low-level data in Part A of TEMP and TEMP SHIP, either as a mandatory surface of 925 hPa or as a fixed height level e.g. 900 m, when meteorological conditions are such that the 925 hPa is below ground-level. The Commission noted that three regional associations, namely RAs I, II and VI had already adopted regional coding procedures for reporting 925 hPa in Part B of TEMP and TEMP SHIP. The Commission therefore invited the other regional associations to consider the question of reporting low-level data under regional procedures before the appropriate global regulations could be considered.

Code for reporting from an Ocean Data Aquisition System (ODAS)

8.12 The Commission considered a proposal by the eighth session of Regional Association VI to introduce a new code for the transmission of data from Ocean Data Acquisition Systems (ODAS). Such a code was needed to avoid sending data in two or more code forms (SHIP, BATHY, TESAC and DRIBU) and thus duplicating groups each time. The Commission noted that it was not intended that the ODAS code should replace any other code used to transmit a more limited sample of data. The Commission accepted the requirement for the global introduction of the ODAS code and entrusted the Working Group on Codes with the study of coding aspects of the requirements so agreed.

Reporting of cloud data in code forms FM 35-V TEMP and FM 36-V TEMP SHIP

8.13 The Commission considered a proposal by a Member to maintain reporting of the base of the lowest cloud in code forms FM 35-V TEMP and FM 36-V TEMP SHIP. In this connexion the Commission agreed that Regulation 35.3.3.1 be re-worded as follows:

> "In TEMP and TEMP SHIP reports, this section shall be used to report cloud data. N_h,h,C_L,C_M and C_H shall be coded in accordance with regulations in FM 12-VII SYNOP (12.2.1.2, 12.2.7.3 and 12.2.7.4)."

Recommendation 11 (CBS-VIII) was adopted.

Amendment to Section I, Part B, of code form FM 20-V RADOB

8.14 The Commission considered a proposal by one Member to amend Section I, Part B of code form FM 20-V RADOB. It noted the current difficulties experienced in using this section of the code and its lack of information content and agreed to the proposed amendment. Recommendation 12 (CBS-VIII) was adopted.

Forecasts for shipping

8.15 The Commission considered a number of proposals submitted by one Member to facilitate the reporting of dust/haze internationally, regionally or as a national practice in code form FM 61-IV MAFOR. The Commission felt that, for the time being, the Member might notify a deviation to international practice by the formal notification of a national practice.

Proposed WINTEM Code - Forecast upper-wind and temperature data for aviation

8.16 The Commission considered a proposal to introduce a new code - WINTEM - for forecast upper-wind and temperature data for aviation developed by the conjoint CAeM-VII/ICAO/Meteorology Divisional Meeting (Montreal 1982), and further revised by the Secretariat in consultation with some Members and the president of CAeM. The Commission noted that the proposed code was, of necessity, self-evident to meet requirements of aeronautical users and that it was intended to replace the current FM 48-IV ARMET. The session suggested some further improvements in the format and regulations and agreed to adopt the revised code FM 50-VIII WINTEM, to replace the present code FM 48-IV ARMET. Recommendation 13 (CBS-VIII) was adopted.

8.17 MSL pressure reports from high-level stations

The Commission noted that the present coding regulations for SYNOP did not allow for simultaneous reporting of station-level pressure and mean sea-level pressure. It noted that GDPS and other forecasting centres experienced difficulties in using reported pressure from high-level stations. The Commission requested the Secretary-General to obtain from Members information concerning the formula(e) used by their stations to convert station-level pressure to MSL pressure (Regulation 12.2.4.1 of FM 12-VII SYNOP refers). The Commission further requested the Secretary-General to distribute this information to Members.

Establishment of the Working Group on Codes

8.18 The Commission considered that there were still a large number of important code matters which would need to be considered during the next four years. It therefore agreed to establish a Working Group on Codes. Resolution 6 (CBS-VIII) was adopted.

Main tasks of the Working Group on Codes for the period 1983-1986

8.19 The Commission considered the work programme of the Working Group on Codes for the period 1983-1986 and agreed that the following main tasks should be given priority:

(a) Continuation of the study of the new structure of Volume I of the Manual on Codes;

(b) General revision of Code table 4677 ww - Present weather and, consequently, of Code table 4561 W_1W_2 - Past weather;

(c) Development of a unified code format (e.g. UNICODE) within the Integrated WWW System Study;

(d) Updating of existing code forms, specifications and code tables;

(e) Development of an international code table for special phenomena to replace the different regional code tables for $S_pS_pS_pS_p$;

(f) Giving guidance on training matters related to codes.

9. TELECOMMUNICATION SYSTEM (INCLUDING THE GTS PART OF THE WWW AND THE REPORT BY THE CHAIRMAN OF THE WORKING GROUP ON THE GTS) (Agenda item 9)

Report of the chairman of the Working Group on the Global Telecommunication System (GTS)

9.1 The Commission noted with appreciation the report by the chairman of the Working Group on the GTS, Mr. I. A. Ravdin (U.S.S.R.). The details of the chairman's report were discussed under the various paragraphs of this agenda item, as appropriate. The discussions on this agenda item were based mainly on the report of the tenth session of the CBS Working Group on the GTS (Geneva, July 1982), which had been submitted to this session of CBS as a document. The Commission also noted the work accomplished by its working group since the extraordinary session (1980).

9.2 The Commission noted that the working group had accomplished important work concerning improvements to the GTS since the extraordinary session in 1980, in particular as regards establishing recommendations on the application of modern technical means and protocols of data transmission, digital facsimile, multiplexing of communication circuits and organizing a comprehensive study in the field of meteorological telecommunications. Furthermore, the Commission was of the opinion that its work at this session

on agenda item 9 had been greatly facilitated by the fact that the tenth session of its Working Group on the GTS had been held some time before the present session of CBS and had already considered in depth most of the existing problems in meteorological telecommunications. It felt that this practice should continue.

9.3 The Commission was also of the opinion that, with a view to speeding up the implementation of the WWW, the co-ordination among the different CBS working groups (GOS, GDPS, GTS and Codes) should be strengthened. The Commission suggested that it would be desirable for the different groups to nominate (a) member(s) to attend sessions of other groups for some days, as required, and to consider holding joint sessions of the different groups, with a restricted number of participants, on subjects of common interest. The Commission requested its president, in co-ordination with the Secretary-General, to make the necessary arrangements whenever appropriate.

Eleventh Status Report on Implementation

9.4 The Commission reviewed the status of implementation of the GTS as given in the Eleventh Status Report on Implementation of the WWW and noted the encouraging progress that had been made in its implementation and upgrading. However, it noted that certain shortcomings still existed which were mainly due to:

(a) The design of the GTS as a whole;

(b) The need for elaboration of additional telecommunication procedures for specific purposes;

(c) The financial difficulties faced by many Members due to the present economic situation when the necessity arose to acquire new telecommunication equipment and to engage qualified telecommunications personnel.

9.5 As regards (a) and (b) above, the Commission took these aspects into consideration when formulating its recommendations for amendments to the Manual on the Global Telecommunication System, Volume I, Global Aspects.

9.6 As regards (c) above, the Commission requested the Secretary-General to assist Members to implement the required GTS facilities, as far as possible, through the different technical co-operation programmes. It also appealed to Members to assist through bilateral or multilateral assistance programmes, whenever possible.

Implementation of the GTS

9.7 In addition to the information already included in the Eleventh Status Report on Implementation, the Commission was informed by Members, and noted with appreciation, that through the constant efforts of those Members concerned, further circuits had been established or upgraded. The relevant information has been included in Annex IV. The Commission requested the Secretary-General to include this information in an addendum to the relevant document for Cg-IX.

Organization of the Global Telecommunication System (GTS)

9.8 The Commission reviewed the text appearing in the Manual on the GTS, Volume I - Global Aspects, Part I - Organization of the Global Telecommunication System, and felt that certain provisions currently included needed some adjustments. These adjustments were required to incorporate decisions of other constituent bodies, as well as the changes agreed upon by the Commission.

9.9 The Commission noted that Regional Association I (Africa) had designated by postal ballot an additional RTH in Africa, namely Niamey. It further noted that the eighth sessions of Regional Associations I (Africa), V (South-West Pacific) and VI (Europe) which had been held in 1982, had expressed an opinion, at the request of the tenth session of the CBS Working Group on the GTS, on the possible inclusion of certain already-existing circuits into the Main Trunk Circuits, either as additional segments or as additional branches.

9.10 The Commission was informed of the views expressed by the different Regional Associations, which could be summarized as follows:

(a) RA I: Supported the proposal for inclusion of the circuit between the RTHs Dakar (Region I) and Paris (Region VI) as a branch of the MTC;

(b) RA II: The acting-president, on behalf of the Association, supported the proposal for inclusion of the circuit between the RTHs Jeddah (Region II) and Offenbach (Region VI) as a branch of the MTC;

(c) RA VI: Supported the proposals for:

(i) Inclusion of the circuits between the RTHs Moscow, Sofia and Prague as segments of the MTC;

(ii) Inclusion of the circuits between the RTHs Offenbach (Region VI) and Jeddah (Region II), as well as between the RTHs Paris (Region VI) and Dakar (Region I) as branches of the MTC.

The Commission invited the Secretary-General to arrange that the necessary adjustments resulting from these additions be made to Figure 1 and Figure 2 of Part I.

Dissemination of Antarctic data

9.11 The Commission noted the request made by the EC Working Group on Antarctic Meteorology (Geneva, April 1982) that, in view of the global importance of Antarctic observational data, an appropriate provision in Volume I of the Manual on the GTS be made to allow the transmission of these data up to 24 hours after the time of observation. The Commission was informed by several delegates of the importance of these data, even delayed, for the operation of many centres. At the same time, the Commission noted the concern expressed by its Working Group on the GTS on this matter in view of the difficulties that the exchange of these delayed data might create at automated centres due to the date/time group.

9.12 The Commission considered the request of the EC Working Group on Antarctic Meteorology, as well as the possibilities of the different centres concerned, to inject these delayed messages into the GTS. In view of the importance of this information, as indicated above, it was agreed that delayed Antarctic observational data should be exchanged over the GTS up to 24 hours after the time of observation, and an appropriate text was proposed for insertion in Attachment I-3, paragraph II.2 of Volume I, Part I of the Manual on the GTS.

9.13 The Commission invited Members responsible for the operation of meteorological telecommunications in the Antarctic to make all possible efforts to ensure the timely collection and dissemination of these data. It also invited Members responsible for the injection of these data into the GTS, and other centres concerned on the MTC, to make the necessary arrangements for their rapid exchange over the GTS.

9.14 The Commisssion requested its Working Group on the GTS to study this matter further taking into account the results of the informal meeting mentioned in paragraph 9.15, and to formulate appropriate recommendations in this respect, such as special headings (in particular date/time group), for messages containing delayed Antarctic observational data.

9.15 In this connexion, the Commission was informed that arrangements had been made to convene an informal meeting of telecommunications experts in the second half of 1983 to review the present telecommunication arrangements within the Antarctic and between GTS centres, and to make suggestions for improved operation. It endorsed the views of the Working Group on the GTS that it would be desirable for telecommunications experts and members of the CBS Working Group on the GTS, nominated by countries concerned with the dissemination of Antarctic data, to participate in this meeting.

Cost of ships' weather reports

9.16 The Commission noted a proposal from its Working Group on the GTS that ships' weather reports received by coastal radio stations should be sent in 10-figure and not five-figure groups. This was because ship-to-shore telegrams were among the few kinds of traffic still subject to charge per word. According to ITU regulations, a word might consist of any number of characters up to 10. So, transmission of ships' weather reports in 10-figure groups instead of five-figure groups might make a saving in communication costs of almost 50 per cent. The session was informed that some countries had already introduced the revised procedure and no operational problems had been experienced.

9.17 It was explained that the procedure involved the ships' sending their observations in 10-figure groups, the restoration to five-figure groups being carried out not later than at the point of insertion into the GTS - usually at the NMC involved.

9.18 Some delegates pointed out that, because of the nature of local arrangements in their countries, the introduction of the proposed change would not lead to a reduction in costs while, at the same time, leading to extra work for the staff. However, other countries would derive considerable advantages and would support the introduction of the proposed arrangement.

9.19 The Commission agreed to recommend that procedures for the transmission of coded ships' weather reports in 10-figure groups should be introduced as soon as practicable, where appropriate and desirable. The procedure to be followed would be very simple: the ship's call sign, though variable in length and in any case composed of a group of less than eight characters, should appear alone at the beginning of the report. Thereafter, the groups in the code would simply run together to form 10-figure groups. If a five-figure group were left over, it would simply be sent as a five-figure group. If the identifier 333 appeared, it would run together with the adjacent five figures to form an eight-figure group. No other adjustments would be necessary and division into the original five-figure groups would be readily accomplished by manual or automatic means.

9.20 The Commission made the necessary addition to the relevant provisions in the Manual on the GTS. The Commission invited Members to inform their national coastal radio stations of these new procedures and to urge their mobile sea stations to use them, where appropriate and desirable. Furthermore, it invited Members to inform the WMO Secretariat of the names of the national coastal radio stations operating with these new procedures, for inclusion in publication WMO-No. 9, Volume D.

9.21 The Commission adopted Recommendation 14 (CBS-VIII).

INMARSAT

9.22 The Commission was informed that a new global system for marine satellite communications established by the International Maritime Satellite Organization (INMARSAT) had begun operation on 1 February 1982. It noted the rapid growth in the use of INMARSAT (over 1 500 ships were using this system by December 1982) and the potential for the installation of INMARSAT terminals aboard a large number of merchant ships. This might eventually include the majority of ships in the voluntary observing fleet. The session recognized that a number of problems might arise in connexion with the widespread use of the INMARSAT system for the transmission of ships' weather reports; however, the relatively small number of planned INMARSAT coast Earth stations (about six now, rising to about 20 in 1984) should be taken into account. However, the following problems might arise:

(a) An excessively high financial burden might be placed on a small number of Members in whose countries INMARSAT coast Earth stations would be located, if the present WMO arrangements for the payment of communication costs of ships' observations were maintained;

(b) The comparatively small number of coast Earth stations meant that arrangements for the distribution of ships' weather reports from these stations over the GTS to the source areas of the observation, would have to be very effective and timely;

(c) The widespread use of INMARSAT would have an effect on present arrangements for collecting ships' weather observations because of the reduction in the number of coastal radio stations available for this purpose. This development should be kept under review.

9.23 The Commission was informed that a joint WMO/INMARSAT mechanism had been approved by the thirty-fourth session of the Executive Committee to consider operational problems in the areas of collection and distribution services provided by INMARSAT. The group is made up of two experts, one from CBS and one from CMM, and an officer from the WMO Secretariat, together with a similar number of representatives nominated by INMARSAT. This joint group deals with all matters in the field of interest of WMO Members relating to the collection and distribution of marine observations, with particular emphasis on ships' weather reports and dissemination of forecasts and warnings.

9.24 The Commission noted that one of the principal reasons for establishing the small joint WMO/INMARSAT group was to address the very many unanswered questions concerning the future co-operation of INMARSAT with WMO. The group would be invited to consider all aspects of WMO/INMARSAT activities with special consideration of the following:

(a) The operational procedures and technical facilities to be adopted for the collection and distribution of meteorological and other marine environmental information through the INMARSAT system; and

(b) Financial matters including the possible establishment and use of preferential rates.

9.25 The Commission was informed that the first WMO/INMARSAT consultative meeting was held in London (4-16 September 1982). The purpose of this meeting was to exchange information regarding WMO's requirements for the collection and distribution of marine meteorological and oceanographic information and the various possibilities offered by the INMARSAT system. The report of this meeting had been distributed to the members of the CBS Working Group on the GTS. The following important points were covered in the report:

(a) It was agreed that INMARSAT would provide WMO, on a regular basis, with a list of ships capable of communicating via INMARSAT;

(b) It was agreed that WMO would be kept informed of the details of charges by the various coast Earth stations;

(c) It was noted that the location of present and planned coast Earth stations were in those areas where the great bulk of ships' weather reports were injected into the GTS;

(d) It was noted that ships may select the coast Earth station through which they wish to communicate. Furthermore, it was agreed that WMO instructions to voluntary observing ships regarding the routeing of observations could be included in the ship Earth station operations handbook issued by INMARSAT;

(e) It was noted that some coast Earth station operators intended to continue, by agreement with their NMCs, the arrangements which apply in the conventional radio services whereby government departments or other national entities, and not ships, are billed for the transmission of meteorological observations;

(f) WMO requested that, in view of safety considerations, the potentially large volume of meteorological reports and temporal predictability of such reports, the possibility of bulk rates for transmission of meteorological reports should be considered by the INMARSAT council and by coast Earth station operators. INMARSAT agreed to bring this matter to the attention of its council.

9.26 The Commission was further informed that, in addition to the WMO/INMARSAT discussions referred to above, the Executive Committee recognized that there would have to be adequate discussions within WMO of all the above-mentioned problems. The Executive Committee therefore authorized the Secretary-General, in consultation with the presidents of CBS and CMM, to convene an informal implementation co-ordination meeting to deal with these questions. In view of this, a meeting of experts on the use of INMARSAT was scheduled for 11-15 April 1983. This meeting would consider, inter alia, the report of the first WMO/INMARSAT consultation meeting.

9.27 The Commission noted that its Working Group on the GTS had established an ad hoc group of experts to study by correspondence the possible impact of INMARSAT on the operation of the GTS, in particular with respect to data routeing. It requested the Secretary-General to ensure that the results of the work of the joint WMO/INMARSAT group be made available to the ad hoc group. It also requested its Working Group on the GTS to continue the consideration of this matter and to make appropriate recommendations whenever required.

9.28 The Commission requested the Secretary-General to ensure that all information concerning the development of INMARSAT and the results of the work of the WMO/INMARSAT group also be made available to all Members of WMO.

Telecommunication procedures

9.29 The Commission considered proposals from its working group concerning the question of identification of individual delayed (RTD) and corrected (COR) bulletins and that possible solutions included RTA, RTB, RTC etc., RT1, RT2, RT3 etc., RTDA, RTDB, RTDC etc., and RTD1, RTD2, RTD3 etc., with corresponding variants of COR.

9.30 The Commission agreed that an arrangement by which RTD and COR bulletins could be individually and uniquely identified would be of great assistance at both automatic and manual centres. This would be particularly true at automated centres during or after circuit or centre outages and for the re-routeing of traffic in dealing with requests for repetition and in other ways. It was felt also to be very helpful for monitoring purposes.

9.31 The Commission agreed that the use of only three letters, would represent the best solution and would be easiest to introduce at most centres. It was pointed out that it would not be necessary for all centres to start using the new identification system at the same time and that it could be introduced progressively. However, it could not be introduced until such time as the message switching at automated centres could handle bulletins using new procedures. It was also pointed out that re-programming might take

some time, that any possibility of confusion between the existing forms and the new forms should be avoided and that, logically, the same procedures should be adopted in respect of amendment (AMD) bulletins.

9.32 The Commission therefore agreed to adopt the identification procedure RRA, RRB ....., CCA, CCB ..... and AAA, AAB ..... progressively throughout the GTS with the proviso that messages in the new form should not be introduced before 15 January 1984 to give time for re-programming to be carried out where necessary.

Format of SYNOP and SHIP bulletins

9.33 The Commission was informed that some difficulties had arisen concerning the presentation of bulletins in the new SYNOP code, since it had been noted that no fewer than nine different formats were being used. It noted that the Working Group on the GTS had recommended that this should be reduced to two alternatives only, namely format (a) and format (b).

9.34 As requested by its Working Group on the GTS, the Commission considered the two above-mentioned alternatives and whether it would be desirable to introduce one format for bulletins for global exchange. It noted that format (a) obeyed the general rule that the full length of lines on the teleprinter should normally be used and that it saved paper. Format (b) facilitated manual processing, especially when quick checking of groups was involved, or the extraction of specific information, such as maximum temperature.

9.35 The Commission, after some discussion, agreed that the use on the GTS of either format (a) or format (b) would be optional and would be left to the decision of Members. It agreed, however, that appropriate indications on this matter should be included in the Manual on the GTS together with examples of the two formats.

9.36 The Commission made appropriate arrangements to include this matter in the relevant part of Part II, Volume I of the Manual on the GTS.

Procedures for data transmission to be used in the GTS

Methods and elements of X.25 procedures for layers 1, 2 and 3

9.37 The Commission noted that, in response to its decision at its extraordinary session (1980) of using on the GTS the Link Access Procedure Balanced Class (LAPB) laid down in CCITT Recommendation X.25, the tenth session of the Working Group on the GTS had developed detailed elements and parameters for layers 1, 2 and 3 concerning this procedure, based on standardized elements of the CCITT Recommendation.

9.38 The Commission considered that reference to the relevant official CCITT publication should be made in the text to be included in the Manual on the GTS. The Commission requested the Secretary-General to make the updating of the references to the paragraphs of CCITT Recommendation X.25 and to the relevant official CCITT publication issuing from the next CCITT Plenary Assembly.

9.39 The Commission agreed to include the elements of X.25 procedures in the Manual on the GTS, Volume I, Part II.

Functions and procedures of higher layers

9.40 The Commission noted that, at its tenth session, the Working Group on the GTS had discussed different questions related to the functions of higher layers, based on the framework of the layered architecture contained in the Draft International Standard ISO/DIS 7498 "Information processing systems. Open systems interconnexion - Basic reference model", and had developed some elements of the transport layer procedure (layer 4).

9.41 The Commission agreed to include these elements of the transport layer procedure (layer 4 of ISO) in the Manual on the GTS, Volume I, Part II.

9.42 In this connexion, the observer from the ITU informed the Commission that the CCITT had developed a Draft Recommendation X.200 on a "reference model of open systems interconnexion for CCITT applications", which, according to the CCITT practice of accelerated procedure, would be recognized as a standard within a few months, although this recommendation had not been adopted by the CCITT Plenary Assembly. This recommendation specified a reference and logical structure for CCITT recommended services and the corresponding procedures and would provide a basic framework for the communication users' requirements.

9.43 The Commission requested the Working Group on the GTS to continue detailed studies of questions related to communications procedures and, in particular, procedures of the transport layer (layer 4) and higher layers, taking into consideration the results of the work carried out by the CCITT and ISO.

9.44 The Commission adopted Recommendation 15 (CBS-VIII).

Technical problems of the Global Telecommunication System

Multiplexing methods used over the GTS

9.45 The Commission noted that, further to the opinion which it had expressed at its extraordinary session (1980) to the effect that encouragement should be given to the application of multiplexing methods whenever they were feasible and desirable, the tenth session of the Working Group on the GTS had developed the method of application. The Commission agreed to adopt a text for insertion in Part III, Volume I of the Manual on the GTS.

Digital facsimile transmissions

9.46 The Commission noted the work carried out by CCITT concerning Group 3 and Group 4 facsimile apparatus. The CCITT observer informed the Commission that, although certain technical characteristics of the Group 4 facsimile apparatus had been the subject of an agreement within CCITT Study Group VIII, many studies were still under way, in particular as regards the mixed facsimile-teletex mode, and that the final results were not to be expected in the near future.

9.47 One Member was of the opinion that it was perhaps preferable to defer a decision on this matter pending the standardization of Group 4 facsimile apparatus, but the Commission finally agreed to adopt the technical characteristics for digital coded facsimile equipment adapted from CCITT Recommendation T 4 concerning Group 3 facsimile apparatus. Moreover, the

Commission felt that, taking into account the coded digital facsimile equipment which was already available or in operation, other technical characteristics for coded digital facsimile equipment could be used. The Commission agreed to introduce these different standards in Volume I, Part III of the Manual on the GTS.

9.48 The Commission requested the Working Group on the GTS to make an in-depth study of the possibilities of using for meteorological purposes the Group 4 facsimile apparatus whose characteristics were undergoing study, in co-operation with CCITT.

9.49 The Commission also agreed to introduce in the Manual on the GTS, Volume I, Part III, certain technical characteristics for non-coded digital facsimile transmissions.

9.50 The Commission adopted Recommendation 16 (CBS-VIII).

New name of the Main Trunk Circuit and its branches

9.51 The Commission examined the evolution of the Main Trunk Circuit and its branches, achieved through the establishment of new circuits and the growing possibilities for routeing traffic, and felt that the initial notion of a circuit linking successive centres had given way to that of a meshed network.

9.52 The Commission agreed to change the name of the "Main Trunk Circuit and its branches", replacing it by the expression "Main Telecommunication Network".

9.53 The Commission felt that, more than just a change of name, the term "Main Telecommunication Network" was also a new concept, introducing further possibilities for the increased transmission of meteorological information, in particular the routeing and re-routeing of data which hitherto could not be implemented.

9.54 The Commission requested the Working Group on the GTS to make an urgent study of information routeing over the Main Telecommunication Network, and of the re-routeing procedures to be implemented, in order to ensure the highest efficiency for this new structure.

9.55 The Commission requested the Secretary-General to make the purely editorial amendments to the WMO regulatory texts connected with the introduction of the new name "Main Telecommunication Network". In addition to these editorial amendments, the Commission agreed to adopt substantial amendments to Parts I and III, Volume I of the Manual on the GTS, in order to define more precisely the organization and functions of the Main Telecommunication Network and to harmonize certain texts.

9.56 The Commission noted that the very fast evolution of techniques and technologies had made it necessary to co-ordinate with the international bodies concerned on the use of vocabulary. The Commission requested the Secretary-General to draw up a list of appropriate terms and definitions for the needs of the World Weather Watch, based on the vocabulary defined by the competent bodies, in particular ISO and ITU.

9.57 The Commission adopted Recommendation 17 (CBS-VIII).

World Area Forecast System (WAFS)

9.58 The Commission noted that the conjoint CAeM/COM/MET Divisional Meeting (Montreal, April/May 1982) had decided to establish the World Area Forecast System (WAFS). In this connexion, the meeting adopted Recommendation 4.2/1 - Telecommunication arrangements for the World Area Forecast System - Initial Phase. In this recommendation it was stated that WMO should be informed:

(a) That the Global Telecommunication System was recognized as the suitable means of fulfilling in general the operational requirements in the initial phase for the transmission of area forecast products from world area forecast centres to world area forecast centres, from world area forecast centres to regional area forecast centres and between regional area forecast centres;

(b) That some parts of the Global Telecommunication System should be used for the dissemination of area forecast products from regional area forecast centres to users when this was efficient and cost-effective;

and that WMO should be invited to take the necessary measures in respect of (a) and (b) above.

9.59 The observer from ICAO informed the Commission that the above recommendation had been approved by the ICAO Council and would be communicated to WMO shortly. In addition, the detailed requirements for the dissemination of the WAFS products on the GTS would be sent to WMO as they became available from the different ICAO Regional Air Navigation Meetings.

9.60 The Commission requested the Secretary-General to arrange that the requirements, when received from ICAO, should be made available to the CBS Working Group on the GTS to study the impact on the GTS and propose arrangements for the dissemination of these products over the GTS.

Use of the GTS for exchange of seismic data

9.61 The Commission recalled that Eighth Congress (April/May 1979) considered a document submitted by the Secretary-General containing a summary of the report of the Ad Hoc Group of Scientific Experts set up by the United Nations Committee on Disarmament (CD) to consider international co-operative measures to detect and identify seismic events. The report recommended the use of the WWW-GTS for the routine transmission of certain information concerning seismic events. Congress agreed, in principle, that WMO should assist the United Nations in this matter in accordance with the basic agreement between the United Nations and WMO without compromising the activities proper to the Organization.

9.62 At the request of the above-mentioned ad hoc group, the WMO Secretariat organized trials on the exchange of seismic data over certain parts of the GTS which were conducted by a limited number of Members in October/November 1980 and November/December 1981. The seismic data exchanged

over the GTS were the so-called "level-I data", which were required for the real-time analysis of seismic events. It was estimated that the volume of the level-I data would be 31 000 characters per day.

9.63 The Commission noted that the results of the first and second trials were reviewed by the thirteenth session of the RA VI Working Group on Meteorological Telecommunications (Geneva, March/April 1982) and the tenth session of the CBS Working Group on the GTS (July 1982). Both working groups reached the conclusion that the results of the two trials indicated a successful exchange of seismic data over the GTS, but that some difficulties had been caused by the absence of an overall plan for the routeing of seismic data. Therefore, it would be sufficient to carry out a further trial on the GTS just before the system for the exchange of seismic data was expected to come into operational use.

9.64 The Commission further noted that the Ad Hoc Group of the Committee on Disarmament at its fourteenth session (Geneva, August 1982) took the above-mentioned views of the WMO into consideration and incorporated them in its progress report which was submitted to the Committee on Disarmament. The Committee on Disarmament held in August 1982 decided to request the Secretary-General of WMO that the co-operation of his organization in the exchange of seismic data through the WWW-GTS be continued.

9.65 The Commission was of the opinion that, taking into account the decision of Cg-VIII, the GTS should be used for the global exchange of seismic level-I data only and Members should be urged to ensure reliable and efficient transmission of seismic bulletins over the GTS. However, it was also of the opinion that the GTS should not be used to exchange the much more detailed seismic level-II data because of its very large volume.

9.66 The Commission adopted Recommendation 18 (CBS-VIII).

9.67 The Commission realized that the inclusion of seismic data (level I) in the Manual on the GTS, Volume I, Part I, Attachment I-3, as recommended in Recommendation 18 (CBS-VIII), in relation to Recommendation 3 (CBS-VIII), where the inclusion of these data was not recommended in the Manual on the GDPS, Volume I, Part II, Attachment II-2, would lead to a permanent difference between these two normally identical attachments. The Commission considered this difference to be of importance since it clearly indicated which part of the data exchanged over the GTS was not required by the GDPS (see also paragraph 7.6).

9.68 The Commission agreed that the implementation date of global exchange of seismic data would be 1 December 1983 and included this implementation date in the above recommendation. The Commission urged Members, in consultation with national seismological authorities, to submit information concerning seismic bulletins for global exchange to the Secretariat for their inclusion in the Catalogue of Meteorological Bulletins as soon as possible in order to give all GTS centres sufficient time to make the necessary arrangements. Furthermore, the Commission requested the Secretary-General to distribute the list of seismic bulletins, as available from Members, to all GTS centres well in advance of the implementation date.

9.69 The Commission felt that detailed telecommunication arrangements should be made between the GTS centre and national seismological centre in

each country in order to ensure efficient exchange of seismic data between them. The Commission, therefore, requested the Secretary-General to take the necessary measures with Members concerned in this respect; in particular, arrangements concerning working hours of the telex or other communications between two centres should be made in order to ensure the smooth transmission of data and to avoid an unacceptable workload at the GTS centres.

9.70 The Commission requested the Secretary-General to maintain close co-ordination with the Ad Hoc Group of the Committee on Disarmament and to arrange for periodical monitoring exercises as appropriate with a view to improving, as necessary, the efficiency of the exchange of seismic data over the GTS.

IGOSS future requirements for transmission over the GTS

9.71 The Commission was informed by the observer of IOC that the joint IOC/WMO Working Committee on IGOSS developed a description of anticipated future requirements for transmission of IGOSS data over the GTS to meet the needs of the IGOSS Observing System and the IGOSS Data Processing and Services System. It noted that a significant increase in the total observations exchanged under the BATHY/TESAC component of the IGOSS Observing System was anticipated over the next five years. It also noted that transmission over the GTS of processed satellite data sets and products under the IGOSS data processing and service system (IDPSS) would be required in the next 5-10 years.

9.72 The Commission noted that it was difficult at present to assess the increase in traffic load on the GTS. The Commission requested the Secretary-General to keep the Working Group on the GTS informed of the IGOSS requirements, as available, for study and to propose arrangements for the dissemination of IGOSS data over the GTS.

Reception of meteorological information by entities not part of national Meteorological Services

9.73 The Commission was informed that it had been brought to the attention of the WMO Secretariat that problems existed in some countries concerning the legal aspects of reception of meteorological broadcasts by private companies, agencies, television and broadcasting services for the preparation of commercial and other meteorological forecasts.

9.74 The Commission noted that the radio frequencies used for meteorological radio broadcasts were chosen from those frequency bands allocated for "Fixed Services" in the ITU Radio Regulations. Despite that, the transmission in WMO terminology was "Meteorological Radio Broadcasts" and was regarded as a "Fixed Service" intended for multipoint reception.

9.75 The Commission was informed that the ITU Radio Regulations included the following definitions:

(a) Broadcasting Service: a radiocommunication service in which the transmissions are intended for direct reception by the general public. This service may include sound transmissions, television transmissions or other types of transmission (CONV.);

(b) Broadcasting-Satellite Service: a radiocommunication service in which signals transmitted or retransmitted by space stations are intended for direct reception by the general public.

9.76 The Commission was informed that Regional Association VI (Europe) had considered this matter at its eighth session (Rome, October 1982) and recognized that this was a difficult legal question requiring detailed study of international regulations and national legislation. Furthermore, it felt that the matter should be considered by CBS and possibly also by EC and Congress.

9.77 The Commission was informed that the Secretary-General of WMO had approached the Secretary-General of ITU to seek the guidance and views of ITU concerning the legal aspects of reception of meteorological broadcasts by private companies and agencies for the preparation of meteorological forecasts and their commercial use. The Commission noted that the reply from the Secretary-General of ITU contained the following information:

> "I am aware that problems do exist in some countries concerning the legal aspects of reception of meteorological broadcasts by private companies, agencies, television and broadcasting services for preparation of meteorological forecasts on a commercial basis. The magnitude or degree of the problem is directly related to the development of radio regulatory legislation at the national level in application of the International Radio Regulations (RR), Article 23 - Secrecy.
>
> Under Article 23, administrations bind themselves to take the necessary measures to prohibit and prevent:
>
> (a) The unauthorized interception of radiocommunications not intended for the general use of the public;
>
> (b) The divulgence of the contents, simple disclosure of the existence, publication or any use whatever, without authorization, of information of any nature whatever obtained by the interception of the radio-communications mentioned above.
>
> The problem has two aspects: one concerns the illegal interception or pirating of radiocommunications, including meteorological data, the second concerns the practices or procedures developed for licensing the reception of radiocommunications. In each category, the problem is primarily one of licensing or the exemption of licensing at the national level. This is with respect to receiving stations and the RR definition of the Broadcasting Service where the transmissions are intended for direct reception of the general public as opposed to the Fixed Service, a service between specified fixed points.
>
> Therefore, depending on the scope of the national radio regulatory legislation, an administration has the possibility of prosecuting anyone involved in the unlawful interception of radiocommunications in the Fixed Service. On the other hand, national legislation requiring the licensing of all receiving application procedures may actually hinder the authorized reception of weather broadcasts of interest to a vast number of private individuals, business, municipal, and miscellaneous government organizations or agencies.

In view of the need to solve the two aspects of the problem, one Administration is now in the process of reviewing and preparing amendments to their national radio regulatory legislation. Other administrations could be encouraged to do the same.

I would be pleased, if you agree, to send a circular letter to the Members of the ITU, bringing this matter to their attention and quoting your letter as a reference."

9.78 The Commission noted that such problems, while existing in some countries, did not exist at all in others. There was a general feeling that this problem was mainly a national one at the level of national legislation. Furthermore, it was felt that WMO might not be in a position to play an important role in this respect. However, it noted that the Secretary-General of WMO had requested Members of Regional Association VI to provide the Secretariat with information on national legislation, if existing, in their countries. The Commission requested the Secretary-General to make this information available to Members requesting it.

9.79 Although the offer of the Secretary-General of ITU to send a circular letter to the Members of the ITU was much appreciated, the Commission felt that there would be no need for such a letter.

Establishment of the Working Group on the GTS

9.80 In view of the efficient manner in which the Working Group on the GTS had conducted its work in the past and the need to continue this work for the development of the WWW Global Telecommunication System, the Commission decided to establish a Working Group on the GTS. Resolution 7 (CBS-VIII) was adopted.

Main tasks of the Working Group on the GTS for the period 1983-1986

9.81 The Commission agreed that the following main tasks should have the highest priority to be carried out by the Working Group on the GTS during the period 1983-1986:

- Study area 2/4 (partly) and Study Area 3 in the framework of the Integrated WWW System Study;
- Development of specifications and procedures for the Main Telecommunication Network;
- Further development of data-transmission techniques;
- Further development of digital facsimile transmission;
- Further development of operational telecommunication procedures;
- Matters related to the use of INMARSAT;
- Matters related to the training of personnel engaged in meteorological telecommunications.

10. MONITORING OF THE OPERATION OF THE WWW (Agenda item 10)

Non-real-time monitoring

10.1 The Commission noted with satisfaction that, in accordance with the Plan for Monitoring the Operation of the WWW which was revised by CBS-Ext.(80) and approved by EC-XXXIII, non-real-time monitoring on a global basis was carried out regularly by the WMO Secretariat with the participation of Members. It also noted with appreciation that the intensive monitoring activities carried out by many Members and the Secretariat during the past two years had resulted in some improvement and in the elimination of some deficiencies in the operation of the WWW.

10.2 The Commission further noted that the annual global monitoring survey had been carried out in October 1981 and 1982 in order to keep under review the efficient operation of the WWW. Specific monitoring surveys related to particular problem areas and certain special types of meteorological bulletins had been carried out during other periods in order to investigate particular problems in the operation of the WWW, as follows:

(a) Zones of RTHs Brasilia, Buenos Aires and Maracay in February 1981;

(b) Zones of RTHs Brazzaville and Kano in March 1981;

(c) Zone of RTH Nairobi in April 1981;

(d) Southern part of Region IV in August 1981;

(e) Exchange between WMC Moscow and RTH Cairo in August 1981;

(f) Exchange of satellite and GRID code bulletins on the MTC and its branches in September 1981;

(g) Zones of RTHs Brazzaville and Kano in January 1982;

(h) Zones of RTHs Lusaka and Nairobi in February 1982;

(i) Zones of RTHs Bangkok and New Delhi in March 1982;

(j) Exchange of BATHY/TESAC bulletins on the GTS in June 1982.

10.3 The Commission noted that, following each non-real-time monitoring survey, the Secretary-General had initiated follow-up action with Members concerned and that, in most cases, action had been taken to remedy the deficiencies revealed. It also noted that the Secretary-General would conduct two roving seminars with the RA I and RA III Members concerned to be carried out in March and September 1983 respectively in order to streamline the operation of the WWW, in particular the GOS and GTS.

10.4 The Commission urged all Members to participate actively in the annual global monitoring and specific monitoring surveys on a non-real-time basis organized by the Secretariat with a view to improving the operation of the WWW, and in particular to identifying exact problem areas and initiating remedial action to eliminate deficiencies.

Real-time monitoring

10.5 The Commission noted that, according to the Plan for Monitoring the Operation of the WWW as mentioned above, Members should carry out real-time monitoring. It also noted that, according to information available from Members in the Secretariat, only 42 Members implemented real-time monitoring and initiated procedures for follow-up action at the time to check on the non-receipt of observational reports, correct errors and ensure that telecommunication formats were correct, etc.

10.6 The Commission stressed that real-time monitoring should also be carried out in parallel with non-real-time monitoring so that remedial action to eliminate deficiencies could be taken immediately. The Commission urged all Members to implement real-time monitoring in accordance with the monitoring plan.

Review of the results of non-real-time monitoring

10.7 The Commission reviewed the results of the annual global monitoring carried out in October 1981 and 1982 as well as specific monitoring surveys carried out in 1981 and 1982. The Commission noted that the availability of observational data for global exchange at the MTC centres reached in general about 75 per cent of the number of reports expected to be received. The results of October 1982 indicated that the MTC centres received from about 1 500 to more than 1 900 SYNOP reports and from fewer than 450 to more than 600 TEMP reports at each observation time. The daily average number of SHIP and AIREP reports received by the MTC centres ranged from 2 500 to 3 000. The Commission expressed concern at the substantial variation in the amount of observational data available at MTC centres and from one observation time to another (see also paragraph 10.13).

10.8 The Commission noted that deficiencies in the operation of the WWW still existed, particularly in some parts of Regions I and III. Furthermore, the data availability from the Antarctic did not reach a satisfactory level.

10.9 The Commission examined a list of global exchange stations, prepared by the Secretariat, from which no reports were received by MTC centres during the whole period of the monitoring carried out from 1 to 15 October 1982. It noted that observations at some of the stations listed had been temporarily suspended due to lack of expendables or reports had not been transmitted due to temporary outages of telecommunication circuits. Furthermore, it noted that the results of the monitoring carried out in the past two or three years indicated that observational data from some stations were not received consistently.

10.10 In this respect, the Commission was of the opinion that it would be necessary to establish a mechanism to identify non-implemented stations and decide whether or not to keep them in the list of stations for global exchange, although deletions of global exchange stations from the list depended primarily upon the decisions of Members concerned. The Commission agreed that the CBS Advisory Working Group should be requested to study the matter and propose mechanisms for establishing a realistic global exchange list.

Follow-up action of CBS-Ext.(80)

10.11 The Commission recalled that CBS-Ext.(80) had requested the Secretary-General to revise, as necessary, the present methods used for the analysis and presentation of results of non-real-time monitoring with a view to making the monitoring more efficient and pinpointing the specific deficiencies in the operation of the GOS and the GTS (reference paragraph 9.2.3 of the general summary of the report). The Commission noted with satisfaction that the Secretary-General had taken the necessary action in this respect and the presentation of the monitoring results, as given in the Eleventh Status Report on the WWW implementation and documents submitted by the Secretary-General, had already been modified for this purpose.

10.12 The Commission noted that, in accordance with the decision of CBS-Ext.(80), the monitoring plan had been modified (reference paragraph 9.2.4 of the general summary of the report). The Commission felt that the present monitoring plan as revised by CBS-Ext.(80) needed no further changes. However, it noted that additional efforts were still needed with regard to implementing the plan and analysing the monitoring results.

10.13 The Commission recalled that CBS-Ext.(80) had recognized some significant discrepancies in the availability of observational data at various centres (reference paragraph 9.2.5 of the general summary of the report). The Commission noted that the tenth session of the CBS Working Group on the GTS (Geneva, July 1982) had examined the results of the annual global monitoring and recognized that these significant discrepancies still existed. These might be due to different criteria used by centres for accepting observational data but no definite conclusions on their cause were reached. The above session of the working group therefore requested the Secretary-General to organize a specific monitoring to be carried out in March 1983 in order to trace data from their source along the pre-determined routes to the MTC and to identify where they were being lost. The Commission noted with appreciation that the Secretary-General had already taken the necessary action to this effect.

Follow-up action of CBS AWG-VI

10.14 The Commission was informed that the sixth session of the CBS Advisory Working Group (September/October 1981) had discussed the following problem: in some cases and for various reasons it happened that certain Members did not respond to circular letters related to the WWW. This led to a discussion on the best way to rationalize circular letters and to ensure their receipt by the operational staff and that a timely reply was sent to the Secretariat. The discussions also aimed at reducing the workload on Members and the Secretariat as well as ensuring a rapid and regular flow of operational information. Furthermore, it was noted that the METNO and WIFMA messages were not being forwarded to many NMCs. The above session was of the opinion, therefore, that this advance notification (METNO and WIFMA) was of importance to Services and should be put to greater use. The following proposals stemmed from the discussion:

(a) A circular letter should be sent to all RTHs emphasizing the importance of METNO and WIFMA messages and urging them to ensure the regular forwarding of these messages to all the NMCs in their zones of responsibility;

(b) All operational information related to WWW should be assembled in one monthly letter sent to Members in order to facilitate the follow-up and updating of their operational manuals, directories, etc., on the understanding that all changes would be included in the METNO messages.

The Secretary-General was requested to consider the above measures and implement them as appropriate with a view to ensuring maximum rationalization of letters related to operational information and the response to these letters.

10.15 The Commission noted that the above-mentioned proposals of the CBS Advisory Working Group had been implemented and, in addition to the advanced notification services of METNO and WIFMA, the monthly operational letters had been issued regularly to all Members since April 1982. The Commission expressed its satisfaction at the presentation and contents of the monthly operational letters and requested the Secretary-General to continue these services.

10.16 In this connexion, the Commission urged Members to send to the Secretariat, whenever necessary, updated information concerning publication WMO-No. 9, Volumes A and C (including the Catalogue of Meteorological Bulletins), as well as the global and regional exchange lists as given in the Manual on the GTS, Attachment I-4 and Attachments AF-1, AI-1, SA-1, NA-1, PS-1 and EU-1.

10.17 The Commission noted that, in conjunction with the issue of the WWW monthly operational letter, the sixth session of the CBS Advisory Working Group further proposed the issue of supplements to Volume C every two months rather than on a monthly basis. The Commission agreed to this proposal and requested the Secretary-General to take the necessary action in this respect.

11. EDUCATION AND TRAINING IN THE FIELD OF CBS (Agenda item 11)

General considerations

11.1 Several delegates from developing countries expressed their appreciation to those Member countries which had provided, on a bilateral basis, equipment and training materials, and organized special training courses in their countries, noting that these activities had proved to be very beneficial. While also appreciating assistance under technical assistance programmes, such as the UNDP and the VCP, some delegates noted that such assistance did not meet all the needs of the developing countries, and hoped that the relevant financial resources under the regular budget would be increased to help solve the problems in the field of education and training.

Training facilities

11.2 In noting the documented information on the WMO Regional Meteorological Training Centres (RMTCs), the Commission also noted that this information needed updating with particular reference to the training activities at the RMTCs in:

(b) Buenos Aires (Argentina) where training programmes are available in data processing as indicated in Annex IV of the

abridged final report of the eighth session of RA III (March 1982) (WMO-No.594). This annex is entitled "Report on the Meteorological and Hydrological Training Activities at Professional and Technical Levels in the Republic of Argentina";

(b) Oran (Algeria) where training is provided in meteorological telecommunications and where Class IV training is also given in Arabic. This Centre plans to organize, over the next two years, training courses in numerical weather forecasting for tropical regions.

11.3 The Commission also noted the valuable roles being played by the many national training institutions and was pleased to learn of the training programmes at the diploma and M.Sc. level at the College of Meteorological and Environmental Studies of the King Abdulaziz University of Saudi Arabia.

11.4 The Commission emphasized the importance of the organization of special courses in meteorological telecommunications at national and regional training facilities, especially in developing countries. It also felt that these courses should differentiate between training on the maintenance of telecommunications equipment, and training on telecommunications procedures. Such specialized courses were also to be viewed as being distinct from the treatment of this subject as a component of more general training courses or programmes.

Syllabi, training publications and training aids

11.5 The Commission was pleased to note that as a result of developments and advances in some areas, the syllabi for training various classes of meteorological personnel with specialization in meteorological telecommunications, data processing and numerical weather prediction had been updated and that the revised third edition of Guidelines for the Education and Training of Personnel in Meteorology and Operational Hydrology (WMO-No. 258) would incorporate and reflect these changes.

11.6 The Commission noted with pleasure that during the inter-sessional period some new, relevant WMO publications (Blue Series) and training aids had been published. It stressed, nevertheless, the requirement for the preparation of compendia of lecture notes on meteorological telecommunications, data processing, numerical weather prediction, and also on meso-meteorology and short-range forecasting, and their distribution in all official languages of the Organization.

11.7 The current preparation of regional synoptic charts for training purposes at RMTCs in Regions I, II, III and IV was noted. The Commission requested that the Secretary-General investigate the possibilities of having chart sets prepared for all regions and, in the meantime, to inform Members of the availability of such sets of charts in other Members' training institutions. In this connexion, the offer of the delegate of Israel to supply a series of synoptic charts to the Secretariat was noted with appreciation.

11.8 The Commission noted that, to facilitate the tasks of translating training publications, the availability of updated and translated meteorological and hydrological glossaries would be essential. It was also noted that

action had already been taken to update glossaries. It further noted with appreciation the offer of Saudi Arabia to translate the poster WMO Standard Format of Meteorological Messages into Arabic. Other Members were invited to participate in translating other relevant WMO training publications.

11.9 With regard to the distribution to RMTCs, on a trial basis, of review articles appearing in recent issues of journals, the Commission decided that its Advisory Working Group would provide the assistance necessary for their selection. It was also agreed that Members should be informed of the availability of such articles, which should be supplied to them on request.

11.10 The Commission noted further the importance of making available as soon as possible the Catalogue of Meteorological Training Publications and Audio-visual Aids available in the WMO training library. It invited Members producing new materials to make them available to the library.

Organization of training events

11.11 The Commission was informed of a number of training events which had been held since the last session in areas such as synoptic meteorology, codes, satellite meteorology and the use of satellite data, data processing, telecommunications procedures, instrument maintenance, and radar observations and meteorology. The Commission expressed its appreciation to WMO of those activities and re-emphasized their importance, especially to developing countries.

11.12 In considering the subject areas in which future training courses, workshops or seminars should be organized, the Commission agreed that:

(a) The highest priority should be given to a training seminar or workshop on the use of numerical weather prediction products for short- and medium-range forecasting;

(b) The importance of training in the areas of telecommunications maintenance and procedures, and data processing should be emphasized;

(c) The report of the Rapporteur of the Working Group on the GOS on Technical Assistance, Training and Maintenance of Equipment in Developing Countries should be used as background material for the determination of training needs;

(d) Roving seminars should be used when appropriate, as this method had proved to be an efficient and effective training procedure.

11.13 The Commission understood that after approval by Congress of a programme and budget for the ninth financial period, the Executive Committee would determine the titles of the training events and the Regions in which these would be held.

Arrangement of individual training programmes and provision of fellowships

11.14 The Commission observed that in the award of fellowships, due consideration had been given to the areas previously identified by the Commission as having the greatest needs for assistance. However, it recognized that there was a continuing need for such fellowships. The Commission also noted the need expressed by the observer of the Palestinian Liberation Organization for training fellowships in meteorology.

11.15 In line with the call for additional fellowship support, the delegate from Algeria indicated that a number of fellowships were offered by his country at the RMTC in Oran, and requested that Members be advised accordingly. The Commission noted this offer with appreciation and indicated that countries wishing to announce such training fellowship offers should provide the Secretariat with full relevant details so that the necessary information could be disseminated to Members.

Future manpower development programme

11.16 The Commission indicated that the necessary assistance and advice for undertaking surveys on the requirements of national Meteorological and Hydrological Services in the field of education and training would be provided by its relevant working groups.

Institutional support to the Organization's education and training activities

11.17 The Commission noted the advisory role to the Executive Committee of the EC Panel of Experts on Education and Training, and that the activities of rapporteurs and working groups on the education and training matters of technical commissions had been of great assistance to it. It agreed that the subject of education and training matters should be assigned to its Working Groups on Codes, the GOS and the GTS as had been done with the GDPS Working Group. It was also agreed that the Advisory Working Group of CBS would coordinate the education and training activities of the Commission.

12. NOMINATION OF MEMBERS OF WORKING GROUPS AND RAPPORTEURS

Under this item the Commission considered the membership of working groups and the designation of chairmen and rapporteurs. (See Resolutions 1 to 7 (CBS-VIII).)

13. REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE COMMISSION AND RELEVANT EXECUTIVE COMMITTEE RESOLUTIONS (Agenda item 13)

13.1 In accordance with current practice, the Commission examined those resolutions and recommendations adopted prior to its eighth session and which were still in force.

13.2 The Commission noted that the action on most of its previous recommendations had either been completed or their content included in the

relevant WMO manuals and decided not to keep them in force. It agreed, however, to maintain in force Recommendations 20 (CBS-VII) and 12 (CBS-Ext.(80)). Resolution 8 (CBS-VIII) was adopted.

13.3 The Commission then examined the Executive Committee's resolutions within the field of activity of the CBS and agreed that Resolutions 5 (EC-XXXI), 3 (EC-XXXIII) and 5 (EC-XXXIII) need no longer to be kept in force. It decided to recommend that Resolution 4 (EC-XXXI) and Resolution 2 (EC-XXXIII) be kept in force. Recommendation 19 (CBS-VIII) was adopted.

14. SCIENTIFIC LECTURES AND DISCUSSIONS (Agenda item 14)

14.1 A large part of one morning session was devoted to the scientific lectures and discussions. The meeting was presided over by Dr. A. A. Vasiliev, vice-president of CBS. The papers presented were as follows:

- FGGE Observing System Studies, by Dr. L. Bengtsson (ECMWF);
- Preliminary results of ALPEX of interest to WWW, by Dr. J. Kuettner (Scientific Director of ALPEX);
- Results of investigations carried out during the period of summer MONEX, by Dr. B. S. Chuchkalov (U.S.S.R.) (presented by Dr. A. A. Vasiliev, due to the absence of Dr. Chuchkalov);
- The First Operational Experiment of TOPEX with particular reference to WWW, by Mr. Itsuro Shimizu (Japan).

14.2 The Commission noted that such international experiments were of importance to the development of the WWW system, especially to the Global Observing System, and requested the Secretary-General to publish the papers after consultation with the authors.

15. ELECTION OF OFFICERS (Agenda item 15)

Mr. J. R. Neilon (U.S.A.) was unanimously elected president of the Commission and Dr. A. A. Vasiliev (U.S.S.R.) was elected vice-president of the Commission.

16. DATE AND PLACE OF THE NINTH SESSION (Agenda item 16)

In the absence of any formal invitation from Members represented at the session, the Commission decided that the date and place of its ninth session should be fixed at a later date and requested its president to make the necessary arrangments in consultation with the Secretary-General.

17. CLOSURE OF THE SESSION (Agenda item 17)

17.1 In his closing address, the president of the Commission, Mr. J. R. Neilon, reviewed the work of the eighth session and recalled the

major results accomplished. He thanked all the participants for their spirit of co-operation which had greatly helped to finalize all their hard work. In particular, Mr. Neilon stressed the importance of the review of the draft World Weather Watch plan for 1984-1987 for consideration by Ninth Congress and of a comprehensive plan for the conduct of the Integrated WWW System Study.

17.2 Mr. Neilon felt it had been noticeable during the discussions which had taken place that increased attention had been given to the idea of services and providing these services to users. Furthermore, he remarked that, if the time schedule of CBS sessions was adhered to, the next session of the Commission would have constructed a WWW plan extending to the beginning of the next century.

17.3 Mr. Neilon thanked all the participants, in particular the vice-president and the chairmen of the two working committees, for all their able work. He recalled the many duties that had been performed by individuals who had accepted extra tasks and worked behind the scenes, which had greatly accelerated the drafting of specific topics. He also recalled the work performed by the chairmen of the different working groups since the seventh session of the Commission and thanked them for the time and effort they had devoted to carrying out their tasks. Particular thanks were given to Mr. I. A. Ravdin of the U.S.S.R. who had ably served as chairman of the Working Group on the Global Telecommunication System for a number of years and who would retire in the near future. He also thanked those members of the Advisory Working Group who had served for many years on this group and had been replaced.

17.4 Mr. Neilon extended special thanks to Dr. O. Lönnqvist, who was the outgoing president and, as such, a member of the Advisory Working Group. He mentioned that this was the first meeting of CBS which Dr. Lönnqvist had not attended and that this session had missed his advice and contribution. He requested the Swedish delegation to convey the feelings of the Commission to Dr. Lönnqvist.

17.5 The president expressed thanks to the Secretary-General of WMO and his representative, Mr. G. K. Weiss, as well as all other members of the Secretariat for the support they had provided. In conclusion, Mr. Neilon wished all the participants a safe trip home and success in their future work.

17.6 The session was closed at 11.15 a.m. on Friday, 11 February 1983.

RESOLUTIONS ADOPTED BY THE SESSION

Res. 1 (CBS-VIII) - ADVISORY WORKING GROUP OF THE COMMISSION FOR BASIC SYSTEMS

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Paragraph 7.13.5 of the general summary of the abridged final report of Fifth Congress,

(2) Resolution 1 (CBS-II) - Advisory Working Group of the Commission for Basic Systems,

CONSIDERING that a working group would be of value in advising the president of the Commission and in assisting him in his duties of co-ordination and planning,

DECIDES:

(1) To establish the Advisory Working Group of CBS with the following terms of reference:

(a) To advise the president of the Commission, as necessary, in his functions of expressing opinions or taking action on urgent or non-controversial matters;

(b) To assist the president in short- and long-term planning of the work of the Commission and of its working groups;

(c) To assist the president in the conduct and co-ordination of the Integrated WWW System Study;

(d) To review the internal structure and working methods of the Commission;

(e) To assist the president in the co-ordination of the activities of the CBS;

(f) To formulate specific plans for the specialized education and training activities in the field of responsibility of CBS;

(g) To keep under review the work of the Commission;

(2) That the composition of the Advisory Working Group should be as follows:

President of CBS (chairman)
Vice-president of CBS
Chairmen of the CBS Working Groups on the GOS, GDPS, GTS and Codes
Mr. S. Alaimo (Argentina)
Mr. R. B. Crowder (Australia)
Mr. E. A. Mukolwe (Kenya)

Res. 2 (CBS-VIII) - RAPPORTEUR ON EXCHANGE FORMATS

THE COMMISSION FOR BASIC SYSTEMS,

NOTING the requirements for an intensified conduct of the Integratd WWW System Study,

CONSIDERING the specific and urgent needs for improved formats for the exchange of meteorological information particularly in real-time and quasi-real-time,

DECIDES:

(1) To appoint a Rapporteur on Exchange Formats with the following terms of reference:

(a) To study the formats available at present for the exchange of observational data and processed information;

(b) To study the need for improved exchange format(s) as a means of fully integrating GOS, GDPS and GTS aspects in the future WWW, taking into account the requirements of various WMO programmes and the ability of Members to implement new formats;

(c) To keep the chairmen of the Working Groups on Codes and GDPS informed of his activities;

(d) To submit a report of his work to the president of CBS not later than 1 January 1984;

(2) To invite ..... to serve as Rapporteur on Exchange Formats.*

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* CBS-VIII authorized the president of CBS to designate the rapporteur.

Res. 3 (CBS-VIII) - RAPPORTEUR ON THE APPLICATION OF IMPROVED FORECASTING METHODS AND REQUIRED TECHNOLOGY FOR OPERATIONAL USE

THE COMMISSION FOR BASIC SYSTEMS,

NOTING the requirements for an intensified conduct of the Integrated WWW System Study,

CONSIDERING:

(1) The specific and urgent needs for upgrading the national and regional GDPS data-processing systems,

(2) The need to provide guidance on the application of advanced forecasting techniques and capabilities to meet Members' operational requirements under the WWW,

DECIDES:

(1) To appoint a Rapporteur on the Application of Improved Forecasting Methods and Required Technology for Operational Use with the following terms of reference:

(a) To review developments in forecasting techniques (numerial weather prediction, model interpretation, statistical methods, etc.) which have recently become available or may shortly become available for operational use;

(b) To assess the technological requirements for the implementation of the forecasting techniques reviewed under (a) and also to enable GDPS centres to interface with the GTS as foreseen in an integrated WWW;

(c) To assemble information on economic and technical aspects (procurement, implementation, operation, maintenance);

(d) To provide guidance on the application of the information assembled under (a), (b) and (c) above for determining how operational forecasting requirements may be met;

(e) To keep the chairmen of the Working Groups on the GDPS and GTS informed of his activities;

(f) To submit a report on this work to the president of CBS not later than 1 January 1984.

(2) To invite ..... to serve as the rapporteur.*

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* CBS-VIII authorized the president of CBS to designate the rapporteur.

Res. 4 (CBS-VIII) - WORKING GROUP ON THE GLOBAL OBSERVING SYSTEM

THE COMMISSION FOR BASIC SYSTEMS,

NOTING Resolution 2 (CBS-VII) - Working Group on the Global Observing System,

CONSIDERING that there is a need for the Working Group on the Global Observing System to be re-established to keep under constant review observational requirements of the WWW, IGOSS, as well as other international programmes,

DECIDES:

(1) To establish a Working Group on the Global Observing System with the following terms of reference:

(a) To make studies in the field of Study Area 1 - Optimized Observing System in the framework of the Integrated WWW System Study;

(b) To take action on matters in the field of the Monitoring of the operation of the WWW (GOS aspects);

(c) To follow developments in the fields of technical assistance and training of personnel for the maintenance and operation of observing networks;

(d) To keep the Manual and the Guide on the Global Observing System under review;

(e) To consider and, as necessary, make recommendations on observational data requirements for the GOS, as put forward by international programmes;

(f) To study functional specifications of software requirements in automatic observing systems;

(g) To take action on matters referred to the working group by the president of the Commission;

(h) To keep up to date relevant training syllabi, as required, and to suggest training materials and the holding of seminars and symposia.

(2) To give the working group the following composition:

(a) An expert designated by each regional association;

(b) Experts nominated by Members operating, or planning to operate, significant parts of the Global Observing System, and experts nominated by other Members wishing to participate actively in the work of the working group;

(c) An expert designated by the president of the Commission for Marine Meteorology;

(d) An expert designated by the president of the Commission for Instruments and Methods of Observation;

(e) Experts who may be designated by presidents of other technical commissions;

(3) To select, in accordance with Regulation 31 of the General Regulations, Dr. T. Mohr (Germany, Federal Republic of) as chairman of the working group.

Res. 5 (CBS-VIII) - WORKING GROUP ON THE GLOBAL DATA-PROCESSING SYSTEM

THE COMMISSION FOR BASIC SYSTEMS,

NOTING Resolution 3 (CBS-VII) - Working Group on the Global Data-processing System,

CONSIDERING that there is a need for the continuation of the work of the working group established by Resolution 3 (CBS-VII),

DECIDES:

(1) To establish the Working Group on the Global Data-processing System with the following terms of reference:

(a) To make studies and formulate recommendations on the following items, taking into account the Integrated WWW System Study and the views expressed by other technical commissions:

(i) Principles and guidance on methods for the co-ordination and monitoring of technical operational matters of the GDPS;

(ii) Co-ordination of observational data needs of the GDPS and provision of advice on the formulation of requirements to be met by the future observing system (in co-operation with the Working Group on the GOS);

(iii) All statements of requirements for the products of GDPS from all users of the system;

(iv) Co-ordination of the products of the WMCs and the RMCs and the time schedules for their output, frequency of issue and distribution;

(v) Transmission priorities and acceptable time delay of WMC and RMC products on the Main Trunk Circuit and its branches, including priorities for resumption of service after outages;

(vi) Matters relating to real-time and non-real-time quality control, storage and retrieval of data and products within the GDPS, in particular in connexion with storage and retrieval of climatological data;

(vii) Regular exchange among WMCs, RMCs and NMCs of information on the techniques and procedures used within the GDPS and the results achieved from these techniques;

(b) To provide co-ordination and guidance on the use of modern data-processing techniques, and to bring the resulting requirements to the attention of other CBS working groups, as necessary;

(c) To keep abreast of scientific and technical developments relating to methods and techniques of meteorological analysis and forecasting for general purposes, including the World Weather Watch, to formulate recommendations on the implementation of new techniques and/or to bring these developments to the attention of the president of CBS, with a view to referring them to other relevant constituent bodies, as required;

(d) To identify problems associated with meteorological analysis and forecasting requiring study and research and to bring them to the attention of the president of CBS, with a view to referring them to the relevant technical commissions, as required;

(e) To keep abreast of, and identify, problems which relate to the processing of basic data and the functions of GDPS centres for climatological, hydrological and other purposes and to bring specific proposals on these matters to the attention of the president of CBS;

(f) To propose additional parts of the Guide on the GDPS and to keep the Guide up to date;

(g) To complete the development of the Manual on the GDPS;

(h) To keep up to date relevant training syllabi, as required, and to suggest training materials and the holding of seminars and symposia;

(i) To establish, as necessary, study groups composed of experts, or to appoint rapporteurs, for consideration of specific problems of a technical or operational nature;

(j) To act upon matters referred to the working group by the president of CBS;

(2) To give the working group the following composition:

(a) An expert designated by each regional association;

(b) An expert to be nominated by each of the Members responsible for the operation of the World Meteorological Centres;

(c) Experts nominated by Members responsible for the operation of Regional Meteorological Centres and other Members wishing to participate actively in the work of the group;

(d) Experts who may be nominated by presidents of other technical commissions;

(3) To select, in accordance with Regulation 31 of the General Regulations, Mr. F. Duvernet (France) as chairman of the working group.

Res. 6 (CBS-VIII) - WORKING GROUP ON CODES

THE COMMISSION FOR BASIC SYSTEMS,

NOTING Resolution 4 (CBS-VII) - Working Group on Codes,

CONSIDERING:

(1) That the rapid evolution of meteorological requirements and techniques gives rise to the necessity for frequent revision of the existing codes or to that of creating new ones,

(2) That the complexity of the problems relating to codes is constantly increasing and that, consequently, it is desirable to entrust their solution to a permanent group of experts on this subject,

DECIDES:

(1) To establish the Working Group on Codes, with the following terms of reference:

(a) To consolidate and co-ordinate statements received from other bodies, Members, regional associations, other technical commissions and appropriate international organizations on the need for new international code forms and tables of specifications;

(b) To develop codes to meet new requirements which have been so established;

(c) To keep under review the existing international codes and to recommend changes to these codes, as required;

(d) To keep up to date relevant training syllabi, as required, and suggest training materials and the holding of seminars and symposia;

(e) To establish, as necessary, study groups composed of experts, or to appoint rapporteurs for consideration of specific problems of a technical nature;

(f) To take action on problems assigned to the working group by the president of CBS;

(g) To initiate the study and development of a unified code format (such as UNICODE) within the Integrated WWW System Study, suited to the automation of data acquisition, transmission and processing;

(h) To co-ordinate its work on the development of new codes and improvements of existing codes with the CBS Working Groups on the GOS, GDPS and GTS;

(2) To give the working group the following composition:

(a) An expert designated by each regional association;

(b) Experts designated by Members wishing to participate actively in the work of the group;

(c) Experts who may be designated by the presidents of the technical commissions;

(3) To select, in accordance with Regulation 31 of the General Regulations, Mr. G. Doumont (Belgium) as chairman of the working group.

Res. 7 (CBS-VIII) - WORKING GROUP ON THE GLOBAL TELECOMMUNICATION SYSTEM

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Resolution 5 (CBS-VII) - Working Group on the Global Telecommunication System,

(2) That the developments in the field of telecommunications are progressing at an accelerated rate, and

CONSIDERING:

(1) That the concept of the World Weather Watch, in the implementation period 1984-1987, will require a series of technical studies,

(2) That changes in meteorological requirements stemming from the World Weather Watch, other WMO programmes and joint programmes between WMO and other organizations, entail a constant review of the world-wide telecommunications system,

DECIDES:

(1) To establish a Working Group on the Global Telecommunication System, with the following terms of reference:

(a) To study and to formulate recommendations, within the framework of the Integrated WWW System Study, in respect to organizational, technical and procedural aspects of the meteorological telecommunication systems, in particular the Global Telecommunication System of the World Weather Watch, including the collection of weather reports from ships, as well as the collection and distribution of meteorological information through meteorological satellites;

(b) To keep under constant review developments in telecommunication techniques and equipment and their adaptation to the requirements of an efficient, world-wide system of meteorological telecommunications, in particular the advantages derived from space communication techniques, including meteorological satellites, and to formulate appropriate recommendations;

(c) To formulate for meteorological information exchange (observational data and processed information in alphanumeric and pictorial form), proposals on international standardization of operating practices, procedures, equipment and related questions, including format, as well as schedules;

(d) To follow closely the progress on the implementation, as well as the operation of the meteorological telecommunication systems and, as necessary, to formulate recommendations with a view to remedying shortcomings and effecting improvements;

(e) To keep in touch with the activities of the Working Groups on Meteorological Telecommunications of regional associations;

(f) To co-ordinate, as necessary, its activities with the work of other working groups of CBS, in respect of meteorological telecommunications;

(g) To keep abreast of the activities of the International Telecommunication Union, the International Organization for Standardization, the International Civil Aviation Organization, the International Maritime Organization and other international organizations concerned on matters pertaining to meteorological telecommunications;

(h) To keep up to date relevant training syllabi, as required, and to suggest training materials and the holding of seminars and symposia;

(i) To establish, as necessary, study groups or panels composed of experts, or appoint rapporteurs, for consideration of special problems of a technical or operational nature;

(j) To act upon matters referred to the working group by the president of CBS.

(2) To give the following composition to the working group:

(a) The chairmen of the Working Groups on Meteorological Telecommunications of all regional associations;

(b) Experts to be nominated by each of the Members responsible for the operation of World Meteorological Centres and the Regional Telecommunication Hubs on the Main Trunk Circuit and its branches;

(c) Experts nominated by other Members wishing to participate actively in the work of the group;

(d) Experts who may be nominated by presidents of other technical commissions;

(3) To select, in accordance with Regulation 31 of the General Regulations, Mr. A. Henaidi (Saudi Arabia) as chairman of the working group.

Res. 8 (CBS-VIII) - REVIEW OF THE PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE COMMISSION FOR BASIC SYSTEMS

THE COMMISSION FOR BASIC SYSTEMS,

CONSIDERING that Resolution 1 (CBS-(Ext.80)) should be reviewed,

NOTING the action taken on several recommendations adopted prior to the eighth session,

DECIDES:

(1) To replace Resolutions 1, 2, 3, 4 and 5 (CBS-VII) by new Resolutions:

(2) To keep in force Recommendations 20 (CBS-VII) and 12 (CBS-Ext.(80)):

(3) To publish in the final report of the eighth session the texts of the recommendations which were kept in force.*

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* These recommendations are reproduced on page 178.

RECOMMENDATIONS ADOPTED BY THE SESSION

Rec. 1 (CBS-VIII) - AUTOMATED SHIPBOARD AND LAND-BASED UPPER-AIR SYSTEMS

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Resolution 6 (Cg-VIII) - Improvement of the World Weather Watch,

(2) Success of preliminary field evaluations of an improved shipboard rawinsonding system,

CONSIDERING:

(1) The need for reliable upper-air data from ocean and isolated land areas for global large-scale/synoptic forecasting,

(2) The need for high-quality upper-air data especially in ocean and in some isolated land areas for retrieval of satellite soundings and verification of satellite wind vectors,

(3) The potential cost-effectiveness of a co-operative multi-ship upper-air rawinsonding programme using NAVAID-based equipment,

(4) The potential for using the NAVAID concept in its entirety or in part at isolated land stations,

RECOMMENDS:

(1) That the development and operational evaluation phase of NAVAID-based upper-air observing systems with associated automated balloon launch and satellite data collection for use on mobile ships and at isolated land areas be completed as soon as possible;

(2) That the system evaluation study be completed and a deployment and operations plan be developed based on ISS studies in particular Observing System Experiments (OSEs) and Observing System Simulation Experiments (OSSEs);

INVITES Members:

(1) To continue the systems development and operational evaluation programme and to make the results available as part of their participation in the ISS;

(2) To participate in the evaluation programme and in planning the implementation of the concept in the WWW, possibly through the formation of a consortium;

REQUESTS the Secretary-General to prepare and distribute a detailed planning report on technical and operational aspects of NAVAID-based observing systems with associated automated launching and satellite data collection for use on mobile ships and at isolated or remote stations.

Rec. 2 (CBS-VIII) - AIRCRAFT TO SATELLITE DATA RELAY PROGRAMME (ASDAR)

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Resolution 1 (EC-XXXII),

(2) The establishment of the Consortium for ASDAR Development (CAD),

CONSIDERING:

(1) The importance of ASDAR data on the quality of analyses and forecasting of significant weather features,

(2) That ASDAR systems established as a multinational co-operative programme within the improved GOS could provide essential upper-air data in a cost-effective manner,

(3) That the work of CAD is supported only by eight Members of the Organization and that a wider participation would broaden the financial basis and operational capabilities of this important programme,

(4) That the Interim Committee for ASDAR Participants at a meeting in December 1982 prepared a detailed outline for an ASDAR implementation plan and has made recommendations for its completion,

RECOMMENDS:

(1) That Members should actively consider their particiption in CAD with a view toward broadening the base for the ASDAR unit development;

(2) That Members should make vigorous efforts to participate in the planned operational ASDAR programme, in negotiating with airlines to carry ASDAR units and in placing purchase orders for operational units at an early date;

REQUESTS the Secretary-General:

(1) To complete as a matter of urgency the planning for full inclusion of ASDAR as an operational element of the GOS;

(2) To distribute the "ASDAR Implementation Plan" to Members not later than the beginning of 1984;

(3) To solicit Members' participation in ASDAR activities including CAD;

(4) To support ASDAR activities within the limits of the financial resources available to the Secretariat.

Rec. 3 (CBS-VIII) - AMENDMENTS TO THE MANUAL ON THE GDPS, VOLUME I

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Paragraph 3.3.2.3 of the Report of the Conjoint CAeM/ICAO Communications/Meteorology Divisional Meeting,

(2) Paragraph 11 of the Annex to Recommendation 10 (CBS-Ext.(80)),

(3) Part A of the Annex to Recommendation 7(CBS-Ext.(80)),

(4) Resolution 2 (EC-XXXII),

CONSIDERING that the Manual on the GDPS should reflect the latest decisions of the Executive Committee concerning the GDPS of the WWW Plan,

RECOMMENDS:

(1) That, in the Manual on the GDPS, Volume I, Part II, paragraph 4.1.2 - Scales and projections of meteorological charts, 1 : 25 000 000 be added as one of the alternative scales in (c) and (d).

(2) That Attachment II.2 be replaced by the new text as given in Part A of the annex* to this recommendation;

(3) That Attachment III.2 - Data to be stored at RMCs, be replaced by the new text as given in Part B of the annex* to this recommendation;

REQUESTS the Secretary-General to make the necessary arrangements to include the above amendments in the Manual on the GDPS, Volume I.

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* See Annex V.

Rec. 4 (CBS-VIII) - NON-REAL-TIME FUNCTIONS OF DATA PROCESSING CENTRES

THE COMMISSION FOR BASIC SYSTEMS,

NOTING paragraphs 3.2 and 3.3 of the report of the seventh session of the CBS Advisory Working Group,

CONSIDERING that the non-real-time functions of WMCs and RMCs contained in Part III, paragraph 1 of Volume I of the Manual on the GDPS, need further development and updating,

RECOMMENDS that the revised non-real-time functions of data-processing centres given in the annex* to this recommendation, replace the existing non-real-time functions contained in Part III, Section 1, Volume I, of the Manual on the GDPS;

REQUESTS the Secretary-General to make the necessary arrangements to include the above amendments in Volume I of the Manual on the GDPS.

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* See Annex VI.

Rec. 5 (CBS-VIII) - PROPOSED AMENDMENTS TO THE TECHNICAL REGULATIONS

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) The term "tropical revolving storm" is used in several places in the Technical Regulations,

(2) Paragraph 7.1.10 of the report of the Conjoint CAeM/ICAO Communication/Meteorology Divisional Meeting,

CONSIDERING:

(1) The term "tropical revolving storm" is not widely accepted or used by the Members concerned,

(2) The term "tropical cyclone" is standard terminology given in the WMO International Vocabulary and is widely used by Members,

RECOMMENDS the replacement of the term "tropical revolving storm" by the term "tropical cyclone" in the Technical Regulations wherever the term tropical revolving storm is used;

REQUESTS the Secretary-General to arrange for the inclusion of the necessary amendments in the consolidated document on Technical Regulations to be submitted to Ninth Congress.

Rec. 6 (CBS-VIII) - MINOR IMPROVEMENTS TO FM 12-VII SYNOP AND FM 13-VII SHIP

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Resolution 5 (EC-XXXI) - Common code for reporting surface observations from different types of surface station,

(2) Recommendation 11 (CBS-VII) - Editorial revision of the structure of the Manual on Codes, Volume I,

(3) The report of the sixth session of the CBS Working Group on Codes,

CONSIDERING that there is a need for the improvement of certain regulations in codes FM 12-VII SYNOP and FM 13-VII SHIP,

RECOMMENDS that the improvements to FM 12-VII SYNOP and FM 13-VII SHIP given in the annex* to this recommendation be adopted.

REQUESTS the Secretary-General to arrange for the necessary amendments to be included in Volume I of the Manual on Codes by the end of 1983.

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* See Annex VII.

Rec. 7 (CBS-VIII) - EDITORIAL REVISION OF THE MANUAL ON CODES, VOLUME I

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Recommendation 11 (CBS-VII) - Editorial revision of the structure of the Manual on Codes, Volume I,

(2) The report of the sixth session of the CBS Working Group on Codes,

CONSIDERING that there is a need for further improvement of the existing text of the Manual on Codes, Volume I,

RECOMMENDS that the editorial amendments as given in the annex* to this recommendation be included in the Manual on Codes, Volume I;

REQUESTS the Secretary-General to arrange for the necessary amendments to be included in Volume I of the Manual on Codes, by the end of 1983.

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* See Annex VIII.

Rec. 8 (CBS-VIII) - REVISION OF THE STRUCTURE OF THE MANUAL ON CODES, VOLUME I

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Recommendation 11 (CBS-VII) - Editorial revision of the structure of the Manual on Codes, Volume I,

(2) The report of the sixth session of the CBS Working Group on Codes,

CONSIDERING that it is desirable to combine similar codes and, if necessary, to select new code names,

RECOMMENDS that the structure of Volume I of the Manual on Codes, be revised, taking into account the revision plan given in the annex* to this recommendation.

REQUESTS the Secretary-General to assist the Working Group on Codes in its task of revising the structure of the Manual on Codes.

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* See Annex IX.

Rec. 9 (CBS-VIII) - MODIFICATIONS TO CODE FORMS FM 63-V BATHY, FM 64-V TESAC AND DRIBU

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) A proposal made by the Joint WMO/IOC Meeting on IGOSS Code Requirements and Exchange Formats (Geneva, March 1982),

(2) The report of the sixth session of the CBS Working Group on Codes,

(3) The present status of the DRIBU code as a code for international use during the first GARP Global Experiment,

RECOGNIZING:

(1) That changes to code forms FM 63-V and FM 64-V should not require any changes in national procedures,

(2) That reporting the depth of the drogue is an essential requirement for oceanographers,

(3) That there is a requirement to maintain the DRIBU code for reporting drifting buoy observations,

RECOMMENDS:

(1) That the modifications to code forms FM 63-V BATHY, FM 64-V TESAC and DRIBU as given in the annex* to this recommendation, be adopted for use as from 1 July 1983;

(2) That the status of the DRIBU code be elevated to a standard code form and named FM 14-VIII DRIBU;

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

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* See Annex X.

Rec. 10 (CBS-VIII) - IMPLEMENTATION DATE FOR CHANGES TO THE MANUAL ON CODES

THE COMMISSION FOR BASIC SYSTEMS,

NOTING the request from the Executive Committee that the date for implementation of changes to the Manual on Codes be changed from 1 January to another suitable date,

CONSIDERING the problems involved when an implementation date falls on a major holiday and the difficulty of fixing such a date for all cases of code changes,

RECOMMENDS that the principle whereby all code changes are introduced on 1 January, except when special or urgent requirements justify a departure from this principle, be deleted from the Manual on Codes;

REQUESTS the Secretary-General to arrange for this information to be deleted from the Manual on Codes.

Rec. 11 (CBS-VIII) - MODIFICATION TO REGULATIONS TO FM 35-V TEMP AND FM 36-V TEMP SHIP

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Manual on Codes, Volume I, Regulation 35.3.3.1,

(2) Conclusions of the sixth session of the CBS Working Group on Codes, final report, general summary, paragraph 4.5,

CONSIDERING that there is a need to maintain the reporting of the base of the lowest cloud in code forms TEMP and TEMP SHIP,

RECOMMENDS that Regulation 35.3.3.1 for coding cloud data in TEMP and TEMP SHIP be re-worded as follows:

"In TEMP and TEMP SHIP reports, this section shall be used to report cloud data. N_h,h,C_L,C_M, and C_H shall be coded in accordance with the regulations in FM 12-VII SYNOP (12.2.1.2, 12.2.7.3 and 12.2.7.4).";

REQUESTS the Secretary-General to arrange for the inclusion of the modification in Volume I of the Manual on Codes by the end of 1983.

Rec. 12 (CBS-VIII) - AMENDMENT TO SECTION 1, PART B, OF CODE FORM FM 20-V RADOB

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Manual on Codes, Volume I,

(2) That operational use of radar weather observations contained in Section I, Part B of code form FM 20-V RADOB is hampered by the complicated coding and low message-information content,

CONSIDERING that an amendment to Section 1, Part B of the code form FM 20-V RADOB to facilitate the reporting of meteorological interpretation of the echoes would make the code more useful,

RECOMMENDS that Section 1, Part B of code form FM 20-V RADOB be amended to the form given in the annex* to this recommendation and that the new procedures become applicable as from 1 November 1983;

REQUESTS the Secretary-General to arrange for the inclusion of the amendments and the new number of the code as FM 20-VIII in Volume I of the Manual on Codes.

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* See Annex XI.

Rec. 13(CBS-VIII) - WINTEM CODE FORM FM 50-VIII - FORECAST UPPER-WIND AND TEMPERATURE DATA FOR AVIATION

THE COMMISSION FOR BASIC SYSTEMS,

NOTING Recommendation 3.3/2 of the Conjoint CAeM-VII/ICAO Communications/Meteorology Meeting (1982) on the WINTEM code form,

CONSIDERING:

(1) That the CAeM Working Group on the provision of meteorological information required before and during flight (PROMET) had studied the matter and reached the conclusion that the WINTEM code, being more user-oriented, adequately met requirements for an alphanumeric code for the exchange of upper-air forecasts,

(2) That the CAeM Working Group on PROMET also considered that after introduction of the WINTEM code there would be no further need for the ARMET code,

RECOMMENDS:

(1) That the FM 50-VIII WINTEM code given in the annex* to this recommendation be made available for the exchange of forecast upper-wind and temperature data as from 1 November 1983;

(2) That the ARMET code cease to be used for international exchange of upper-air forecasts as from 1 November 1984;

REQUESTS the Secretary-General of WMO to arrange for the inclusion of the WINTEM code form FM 50-VIII in Volume I of the Manual on Codes and for the deletion of the ARMET code from the Manual, at the appropriate date.

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* See Annex XII.

Rec. 14 (CBS-VIII) - AMENDMENTS TO THE MANUAL ON THE GTS, VOLUME 1 - GLOBAL ASPECTS, PART I - ORGANIZATION OF THE GLOBAL TELECOMMUNICATION SYSTEM

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Resolution 5 (Cg-VIII) - World Weather Watch,

(2) The WWW plan for 1980-1983 (WMO-No. 535),

RECOMMENDS the approval of the amendments to the Manual on the Global Telecommunication System, Volume I - Global Aspects, Part I - Organization of the Global Telecommunication System, given in the annex* to this recommendation;

REQUESTS the Secretary-General to make the appropriate changes as given in the annex to this recommendation, in the Manual on the Global Telecommunication System, Volume I - Global Aspects, Part I - Organization of the Global Telecommunication System.

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* See Annex XIII.

Rec. 15 (CBS-VIII) - AMENDMENTS TO THE MANUAL ON THE GLOBAL TELECOMMUNICATION SYSTEM, VOLUME I - GLOBAL ASPECTS, PART II - METEOROLOGICAL TELECOMMUNICATION PROCEDURES FOR THE GLOBAL TELECOMMUNICATION SYSTEM

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Resolution 5 (Cg-VIII) - World Weather Watch,

(2) The WWW plan for 1980-1983 (WMO-No. 535),

RECOMMENDS the approval of the amendments to the Manual on the Global Telecommunication System, Volume I - Global Aspects, Part II - Meteorological Telecommunication Procedures for the Global Telecommunication System, given in the annex* to this recommendation.

REQUESTS the Secretary-General to make the appropriate changes as given in the annex* to this recommendation, in the Manual on the Global Telecommunication System, Volume I - Global Aspects, Part II - Meteorological Telecommunication Procedures for the Global Telecommunication System.

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* See Annex XIV.

Rec. 16 (CBS-VIII) - AMENDMENTS TO THE MANUAL ON THE GLOBAL TELECOMMUNICATION SYSTEM, VOLUME I - GLOBAL ASPECTS, PART III - TECHNICAL CHARACTERISTICS AND SPECIFICATIONS FOR THE GLOBAL TELECOMMUNICATION SYSTEM

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Resolution 5 (Cg-VIII) - World Weather Watch,

(2) The WWW plan for 1980-1983 (WMO-No. 535),

RECOMMENDS the approval of the amendments to the Manual on the Global Telecommunication System, Volume I - Global Aspects, Part III - Technical Characteristics and Specifications for the Global Telecommunication System, contained in the annex* to this recommendation;

REQUESTS the Secretary-General to make the appropriate changes in the Manual on the Global Telecommunication System, Volume I - Global Aspects, Part III - Technical Characteristics and Specifications for the Global Telecommunication System.

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* See Annex XV.

Rec. 17 (CBS-VIII) - AMENDMENTS TO THE MANUAL ON THE GLOBAL TELECOMMUNICATION SYSTEM - MAIN TELECOMMUNICATION NETWORK

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Resolution 5 (Cg-VIII) - World Weather Watch,

(2) Paragraphs 6.8 and 6.9 of the final report of the tenth session of the Working Group on the GTS,

CONSIDERING the evolution of the structure of the GTS and the requirements which the GTS has to meet,

RECOMMENDS:

(1) That the name "Main Trunk Circuit and its branches" be replaced by "Main Telecommunication Network",

(2) That the amendments given in the annex* to the present recommendation be made to Volume I of the Manual on the Global Telecommunication System;

(3) That these arrangements come into effect on 1 January 1984;

REQUESTS the Secretary-General to take the necessary steps for these amendments to be inserted in the Manual on the Global Telecommunication System;

AUTHORIZES the Secretary-General to make any consequent, purely editorial, amendments, in consultation with the president of CBS as regards Volume I and, in consultation with the presidents of the regional associations, as regards the appropriate parts of Volume II.

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* See Annex XVI.

Rec. 18 (CBS-VIII) - AMENDMENTS TO THE MANUAL ON THE GTS, VOLUME I - GLOBAL ASPECTS - PART I - ORGANIZATION OF THE GLOBAL TELECOMMUNICATION SYSTEM

INCLUSION OF SEISMIC BULLETINS IN THE GLOBAL EXCHANGE PROGRAMME

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) The abridged report of Eighth Congress, general summary, paragraph 8.6, concerning use of the WWW Global Telecommunication System for the routine transmission of seismic data,

(2) The request from the Chairman of the United Nations Committee on Disarmament dated 31 August 1982 to the Secretary-General of the WMO to use the Global Telecommunication System for exchange of seismic data on a routine basis,

CONSIDERING the need for co-ordinating arrangements for the exchange of seismic data (level-I data) on the GTS and the relevent telecommunication procedures,

RECOMMENDS:

(1) That seismic data (level-I data) be disseminated on a global and routine basis on the GTS,

(2) That the text given in the annex* to this recommendation be included in the Manual on the Global Telecommunication System, Volume I, Part I, Attachment I-3,

(3) That the amendments given in the annex* to this recommendation be implemented as soon as possible but not later than 1 December 1983.

REQUESTS the Secretary-General to include the amendments, as given in the annex to this recommendation, in the Manual on the Global Telecommunication System, Volume I, Part I - Organization of the Global Telecommunication System, Attachment I-3.

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* See Annex XVII.

Rec. 19 (CBS-VIII) - REVIEW OF THE RESOLUTIONS OF THE EXECUTIVE COMMITTEE BASED ON PREVIOUS RECOMMENDATIONS OF THE COMMISSION FOR BASIC SYSTEMS

THE COMMISSION FOR BASIC SYSTEMS,

NOTING with satisfaction the action taken by the Executive Committee on the recommendations of the extraordinary session of the Commission held in 1980,

CONSIDERING that some of the previous Executive Committee resolutions are still to be implemented,

RECOMMENDS:

(1) That the following Executive Committee resolutions should be kept in force:

Resolution 4 (EC-XXXI)
Resolution 2 (EC-XXXIII),

(2) That the following Executive Committee resolutions are no longer needed and should not be kept in force:

Resolution 5 (EC-XXXI)
Resolution 3 (EC-XXXIII)
Resolution 5 (EC-XXXIII).

A N N E X I

Annex to paragraph 5.5 of the general summary

DRAFT WORLD WEATHER WATCH PLAN FOR 1984-1987

PART I - BASIC OBJECTIVES AND PRINCIPLES

General introduction

1. The World Weather Watch (WWW) serves as the basic programme of the World Meteorological Organization (WMO), supporting other programmes and activities of the Organization. Since the first WWW Plan for 1968-1971 was approved by the Fifth World Meteorological Congress in 1967, the plan has been revised and approved for each new four-year period. The present plan, for 1984-1987, was approved by the Ninth World Meteorological Congress (Geneva, 1983). Members' progress in implementation of the WWW is reviewed periodically, and status reports are issued every two years.

2. Co-operation in operational meteorology among WMO Member nations is the cornerstone of the WWW, especially since modern developments in technology over the last fifteen to twenty years have brought about some rather remarkable changes in the way weather services operate. The observation of weather from space by satellites and the use of electronic computers in weather-data processing have had significant impacts for national services on the methods of producing and exchanging weather observations analyses and forecasts.

Basic concepts and purposes

3. The WWW is used for peaceful purposes, taking into account the national sovereignty and security of States, in accordance with the provisions in the Charter of the United Nations and the convention of WMO.

4. The basic purpose of the WWW shall be the provision of meteorological and related geophysical and environmental information to all Members, within the limits of the agreed system, so that Members can experience the most effective and efficient services possible, in both real-time and non-real-time operations. WWW shall provide Members with data and output products, which will support their provision of services at the national and international levels. Within the WWW available data and products should be exchanged freely between Members in accordance with agreed procedures. For operational work, it is essential that the information be received speedily and in a co-ordinated fashion. For research purposes speed is, in general, not of such vital importance, but the information must be readily accessible in convenient forms.

5. The WWW plays an important role in stimulating research in weather analysis and forecasting. A close working relationship must continue between the scientists who do the research in weather analysis and forecasting and those who use the results of this research, that is, the operational forecaster and also the end user of the product.

6. The WWW is an integrated system which functions on three levels, namely, the global, regional and national levels. Congress decides on general directives for the structure and operation of the WWW. Appropriate bodies of the Organization are concerned with the organizational and procedural details of the WWW. Planning at the national level is, of course, left to individual Members.

Essential elements of the WWW

7. The WWW is divided into three essential elements, largely as a matter of convenience, since these elements are closely linked and inter-dependent. The essential elements are:

(a) The GOS, consisting of facilities and arrangements for making observations at stations on land and at sea, from aircraft, meteorological satellites and other platforms;

(b) The GDPS, consisting of meteorological centres with arrangements for the processing of the required observational data (real-time uses) and for the storage and retrieval of data (non-real-time uses);

(c) The GTS, consisting of telecommunication facilities and arrangements necessary for the rapid and reliable collection and distribution of the required observational data and processed information.

The two support elements, essential for the smooth operation and further co-ordinated development of the WWW, are:

(i) The Monitoring and Operational Information Service, consisting of arrangements for real-time and non-real-time monitoring of the operation of the WWW and making available to all Members information on the status of operations of the WWW and its subsystems;

(ii) The WWW Implementation Support Activity, consisting of arrangements for exchange of knowledge, methodology and means between Members to facilitate the planning, design, establishment and operation of WWW facilities and services in a cost-effective and co-ordinated manner.

8. The Integrated WWW System Study, as described in more detail in Part IV of the plan, is one of the major WWW activities during the period 1984-1987 and is concerned with the future improvement of the WWW. The study involves the further co-ordination and implementation of a composite observing system, an improved data processing/data-communications system, including information exchange formats, and output products and user interface. The study also concentrates on narrowing the gap between developed and developing countries by introducing new technology for the benefit of all Members of the Organization.

9. The WWW is a flexible system which can be adapted to changing technology and operational conditions. The latest technological and scientific developments in observations, data processing and telecommunications should be under constant review. Members should include such developments in the WWW when they implement their components of this plan.

Support of WWW to other international programmes

10. Provided that there is no interference with carrying out the basic purpose of the WWW, the facilities of the WWW may be used in support of other international programmes, jointly established with WMO in conformity with policy decisions of the Organization. Some of the international programmes that use WWW facilities are the World Climate Programme (WCP) and the Global Atmospheric Research Programme (GARP), jointly approved by WMO and the International Council of Scientific Unions (ICSU), the implemented elements of the World Area Forecast System (WAFS), the joint IOC/WMO Integrated Global Ocean Services System (IGOSS) and the Global Environmental Monitoring System (GEMS) of the United Nations Environmental Programme (UNEP).

World Climate Programme

11. The Eighth World Congress established the World Climate Programme comprised of the following components:

(a) World Climate Data Programme (WCDP);

(b) World Climate Applications Programme (WCAP);

(c) World Climate Impact Studies Programme (WCIP);

(d) World Climate Research Programme (WCRP).

12. The purpose of the WCDP is to improve the timely availability of reliable data required for the activities in the other three components of WCP. The WCDP tasks are to:

(a) Consolidate data requirements defined by the WCAP and WCRP;

(b) Promote the development and upgrading of climate data archives, data management and user services at the national, sub-regional and regional levels;

(c) Promote the compilation of basic and derived data sets;

(d) Improve information on data sources;

(e) Promote the long-term development of a co-ordinated distributed climate data system, based on existing systems and in co-operation with the WWW.

13. The WCDP requirements for support from the WWW system are expected to increase rapidly during this financial period. The observational facilities of the GOS (both surface and space-based) will be used more extensively by the WCDP. The development of sub-regional and regional climate data centres will be closely linked with the design and operation of real-time and non-real-time data management subsystems at WWW centres. Segments of the WCP data bases will be stored at WWW data banks where more effective quality control methods and archive retrieval strategies will have to be implemented. For the international exchange and utilization of climatological data for research and application purposes, exchange format guidelines will be developed.

GARP

14. The scientific objectives of GARP are:

(a) To obtain a better understanding of atmospheric motion for the development of more realistic models for weather prediction;

(b) To assess the ultimate limit of predictability of weather systems;

(c) To design an optimum composite meteorological observing system for routine numerical weather prediction of the larger-scale features of the general circulation;

(d) To investigate, within the limitation of a one-year period of observation, the physical mechanisms underlying the fluctuations of climate in the time range of a few weeks to a few years and to develop and test appropriate climatic models.

15. The relationship between the WWW and the GARP is presently focused in objective (c) above. During the present financial period FGGE data will be utilized in helping the design of an optimum composite meteorological observing system for routine numerical weather prediction of the larger-scale features of the general circulation. It is foreseen that co-ordinated series of research activities, carried out by research groups and weather services in countries participating in the FGGE, will be continued during the period. Research into the optimum utilization of satellite data will be a central element of this effort. Further details are also given in Part IV of the plan.

16. The research phases of WAMEX and MONEX, regional activities of GARP, will contribute to the future development of the WWW in the tropical region. The improvement in the basic understanding of the tropical atmosphere and its weather systems will assist in the definition and design of realistic observing systems for the tropics. Similarly, other research projects such as ALPEX will provide design information for areas other than the tropics.

Tropical Cyclone Programme

17. A close relationship exists between the WWW and the Tropical Cyclone Programme. Requirements for the forecasting and warning of tropical cyclones depend principally upon observational data provided through the GOS and processed information provided through the GDPS and transmitted via the GTS. Implementation of the Tropical Cyclone Programme in the period 1984-1987 will rely heavily upon further improvement in the operation of the WWW.

Global Environmental Monitoring System

18. One of the major components of the UNEP Global Environmental Monitoring System is the "Earthwatch", the primary purpose of which is to monitor and assess the state of the oceans, the inland waters, the atmosphere, the land and human health in order that rational decisions can be made for the management of the environment. The monitoring of pollutants that affect weather, climate and human health will receive the first priority. In many respects the Earthwatch is similar to the WWW in that it is a global system comprising national facilities, services and research provided by individual Member

nations. The monitoring of physical parameters of the atmosphere on a global basis for various environmental purposes has been in existence for many years through the WWW and other WMO programmes. As a result, the implementation of the atmospheric monitoring part of the Earthwatch will rely heavily upon the WWW.

Area Forecast System

19. A close relationship will continue to be necessary between the components of the WWW and the World Area Forecast System (WAFS). The WAFS will be a three-tiered system comprising:

(a) World area forecast centres (WAFCs) which would prepare upper-air forecasts for grid points in digital form and disseminate them to regional area forecast centres (RAFCs);

(b) RAFCs which would:

(i) Receive and process, as necessary, the data received from a WAFC and transmit it to users;

(ii) Prepare significant weather forecasts for their respective area of responsibility and exchange them with other RAFC(s) as necessary;

(iii) Prepare significant weather forecasts, based on their own forecasts and on forecasts received from other RAFCs, for a designated area of coverage. These forecasts are then transmitted to users and intended for inclusion in flight documentation;

(c) Users.

20. The support of the WWW to the WAFS by the GOS, GDPS and GTS will be based on the following principles:

(a) That the WAFS relies on the WWW GOS and GTS for the availability of the required basic data on a global scale in the case of WAFCs and for the areas of responsibility in the case of RAFCs;

(b) That the WAFS relies on the WWW GTS, in the initial phase, for the exchange of products between WAFCs and RAFCs. Some parts of the GTS should be used for the dissemination of products from RAFCs to users where this is cost-effective;

(c) That the analysis and forecast products of the WAFS are developed and processed in close co-ordination with the WWW GDPS.

IOC/WMO Integrated Global Ocean Services System

21. The IGOSS is a programme jointly undertaken by WMO and IOC. The main purpose of the programme is:

(a) To provide extensive and timely information on, and prediction of, the state of the ocean;

(b) To support research on the physical and dynamic processes of the ocean.

The close co-operation of the WWW and the IGOSS should provide for the development of a comprehensive monitoring system for the ocean-atmosphere environment.

22. The plans for the IGOSS and the WWW are based on the principles:

(a) That appropriate observational facilities of both programmes, such as voluntary observing ships, research ships, buoys, coastal and island stations, ocean weather stations, ice stations and satellite systems, are used for common purposes and that observational data originating therefrom are exchanged between the two programmes;

(b) That IGOSS relies on the WWW GTS for the collection and dissemination of observational data originating from its observing system;

(c) That the IGOSS Data-processing and Services System (IDPSS) is developed in close co-ordination with the WWW GDPS and the associated Marine Meteorological Services programme. Members therefore have the possibility to develop, by national decision, part or the whole of their national and international marine environmental services programmes through the GDPS of the WWW, the Marine Meteorological Services programme and/or the IDPSS of the IGOSS.

GLOBAL OBSERVING SYSTEM (GOS)*

Purpose and principles

23. The GOS is the co-ordinated system of methods, techniques and facilities for making observations on a world-wide scale within the framework of the WWW.

24. The GOS has been established to provide the meteorological and related environmental and geophysical observations, from all parts of the globe, required by Members for operational and research purposes. It should be flexible and evolutionary in nature so that the mix of specific observational elements can be changed as necessary to take advantage of advances in technology and meet changes in the requirements. The concept of the development of the GOS through the Integrated System Study is outlined in Part IV.

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* Further specifications and details of the functions and organization of GOS are given in the Manual on the GOS (WMO Publication No. 544) (Annex V to the WMO Technical Regulations).

Components

25. The GOS is a composite system containing the surface-based sub-system and the space-based (satellite) sub-system. The former is composed of the regional basic synoptic networks, other observational networks of stations on land and at sea, aircraft meteorological observations, climatological stations, agricultural meteorological stations and special stations. The latter is composed of the near-polar-orbiting and geostationary meteorological satellites.

26. The GOS provides observational information which falls broadly into two categories: quantitative information, derived directly or indirectly from instrumental measurements, and qualitative (descriptive) information. Examples of quantitative information, which specifies the physical state of the atmosphere, are instrumental measurements of the atmospheric pressure and humidity, air temperature and wind velocity. Examples of qualitative (descriptive) information are observations of the state of the sky, the forms of clouds and the types of precipitation.

Classification of requirements

27. The requirements of Members for observations are divided into three categories: global, regional and national.

28. The variations in requirements of the three categories are based on the different scales of meteorological phenomena and processes which occur in the atmosphere. These variations are described in detail in the Manual on the GOS (WMO-No. 544).

Members' major requirements for the period 1984-1987

Global requirements

29. The global requirements derive primarily from the need to provide input to numerical models dealing with atmospheric motions on large and planetary scales. These requirements emphasize averages over large volumes of the atmosphere and the distribution of the wind, mass and moisture fields. At all latitudes, an increasing part of these requirements will be met during the period by a system of satellites. The surface-based system will continue to play its important role by providing the main information required to meet global requirements. The two systems, one based on the surface and the other in space, will complement each other. Surface observations, radiosonde and aircraft reports will provide reference and calibration input to the space system. The space system augments the data points provided by the surface-based system to complete the global coverage.

30. However, in the tropics much more emphasis is placed on the contribution of meso-scale convection to the large-scale dynamics and the large-scale wind field. While satellites are increasingly meeting these requirements, considerable input will be required from the surface-based sub-system, particularly upper-wind data from land, fixed and mobile ship stations and aircraft.

Regional and national requirements

31. There are certain specialized user requirements, such as those for the Area Forecast System, which include global, regional and national categories. Decisions regarding additional observations required internationally for specialized users should be taken under the relevant WMO programme, in co-operation with other international organizations as appropriate.

Scales of meteorological phenomena

32. The frequency and spacing of the observations should be adjusted to the physical scales of the meteorological phenomena to be described and specified.

33. For the purpose of the planning of the GOS the classificaton of scales of meteorological phenomena are small-scale, mesoscale, large-scale and planetary-scale. It must be stressed that this classification is at best a very rough approximation to physical reality. Many phenomena overlap between the classes indicated, and there is also dynamic interaction between the phenomena in the different scales. The description of these scales is given in the Manual on the GOS (WMO-No. 544).

Observational requirements

34. Theoretically, the observing programme should provide data which, through appropriate analysis schemes, describe the state of and temporal and spatial changes in the atmosphere and its boundaries (e.g. the sea surface). In practice, however, it has not been possible to specify the optimum observational requirements for any of the scales, listed in paragraph 33. One of the purposes of the Integrated WWW System Study is to specify the future composite GOS for all atmospheric scales of motion (see Part IV of the plan). However, minimum data requirements have been specified, based upon extensive preparatory studies for the FGGE. These are stated in the Manual on the GOS. Practical requirements stated in the WMO Technical Regulations and elsewhere reflect the influence of two factors: (1) the capability of users to apply the data manually, by automatic techniques or through numerical models; and (2) the capability of observing systems. Both the methods of application and the observing systems are changing and, therefore, the practical observational requirements are also expected to change.

35. Large- and planetary-scale requirements are mainly based on the needs for numerical methods. Manual processors of data have long had requirements for uniform networks and observations at synoptic times. Employment of numerical methods in models, which cover the globe or significant portions thereof, have served to emphasize existing requirements for uniform data networks. Data-assimilation techniques used to integrate asynoptic data into the analysis and forecast models have been implemented at several centres. As a result, the evolving large-scale models have been able to use asynoptic data as well as data collected at standard synoptic hours. With this development, the operational use of asynoptic data has increased considerably in importance, and will affect the design and configuration of the observing system during the present financial period.

36. For the small and meso-scale there is much more variation geographically in the time and space requirements for data than for large-scale phenomena. In this respect the use of asynoptic data as well as of synoptic data in both numerical and manual analysis schemes should be taken into account as well in short-range forecasting, very short-range forecasting and in now-casting methodology.*

SURFACE-BASED SUB-SYSTEM

Composition of the sub-system

37. The surface-based sub-system is a composite of main and other elements.

Main elements

Basic synoptic networks (manned and automatic stations) and other synoptic networks of observing stations

38. The regional basic synoptic networks of both surface and upper-air observing stations constitute the basic synoptic network. They continue to be the main part of the surface-based sub-system. They have been drawn up by decisions of the various regional associations according to their regional requirements and international obligations. They are contained in WMO Publication No. 217 - Basic synoptic networks of observing stations.

39. Automatic weather stations can be used to provide a large part of the surface observations required from stations in the regional basic synoptic networks (see Vol. II, Manual on the GOS), where it would be economical and feasible, particularly at locations where it is not practicable to have manned stations, or at manned stations where shortage of trained staff would otherwise preclude round-the-clock operations.

Fixed sea stations (ocean weather stations, fixed and anchored platform stations and island and coastal stations)

40. Fixed sea stations provide essential and detailed meteorological and oceanographic data from critical locations or ocean areas. Fixed sea stations also provide data for the calibration and verification of soundings by remote sensing from satellites. Ocean weather stations also constitute an important source of sub-surface information (BATHY/TESAC reports) required for WWW and IGOSS.

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* Pending publication of the revised International Meteorological Vocabulary, CBS-VIII adopted the following definitions for these terms used in the WWW Plan for the period 1984-1987:

(a) Short-range forecasting - less then three days;

(i) Very short-range forecasting - 0 to 12 hours;

(ii) Nowcasting - a description of current weather and a 0 to 2 hour forecast;

(b) Medium-range forecasting - 3 to ten days;

(c) Extended (long-) -range forecasting - beyond ten days.

41. The existing number of ocean weather stations should be retained until such time as completely satisfactory and proven alternative observation systems, capable of maintaining the necessary regular reliable observations, become available.

Mobile sea stations (selected, supplementary and auxiliary ship stations and ice floe)

42. Mobile sea stations continue to be one of the main sources of WMO and IGOSS observations over the oceans. Members should endeavour to recruit all suitable ships which may traverse the data-sparse areas. Furthermore, Members should install automatic observing and transmission equipment on mobile ships whenever possible, in order to aid the prompt and accurate transmission of ship reports to meteorological centres through INMARSAT, meteorological satellites or by other means. All efforts should be made to ensure that data transmitted via satellite to a central facility are distributed by appropriate means to the Members having need for them, especially those data taken near coastal areas.

Automatic sea stations (fixed and mobile sea stations and drifting buoy stations)

43. Fixed or drifting automatic marine stations (buoys) are used to obtain meteorological and oceanographic information from critical locations and data-sparse areas. Co-ordinated efforts should be made by Members to initiate a network of drifting buoys over the data-sparse areas of the oceans.

Aircraft meteorological stations

44. Commercial aircraft constitute a valuable source of upper-air data, especially over the oceans and sparsely inhabited areas. The interest shown for this kind of meteorological information has been reinforced by the introduction of the Automated Aircraft Reporting System (AARS) on board wide-bodied commercial aircraft. With the further development of AARS these data (and vertical profiles) will constitute an important part of the composite observation system. Members are invited to arrange with airlines for carrying operational AARS (e.g. Aircraft to Satellite Data Relay, ASDAR) equipment on wide-bodied aircraft when it becomes available .

Other elements

45. Each of the following elements constitutes an important part of the GOS and provides specialized information which is important to the overall purpose of the WWW. Members should endeavour to implement the stations in the elements which meet their own and international needs. These elements are as follows:

Aeronautical meteorological stations

Research and special-purpose vessel stations

Climatological stations (reference, principal and ordinary climatological stations, precipitation stations, climatological stations for special purposes, automatic climatological stations)

Agricultural meteorological stations (principal, ordinary and auxiliary agricultural meteorological stations and agricultural meteorological stations for specific purposes)

Special stations, which include:

Weather radar stations

Radiation stations

Atmospherics-detection stations

Meteorological reconnaissance aircraft stations

Meteorological rocket stations

Ozone sounding stations

Background pollution stations

Planetary boundary-layer stations

Tide-gauge stations

Systems specifications

46. The specifications for each of the above elements, network configurations, observing programmes and frequency of observations are published in the WMO Technical Regulations and its annexes (i.e. Manual on the GOS, Manual on Codes) and in other relevant WMO publications such as the Guide on the GOS, (WMO-No. 488), Guide to meteorological instrument and observing practices, (WMO-No. 8), etc. Further details can be found in the Manual on the GOS (WMO-No. 544).

SPACE-BASED SUB-SYSTEM

47. In accordance with the WWW concept, the space-based sub-system is designed to meet the needs for satellite data on three levels, namely, global, regional and national. There are meteorological satellite systems which have reached advanced stages of development and have become operational or are nearing this stage. Observational information is therefore routinely available to all Members, as part of the GOS, in accordance with the general principles of the WWW. The operational status of satellite systems is announced by the satellite operators, and any change will be made known to all Members. In addition to operational satellite systems, experimental satellites are being tested. Information obtained from these systems may be made available to Members, but does not form a part of the GOS.

Composition of the sub-system

48. Each operational system is composed of:

(a) A space segment, composed of operational satellites, in either operational or standby mode, which should provide the following missions:

(i) Imagery;

(ii) Sounding;

(iii) Data collection;

(iv) Data dissemination;

(v) Direct readout;

(b) A ground segment, composed of:

(i) Receiving and processing stations for satellite signals and data from data-collection platforms (DCPs) with capabilities for further distribution of the data products to the GTS;

(ii) DCPs.

Each specific satellite system is operated and controlled by a Member directly or by an international organization established by several Members.

Space segment

49. The following types of satellite will constitute the space segment:

(a) Near-polar-orbiting satellites will consist of satellites operated by the USSR and by the USA. Each of the operators is expected to have two operational satellites in orbit at any time during the period 1984-1987. (At present the system consists of METEOR/Model 2 and the NOAA/TIROS-N model satellites.);

(b) Geostationary satellites are expected to consist of six satellites at the following locations over the Equator:

140°E - operated by Japan *
94°E - operated by India
70°E - operated by the USSR
0°E - operated by the European Space Agency *
75°W - operated by the USA *
135°W - operated by the USA *

* denoting those in operation in February 1983

Appendix A shows the location of the satellite sub-points of geostationary satellites, as well as the geographical coverage for each of the main missions. This figure does not necessarily show the exact location of the geostationary satellites. It is only meant to illustrate in a general way the coverage provided by such a system. Some of these systems are fully operational, and arrangements for ensuring continuity of operation have been made by the operators in the case of satellite failure or degradation of satellite performance. This will be achieved by an appropriate launching schedule of replacement satellites and standby satellites in orbit. A description of the types of information derived from operational satellites is given in the Guide on the Global Observing System (WMO-No. 488) and also in the WWW Planning Report No. 36 (Role of Satellites in WMO Programmes in the 1980's (WMO-No. 494)).

50. Operational near-polar-orbiting and geostationary satellites, with a capability of data collection and/or platform location, are essential for a number of surface-based observing systems, e.g., drifting buoys, Automated Aircraft Reporting System.

51. In addition to the above operational satellite systems, plans are known for a number of experimental satellites. Other experimental satellite programmes may become operational during the period and may be added to the list of satellites given above.

Ground segment

52. The ground segment is an essential part of the space-based sub-system. Receiving and processing stations of the satellite operators provide for the reception of signals and DCP data from operatonal satellites and the processing, formating and display of meteorologically meaningful information, with a view to distributing it further on the GTS in a convenient form, as required. In addition, other Members operate receiving and processing stations to provide satellite data on a regional and/or national basis.

53. Data-collection platforms play an increasingly important role in transmitting their observations to satellites.

Satellite data for meeting global requirements

54. Global satellite data required for analysis and forecasting of large- and planetary-scale processes should be available for distribution over the GTS by WMCs or satellite operators. They include:

(a) Vertical profiles of temperature and humidity;

(b) Temperature of sea, land and cloud-top surfaces;

(c) Wind field derived from cloud displacements;

(d) Cloud amount, type and height of cloud tops;

(e) Snow and ice cover;

(f) Radiation balance data;

(g) Measurement of liquid water content.

55. The quantitative data should meet specifications stated in the Manual on the GOS (WMO-No. 544).

56. Satellite operators should arrange for the reception and processing of data-collection signals for the area covered, or which are collected by satellite, for distribution, as required, to meet global requirements.

Satellite data to meet regional requirements

57. In order to meet specific regional requirements, regional facilities, established in co-ordination with the satellite operator(s) concerned, should be capable of receiving and processing full-resolution images from appropriate geostationary satellite(s), as well as high-resolution images and sounding

data by direct broadcast from the satellites in polar orbit. Regional satellite facilities should generally be located at or be associated with an RMC or with a very well-developed NMC. Regional satellite facilities should also derive regional wind data from sequences of high-resolution images received from geostationary satellites by direct broadcast. These wind and sounding data should be made available regionally on the GTS. Regional facilities may also receive and process data-collection signals from DCPs which have been relayed by geostationary and polar-orbiting satellites in a designated area.

58. The regional satellite products, together with satellite data received from other centres, should, in general, meet the data requirements of RMCs. On the basis of regional satellite information, alphanumeric messages giving the location and intensity of storms, as well as warnings concerning their occurrence and development, should be distributed over the GTS and/or other telecommunications channels. Regional associations should examine in detail the role of the existing and planned satellite facilities in their respective Regions, with a view to determining their precise regional functions.

Satellite data to meet national requirements

59. The continuing development of the WWW and of space techniques requires a strengthening of the capabilities of the NMCs. Each NMC should receive high- and low-resolution satellite information, in order to maintain a continuous weather watch and support mesoscale and smale-scale analysis or prediction. As a minimum, provision should be made for APT and WEFAX reception at the national level.

60. NMCs may also be equipped to receive relayed signals from DCPs in their territories via the direct-broadcast capabilities of polar-orbiting and geostationary satellites.

Satellite data from experimental and other environmental satellites

61. The primary purpose of experimental satellites is the development and testing of new instrumentation and improvement of that already existing. Satellite programmes established for various environmental applications and experimental satellites may provide information which may be available for operational use. It can be expected that these satellites will provide information on:

(a) Improved temperature and humidity vertical profiles;

(b) Soil-moisture distribution;

(c) Ice type and extent;

(d) State of sea;

(e) Cloud composition;

(f) Cloud liquid water content;

(g) Precipitation distribution;

(h) Distribution of particulate matter in the atmosphere;

(i) Certain atmospheric constituents, e.g. ozone;

(j) Marine pollution;

(k) Sea-surface temperature;

(l) Sea-surface wind speed/stress.

62. However, in contrast to the operational meteorological satellite system which provides real-time data on a continuous and permanent basis, no such feature could be expected from experimental and other environmental satellites. The results of these programmes may assist in determining the desired future evolution of operational systems.

GLOBAL DATA-PROCESSING SYSTEM (GDPS)*

Purpose and principles

63. The purpose of the GDPS is to co-ordinate the data-processing activities of Members in order to make available all processed information they require for both real-time and non-real time applications in an effective and efficient manner. The GDPS should allow access to products and processed information prepared on the basis of recent advances in atmospheric science, using powerful numerical computer methods. Each Member, through the GTS employing suitable transmission techniques, should have real-time access to GDPS products allowing them to benefit from their participation in the WWW. The access to information in the non-real-time mode should allow an effective exchange of delayed information for Members to meet their requirements for observational and processed information.

64. The GDPS is organized as a three-level system of WMCs and RMCs at the global and regional levels, respectively, and NMCs which carry out GDPS functions at the national level. In general, real-time functions of the system involve pre-processing of data, analysis and prognosis, including derivation of appropriate meteorological parameters. The non-real-time functions include collection, quality control, storage and retrieval as well as cataloguing of observational data and processed information for operational and special applications as well as for research.

Organization and functions of GDPS centres

65. The WMCs located in Melbourne, Moscow and Washington, provide products which can be used for general short-, medium- and long-range forecasting of planetary or large-scale meteorological systems. Melbourne will provide products for the southern hemisphere.

66. The RMCs are: Algiers, Antananarivo, Beijing, Bracknell, Brasilia, Buenos Aires, Cairo, Dakar, Darwin, Jeddah, Khabarovsk, Lagos, Melbourne, Miami, Montreal, Moscow, Nairobi, New Delhi, Norrköping, Novosibirsk,

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* Further specifications and details of the functions and organization of the GDPS are given in Volume I of the Manual on the GDPS (WMO Publication No. 485) (Annex IV to the Technical Regulations).

Offenbach, Rome, Tashkent, Tokyo, Tunis/Casablanca, Wellington. These centres should provide regional products which can be used for forecasting of small-, meso- and large-scale meteorological systems by NMCs. Products of RMCs should be presented in such a way that they can be used by Members at the national level as input to data-processing or interpretation procedures which must be performed to provide assistance or service to users.

67. NMCs should be equipped to receive WMC, RMC and other products for further processing, especially in respect to meso- and small-scale meteorological systems. NMCs should also develop a capability of interpreting NWP products for provision of services to users. NMCs should have an independent capability, if needed, to develop their own manual or NWP products to meet national requirements.

68. The system of WMCs and RMCs should be kept under review by CBS and, as appropriate, by regional associations. Steps should be taken by them to fill any gaps in the system and to avoid any undesirable redundancy, and to make appropriate recommendations for this purpose to the Executive Committee.

PRINCIPLES OF OPERATION OF THE GDPS

Real-time service*

Observational data requirements of the GDPS

69. The GDPS will require complete and timely observational data from both the surface-based and space-based subsystems of the GOS to meet the operational forecasting and processing requirements at the national, regional and global levels. Therefore, complete, reliable and timely collection of quality-controlled observational data is a prerequisite for the proper functioning of the GDPS. This requires full integration of the GDPS with the GOS and the GTS.

70. The GDPS data requirements for short-range and medium-range weather forecasting could be summarized as follows:

(a) The short-range weather forecasts, including the quantitative precipitation forecasts and warning services, require data from both manned and automatic stations on land and at sea, as well as from radar, polar-orbiting and geostationary satellites, as well as inputs from global models for use in initialization and boundary specification. Methods should be developed for the rapid communication of these data to the forecast office and for their automatic display and assimilation in short-range forecasting. Special emphasis should be placed on the general distribution of visual and infra-red satellite images from both geostationary and polar-orbiting satellites;

(b) Global data will be needed for forecasting in the medium-time range. During the period of 1984-1987 these data will be a combination of observations from surface-based and space-based

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* Details of methods used in real-time operations of GDPS centres are found in the Guide on the GDPS (WMO Publication No. 305).

stations/platforms providing a continuous mix of synoptic and asynoptic data. In addition to medium-range forecasting needs, global models are expected to provide initial and boundary conditions for regional and national models.

To assist in determining future data requirements, studies must also be pursued on the best mix of observing systems and on the most economic instrument systems for observing the weather over the globe.

71. To ensure a high level of data integrity, the GDPS will need to pay particular attention to the quality-control of observational data and the methods used for converting Level I (raw) data to Level II data, in particular, wind vector data from geostationary satellites and vertical temperature profile and sea surface temperature data from polar-orbiting satellites, and as applicable, from geostationary satellites.

Processing requirements of the GDPS

72. To exploit more effectively the surface and spaced-based subsystems of the GOS, adequate methods of data processing will need to be developed further for the various scales and time ranges in operational weather forecasting.

73. The use of global or hemispheric numerical models for short- and medium-range weather forecasting will require sophisticated methods of multivariate analysis and data assimilation, including model-dependent initialization techniques such as normal modes and four-dimensional assimilation methods.

74. To improve warning and short-range forecasts on the regional and national scales, it is desirable to implement numerical fine mesh limited area models. For this purpose, there is a need to improve the technique of using boundary values, provided by large-scale NWP models, to improve the integration in fine mesh models.

75. Limited area models as well as larger-scale ones can provide useful inputs for various interpretation methods. These techniques are able to provide direct forecasts of specific weather elements which are of interest for the users of meteorological services such as temperature, precipitation, wind, ceiling, visibility, etc.

76. The techniques are now available for a considerable improvement of now-casting and very short-range forecasting based on radar and satellite information as well as highly automatized mesoscale network. The development of such systems should be encouraged to improve the forecasts and warnings issued to the public. In particular, these techniques allow the drastic improvement of the real-time warnings of rainfall amount.

Production and distribution of GDPS products

77. The standard and recommended procedures, given in Volume I of the Manual on the GDPS, include those concerned with the production and distribution of products at WMCs, RMCs and NMCs. These procedures include programmes of output products, information on times of receipt of observational and processed data and exchange of products between centres. Also included are procedures and minimum standards for real-time quality control of data within the GDPS. It is important that these procedures be followed by all Members to the maximum extent possible.

Non-real-time service

78. The non-real-time functions and operations of WMCs, RMCs and NMCs are given in Volume I of the Manual on the GDPS. These include:

(a) Collection and storage in the GDPS of all direct observations and a selection of derived data, analyses and forecasts;

(b) Quality control of data to be stored, including minimum standards for non-real-time quality control;

(c) Use of media and formats recommended for international exchange of data;

(d) Publication of catalogues of stored data.

The non-real-time service should be developed as an integrated part of the GDPS activities and should particularly support the activities of NMCs in respect to information services provided to users.

GLOBAL TELECOMMUNICATION SYSTEM (GTS)*

Purpose and principles

79. The GTS is a fully integrated component of the WWW which should provide for the flow of data and information required to meet the agreed WWW system requirement in a timely, reliable and cost-effective way. It should ensure that all Members have access to all data and information available in the system needed to satisfy their requirements.

80. The GTS has been established primarily to provide communication services for the rapid and reliable collection, exchange and distribution of the required observational data, particularly GOS data, and also processed information from WMCs and RMCs operating within the GDPS of the WWW, to meet the needs of Members for operational purposes and those research purposes which necessarily involve the exchange of information in real-time or quasi-real time. The GTS will also give telecommunication support for the implementation of other WMO programmes, joint programmes with other international organizations and other environmental programmes as decided by Congress or the Executive Committee, in as far as its primary objectives allow.

81. The facilities provided in the GTS and the techniques to be employed should take into account the ability of Members to establish, operate and use them, and be adequate to accommodate the types and volume of traffic of meteorological data/or information and its transmission within the required time limits to meet the needs of Members for operational and research purposes within the WWW and other programmes, as agreed by Congress or the Executive Committee.

82. The GTS should be fully integrated with the GOS and GDPS through appropriate interfaces allowing for flexibility in the evolution of the WWW and allowing freedom in the selection of technology, which will continue to vary considerably between Regions and parts thereof.

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* Further specifications and details of the functions and organization of GTS are given in the Manual on the GTS (WMO Publication No. 386) (Annex III to the Technical Regulations).

83. The collection, exchange, co-ordination of transmission schedules for all types of data or information, and establishment of procedures for the operation of the GTS should be co-ordinated by CBS and regional associations concerned.

General organization and functions of the GTS

84. The GTS is organized on a three-level basis, namely:

(a) The Main Telecommunication Network;

(b) The Regional Meteorological Telecommunication Networks; and

(c) The National Meteorological Telecommunication Networks.

85. The GTS is internationally supported by the telecommunication functions of the following centres:

(a) World Meteorological Centres (WMCs);

(b) Regional Telecommunication Hubs (RTHs);

(c) Regional Meteorological Centres (RMCs), as necessary, in accordance with regional agreement; and

(d) National Meteorological Centres (NMCs).

86. The Main Telecommunication Network links together the World Meteorological Centres and the Regional Telecommunication Hubs which have been specified by Congress. These are:

(a) WMCs: Melbourne, Moscow, Washington;

(b) RTHs: Beijing, Bracknell, Brasilia, Buenos Aires, Cairo, Dakar, Jeddah, Nairobi, New Delhi, Offenbach, Paris, Prague, Sofia, Tokyo.

The Main Telecommunication Network provides a data transport function between WMCs and those designated RTHs. It ensures the rapid and reliable exchange of observational data and processed information required by Members. Maximum effectiveness is gained by routeing data through the growing number of circuits of the MTN. A diagram indicating the configuration of the Main Telecommunication Network is given in Part I of Appendix B.

87. The Regional Meteorological Telecommunication Networks consist of an integrated system of links which interconnect RTHs, NMCs and RMCs and/or WMCs. Regional Telecommunication Hubs, in addition to those listed above, have been specified by the regional associations. These are given in Part II of Appendix B. The Regional Meteorological Telecommunication Networks ensure collection of observational data and selective distribution of meteorological information to Members. The RTHs on the MTN perform a determining interface function between the Regional Telecommunication Networks and the MTN.

88. The National Telecommunication Networks enable the NMCs to collect observational data and to receive and distribute meteorological information to meet the requirements of Members concerned.

89. In addition to the above elements, data-collection and -distribution missions of meteorological and environmental satellites will play an important role within the GTS. Data collection platforms constitute an integral part of the GTS for the collection of in-situ observations from fixed and mobile platforms. Furthermore, direct broadcast channel(s), e.g. analogue low-resolution transmission, known as WEFAX, is an important part of the GTS for the areal distribution of pictorial information. Arrangements for the use of specialized satellites for data collection and distribution to ships using INMARSAT will be made under the GTS; the same applies to other similar systems. The special satellite capabilities will be co-ordinated and fully integrated into the WWW operation as far as required and possible.

90. Details of the organization and functions of the networks and centres mentioned above are given in the Manual on the GTS.

Operational procedures, technical characteristics and specifications for the GTS

91. The standard operational procedures and technical characteristics, specifications of meteorological transmissions and engineering of WMCs and RTHs on the Main Telecommunication Network have been developed in detail and are contained in the Manual on the GTS (Volume I - Global Aspects). In particular, appropriate procedures and technical characteristics have been developed for the use of improved telecommunications means and techniques, such as satellite links, multiplexed digital channels, digital facsimile, bit-oriented protocols, etc. CBS is responsible for reviewing, modifying and updating the regulatory material contained in Volume I of the Manual on the GTS in the light of organizational and technological developments and results of the Integrated WWW System Study.

92. Regional Meteorological Telecommunication Networks are so developed by regional associations as to be compatible with the system characteristics (engineering, transmission characteristics, operation) of the MTN. Compatibility and proper interfacing with the MTN is essential to ensure an efficient flow of traffic over the GTS, while allowing maximum flexibility in the planning, design and in the mode of implementation of Regional Telecommunication Networks. Details of regional telecommunication networks are contained in the Manual on the GTS (Volume II - Regional Aspects).

93. National Telecommunication Networks should be developed so as to ensure an efficient flow of traffic over the GTS within the specified time limits and a maximum benefit to the Member from the whole system.

94. The satellite operators and WMO have developed and promulgated the standardized technical characteristics of international and national data collection platforms, as well as their certification and admission procedures. Details may be included in the Manual on the GTS (Volume I), as appropriate.

95. Arrangements for the collection of observations from ships have been developed jointly by CBS, CMM and IOC/WMO, in consultation with appropriate international organizations and are contained in the Manual on the GTS, Volumes I and II, as appropriate.

96. Arrangements for collection of aircraft weather reports have been developed jointly by CBS, CAeM and ICAO, as appropriate, and are contained in the WMO Technical Regulations (WMO-No. 49), Volume II - Meteorological Services for International Air Navigation, and in the Manual on the GTS (Volume I).

MONITORING THE OPERATION OF THE WORLD WEATHER WATCH

Objectives

97. The objectives of the monitoring of the operational performance of the World Weather Watch, are in particular to facilitate the co-ordination and co-operation between Members and centres with a view of maintaining efficiency and effectiveness of the WWW on a global, regional and national level. As the operation of the three main elements of the WWW (GOS, GDPS and GTS) is so interrelated, individual elements cannot be monitored independently.

Components

98. The primary components for monitoring the operation of the WWW are:

(a) Real-time monitoring;

(b) Non-real-time monitoring;

(c) Follow-up action for co-ordination and assistance.

The details of these components, as well as the aspects of their implementation are included in the plan for monitoring the operation of the WWW developed by CBS and approved by the Executive Committee, which is published in the appropriate WWW Manuals. An essential aspect of the monitoring is to assess the quality as well as the quantity of data which are available to Members. Emphasis should be placed on real-time monitoring as a first priority to ensure that observational and processed data are available operationally in a usable and timely fashion.

99. The GOS is concerned with ensuring that observations are made according to the prescribed standards, are encoded correctly and are presented for transmission at the times laid down.

100. The GTS is concerned with ensuring the regular flow of meteorological information, both raw and processed. All GTS centres (NMC, RTH/RMC, WMC) check on the standard format of messages and their reception within specified times, and inform the relevant centre about inadequacies, for real-time monitoring. All GTS centres, and in particular those on the Main Telecommunication Network, participate in the non-real-time monitoring by checking the reception of data and compiling statistics during the agreed periods.

101. The GDPS is concerned with elaborating and providing processed information for timely distribution, and for controlling quality of data.

Responsibilities

102. The basic responsibilities for monitoring the operation of the WWW rest with Members.

103. The Members should implement the plan for monitoring the operation of the WWW at the earliest possible date, in particular the real-time monitoring.

104. The WMO Secretariat plays an important role in the monitoring of the operation of the WWW on a non-real-time basis as prescribed in the plan for monitoring the operation of the WWW. The Secretariat will carry out the necessary analyses of the non-real-time monitoring reports from the WWW centres to identify the level - global, regional or national - at which deficiencies occur. The Secretary-General will co-ordinate and advise on assistance necessary to rectify the deficiencies revealed by the results of the monitoring.

WWW IMPLEMENTATION SUPPORT ACTIVITY

Objective

105. The overall objective of the co-ordinated WWW Implementation Support Activity is to guide, advise and support Members in the planning, establishment and operation of observing, telecommunication and data-processing systems of the WWW in such a way that the minimum requirements of the WWW system could be fulfilled in a cost-effective and co-ordinated manner.

Components

106. The WWW Implementation Support Activity components and the mechanism for the exchange of knowledge, experience, methodology, means etc., between Members will be determined through the Integrated WWW System Study (Part IV). The WWW Implementation Support Activity should include at least the following main areas:

(a) Analysis and definition of needs and resources required:

  (i) WWW users' guides and manuals;

  (ii) Library of functional system specifications for key facilities and services;

  (iii) Cost/benefit analyses;

  (iv) Analyses and determination of Members' needs;

(b) Provision of technical advice:

  (i) WWW scientific and technological referral (information systems);

  (ii) Specialized training;

  (iii) Advisory services on WWW system operational aspects;

(c) Development of support structure:

  (i) Site surveys, determination of power requirements, telecommunication needs, etc.;

(ii) Co-ordination of assistance;

(iii) Physical installation and commissioning;

(iv) Operating manuals and procedures.

107. The focus of these activities will be initiated during the 1984-1987 time frame. The CBS will provide the basic philosophy and concept of operation for the Implementation Support Activity of the WWW. There will be established, through the CBS and the WMO Secretariat, a feedback mechanism whereby improvements and inputs from the ISS associated with (a) to (c) above, will be integrated into this WWW activity. The Secretariat will carry out the necessary co-ordination with Members to ensure that they benefit from this aspect of the WWW.

108. Some of these activities are presently being accomplished within the framework of the WMO, but are loosely organized. The purpose of including the WWW Implementation Support Activity as a separate element within the WWW is to focus the activities which are necessary to maintain an operational WWW.

PART II - OBJECTIVES OF THE WWW DURING 1984-1987

General goals

109. The main objective of the WWW during 1984-1987 is to raise its level of effectiveness and homogeneity of operation of the total system through closer co-ordination and integration of the activities under all main elements, i.e., GOS, GDPS and GTS. The integration of the WWW elements will be one of the most urgent objectives. It should allow a flexible implementation of new advances in atmospheric sciences and technology. It should also allow Members to participate and reap benefits through properly designed interfaces between the high technology part of the system and conventional facilities operated at the rest of the WWW.

110. The integration and interfacing of systems to achieve this objective will be an important activity during 1984-1987 of the EC, CBS and regional associations.

111. The overall goals of the WWW during 1984-1987 should be the further development along the general lines indicated in paragraph 109 above, to achieve:

(a) Improvements in the short- and medium-range meteorological forecasting for general purposes and in support of special activities in the sectors of agriculture, aviation, shipping, fishing, land transportation, water resources management, energy, industry, recreation, etc.;

(b) Improvement of the longer range meteorological forecasts for the benefit of long-term planning in agriculture, water resources management, etc.;

(c) Improvements in the timeliness and accuracy of warnings against natural disasters caused by meteorological phenomena, such as tropical cyclones, storm surges, squall lines and tornadoes, sand storms, etc.;

(d) Improvements in the provision of observational data and processed information for applications in a real- and non-real-time mode as required;

(e) Improvements in the provision of meteorological and other related environmental information for understanding many aspects of environmental pollution and for taking remedial action;

(f) Improved methods and numerical models for analysis and very short-range forecasting of meso-scale atmospheric phenomena as well as for "now-casting";

(g) Arrangement for easier access to stored (archived) data and information for all parts of the world for applied as well as basic atmospheric research or related environmental research projects, including the World Climate Programme;

(h) Improved monitoring of WWW global, regional and national operations and introduction of more effective measures to remove the detected deficiencies in the system;

(i) Improvement of speed, reliability and capacity of data exchange to meet the global, regional and national requirements;

(j) Orderly exchange of knowledge, methodology and means in support of the design, establishment and operation of WWW components.

Main tasks to be carried out during 1984-1987

112. The main tasks within the GOS are:

(a) Consolidation, further implementation and expansion, where appropriate, of the regional basic synoptic networks of surface and upper-air stations, particularly in Regions I, II, III and in parts of other Regions where required;

(b) Gradual implementation of an optimized GOS, taking into account the results of the Observing System Experiments (see also Part IV);

(c) Gradual updating of the appropriate parts of the GOS, taking into account the results of the Observing Systems Simulation Experiments for sub-synoptic, meso- and small-scale phenomena;

(d) Increased implementation of the ASDAR and drifting/fixed buoys technology and network programmes to enhance the GOS in data-sparse areas through broad support by Members;

(e) Improvements, as appropriate, in the surface and upper-air networks through use of automation techniques and increased use of advanced technology for upper-air measurements including use of microcomputers for conversion of Level I signals into Level II (meteorological parameter) data;

(f) Improved quality and variety of data available from polar-orbiting and geostationary satellites to meet the requirements of Members for analysis and forecasting and storm-warning centres;

(g) Conversion of experimental/temporary geostationary satellite programmes into an operational system of geostationary satellites comprised of appropriate space and ground segments.

113. The main tasks within the GDPS are:

(a) Establishment and gradual implementation of an appropriate data management concept for handling of WWW data and information to assist Members to meet national and international obligations;

(b) To promote development of improved data assimilation and analysis schemes, initialization and interactive processing of data for short- and medium-range forecasting and their implementation by GDPS centres for operational use;

(c) To promote development of improved NWP product interpretation methods and arrange for gradual implementation at GDPS centres as appropriate;

(d) To promote development of techniques for improvement of very short-range weather forecasting and now-casting;

(e) To promote improvement of procedures and mechanisms for collection, storage and retrieval of near-real-time and non-real-time data in supporting real-time activities as well as long-range weather forecasting service;

(f) To establish guidance or minimum standards for quality control of non-real-time meteorological data.

114. The main tasks within the GTS are:

(a) Gradual introduction of the CCITT and ISO data transmission standards, suitable for use within WWW;

(b) Upgrading of the Main Telecommunication Network into a fully automated system according to the relevant ISO and CCITT standards;

(c) Interfacing of the Regional Telecommunication Networks of all WMO Regions with the Main Telecommunication Network as well as with National Meteorological Centres in such a way that Members can use telecommunications techniques suitable for their specific purposes, abilities and economic conditions;

(d) Development and upgrading of the Regional and National Telecommunications Networks in order to meet the requirements of Members;

(e) Completing integration of the telecommunication capabilities of meteorological satellites and of the telecommunication services provided by other specialized satellites (e.g. INMARSAT);

(f) Development and implementation of telecommunication procedures for real-time access to the data management sub-system of the GDPS;

(g) To fulfil the requirements of ICAO for the transmission of area forecast products between World Area Forecast Centres and/or Regional Area Forecast Centres during the initial phase of the WAFS.

115. The main tasks to be carried out within the WWW as a whole are:

(a) To conduct, by active participation of Members, WMO technical commissions, the Secretariat and other concerned bodies, the Integrated WWW System Study with the aim to reach early results and conclusions on key issues of particular importance for the development and improvement of WWW main elements;

(b) To develop and improve the Monitoring and Operational Information System through the three main elements GOS, GDPS and GTS in both real-time and non-real-time mode, making available in due time to all Members information on the status of operations of the WWW and its deficiencies;

(c) Development and gradual introduction of WWW Implementation Support Activities to ensure an orderly establishment and operation of GOS, GDPS and GTS sub-systems and components.

PART III - IMPLEMENTATION OF THE WORLD WEATHER WATCH PLAN

General

116. The continued implementation of the WWW should be maintained according to the following basic principles:

(a) All activities connected with the implementation and operation of the WWW on the territories of individual countries should be the responsibility of the countries themselves but, where necessary and so requested, assistance may be in part provided by:

(i) The United Nations Development Programme (UNDP), which should be used to the maximum possible extent;

(ii) Bilateral or multilateral arrangements;

(iii) Contributions in financial form or in the form of equipment or services by Members of WMO; such contributions will constitute the WMO Voluntary Co-operation Programme (VCP);

(b) The continued implementation of the WWW in regions outside the territories of individual countries (i.e., outer space, oceans, Antarctica) should be based on the principle of voluntary participation of countries which desire and are able to do so, by providing facilities and services, either individually or jointly, from their national resources or through bilateral or multilateral arrangements. The possibility of granting assistance from the WMO VCP should, however, not be excluded;

(c) Establishment and operation of WWW components and sub-systems should be undertaken through co-operative arrangements between Members or groups of Members, when appropriate;

(d) In the implementation of the WWW Plan, maximum use should be made of existing facilities and arrangements in the different fields of activity involved. The implementation programme includes the establishment during the period 1984-1987 of the new and improved facilities required by the plan and any necessary further work concerning details relating to these facilities. The main actions required in implementing the WWW during the period 1984-1987 are given in the paragraphs below;

(e) No existing component or facility of the WWW should be removed before the corresponding new component or facility can meet the requirements at least to the same extent as the old;

(f) The further development of the three main elements - GOS, GDPS and GTS - through the WWW Implementation Support Activity and the monitoring of the operation of the new and improved facilities and services which are projected, require a considerable amount of scientific research, development and engineering, coordination of procedures, standardization of methods and coordination of implementation, education and training, and feedback of monitoring results.

The main actions required during the period 1984-1987 are:

(a) Continuing the further development of the WWW based on the decisions of Cg-IX, EC, RAs and upon recommendations of CBS, incorporating to the maximum extent possible the results of the Integrated WWW System Study (see Part IV);

(b) Extending and improving the operations of the WWW and its major elements, i.e. GOS, GDPS and GTS, with a view to achieving high system reliability and effectiveness;

(c) Providing increased support needed by other WMO and international programmes established jointly with other international organizations.

Specific priorities for the Implementation of WWW

117. The specific priorities for implementation actions within the WWW elements are given below:

GOS

(a) Continued and co-ordinated efforts towards the implementation of the existing plans for the regional basic synoptic networks of surface and upper-air stations, particularly in regions or sub-regions where strong requirements exist;

(b) Development of new or improved cost-effective operational observing systems or components through individual studies carried out within the ISS, especially through global, regional or national observing-system experiments;

(c) Continued efforts towards firm arrangements from operational meteorological satellite systems, consisting of a minimum of 4 near-polar-orbiting satellites and at least 5 geostationary satellites, and the improvement of the quality and variety of data from these systems;

(d) Development and implementation of data management concepts in the WWW to meet users' needs.

GDPS

(a) Continued development of forecasting systems, on all time- and space-scales, taking into account new observation mixes and advanced data assimilation methods;

(b) Development of operational now-casting and very short-range forecasting systems using satellite and radar information;

(c) Development of non-real-time data processing to provide increased support to WCP and other national and international activities;

(d) Development of phased implementation of data management concepts in the WWW to meet users' needs.

GTS

(a) Operation of all circuits of the Main Telecommunication Network (MTN) on 4800/9600 bit/s using cable or satellites;

(b) Usage of protocols for data transmission according to CCITT and ISO recommendations;

(c) Increased application of digital facsimile and multiplexing techniques;

(d) Speeding-up the implementation of the Regional Meteorological Telecommunication Network (RMTN) and automation of RTHs/NMCs;

(e) Improvement of the regional collection of observational data and exchange of these data and processed information between the RMTNs and MTN, in particular in Regions I and III and some parts of other Regions, as well as between RTHs and NMCs.

MONITORING OF THE OPERATION OF WWW

(a) Assist in organizing on-site monitoring at specific Regional Telecommunication Hubs;

(b) Develop uniform procedures for conducting periodic monitoring of the MTN;

(c) Develop procedures for monitoring/verifying processed information;

(d) Implement co-ordinated real-time monitoring of the GOS and the GTS;

(e) Development of procedures for periodic monitoring of the quality of the meteorological content of observational data as received by GDPS centres.

WWW IMPLEMENTATION SUPPORT ACTIVITY

(a) Summary of scientific and technological development in the form of planning reports, technical notes and other publications;

(b) Improvement of advisory service on WWW systems operation aspects through arrangements for the provision of experts' services and advice;

(c) Co-ordination of assistance in the implementation of services and facilities;

(d) Roving seminars on the implementation of new developments.

PART IV - THE INTEGRATED WWW SYSTEM STUDY (ISS)

General introduction

118. The completion of the Integrated WWW System Study (ISS) is one of the major WWW activities during the period 1984-1987. The CBS is the leading technical commission for the conduct of the ISS, in co-operation with other technical commissions, other bodies and WMO programmes, as necessary and appropriate.

119. The planning activities of the ISS are grouped under the following 6 study areas:

Study Area (1) Optimized observing system;

Study Area (2) Inter-relation of data-processing/data-communication;

Study Area (3) Improvement of the GTS;

Study Area (4) Information exchange formats;

Study Area (5) Output products and users interface;

Study Area (6) Implementation Support.

120. The overall co-ordination of the conduct of the Integrated WWW System Study is carried out by the president of CBS with the assistance of the CBS Advisory Working Group and the WMO Secretariat. Numerical Observing System Experiments are co-ordinated by the JSC and its Working Group on Numerical Experimentation.

121. Results of studies made available by WMO Members or from the work of experts, study groups, the Secretariat, etc. will be reviewed by the president and working groups of CBS and by Members. Final results will be made available to Members as soon as possible for considering and planning their implementation activities related to the WWW programme. The conclusions and recommendations on the ISS will be developed by the CBS.

Basic directives for ISS

122. The general directives for the planning and conduct of the study are as follows:

(a) The basic purpose of the ISS is to develop plans which would ensure a more complete implementation of the stated objectives of the WWW plan (see Part I of this plan). The study will thus provide a realistic long-term plan to be used by Members in developing their national programmes for future improvements of the WWW;

(b) Overall policy and strategy for the planning and implementation of the future WWW will involve consideration of the ability of Members to implement and operate WWW facilities and services;

(c) While recognizing all aspects contributing to fulfilling the purpose of the WWW, highest priority within the ISS should be given to those aspects related to the real-time operations for the production and dissemination of data, analyses and forecasts required to forecast globally significant atmospheric features up to several days ahead, including short-range forecasting of meso-scale features;

(d) Strong emphasis is placed on the need to narrow the gap in the implementation and operation of the WWW which now exists between developed and developing countries. Appropriate ways must be found for the transfer of knowledge and proven methodologies to developing countries and for assisting them in the implementation and operation of the WWW;

(e) The Integrated WWW System Study will take into account scientific and technological developments and determine their suitability for incorporation into an integrated WWW system;

(f) The actual implementaton of the results of the study will be carried out in a step-by-step fashion over many years.

123. The conduct of the ISS and planning of the improved WWW should be forward-looking, imaginative and realistic, along the following lines:

(a) Special attention should be given in helping national Meteorological Services to meet their national responsilbilities and obligations. In this regard, attention is needed to improve techniques for meso-scale forecasting, and for the application of WWW data and products to specialized service programmes;

(b) The need for the improvement of the WWW in the tropics and the sub-tropical regions should receive special attention in order to eliminate the most serious deficiencies and to upgrade observation, telecommunication and data-processing systems. A strong tropical weather prediction research programme is necessary to facilitate improved forecasts and warnings for the tropical belt;

(c) The proposed WWW improvements should consider both modern technology and Members' abilities to implement and operate new or upgraded facilities and should also ensure that all Members of the Organization should be able to participate fully in the WWW.

The Observing System

124. The Observing System of the improved WWW is expected to be a composite system, a mix of surface-based and space-based networks. Contingency planning should be built into the future WWW to prevent catastrophic large-scale outages. Early experiments with FGGE data show clearly the importance of observational data obtained by satellites; indeed they are playing an increasingly important operational role, especially in covering the data-sparse areas in the tropics and southern hemisphere. Thus the GOS will provide observations which to a great extent are asynoptic. The impact of drifting buoy, ASDAR and other special data systems on the quality and range of useful weather forecasting needs additional evaluation in order to guide decisions by the appropriate WMO bodies for further operational implementation.

125. In proceeding with the ISS it should be accepted that a complete, fully operational space-based system must be regarded as an essential part of the improved GOS. In this connexion, an extension of the existing upper-air network, primarily in oceanic areas, covering all climatic regions, may be essential to produce high quality vertical sounding data from satellites.

126. The composition and configuration of the Global Observing System will primarily be determined and optimized for the description of the initial state of the planetary- and large-scale atmospheric phenomena for use in numerical data assimilation schemes. The design of the global observing system and the future development of numerical modelling techniques will therefore be closely inter-related and inter-connected and guided by the results of numerical observing system experiments.

127. Observing System Experiments (OSEs) and Observing System Simulation Experiments (OSSEs) are essential in planning a composite optimum observing system for forecasting on various time and space scales and for demonstrating the need for the introduction of new observing systems and techniques. Well-defined guidelines and programmes for the conduct of OSEs and OSSEs are required in order to receive the maximum guidance for the design and planning of the improved GOS. The ISS will rely heavily on the participation and support of various research and forecasting centres for the conduct of such experiments. Results from the OSEs and OSSEs will have to be available to the ISS by the end of 1984.

128. Major efforts will also be required to determine the type and configuration of observing systems and networks needed for analysis and forecasting of meso- and small-scale atmospheric phenomena. Such networks may vary in composition and configuration from area to area.

The Data Processing System

129. The Data Processing System of the improved WWW is expected to continue with the present real- and non-real-time functions but should be enhanced through closer co-ordination between WMCs, RMCs and NMCs for providing improved processed information to Members according to their national and international requirements and obligations. The increasing amount of asynoptic data might require the development and adoption of more sophisticated data assimilation techniques at GDPS centres. The ISS also should focus its study efforts on the inter-relationship of data-processing and data communications and the associated procedures and techniques as well as defining adequate and appropriate interfaces between Data Processing Centres. These steps must be taken to ensure that Members can produce and receive the products and data they need for areas within and outside their region. The ISS also should note the differences in forecast methodologies and product requirements for tropical and extra-tropical regions and for different scales of motion. A review of the present arrangements for data handling is required to permit evaluation of the need for a more effective data management scheme in the WWW.

The Telecommunication System

130. The improved Telecommunication System will continue to have a three-level structure, namely the Main Telecommunication Network (MTN), Regional Telecommunication Networks (RTN) and National Telecommunication Networks (NTN). New efficient data transmission techniques and procedures as well as organizational concepts which have been developed by the CCITT of ITU and by ISO should be considered by the ISS for possible incorporation in the system; the development of special WMO standards should be avoided as far as possible. The detailed design of the networks should take into account the different telecommunication policies of individual States. In-depth studies of various telecommunication techniques and systems will be accelerated within the ISS and will take into account the changes that can be foreseen in tariff arrangements and new data-handling technology. The studies also will consider the degree to which various kinds of satellites should be used for meteorological telecommunication.

131. Suitable interfaces will be defined whereby National Centres can access the GTS/GDPS system. The improved Telecommunication System should preferably also include a system which will monitor the actual flow of data and automatically re-route traffic in the most expeditious and optimum manner. Furthermore, studies are needed to determine the extent to which the improved Telecommunication System should also include special data collection and data distribution features (such as DCP, INMARSAT, WEFAX, etc.) and interconnexion with other networks (e.g. CIDIN). Cost-benefit studies on various GTS components and configurations are essential.

132. Such studies of the Telecommunication System, closely co-ordinated with those of the Data Processing System and the Observing System, must take into account the ability of Members to establish and operate their equipment.

This condition will require careful planning and introduction of interfaces, which would allow all Members to gain early benefits from upgraded facilities with their terminals, whatever their level of sophistication.

WWW Implementation Support Activity

133. The ISS is focused on the development of a plan for an improved, highly integrated, cost-effective WWW system through which Members can receive the data and the products they need for the operation of their National Meteorological Services. In order to implement successfully an improved WWW with a minimum of duplication and cost, an effective and closely co-ordinated exchange of knowledge, proven methodology and techniques between Members must be established. This WWW Implementation Activity should guide, advise and support Members in their design, planning and operation of national components and facilities of the WWW. It also must facilitate the use of WWW data and products in service programmes. Training must be an essential part of this activity.

134. To develop plans for the WWW Implementation Support Activity, the ISS must assess the needs of Members for the exchange of knowledge, proven methodology and techniques, and the capabilities of Members to provide the needed support. A plan should then be devised to provide the feasible support. The Implementation Support Activity must include a strong training programme for the personnel required for the planning, implementation and operation of the future WWW. This would require provision of expert services, organization of specialized workshops and regional training seminars and refresher courses for all levels of personnel. Special priority should be given to the provision of short-term fellowships.

Results of the Integrated WWW System Study

135. Early results of the ISS are required to allow internationally co-ordinated implementation actions leading to a substantially improved WWW. Where deficiencies exist or improved services are required, the ISS will provide a framework for the incorporation of proven new technology and results from atmospheric research in the evolving WWW. However, the implementation of new facilities should not interrupt the ongoing operations of the WWW.

136. It is therefore required to intensify the ISS planning effort so as to provide a plan by mid-1985 for an improved WWW to the year 2000 and a detailed implementation programme for the period 1986 to 1991. The WWW plan should be reviewed by CBS in the light of the results of ISS and appropriate recommendations made for action by the EC. The implementation programme for the latter part of the present WWW planning period as well as the new period 1988 to 1991, should cover those new or upgraded components which could appropriately proceed within that period. This may include the operational ASDAR programme, an operational drifting buoy programme, an operational upper-air sounding programme from moving ships as well as part of the upgrading of the GTS. In addition, detailed plans should be completed in the same time frame on the arrangements, procedures and actions for the WWW Implementation Support Activity to facilitate implementation and operation of all components of the WWW system.

137. The Executive Committee should examine mechanisms to ensure the application of technical co-operation programmes such as VCP in response to overall system requirements, in a co-ordinated manner to achieve a more uniform imple-

mentation of the WWW; devise an approach to and proceed with obtaining the firm commitments of Member governments required for the continuation of the space-based subsystem, at least on a medium-term basis (e.g., 10 years); investigate the problem of maintaining in operation WWW facilities and to take appropriate actions; provide policy guidance in the conduct of the ISS as appropriate; and call inter-governmental conferences if needed to consider co-operative actions for the implementation of essential facilities and services which are critical to the global operation of the WWW.

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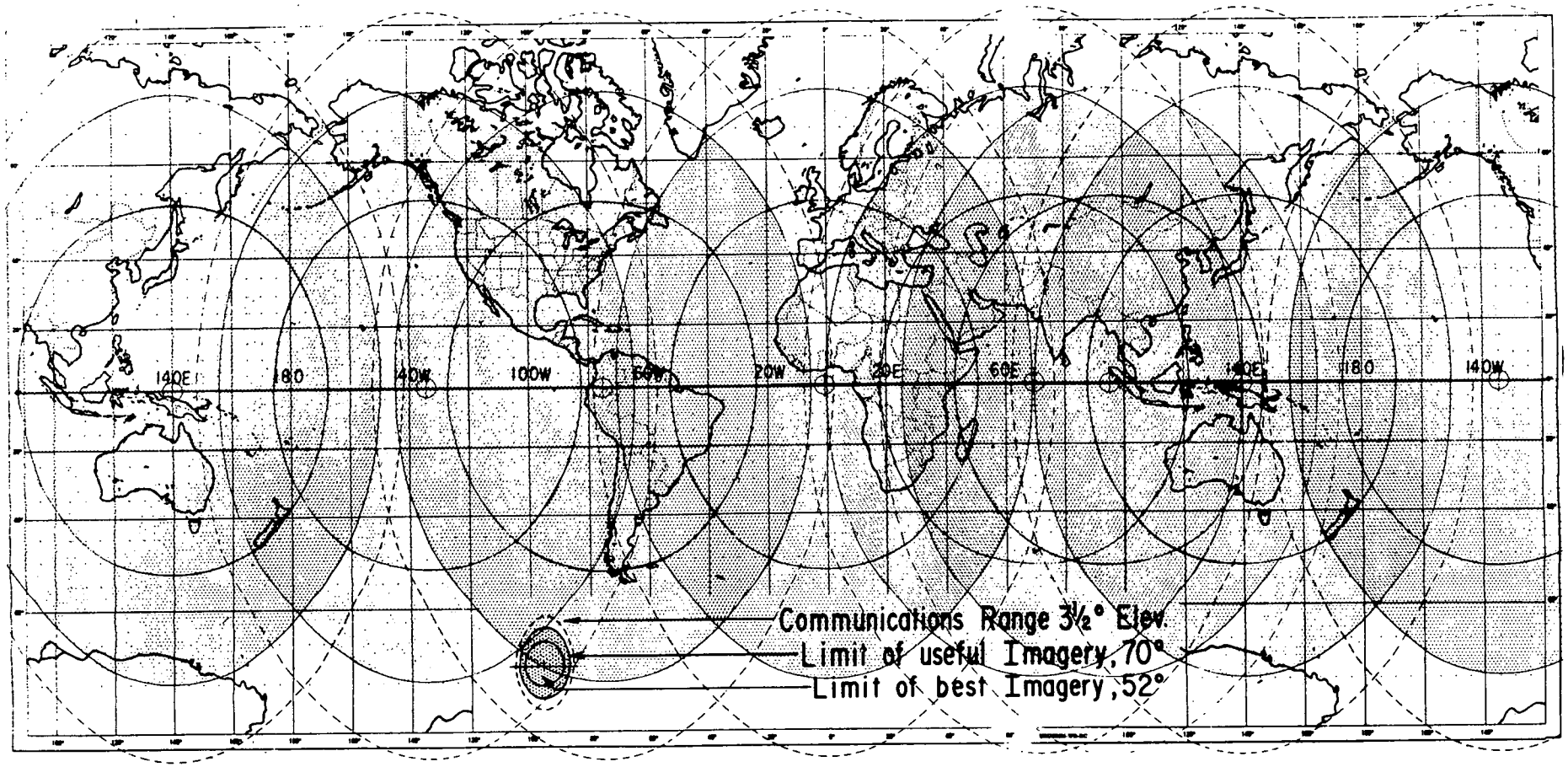
APPENDIX A

Planned geostationary meteorological satellites
(Reference paragraph 49 of the plan)



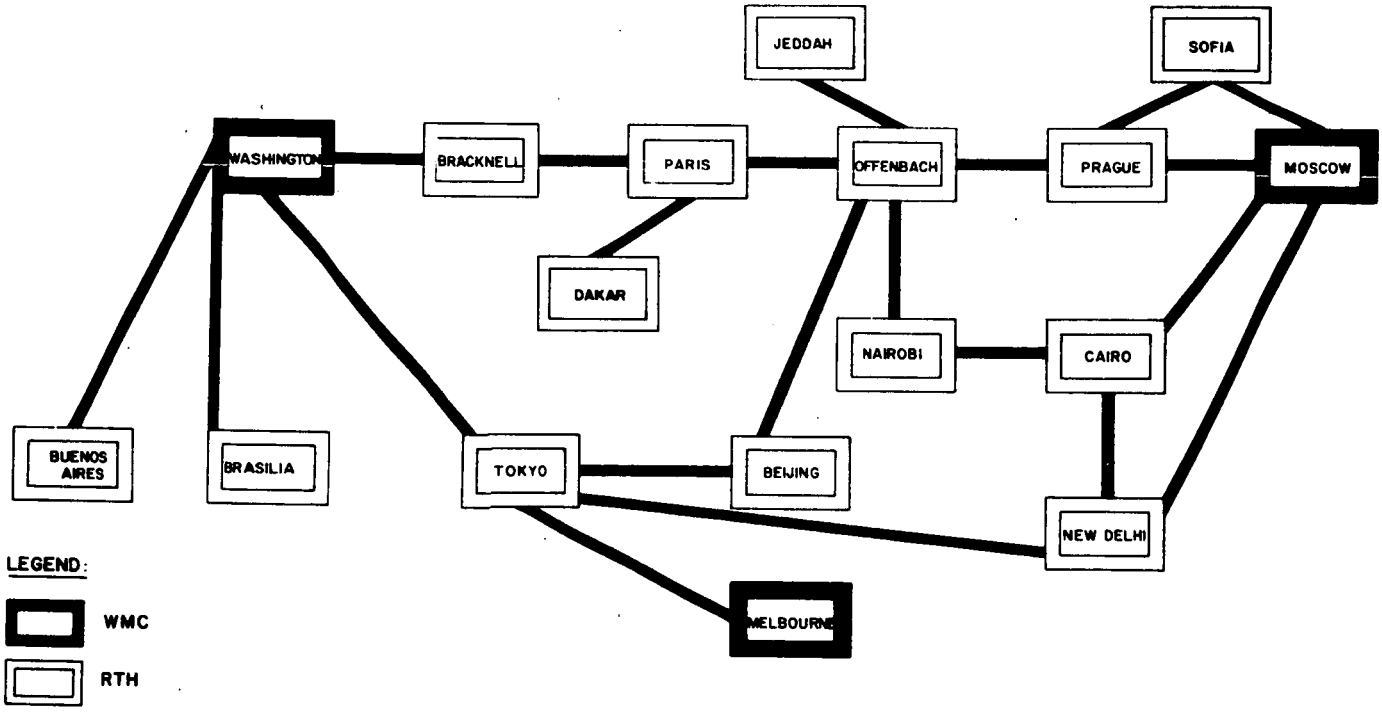
AMENDED DIAGRAM IN RESPECT OF THE SATELLITES OPERATED
BY INDIA WILL APPEAR IN FINAL VERSION

ANNEX I

APPENDIX B

World Meteorological Centres and Regional Telecommunicaton Hubs
(Reference paragraph 86 of the plan)

PART I - ROUTEING OF THE MAIN TELECOMMUNICATION NETWORK



PART II - REGIONAL TELECOMMUNICATION HUBS OTHER THAN THOSE ON THE MAIN TELECOMMUNICATION NETWORK, AS INCLUDED BY THE REGIONAL ASSOCIATIONS IN THEIR REGIONAL TELECOMMUNICATION PLANS

Algiers
Bangkok
Brazzaville
Casablanca
Kano
Khabarovsk
Lusaka
Maracay
Niamey
Norrköping
Novosibirsk
Rome
Tashkent
Tehran
Vienna
Wellington

APPENDIX C

Abbreviations used in the WWW Plan

AARS	Automated Aircraft Reporting System
ALPEX	Alpine Experiment
ASDAR	Aircraft to Satellite Data Relay
BATHY	Report on bathythermal observation
CAeM	Commission for Aeronautical Meteorology
CBS	Commission for Basic Systems
CCITT	International Telegraph and Telephone Consultative Committee
Cg	World Meteorological Congress
CIDIN	Common ICAO Data Interchange Network
CIMO	Commission for Instruments and Methods of Observation
CMM	Commission for Marine Meteorology
DCP	Data Collection Platform
EC	Executive Committee
FGGE	First GARP Global Experiment
GARP	Global Atmospheric Research Programme
GEMS	Global Environmental Monitoring System
GDPS	Global Data-Processing System
GOS	Global Observing System
GTS	Global Telecommunication System
ICAO	International Civil Aviation Organization
ICSU	International Council of Scientific Unions
IDPSS	IGOSS Data-Processing and Services System
IGOSS	Integrated Global Ocean Station Services
INMARSAT	International Maritime Satellite System
IOC	Intergovernmental Oceanographic Commission
ISO	International Organization for Standardization

ISS	Integrated WWW System Study
ITU	International Telecommunication Union
JSC	Joint Scientific Committee
MONEX	Monsoon Experiment
MTN	Main Telecommunication Network
NAOS	North Atlantic Ocean Stations
NOAA	National Oceanic and Atmospheric Administration
NMC	National Meteorological Centre
NWP	Numerical Weather Prediction
OSE	Observing System Experiment
OSSE	Observing System Simulation Experiment
RA	Regional Association
RAFC	Regional Area Forecast Centre
RMC	Regional Meteorological Centre
RMTN	Regional Meteorological Telecommunication Network
RTH	Regional Telecommunication Hub
TCP	Tropical Cyclone Project
TESAC	Temperature, Salinity and Current report from a sea station
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
VCP	Voluntary Co-operation Programme
WAFC	World Area Forecast Centre
WAFS	World Area Forecast System
WAMEX	West African Monsoon Experiment
WCAP	World Climate Applications Programme
WCDP	World Climate Data Programme
WCIP	World Climate Impact Programme
WCP	World Climate Programme
WCRP	World Climate Research Programme

WEFAX	The narrowband Weather Facsimile
WMC	World Meteorological Centre
WMO	World Meteorological Organization
WWW	World Weather Watch

A N N E X II

Annex to paragraph 6.12 of the general summary

LAYOUT OF THE GUIDE ON THE GLOBAL OBSERVING SYSTEM

Introduction

General information on the document, composition, development, purpose and relationship with other publications on the GOS.

PART I

Organization of the Global Observing System. This part will contain information on the basic purpose of the GOS, its design, composition and implementation.

PART II

Requirements for Observational Information Data: This part will be based on requirements which have been imposed on the GOS from other sub-systems of the WWW as well as other activities pursued and supported by the GOS component of the WWW. It will also include information on how the GOS meets the national, regional and global requirements of the Members of WMO.

PART III

Surface-based Sub-system: General description of the main and other elements of the surface-based components of the GOS and the types of observations taken by stations and their respective networks.

Included in this part will be information on how the stations and networks are organized to meet the needs of the users and types of data which will be available. Also included will be areas where additional capabilities are needed to meet users' requirements.

PART IV

Space-based sub-system: Similar to information contained in Part III above with applicability to the space-based sub-system.

PART V

Reduction of Level I data: Much of the information contained in the present Guide has already been updated and will be included in the revision. Reduction of Level-I data from both the surface-based and space-based sub-systems will be covered as well as information on automatic weather stations and the data which are and will be available from them. Information on what constitutes the various levels of data will also be included.

PART VI

Quality Control: This part of the Guide will focus on the quality control of the observations and will include information on instru-

mentation methods of observation (siting exposure, environmental factors, etc.) standards, conversion observations from raw signals to Level I/II data. General information on quality control methods and principles will also be included. An input to this part will be requested from the joint GOS/GDPS study group on quality control.

PART VII

Monitoring the Operation of the WWW: The Working Group on the GTS is the lead working group within the CBS for monitoring the operation of the WWW. This part will therefore be quite general and will include information on types of monitoring and subsequent action applicable to the GOS.

PART VIII

Improved Operational Observing System: This part was formerly called "The Best Mix of Observing Systems". Information will be added at a later stage after further information is available from the study areas concerned with the observing system experiments of the Integrated World Weather Watch System Study.

NOTE: The above layout of the Guide on the GOS is a first draft and therefore may have left out important items which should be included. The chairman of the Working Group on the GOS should be informed by 1 April 1983 of any additions and/or deletions to the proposed layout. In addition, if there are any national or regional practices that Members desire to see included in the Guide, they should also be communicated to the chairman of the Working Group on the GOS by 1 April 1983.

A N N E X III

Annex to paragraph 7.9 of the general summary

BASIC PRINCIPLES CONCERNED WITH THE STRUCTURE OF AN INTERNATIONAL TAPE FORMAT FOR EXCHANGE OF NON-REAL-TIME DATA

1. The structure of the tape format should be general enough to meet all requirements for observational data and processed data (e.g. gridded analyses and forecasts, climatological summaries, etc.).

2. Use of the format should cause a minimum impact on the non-real-time operations of the WWW centres concerned:

   (a) The format should have a simple generalized structure which eases software changes;

   (b) The format should contain enough self-descriptive documentation so it can be used without excessive reference to other sources;

   (c) The format should not require too much "history" of documentation.

3. The format should not require that data be exchanged in "bit-oriented" form; use of a character-oriented form is recommended. The "bit-oriented" form should only be used for international exchange of large volumes of data, by special bilateral or multilateral agreements.

4. The format should promote the management of data bases, in WWW centres, in the most efficient form. However, format structure should not dictate the logical structure of data within files or data bases at WWW centres.

5. Provision should be made within the logical structures of the format for quality-control flags where appropriate.

6. The format should not contain records which are too long, in order to facilitate output of data in printed form by use of simple software among a variety of users.

7. Development of the format should not preclude the use of common high-level data description language within WWW centres.

8. The format structure should be able to accommodate either a synoptic or a time-series organization of data sets that are exchanged.

9. The physical characteristics of the exchange media should conform to the recommendations given in the Manual on the GDPS. In this connexion, the Study Group recommended that the Working Group on the GDPS review these recommendations on media with a view to bringing them into line with available technology.

A N N E X IV

Annex to paragraph 9.7 of the general summary

RECENTLY IMPLEMENTED OR UPGRADED CIRCUITS IN THE GLOBAL TELECOMMUNICATION SYSTEM

(1) Algiers-Rome:
cable, 50 bauds;

(2) Banjul-Dakar:
microwave, 50 bauds;

(3) Beijing-Offenbach:
satellite, V.29 4800/2400/2400 bit/s, data + FAX, X.25 LAPB;

(4) Beijing-Ulan Bator:
landline, 75 bauds;

(5) Bogota-Maracay:
satellite, 75 bauds (duplex);

(6) Bracknell-Offenbach:
cable, V.29, 4800/2400/2400 bit/s, data, software EDC procedures + FAX;

(7) Bracknell-Paris:
cable, V.29, 4800/2400/2400 bit/s, data, software EDC procedures + FAX;

(8) Buenos Aires-Brasilia:
satellite, 50 bauds;

(9) Casablanca-Paris:
cable, 75 bauds;

(10) Dakar-Sal:
RTT, 50 bauds;

(11) Jeddah-Offenbach:
satellite, V.29, 4800/2400/2400 bit/s, data + FAX, X.25 LAPB;

(12) Helsinki-Moscow:
cable, 50 bauds;

(13) Larnaca-Sofia:
cable, 100 bauds;

(14) Lisbon-Paris:
cable, 2400 bit/s, data, software EDC procedures;

(15) Maracay-Paramaribo:
satellite, 50 bauds (AFTN);

(16) Maracay-Quito:
satellite, 50 bauds (duplex);

ANNEX IV

(17) Mogadiscio-Nairobi:
RTT, 75 bauds.

(18) Offenbach-Paris:
cable, V.29, 4800/2400/2400 bit/s, data, software EDC procedures + FAX;

(19) Offenbach-Potsdam:
cable, 100 bauds;

(20) Offenbach-Prague:
cable, V.29, 4800/2400/2400 bit/s, data, software EDC procedures + FAX;

(21) Offenbach-Rome:
cable, V.29, 4800/2400/2400 bit/s, data, software EDC procedures + FAX;

(22) Offenbach-Vienna:
cable, V.29, 4800/2400/2400 bit/s, data, software EDC procedures + FAX;

(23) Offenbach-Zürich:
cable, V.29, 4800/2400/2400 bit/s, data, software EDC procedures + FAX;

(24) Oran-Tunis:
cable, 2400 bit/s, data;

(25) Paris-Rome:
cable, V.29, 4800/2400/2400 bit/s, data, software EDC procedures + FAX;

(26) Sofia-Tirana:
RTT, 50 bauds;

(27) Tokyo-Washington:
satellite/cable, V.29, 4800/2400/2400 bit/s, data;

A N N E X V

Annex to Recommendation 3 (CBS-VIII)

AMENDMENTS TO THE MANUAL ON THE GDPS, VOLUME I

PART A

ATTACHMENT II.2

OBSERVATIONAL DATA REQUIREMENTS OF GDPS CENTRES FOR GLOBAL EXCHANGE

(See also Part II of Attachment I-3 of the Manual on the GTS (WMO-No.386): Principles for the establishment of the exchange programme for observational data on the Main Trunk Circuit and its branches)

1. Type of report/data

The types of message are as follows:

(a) TEMP - Parts A and C, and Parts B and D when the capacity of the MTC and its branches permits;

(b) PILOT - Parts A and C;

(c) TEMP SHIP - Parts A and C, and Parts B and D when the capacity of the MTC and its branches permits;

(d) PILOT SHIP - Parts A and C;

(e) SYNOP;

(f) SHIP;

(g) Reports from automatic stations on land and at sea;

(h) CODAR/AIREP;

(i) Selected satellite data, such as cloud images, SATEM, SAREP, SARAD, SATOB;

(j) DRIBU;

(k) CLIMAT, CLIMAT SHIP;

(l) CLIMAT TEMP, CLIMAT TEMP SHIP;

(m) BATHY, TESAC.

NOTE: Items (a) to (m) do not indicate priorities.

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2. Frequency of exchanges

The frequency of exchanges is as follows:

(a) TEMP, TEMP SHIP, PILOT, PILOT SHIP - for 0000 and 1200 GMT and if available, 0600 and/or 1800 GMT;

(b) SYNOP, SHIP and reports from automatic stations on land and at sea - 0000, 0600, 1200 and 1800 GMT;

(c) CODAR/AIREP reports, as available;

(d) Selected satellite data, such as cloud images, SATEM, SAREP, SARAD and SATOB, as available;

(e) DRIBU as available orbit by orbit;

(f) CLIMAT, CLIMAT SHIP, CLIMAT TEMP and CLIMAT TEMP SHIP - once per month;

(g) BATHY and TESAC, as available.

NOTE to 1 and 2 above: On certain segments of the Main Trunk Circuit and its branches, additional information may be exchanged if necessary and possible, to meet interregional exchange requirements.

3. Stations/areas from which reports should be included in the bulletins that are to be exchanged

The lists of stations or areas from which reports should be included in the bulletins that are to be exchanged are established as follows:

(a) All stations (on land or at sea) making radiosonde/radiowind observations and reporting by means of TEMP/TEMP SHIP code forms;

(b) All stations (on land or at sea) making radiowind observations and reporting by means of PILOT/PILOT SHIP code forms, except those stations from which wind data are included in TEMP/TEMP SHIP reports, or which, while not included in the regional basic networks, are located in areas where the network is sufficiently dense;

(c) Stations (on land or at sea) making pilot-balloon observations and reporting by means of PILOT/PILOT SHIP code forms, situated in areas where the upper-air network is not adequate, except those stations from which wind data are included in TEMP/TEMP SHIP reports;

(d) Stations selected from the basic synoptic networks making surface observations and reporting by means of the SYNOP code form:

(i) The stations are to form a sufficiently dense network for large- and planetary-scale analysis, i.e. a network with a spacing of 300 km;

(ii) The list of stations in (i) above should include all the surface observing stations from the basic synoptic network which are associated with radiosonde/radiowind observing stations (or nearby stations);

(iii) Synoptic surface observation reports from land stations exchanged on the MTC and its branches shall include at least Sections 0 and 1 of the SYNOP code form;

(e) SHIP reports ensuring adequate data coverage, e.g. SHIP reports from locations within 50-100 km of coastline, could be excluded if the land surface network is adequate. However, all SHIP reports from the southern hemisphere and tropical zones should be included;

(f) CODAR/AIREP reports over ocean areas and data-sparse land areas;

(g) Reports from automatic weather stations in data-sparse areas;

(h) All DRIBU data available;

(i) CLIMAT/CLIMAT TEMP and CLIMAT SHIP/CLIMAT TEMP SHIP reports from the networks of stations recommended by regional associations.

4. The lists of stations from which reports are to be exchanged globally (global exchange) are given in Attachment I-4 to the Manual on the GTS.

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PART B

ATTACHMENT III.2

DATA TO BE STORED AT RMCs

1. Members should ensure that their RMCs provide for the storage and retrieval of basic observational data received through the GTS and/or other means for the zones of responsibility as indicated below:

RMC	Zone of responsibility
Region I	
Antananarivo	To be decided later
Algiers	The zone of responsibility of RTH Algiers for collection of observational data
Cairo	The zone of responsibility of RTH Cairo for collection of observational data
Dakar	Zone of responsibility of RTH Dakar for collection of observational data
Lagos	To be decided later
Nairobi	The zone of responsibility of RTH Nairobi for collection of observational data
Tunis/ Casablanca	To be decided later
Region II	
Beijing	The zone of responsibility of RTH Beijing for collection of observational data
Jeddah	The zone of responsibility of RTH Jeddah for collection of observational data
Khabarovsk	The zone of responsibility of RTH Khabarovsk for collection of observational data
New Delhi	The zone of responsibility of RTH New Delhi for collection of observational data
Novosibirsk	The zone of responsibility of RTH Novosibirsk for collection of observational data
Tashkent	The zones of responsibility of RTHs Tashkent and Tehran for collection of observational data
Tokyo	The zones of responsibility of RTHs Tokyo, and Bangkok for collection of observational data

NOTE: Certain RMCs are not proposed for any specific zone of responsibility because of the need to avoid unwarranted duplication and to achieve the best compatibility of RMC zones with RTH zones, considering the capabilities and arrangements of the GTS.

Region III

Brasilia	The zones of responsibility of RTHs Brasilia and Maracay for collection of observational data
Buenos Aires	The zone of responsibility of RTH Buenos Aires for collection of observational data

Region IV

Washington	All Region IV (Acting for RMCs Miami and Montreal)

Region V

Melbourne	The zones of responsibility of WMC/RTH Melbourne for collection of observational data (Acting for RMC Darwin)
Wellington	The zone of responsibility of RTH Wellington for collection of observational data

Region VI

Bracknell	The zone of responsibility of RTH Bracknell for collection of observational data
Moscow	The zones of responsibility of WMC/RTH Moscow and RTHs Prague and Sofia for collection of observational data
Norrköping	The zone of responsibility of RTH Norrköping for collection of observational data
Offenbach	The zones of responsibility of the RTHs Offenbach, Vienna and Paris for the collection of observational data
Rome	The zone of responsibility of RTH Rome for collection of observational data

2. The types and frequency of basic meteorological data to be stored by the RMCs are as indicated below:

Type	Frequency
SYNOP	3 hourly
SHIP	6 hourly
PILOT/TEMP	6 or 12 hourly
PILOT SHIP/TEMP SHIP	6 or 12 hourly
Selected aircraft reports	
Selected satellite data	
DRIBU	

3. Members should ensure that their RMCs archive the following analyses for their zones of responsibility:

(a) Surface analyses twice per day;

(b) Upper-air analyses for at least four of the standard isobaric surfaces listed in paragraph 3.2.1 of Part II of this Manual.

A N N E X VI

Annex to Recommendation 4 (CBS-VIII)

AMENDMENTS TO THE MANUAL ON THE GDPS, VOLUME I

PART III

DATA PROCESSING FOR NON-REAL-TIME USES

1. Non-real-time functions of data-processing centres

1.1 The non-real-time functions of a WMC should include:

(a) Management of non-real-time data involving:

(i) Collection and quality control of data not available from the GOS in real-time, via mail or other means;

(ii) Storage and retrieval of all basic observational data and processed information needed for large and planetary-scale research and applications;

(iii) Making non-real-time data available to Members or research institutes upon request;

(b) Carrying out the development of research in support of large-scale and planetary analyses and forecasting;

(c) Carrying out of comparative verification of WMC products and making results available to all Members concerned;

(d) Exchange of technical information with other centres;

(e) Providing opportunities for training of personnel in data processing.

1.2 The non-real-time functions of an RMC should include:

(a) Assisting in the management of non-real-time data involving:

(i) Assistance to the WMC in management and maintenance of non-real-time data, in particular by obtaining late and delayed observational data for its area of responsibility;

(ii) Storage and retrieval of basic observational data and processed information needed to discharge the non-real-time responsibilities of the RMC;

(iii) Making non-real-time data available to Members or research institutes upon request;

(b) Development and refinement of new techniques and applications;

(c) Carrying out of comparative verifications of RMC products and making results available to all Members concerned;

(d) Regular exchange with other centres of information on techniques and procedures used and results achieved;

(e) Providing opportunities for training of personnel in manual and automated techniques.

1.3 The non-real-time functions of an NMC should include:

(a) Support, as required, of the appropriate RMC in managing non-real-time data, including management of its national data base;

(b) Storage and retrieval (including quality control) of observational data and processed information to meet national and certain international requirements;

(c) Research concerning operations to meet national requirements.

A N N E X VII

Annex to Recommendation 6 (CBS-VIII)

MINOR IMPROVEMENTS TO FM 12-VII SYNOP AND FM 13-VII SHIP

1. In accordance with Regulations 12.2.3.3.1, 12.2.3.4.2, 12.3.5 and 12.4.7.1.2 amend the code form to read as follows:

FM 12-VII SYNOP — Report of surface observation from a land station

FM 13-VII SHIP — Report of surface observation from a sea station

CODE FORM:

SECTION 0 $M_iM_iM_jM_j$ (D....D) (or) ($A_1b_wn_bn_bn_b$)** YYGGIw (IIiii* (or) ($99L_aL_aL_a$ $Q_cL_aL_aL_aL_a$**

SECTION 1 i_Ri_xhVV Nddff $1s_nTTT$ ($2s_nT_dT_dT_d$) (or) ($29UUU$) $3P_oP_oP_oP_o$

(4PPPP) (or) ($4a_3hhh$) 5appp 6RRRtR 7wwW1W2 8NhCLCMCH 9hh//

SECTION 2 $222D_sv_s$ ($0s_nT_wT_wT_w$) ($1P_{ws}P_{ws}H_{ws}H_{ws}$) ($2P_wP_wH_wH_w$) (($3d_{w1}d_{w1}d_{w2}d_{w2}$) ($4P_{w1}P_{w1}H_{w1}H_{w1}$) ($5P_{w2}P_{w2}H_{w2}H_{w2}$))

((($6I_ss_sE_sE_sR_s$) or (ICING + plain language))) (ICE + (($c_iS_ib_iD_iz_i$) or (plain language)))

SECTION 3 333 (0....) ($1s_nT_xT_xT_x$) ($2s_nT_nT_nT_n$) (3Eiii) (4E'sss) ($5j_1j_2j_3j_4$ ($j_5j_6j_7j_8j_9$)) (6RRRtR) (7....) ($8N_sCh_sh_s$) ($9SpSp_sp_sp_p$) (80000 (0....) (1....) .....)

SECTION 4 444 N'C'H'H'C_t

SECTION 5 555 Groups to be developed nationally

2. Change NOTE (4) (b) as follows:

(b) The first data group of Section 2 - $222D_sv_s$, which is always included in the report of a sea station if data are available.

3. In NOTE (5) to FM 12-VII and FM 13-VII, change the contents of Sections 1 to 5 as follows:

ANNEX VII

Section	Contents
1.	Data for global exchange...
2.	Maritime data for global exchange...
3.	Data for regional exchange...
4.	Data for national use...
5.	Data for national use.

4. Replace Regulations 12.1.3.1 to 12.1.3.6 with the following:

12.1.3.1

Reports from a land station shall always contain at least Sections 0 and 1. When a report from a coastal land station contains maritime data, that report shall also include Section 2. The identification and position of a land station shall be indicated by means of the group IIiii.

12.1.3.2

Reports from a sea station shall always include sections 0 and 1 and, whenever the corresponding data are available, Section 2. Section 2 shall always include the maximum number of data groups consistent with observed conditions. The identification of a sea station shall be indicated by either the group D....D or the group $A_1b_wn_bn_bn_b$. The position of a sea station shall be indicated by the groups $99L_aL_aL_a$ $Q_cL_oL_oL_oL_o$.

12.1.3.3

Ocean weather stations shall include (besides Sections 0, 1 and 2), whenever the corresponding data are available, Section 3 containing at least the groups with indicator figures 5, 8 and 9.

12.1.3.4

In reports from supplementary ships, Section 1 shall contain at least:

i_Ri_xhVV Nddff $1s_nTTT$ 4PPPP $7wwW_1W_2$ $8N_hC_LC_MC_H$

where:
(i) i_R shall be set to code figure 4;
(ii) i_x shall be coded as 1, 2 or 3 as the case may be.

12.1.3.5

In reports from auxiliary ships, Section 1 shall contain at least:

i_Ri_xhVV Nddff $1s_nTTT$ 4PPPP $7wwW_1W_2$

where:
(i) i_R shall be set to code figure 4;
(ii) i_x shall be coded as 1, 2 or 3 as the case may be.

NOTES:

(1) The above mentioned version of Section 1 is considered suitable for any ship which is not supplied with tested instruments and may be

requested to report in areas where shipping is relatively sparse, or on request and especially when storm conditions threaten or prevail. These ships may report in plain language if the use of code is impracticable.

(2) If the ship does not report cloud data h should be coded with a solidus (/).

(3) If the ship is not equipped with tested instruments permitting the determination of tenths of a degree in air temperature and/or tenths of a hectopascal in pressure, a solidus should be coded for the tenths of degrees and/or tenths of hectopascals, as appropriate.

5. Replace Regulation 12.1.5 with the following:

12.1.5

A fixed sea station (other than an ocean weather station or a moored buoy), which is considered by the Member operating it to be in the same category as a land station, shall report its identification and position by means of the group IIiii.

6. Replace Regulation 12.2.2.2.2 with the following:

12.2.2.2.2

Altocumulus perlucidus or stratocumulus perlucidus ("mackerel sky") shall be reported using N = 7 or less (unless overlying clouds appear to cover the whole sky) since breaks are always present in this cloud form even if it extends over the whole celestial dome.

7. Replace Regulation 12.2.3.3.1 with the following:

12.2.3.3.1

Under unusual conditions, when the dew-point temperature is not available temporarily (e.g. due to instrument failure) but relative humidity is available, the group 29UUU shall replace the group $2s_nT_dT_dT_d$. However, every attempt shall first be made to convert relative humidity to dew-point temperature, and the relative humidity included only as a last resort.

8. Replace Regulation 12.2.4.1 with the following:

This group shall be included only in reports from a land station in lieu of group 4PPPP whenever the following conditions apply together:

(a) The station elevation is more than 500 metres;

(b) Regulation 12.2.3.4.2 does not apply, i.e. group $4a_3hhh$ is not used;

(c) The reduction method in use does not permit the computation of station pressure from the actual SYNOP report and from information contained in WMO publications.

9. Add the following after Regulation 12.2.6.3 (b):

The indicator i_x shall indicate which one of these conditions applies.

10. Replace the note following Regulation 12.2.6.4.17 with the following:

NOTE: Showers are produced by convective clouds. They are characterized by their abrupt beginning and end, and by the generally rapid and sometimes great variations in the intensity of the precipitation. Drops and solid particles falling in a shower are generally larger than those falling in non-showery precipitation. Between showers openings may be observed, unless stratiform clouds fill the intervals between the cumuliform clouds.

11. Replace Regulation 12.2.6.5.5 with the following new regulation:

12.2.6.5.5

If the weather during the period has not changed so that only one code figure may be selected for the past weather, then that code figure shall be reported for both W_1 and W_2. For example, rain during the entire period shall be reported as $W_1W_2 = 66$.

12. Replace Regulations 12.2.7.3 to 12.2.7.4 with the following:

12.2.7.3

Certain regulations concerning the coding of N shall also apply to the coding of N_h.

12.2.7.3.1

(a) If there are C_L clouds then the total amount of all C_L clouds, as actually seen by the observer during the observation, shall be reported for N_h;

(b) If there are no C_L clouds but there are C_M clouds, then the total amount of the C_M clouds shall be reported for N_h;

(c) If there are no C_L clouds and there are no C_M level clouds, but there are C_H clouds, then N_h shall be coded as 0.

12.2.7.3.2

If the variety of the cloud reported for N_h is perlucidus (stratocumulus perlucidus for a C_L cloud or altocumulus perlucidus for a C_M cloud) then N_h shall be coded as 7 or less. See Regulation 12.2.2.2.2.

NOTE: See Regulation 12.2.2.2.2.

12.2.7.3.3

When the clouds reported for N_h are observed through fog or an analogous phenomenon their amount shall be reported as if these phenomena were not present.

12.2.7.3.4

If the clouds reported for N_h include contrails, then N_h shall include the amount of persistent contrails. Rapidly dissipating contrails shall not be included in the value for N_h.

NOTE: See Regulation 12.5 concerning the use of Section 4.

12.2.7.4

The coding of C_L, C_M and C_H clouds shall be as specified in the International Cloud Atlas, Volume I, WMO-No. 407.

NOTE: It is recommended that the pictorial guides included at the end of chapter II.8 in the International Cloud Atlas, Volume I, be fully utilized in determining the priority of reporting the code figures for C_L, C_M and C_H.

13. Amend the term "low cloud" in Regulation 12.2.8 to read "lowest cloud seen" as at present in the specification of hh.

14. Replace Regulations 12.3 to 12.3.1.2 with the following:

12.3
Section 2

General

The inclusion of the groups of Section 2 in reports of merchant ships shall be determined by the Member who recruits the ship. The same rule shall be applied for automatic sea stations.

NOTE: Members are recommended to encourage the inclusion of the maximum possible number of data groups in Section 2 in accordance with Regulation 12.1.3.2.

12.3.1

Group $222D_sv_s$

12.3.1.1

This group shall always be included in reports from stations which have observed maritime conditions and in reports from ships being requested to include D_sv_s as a routine procedure.

12.3.1.2

This group shall be encoded as:

(a) 22200 for a stationary sea station;

(b) 222// for:

(i) A coastal land station which reports maritime conditions.

(ii) A supplementary or auxiliary ship, except when reporting from an area for which the ship report collecting centre, in order to meet a requirement of a search and rescue centre, has requested inclusion of D_sv_s as a routine procedure.

15. Replace Regulation 12.3.3.4 with the following:

12.3.3.4

(a) When the sea is calm (no waves and no swell) $P_{wa}P_{wa}H_{wa}H_{wa}$, or $P_wP_wH_wH_w$ as the case may be, shall be reported as 0000.

NOTE: See Regulation 12.3.3.5;

(b) When the estimation of the period is impossible owing to confused sea, P_wP_w shall be reported as 99. When, for the same reason, the height of the waves cannot be determined, H_wH_w shall be encoded as //;

(c) In a report from a station that includes instrumental wave data, if data are not available for any other reason for either period or height of waves, $P_{wa}P_{wa}$ or $H_{wa}H_{wa}$, as the case may be, shall be encoded as //. If data are not available for either period or height of waves Regulation 12.2.3.2 shall apply and the group ($1P_{wa}P_{wa}H_{wa}H_{wa}$) shall either be omitted or encoded as 1////;

(d) In a report from a station that does not include instrumental wave data, if data are not available for any other reason for either period of height of waves, P_wP_w or H_wH_w, as the case may be, shall be encoded as //. If data are not available for both period and height of waves, the group ($2P_wP_wH_wH_w$) shall be omitted.

16. Replace Regulation 12.3.4.4 with the following:

12.3.4.4

Ocean weather stations shall always include swell data when data are available.

17. Replace Regulations 12.4.9.6 to 12.4.9.7 with the following:

12.4.9.6

If two or more types of cloud occur with their bases at the same level and this level is one to be reported in accordance with Regulation 12.4.9.1, the selection for C and N_s shall be made in accordance with the following criteria:

(a) If these types do not include Cumulonimbus then C shall refer to the cloud type that represents the greatest amount, or if there are two or more types of cloud all having the same amount, the highest applicable code figure for C shall be reported. N_s shall refer to the total amount of cloud whose bases are all at the same level;

(b) If these types do include Cumulonimbus then one group shall be used to describe only this type with C reported as 9 and N_S as the amount of Cumulonimbus. If the total amount of the remaining type(s) of cloud (excluding Cumulonimbus) whose bases are all at the same level is greater than that required by Regulation 12.4.9.1 then another group shall be reported with C being selected in accordance with (a) and N_S refering to the total amount of the remaining cloud (excluding Cumulonimbus).

12.4.9.7

Regulations 12.2.2.2.3 to 12.2.2.2.6 inclusive shall apply.

18. Insert the following notes after the specification of t_R in Section C of the Manual on Codes, Volume I:

(1) If the duration of the period of reference is not a multiple of 6 hours or the period does not end at the time of the report t_R shall be coded 0.

(2) Members are recommended to avoid any deviations from international practices which require the use of code figure 0. The specification of code figure 0 should be indicated in Volume II under national coding procedures.

A N N E X VIII

Annex to Recommendation 7 (CBS-VIII)

EDITORIAL REVISION OF THE MANUAL ON CODES, VOLUME I

1. Replace Regulation 15.7.2 with the following:

15.7.2

If the observed present weather cannot be reported by use of a code figure from code table 4678, the group w'w' shall be omitted from the report.

2. Change the titles of code FM 15-V METAR and FM 16-V SPECI to bring it in line with the provisions of the Technical Regulations as indicated for SPECI below:

FM 16-V SPECI - Aviation selected special weather report (with or without trend forecast).

3. Change Note (1) to FM 15-V METAR and FM 16-V to bring them in line with provisions of the Technical Regulations:

(1) SPECI is the name of the code for an aviation selected special weather report. A SPECI report may also include a trend forecast.

4. Add the following sentence to Regulation 20.3.3.1:

In the group, or series of groups, rr shall be reported in units of 5 km.

5. Replace Regulation 20.3.5 with the following:

20.3.5

Group /999/

The last group in the coded description of each significant feature shall be /999/.

6. Replace Regulation 35.3.3.1 with the following:

35.3.3.1

In TEMP and TEMP SHIP reports, this section shall be used to report cloud data in accordance with Regulations 12.2.1.2, 12.2.7.3 and 12.2.7.4.

7. Replace Regulation 39.3.3 with the following:

39.3.3

Group ddfff

The thickness of the layer through which wind direction and speed are determined shall be 2 km for both mandatory and significant levels, i.e. from 1 km below to 1 km above the altitude reported.

8. Change the last sentence in NOTE (7) to FM 45-IV to the following:

This section will be restricted normally to winds exceeding 60 knots or 30 m/sec or 100 km/h (depending on the value selected for i_j).

9. Replace the first part of Regulation 45.3.6.2 with the following:

45.3.6.2

Wind speeds of 100 knots or more shall be encoded as follows: ...

10. Replace Regulation 47.1.3 with the following:

47.1.3

If several complete analyses or forecasts are transmitted one after another in the same bulletin, each of them shall contain Sections 0, 1, 3 and 5. Sections 2 and 4 shall also be included, as required.

11. Replace Regulation 49.1.3 with the following:

49.1.3

If several complete analyses or prognoses are transmitted one after the other in one meteorological bulletin, each of them shall contain Sections 0, 1, 3 and 5.

12. Replace in both Regulations 53.1.2 and 54.1.3 the "51.1.5" by "51.1.4" as Regulation 54.1.5 does not exist.

13. In NOTE (3) to FM 67-VI, replace the description of Section 1 with the following:

Section 1: Identification, day and hour of observation, station identification (using one or two groups).

14. Replace NOTE (2) to FM 87-VI Ext. with the following:

(2) A SARAD report is identified by the symbolic letters $M_iM_iM_jM_j$ = WWXX.

15. Replace NOTE (2) to FM 88-VI Ext. with the following:

(2) A SATOB report is identified by the symbolic letters $M_iM_iM_jM_j$ = YYXX.

16. Delete symbolic words IAC and IAC FLEET, and their definitions from Section B, a, List of symbolic words and letter groups.

17. Make the following amendments to Section B, b, List of symbolic figures and figure groups:

0/0/0 Indicates that radar equipment is inoperative.

19191 Indicates the end of an analysis or prognosis.

333 (second spec.) Form in which point position groups are given follows.

44777 Indicates the end of the vocabulary section.

88999 Indicates that tropopause data have not been observed.

/999/ Indicates the end of the description of a significant feature.

18. Amend the numbering of code tables as follows:

Present Code table number	Symbolic letters	Proposed Code table number
0159	A_1b_w	0161
0363	$B_1B_2B_3$	0371
0547	C, C_e, ... , C_5, R_e	0501
0724	D_w	0755
1005	e_Te_T	1085
1053	e_we_w	1095
1545	H_1	1561
1701	I_1	1761
2339	L_iL_i, L_jL_j	2382

In addition, Code table 1147 (symbolic letters F_e, ... , F_u) is within the proper range of values, but should be numbered between the code tables for F_c and F_1. Proposed code table number is 1135.

19. There are several generalities concerning the specifications of symbolic letters, and the code tables.

(a) Concerning the use of the word "indicator", some of the code tables include this word as a part of the title, while others do not. It could be said that any code table could include this word, since each uses a code figure or code word to indicate something. However, for the sake of brevity, it is recommended that the word be limited to those few cases where its omission would change the meaning of the code table;

(b) Concerning the various methods used to indicate a direction (e.g. direction (true); true direction; etc.), there should be a standard terminology;

(c) Concerning the various methods used to indicate time (e.g. time, to the nearest hour GMT; hour (GMT) etc.), there should be a standard terminology.

20. Specific proposals for Section C

Symbolic Letters	Comments
A	For clarity, change to: WMO Regional Association in which the hydrological observing station is located (1 - Region I, 2 - Region II, etc).
A_C	For clarity, change to: Accuracy of the position of the centre or the eye of the tropical cyclone.
AAA	Change to: Maritime area.

AAAAA	Change to: Area
a_C	For clarity, change to: Change in character of the eye, during the 30 minutes preceding the time of observation.
a_m	Change to: Portion of the maritime area.
a_1	Since the two parts of the table are mutually exclusive (if there is no report there is no need to tell the type of equipment, and vice versa), it is more accurate for this to read: Reason for no report or ground equipment employed.
a_3	Change to: Standard isobaric surface for which the geopotential is reported.
a_4	Change to: Type of measuring equipment used.
$B_1B_2B_3$	Change the first part of the specification to: Number designating a 10^o x 10^o square in the geographical grid formed by the intersection of two meridians and two parallels of latitude. Change the specification for B_1 to: B_1 = Q, Octant of the globe (Code table 3300)
bbb	Change to: True azimuth in whole degrees.
D	Change first specification to: True direction from which surface wind is blowing.
D	Change second specification to: True direction toward which ice has drifted in the past 12 hours.
D_H	Change to: True direction from which C_H clouds are moving.
D_K	Change to: True direction from which swell is moving.
D_L	Change to: True direction from which C_L clouds are moving.
D_M	Change to: True direction from which C_M clouds are moving.
D_a	Change to: True direction in which orographic clouds or clouds with vertical development are seen.
D_i	Change to: True bearing of principal ice edge. Also, delete the second note.
D_s	Change to: True direction of resulting displacement of the ship during the three hours preceding the time of observation.
D_w	Change to: True orientation of water feature given in W_t.

D_1 — Change to: True direction of the point position from the station.

$D_1D_1D_1$
$D_2D_2D_2$
etc. — Change to: True direction, in whole degrees, of source.

$D_1'D_1'D_1'$
$D_2'D_2'D_2'$
etc. — Change to: True direction, in whole degrees, of the axis of the centre corresponding to g_1g_1, g_2g_2, etc.

d_T — To be consistent with the specification for j_4, as given in code table 2061, change to: Amount of temperature change, the sign of the change being given by s_n.

dd — Change first part of Note (1) to read:

When encoding wind direction that has been rounded off to the nearest 5°, the.....

d_jd_j — To be consistent with the specifications for dd, put parentheses around the last three words. That is, change to: True direction, in tens of degrees, from which jet-stream is blowing (or will blow).

$d_{v1}d_{v1}d_{v1}$
$d_{v2}d_{v2}d_{v2}$
...
$d_{vn}d_{vn}d_{vn}$ — Change to: True direction, in whole degrees, of the monthly mean vector wind at specified isobaric surfaces.

e_1 — Change to: Type of isopleth and units of isopleth values uuu (see Code table 1062).

e_2 — Change to: Type of isopleth and units of isopleth values uu (see Code table 1063).

ff (second spec.) — Add the following note to the specification:

(1) For wind speeds of 100 knots or more, see Regulations 15.4.4, 16.2.2, 45.3.6.2 or 51.3.4, as appropriate.

f_mf_m — Add the following note to the specification:

(1) See Note (1) under ff (second specification).

f_sf_s — In the second specification the use of the word "true" is inconsistent with other specifications, and adds nothing to the specification. Change to: Speed, in knots, of tropical cyclone or other system.

G_p Change to: Period, to the nearest whole hour. Also, add this note:

(1) If the period is less than half an hour G_p shall be encoded as 0.

GG The second specification should be broken into two parts; one for forecasts and the other for observations, as follows:

- Valid time, to the nearest whole hour GMT, of the beginning of the forecast. (FM 51-V, FM 53-V, FM 54-V)
(1) See Regulations 51.11, 53.4 and 54.4.

- Actual time, to the nearest whole hour GMT, of the observed satellite data. (FM 86-VI Ext., FM 87-VI Ext.).

G_AG_A Change to: Valid time, to the nearest whole hour GMT, of the ARMET forecast.

G_FG_F Change to: Valid time, to the nearest whole hour GMT, of the temperature forecast.

G_CG_C The two specifications should be changed, and a note added, as follows:

G_CG_C Actual time, to the nearest whole hour GMT, of the observed data from which the chart is prepared. (FM 44-V, FM 45-IV, FM 46-IV)

- Actual time, to the nearest whole hour GMT, of

(a) Observations of data from which the analysed data field has been derived; or

(b) Analysed data field from which the prognostic data field has been derived; or

(c) End of period which was used to compute values (actual or prognostic) of mean field or field change. (FM 47-V, FM 49-VII);

(1) The time shall be one of the standard times for synoptic observations (surface or upper-air, as the case may be).

G_eG_e Change to: Time, to the nearest whole hour GMT, of the end of the forecast period that began at GG.

G_pG_p Change to: Number of whole hours to be added to G_CG_C to obtain the time at which the forecast is valid.

G_sG_s Change to: Actual time, to the nearest whole hour GMT, of the satellite data used to prepare the chart.

G_2G_2 The wording of the second note is not consistent with the first. Change as follows:

(2) When the period is between 25 and 48 hours after G_1G_1, G_2G_2 shall be encoded by adding 50 to the time of ending of period of forecast.

g Change to: Time of the observations used to compute the reported mean values of geopotential, temperature and humidity.

g_o The present specification is confusing, and open to misinterpretation. Change specification, and add a second note, as follows:

g_o Period of time, in hours, between the time of the observation and the time of the wind change, the time of occurrence of the maximum mean wind speed, or the time of temperature change. (FM 12-VII, FM 13-VII)

(1) The period is the number of whole hours, disregarding the minutes. For example, if the time of occurrence is 45 minutes after the time of the observation, g_o shall be encoded as 0; if the time of occurrence is 1 hour or more, but less than 2 hours after the observation, g_o shall be encoded as 1; and so on.

(2) The value of g_o can be any whole number from 0 to 5.

g_rg_r Change to: Grid geometry and geographical support.

H_e The present specification is not consistent with other references to vertical distances, which use the terms "altitude". Altitude, as defined in the Technical Regulations, includes a reference to sea-level. Change to: Altitude of echo top.

h Change to: Height above surface of the base of the lowest cloud seen.

(1) The term "height above surface" shall be considered as being the height above the official aerodrome elevation or above station level at a non-aerodrome station, or above the surface of the water in reports from ships.

hh Change to: Height above surface of the base of the lowest cloud seen

h_sh_s Change the present Note (2) to:

(2) Heights are above surface (see Note (1) under h).

$h_f h_f h_f$ — See comments concerning symbolic letters H_e. Also, after the change in the specifications the note may be deleted, since it is only used to say the height is above sea-level. Change to: Altitude of the 0°C isotherm.

$h_t h_t h_t$ — See comments concerning symbolic letters $h_f h_f h_f$, including deleting the note. Change to: Altitude of cloud layer or mass whose genus is indicated by CC.

$h_x h_x h_x$ — See comments concerning symbolic letters $h_f h_f h_f$, including deleting the note. Change to: Altitude to which temperature and wind refer.

I_c — There should be an indication in the specification that this is a forecast. Change to: Type of forecast ice accretion on the external parts of aircraft.

I_l — Change to: Name of country or international agency which operates the satellite.

i_j — Change to: Indicator for units of wind speed and height or pressure in the jetstream core.

i_u — Change to: Indicator for units of wind speed and type of instrumentation.

i_w — Change to: Indicator for source and units of wind speed.

i_3 — Change to: Indicator for supplementary phenomena.

iii — Delete the word international from both specifications. Replace the two notes by:

(1) See Section E of this Manual.

Of the three methods of showing units digit(s) of the year (J, JJ, JJJ), only one shows an example. For consistency make these two changes:

J — Change to: Units digit of the year (GMT), i.e. 1974 = 4.

JJJ — Change to: Hundreds, tens and units digits of the year (GMT), i.e. 1974 = 974.

M_h — Change to: Character of air mass.

M_1 — Change to: Month when the period covered by the forecast begins.

M_2 — Change to: Month when the period covered by the forecast ends.

m — Change to: Movement.

N_s — Change to: Amount of individual cloud layer or mass whose genus is indicated by C or CC.

NN — Change to: Identification number of a front or system.

P_i — Change to: Forecast ice phenomenon.

PP — Change to: Pressure at a constant level surface, in whole hectopascals.

P_1P_1 — Change note (1) to:

(1) The pressure of surfaces up to and including the 100 hPa surface shall be reported in tenths of hectopascals. Above the 100 hPa surface pressures shall be reported in whole hectopascals.

P_1P_1, P_2P_2, ... P_nP_n — To be consistent with the specifications for P_1P_1, change the first and third specifications, and add Note (1) and Note (2) as follows:

Change the first specification to: Pressure of standard isobaric surfaces (1000 hPa = 00).

Change the third specification to: Pressure of specified isobaric surfaces (1000 hPa = 00, 10 hPa = 01).

Add these Notes:

(1) For TEMP, TEMP SHIP, and TEMP DROP reports, see Note (1) under P_1P_1.

(2) For SATEM reports, the pressure of surfaces up to and including 10 hPa shall be reported in tens of hectopascals. Above the 10 hPa surface pressures shall be reported in tenths of a hectopascal.

P_1P_1, P_2P_2. P_1P_1, P_2P_2. P_1P_1, P_2P_2. ... ... — First, there is a typographical error in the second line of the symbolic letters (it shows P_1P^1) that must be corrected. Second, there is no indication of pressure units. Add this note:
(1) For units of pressure, see Regulation 73.5.1.

$P_mP_mP_m$ — Change to: Pressure at the maximum wind level. Add this note:

(1) The pressure of surfaces up to and including the 100 hPa surface shall be reported in whole hectopascals. Above the 100 hPa surface pressure shall be reported in tenths of a hectopascal.

$P_tP_tP_t$ — Change to: Pressure at the tropopause level. Add this note:
(1) See Note (1) under $P_mP_mP_m$

$P_oP_oP_o$, $P_1P_1P_1$, ... $P_nP_nP_n$ — Change to: Pressure at specified levels.
Add this note:
(1) See Note (1) under $P_mP_mP_m$.

R_d Change to: Frequency group within which $R_1R_1R_1R_1$ falls.

rr Add the following note:

(1) For distances of 500 km or more see Regulation 20.3.3.2.

r_1r_1 Change to: Distance in nautical miles that the ice has travelled during a 12 hour period.

s_h Change to: Type of temperature and height data.

s_n Change the first specification to: Sign of the data, and relative humidity indicator. Replace the present note with this note:

(1) See Note (1) under UUU.

Change the second specification to:
Sign of the reference value indicated by rrrrrrr. (Code table 3845).

sss Change to: Total depth of snow.

TT Change the fourth specification to: Air temperature, in whole degrees Celsius.

T_cT_c Change to: Temperature of cloud top, in whole degrees Celsius, at pressure estimated from infra-red observations of clouds.

T_oT_o Change to: Temperature of the surface (land, water, ice, etc.), in whole degrees Celsius.

T_sT_s Change to: Temperature of the surface (land, water, ice, etc.), in whole degrees Celsius.

T_1T_1 Change to: Air temperature, in whole degrees Celsius,

T_2T_2 at the specified isobaric surfaces.

...

T_nT_n

$T_dT_dT_d$ Add the following note:
(1) See Note (1) under UUU.

$T_nT_nT_n$ Change to: Minimum temperature, in tenths of a degree Celsius, its sign being given by s_n.

$T_xT_xT_x$ Change to: Maximum temperature, in tenths of a degree Celsius, its sign being given by s_n.

UUU Add the following note:
(1) See Regulation 12.2.3.3.1.

u Change to: Scale factor.

uu Change to: Isopleth values, its units being given by e_2. Delete the reference to the code table.

uuu	Change to: Isopleth values, its units being given by e_1. Delete the reference to the code table.
V	This symbolic letter is now used only in MAFOR. As such, the specification should be changed, and the Note following the specification should be deleted. Change to: Forecast surface visibility.
	In both vv and vvv the second comma changes the meaning of the specification. Change both as follows:
vv	Vertical wind shear, in knots per 300 m.
vvv	Vertical wind shear, in knots per 1000 m.
$x_2x_2x_2$	Change to: Type of analysis.
Y	Change to: Day of the week (GMT). Delete note (1) and renumber notes (2) and (3) accordingly.
zz	Change to: Depth, in hundreds of metres, starting with the surface.

21. The remainder of the proposals concern the code tables in Section D. Changes in the titles of certain tables to match the proposed change in the specifications in Section C, as well as the change in the code table numbers mentioned before the proposed changes to Section C are not explicitely included in the following list of changes.

Code table	Comments
0139	Change title of the second column, to agree with the specification. Change to: Repetition rate.
0152	Change the specification for / as follows: / Cyclone centre undetermined.
0159	The exact boundaries between sub-areas are obscure. The map should first be enlarged (as with Code table 2590). and then key values of latitude and longitude inserted.
0210	To bring the definition for code figure 9 in line with the definition in the WMO Sea-Ice Nomenclature (WMO-No. 259), change it to: Ice hummocking, or hummocking and screwing.
0252	The word "apparent" in code figures 0 - 4 is not necessary, since it is already included in the title. Change them to: 0 Much weakening 1 Weakening 2 No change 3 Intensification 4 Strong intensification
0262	Delete the column heading, since it is redundant. Replace the present Note with the following Notes:

(1) Code figures 0 to 6 shall be used to show the reason for no report when a scheduled launch is aborted, or when a launch is accomplished but no data are available.

(2) Code figures 7 to 9 shall be used to show the type of ground equipment employed during a satisfactory launch.

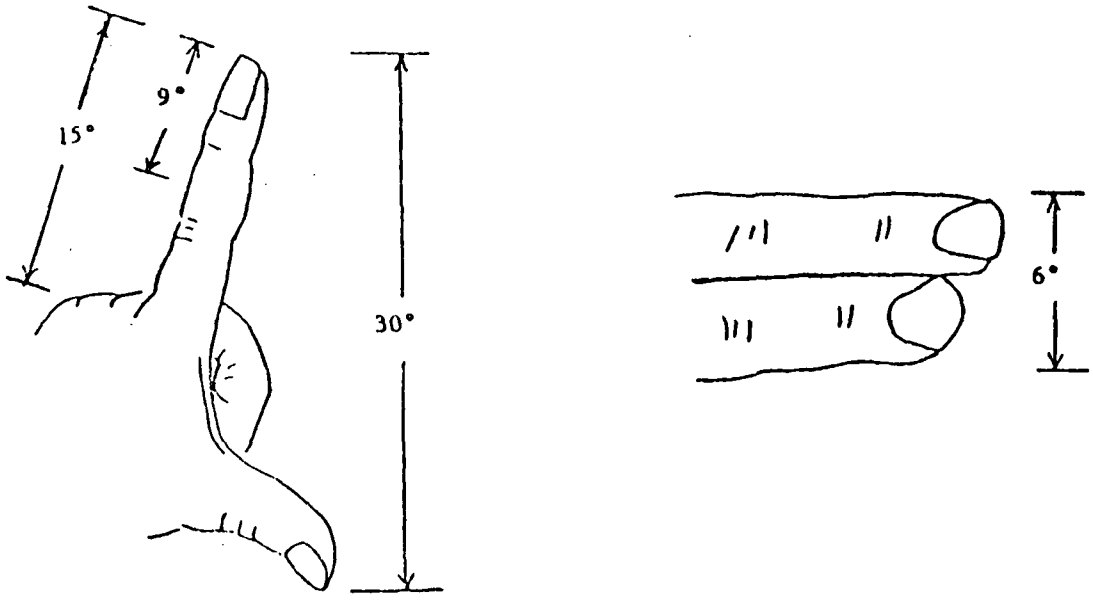
0265 Delete the column heading, since it is redundant.

0822 Rearrange the code figures in proper numerical order (see Code table 3155 for a similar case).

1004 The note following the code table is very complete but is also somewhat confusing. Replace with this short explanation and an illustration similar to the one given below.

NOTE: Angular elevation may be estimated by a rough-and-ready method. The following illustration demonstrates that method.

Estimating elevation angles



At a distance of 30 cm (about a foot) from your eye, the span formed by your thumb and forefinger is about 15°. The length of the top of your forefinger is about 9°. The breadth of two fingers is about 6°.

1005 Delete the column heading, since it is redundant.

1053 Delete the column heading, since it is redundant.

1062 To be consistent with other code tables the note following code figure 0 should be at the bottom of the table. Reword the note as follows:

NOTE: For code figure 0, in a tropopause analysis uuu shall be reported in hundreds of standard geopotential metres.

1147 Change code figures 4 to 8 to include the dimensions of the various floes, as given in the WMO Sea-Ice Nomenclature:

4	Small ice floes (20 - 100 m across)
5	Medium ice floes (100 - 500 m across)
6	Big ice floes (500 - 2000 m across)
7	Vast ice floes (2 - 10 km across)
8	Giant ice floes (over 10 km across)

1400 The column heading is actually an explanatory note, and should be included as a Note following the table:

NOTE: The times of observation are one hour or less from the reported times.

1545 To be consistant with other code tables (e.g. 4044, 4504, 4535, etc.), change code figures as follows:

0	3000 m or less
1	Above 3000 m to 4500 m
2	Above 4500 m to 6000 m
3	Above 6000 m to 7500 m
4	Above 7500 m to 9000 m
5	Above 9000 m to 10 500 m
6	Above 10 500 m to 12 000 m
7	Above 12 000 m to 13 500 m
8	Above 13 500 m to 15 000 m
9	Above 15 000 m

2582 Under the column titled "No distinction", replace each of the two asterisks by XX. Delete the "Note" following the table.

2836 Delete the column heading, since it is redundant.

2877 There is no indication of when the different parts of the code table should be used. Add these Notes:

NOTES:

(1) If the exact number, 1 to 19, is known, code figures 01 - 19 shall be used.

(2) If the number is more than 19, or if the exact number can only be estimated, code figures 20 - 28 shall be used.

(3) Code figure 99 shall only be used when it is absolutely impossible to make a reasonable estimate of the number.

3300 Delete the word "Greenwich" in each of the column headings, since it is redundant (all longitudes are with reference to Greenwich). Also, it would help if this code table included an illustration (as with Code table 3333) and a note explaining how to handle the ambiguous cases.

3845 Change the entire table as follows:

3845

s_n - Sign of the data and relative humidity indicator.

Code figure	
0	Positive or zero
1	Negative
9	Relative humidity follows.

NOTES:
(1) Code figures 2 - 8 are not used.
(2) See Regulation 12.2.3.3.1 for the use of code figure 9.

3889 Remove the units from individual code figures and use a single column heading. Add code figure 000 with specification "Not used".

4200 Delete column heading, since it is redundant.

4377 Delete the Notes following the code table.

4635 Add this note to the table:
NOTE: See code table 1800 for intensity or character of w_e.

A N N E X IX

Annex to Recommendation 8 (CBS-VIII)

REVISION OF THE STRUCTURE OF THE MANUAL ON CODES, VOLUME I

A new system of code identification

The first step is the combination of code forms that now share a common set of regulations. Some editorial revision may be required. The codes that will be combined and the new code names are:

FM 12-VII SYNOP and FM 13-VII SHIP (to be called SYNOP);
FM 32-V PILOT and FM 33-V PILOT SHIP (to be called PILOT),
FM 35-V TEMP, FM 36-V TEMP SHIP and FM 37-VII TEMP DROP (to be called TEMP);
FM 39-VI ROCOB and FM 40-VI ROCOB SHIP (to be called ROCOB), and
FM 75-VI CLIMAT TEMP and FM 76-VI CLIMAT TEMP SHIP (to be called CLIMAT TEMP).

The new system is based on the classification of the codes into four categories:

- Observations (identified as OB),
- Analyses and forecasts (identified as AF),
- Forecasts (identified as FO), and
- Climatological (identified as CL).

Observations are surface and upper-air reports of meteorological data. This category includes synoptic observations, aviation observations, observations for marine use, and hydrological observations. Using the present form of identification, the following codes fall in this category:

FM 12-VII SYNOP/FM 13-VII SHIP;
FM 15-V METAR;
FM 16-V SPECI;
FM 20-V RADOB;
FM 32-V PILOT/FM 33-V PILOT SHIP;
FM 35-V TEMP/FM 36-V TEMP SHIP/FM 37-VII TEMP DROP;
FM 39-VI ROCOB/FM 40-VI ROCOB SHIP;
FM 41-IV CODAR;
FM 63-V BATHY;
FM 64-V TESAC;
FM 67-VI HYDRA;
FM 81-I SFAZI;
FM 82-I SFLOC;
FM 83-I SFAZU;
FM 86-VI Ext. SATEM;
FM 87-VI Ext. SARAD.

Analyses and forecasts are those analyses and forecasts, expect those prepared for aviation, that are either derived from charts or have a one-to-one relation to a given chart. Using the present form of identification, the following codes fall in this category:

FM 44-V ICEAN;
FM 45-IV IAC;
FM 47-V GRID;
FM 49-VII GRAF;
FM 85-VI SAREP;
FM 88-VI Ext. SATOB.

Forecasts are surface and upper-air forecasts, including those prepared for aviation, marine use, and hydrological use. Using the present form of identification, the following codes fall in this category:

FM 48-V ARMET;
FM 51-V TAF;
FM 53-V ARFOR;
FM 54-V ROFOR;
FM 61-IV MAFOR;
FM 68-VI HYFOR.

Climatological codes include those used to report means and totals for individual stations and areas. Using the present form of identification, the following codes fall in this category:

FM 71-V CLIMAT;
FM 72-VI CLIMAT SHIP;
FM 73-VI NACLI .... INCLI;
FM 75-VI CLIMAT TEMP;
FM 76-VI CLIMAT TEMP SHIP.

In addition to the change from a common FM identifier to an identifier showing the category, code numbers within each category will be changed according to these general meanings:

10 - 49 surface codes
- 10 - 19 synoptic (land and marine)
- 20 - 29 aviation
- 30 - 39 marine only
- 40 - 49 hydrological

50 - 79 upper-air codes
- 50 - 59 aviation
- 60 - 69 soundings
- 70 - 79 other

80 - 89 surface and upper-air codes

90 - 99 other codes.

Table I shows how the present codes are combined and renumbered at the end of Step 2.

*

* *

TABLE I

PRESENT CODE	...BECOMES...	AT THE END OF STEP 2
FM 12-VII SYNOP/FM 13-VII SHIP	----------	OB 10 SYNOP
FM 15-V METAR	----------	OB 20 METAR
FM 16-V SPECI	----------	OB 21 SPECI
FM 20-V RADOB	----------	OB 90 RADOB
FM 32-V PILOT/FM 33-V PILOT SHIP	----------	OB 60 PILOT
FM 35-V TEMP/FM 36-V TEMP SHIP/FM 37-VII TEMP DROP	-----	OB 61 TEMP
FM 39-VI ROCOB/FM 40-VI ROCOB SHIP	----------	OB 62 ROCOB
FM 86-VI Ext. SATEM	----------	OB 63 SATEM
FM 41-V CODAR	----------	OB 50 CODAR
FM 44-V ICEAN	----------	AF 30 ICEAN
FM 45-IV IAC	----------	AF 80 IAC
FM 46-IV IAC FLEET	----------	AF 81 IAC FLEET
FM 47-V GRID	----------	AF 82 GRID
FM 49-VII GRAF	----------	AF 83 GRAF
FM 48-V ARMET	----------	FO 50 ARMET
FM 53-V ARFOR	----------	FO 51 ARFOR
FM 51-V TAF	----------	FO 20 TAF
FM 54-V ROFOR	----------	FO 52 ROFOR
FM 61-V MAFOR	----------	FO 30 MAFOR
FM 63-V BATHY	----------	OB 30 BATHY
FM 64-V TESAC	----------	OB 31 TESAC
FM 67-VI HYDRA	----------	OB 40 HYDRA
FM 68-VI HYFOR	----------	FO 40 HYFOR
FM 71-VI CLIMAT	----------	CL 10 CLIMAT
FM 72-VI CLIMAT SHIP	----------	CL 30 CLIMAT SHIP
FM 73-VI NACLI ... INCLI	----------	CL 31 NACLI ... INCLI
FM 75-VI CLIMAT TEMP/FM 76-VI CLIMAT TEMP SHIP	---------	CL 60 CLIMAT TEMP
FM 81-I SFAZI	----------	OB 91 SFAZI
FM 82-I SFLOC	----------	OB 92 SFLOC
FM 83-I SFAZU	----------	OB 93 SFAZU
FM 85-VI SAREP	----------	AF 10 SAREP
FM 87-VI Ext. SARAD	----------	OB 94 SARAD
FM 88-VI Ext. SATOB	----------	AF 84 SATOB

"Final" form of code identification

Assuming the successful conclusion of Step 2, Step 3 includes the combination of similar codes (e.g. all codes used for atmospheric soundings) and the selection of new code names.

The table on the next page shows the evolution of the "final" form. Since it is the complete evolution it includes the intermediate codes from Annex VIII. It also includes, as comments between the intermediate and "final" forms, some problems that should be addressed at that time.

Table II is a provisional list of the code names after conclusion of Step 3.

TABLE II

Evolution of new codes

PRESENT CODE	INTERMEDIATE	(COMMENTS)	"FINAL"
FM 12-VII SYNOP/FM 13-VII SHIP	OB 10 SYNOP		OB 10 OBSYN
FM 15-V METAR	OB 20 METAR		OB 20 OBSAV
FM 16-V SPECI	OB 21 SPECI		
FM 20-V RADOB	OB 90 RADOB		OB 90 RADAR
FM 32-V PILOT/FM 33-V PILOT SHIP	OB 60 PILOT		
FM 35-V TEMP/FM 36-V TEMP SHIP			
FM 37-VII TEMP DROP	OB 61 TEMP		OB 60 OBSUP
FM 39-VI ROCOB/FM 40-VI ROBOC SHIP	OB 62 ROCOB		
FM 86-VI Ext. SATEM	OB 63 SATEM		
FM 41-V CODAR	OB 50 CODAR	(is this code used?)	OB 50 PIREP
FM 44-V ICEAN	AF 30 ICEAN		AF 30 ICECON
FM 45-IV IAC	AF 80 IAC	AF 80 CHART	
FM 46-IV IAC FLEET	AF 81 IAC FLEET		(or preferably)- AF 80 CHART
FM 47-V GRID	AF 82 GRID	AF 81 GRID	
FM 49-VII GRAF	AF 83 GRAF		
FM 43-V ARMET	FO 50 ARMET		FO 50 WITAR
FM 53-V ARFOR	FO 51 ARFOR		
FM 51-V TAF	FO 20 TAF		FO 20 TERFOR
FM 54-V ROFOR	FO 52 ROFOR	(combine with FO 50?)	FO 52 AVROF
FM 61-V MAFOR	FO 30 MAFOR		FO 30 MARFOR
FM 63-V BATHY	OB 30 BATHY		OB 30 MARSOND
FM 64-V TESAC	OB 31 TESAC		
FM 67-VI HYDRA	OB 40 HYDRA		OB 40 HYDROB
FM 68-VI HYFOR	FO 40 HYFOR		FO 40 HYFOR
FM 71-VI CLIMAT	CL 10 CLIMAT		CL 10 CLIMATE
FM 72-VI CLIMAT SHIP	CL 30 CLIMAT SHIP		
FM 73-VI NACLI ... INCLI	CL 31 NACLI ... INCLI		CL 31 CLION
FM 75-VI CLIMAT TEMP/			
FM 76-VI CLIMAT TEMP SHIP	CL 60 CLIMAT TEMP		CL 60 CLIMUP
FM 81-I SFAZI	OB 91 SFAZI		
FM 82-I SFLOC	OB 92 SFLOC	(are these codes used?)	OB 91 SFERIC
FM 83-I SFAZU	OB 93 SFAZU		
FM 85-VI SAREP	AF 10 SAREP	(combine with SATOB?)	AF 10 SACLO
FM 87-VI Ext. SARAD	OB 94 SARAD		OB 94 SARAD
FM 88-VI Ext. SATOB	AF 84 SATOB	(combine with SAREP?)	AF 84 SATOB

"Final" code names

OB 10 OBSYN	Surface synoptic observation
OB 20 OBSAV	Aviation terminal weather observation
OB 30 MARSOND	Marine subsurface sounding
OB 40 HYDROB	Hydrological observation
OB 50 PIREP	Pilot report
OB 60 OBSUP	Atmospheric sounding
OB 90 RADAR	Ground radar weather observation
OB 91 SFERIC	Report of atmospherics
OB 94 SARAD	Satellite clear radiance observations
AF 10 SACLO	Synoptic interpretation of satellite cloud data
AF 30 ICECON	Observed and forecast ice conditions
AF 80 CHART	Analyses and forecasts in a grid code
AF 84 SATOB	Satellite observation of surface and upper-air data
FO 20 TERFOR	Aviation terminal forecast
FO 30 MARFOR	Marine area forecast
FO 40 WITAR	Aviation area forecast, including winds and temperatures aloft
FO 52 AVROF	Aviation route forecast
CL 10 CLIMATE	Monthly means and totals for a surface synoptic station
CL 31 CLION	Monthly mean pressures for an ocean area
CL 60 CLIMUP	Monthly means for an upper-air synoptic station

A N N E X X

Annex to Recommendation 9 (CBS-VIII)

MODIFICATION TO CODE FORMS FM 63-V BATHY, FM 64-V TESAC AND DRIBU

Modification of the existing BATHY code

Proposed design:

- Section 1: $M_iM_iM_jM_j$ YYMMJ GGgg/ $Q_cL_aL_aL_aL_a$ $L_oL_oL_oL_oL_o$ ($i_u$ddff) ($4s_n$TTT) - no changes

- Section 2: 8888k_1 $z_oz_oT_oT_oT_o$ . . . . . $z_nz_nT_nT_nT_n$ (00000) - modification in 88888 group

(Section 3 presently in use should be removed)

- Section 3: (66666 ($1Z_dZ_dZ_dZ_d$) ($k_5D_cD_cV_cV_c$)) - new group, optional

- D . . . . D

Legend

k_1 = Indicator for digitization

k_1 = 8 values at significant depths (data points taken from traces at significant depths)

k_1 = 7 values at selected depths (data points fixed by the instrument or selected by any other method)

$Z_dZ_dZ_dZ_d$ total water depth in metres

k_5 = Indicator of the method of current measurement

k_5 = 2 GEK (Geomagnetic Electrokinetograph)

k_5 = 3 ship's set and drift determined by fixes 3-6 hours apart

k_5 = 4 ship's set and drift determined by fixes more than 6 hours but less than 12 hours apart

D_cD_c surface current direction in tens of degrees

V_cV_c surface current speed in 0.1 knots

Modificaton of the existing TESAC code

Proposed design:

- Section 1: $M_1M_1M_jM_j$ YYMMJ GGgg/ $Q_cL_aL_aL_aL_a$ $L_oL_oL_oL_oL_o$ ($i_u$ddff) ($4s_n$TTT) - no changes

- Section 2: $888k_1k_2$ $2z_oz_oz_oz_o$ $3T_oT_oT_oT_o$ $4S_oS_oS_oS_o$ . . . . (00000) - modification in $8888k_2$ group

  (Section 3 presently in use should be removed)

- Section 3: ($666k_4k_3$ . . . . _ . . . . $d_nd_nc_nc_nc_n$) - as present Section 4

- Section 4: (55555 $1Z_dZ_dZ_dZ_d$) - new Section, optional

  _____ D.... D

k_1 and $Z_dZ_dZ_dZ_d$ are specified as in the proposal for the BATHY code

ANNEX X

Revision of the notes and regulations to code forms FM 63-V BATHY, FM 64-V TESAC AND DRIBU

1. Amend Note (3) to FM 63-V BATHY to read:

(3) The code form is divided into three sections:

Section number	Symbolic figure group	Contents
1	---	Identification and position data. Wind and air temperature (optional)
2	8888	Temperatures at either significant or selected depths
3	66666	Total water depth and surface current (optional)

2. Amend Regulation 63.3.1 to read:

63.3.1
If temperatures are reported at significant depth, the values

(a) Shall be sufficient to reproduce basic features of the temperature profile;
(b) Shall define the top and the bottom of isothermal layers;
(c) Shall, in the upper 500 metres, never be more and usually less than 20 in number, even at the cost of loss of detail.

3. Replace Regulation 63.4.2 by the following:

63.4.2
Group ($1z_dz_dz_dz_d$) shall be omitted when group 00000 is included in Section 2.

4. Amend Note (3) to FM 64-V TESAC to read:

(3) The code form is divided into four sections:

Section number	Symbolic figure group	Contents
1	---	Identification and position data. Wind and air temperature (optional)
2	888	Temperatures and salinity at either significant or selected depths.
3	666	Current at selected and/or significant depths (optional)
4	55555	Total water depth (optional)

5. Amend Regulation 64.3.1 to read:

If temperatures and salinity are reported at significant depths, the values:

(a) Shall be sufficient to reproduce basic features of the temperature and salinity profile;

(b) Shall define the top and the bottom of isothermal/isohaline layers;

(c) Shall, in the upper 500 metres, never be more and usually less than 20 in number, even at the cost of loss of detail.

6. Amend Regulations 64.4 to 64.5 to read:

64.4

Section 3

The inclusion of this section shall be determined by national decision.

64.5

Section 4

64.5.1

The inclusion of this section shall be determined by national decision.

64.5.2

This Section shall be omitted when group 00000 is included in Section 2.

7. Amendments to code form DRIBU

Amend Section 1 of the DRIBU code to provide for optional reporting of pressure tendency as follows:

.. ... . ($4S_nTTT$) (5appp)

Amend Section 2 of the DRIBU code in order to provide for optional reporting of the depth of the drogue as follows:

.. ... . ($8V_iV_iV_iV_i$) ($9i_dz_dz_dz_d$) 69696 where:

9 Indicator for the drogue group

i_d Indicator for the type of the drogue (to be defined at a later time, at present i_d = 0 should be used)

$z_dz_dz_d$ Length of the cable at which the drogue is attached, in metres.

NOTES:

(1) The inclusion of this group is strongly recommended for buoys which have been deployed as drogued buoys.

(2) This group should not be used in reports from a buoy on which a drogue was never installed.

(3) Section number	Contents - amend to read
1	Identification and position data, surface pressure and sea-surface temperature, (optional) wind, air temperature and pressure tendency.

A N N E X XI

Annex to Recommendation 12 (CBS-VIII)

AMENDMENT TO SECTION 1, PART B, OF CODE FORM FM 20-V RADOB

1. Amend Section 1, Part B, of code form RADOB (Manual on Codes, Volume I, p. I-A-41) as follows:

"Part B

SECTION 1 $M_iM_iM_jM_j$ YYGGg { IIiii or 99$L_aL_aL_a$ $Q_cL_oL_oL_oL_o$ }

$N_eN_eW_RH_eI_e$ .... $N_eN_eW_RH_eI_e$

/555/ $N_eN_ea_eD_ef_e$ ..... $N_eN_ea_eD_ef_e$"

2. Amend Regulation 20.3 to read as follows:

"20.3

Part B

20.3.1

In Part B, one series of groups $N_eN_eW_RH_eI_e$ shall be used to report the location of phenomena and/or clouds and their characteristics. Group $N_eN_eW_RH_eI_e$ shall be repeated as necessary for a full description of the spatial distribution of the echo on the radar scope in 60x60 km squares.

20.3.2

Group $N_eN_eW_RH_eI_e$

20.3.2.1

Characteristics concerning the location, type of phenomena and/or clouds and the elevation and intensity of their echoes shall be reported by group $N_eN_eW_RH_eI_e$.

20.3.2.2

Group $N_eN_eW_RH_eI_e$ shall be included in the report in the rising order of the squares' sequential numbers N_eN_e.

20.3.2.3

If several weather phenomena were observed in a single 60x60 km square, the most dangerous phenomenon shall be reported in W_R, the highest echo elevation in H_e and the greatest echo intensity in I_e.

20.3.2.4

Cloud type data (W_R) shall be reported only if no weather phenomena were observed in the 60x60 km square.

20.3.2.5

Data on stratiform cloud without precipitation shall be reported if it occupies no less than 1/4 of the 60x60 km square's area.

20.3.2.6

Data on convective cloud shall be reported irrespective of the centres' dimensions within the limits of the 60x60 km square.

20.3.2.7

If, in the 60x60 km square, convective and stratiform clouds were observed, only data on the convective cloud shall be reported.

20.3.2.8

Cloud echo intensity (I_e) shall be coded as /.

20.3.3

Group $N_eN_ea_eD_ef_e$

20.3.3.1

Characteristics concerning change and movement of the echo pattern shall be reported by group $N_eN_ea_eD_ef_e$, followed by the identifier group /555/.

20.3.3.2

Group $N_eN_ea_eD_ef_e$ shall be used to report the evolutionary characteristics of no more than three echo patterns. The identifier group /555/ shall not be repeated.

20.3.3.3

N_eN_e shall be used to report the number of the 60x60 km square in which the radar operator placed the origin of the speed vector characterizing the direction of movement D_e of the echo pattern. If only the tendency of the echo pattern a_e has been estimated, the number of any square covered by the pattern shall be reported in N_eN_e.

20.3.3.4

The tendency of the echo pattern a_e shall be estimated over a period of approximately one hour, but not longer than 90 minutes and not shorter than 30 minutes. The echo area shall be considered as increasing or diminishing if it changed by more than 25 per cent over a period of time not exceeding 90 minutes.

20.3.3.5

If no information is available on the change and movement of the echo, groups /555/ and $N_eN_ea_eD_ef_e$ shall not be included in the report.

20.3.3.6

The movement of individual echoes in the echo pattern shall not be reported.

20.3.4

Reporting of inoperative equipment, anomalous propagation and absence of an echo.

In the case of inoperative equipment, anomalous propagation or absence of an echo on the radar scope, groups $N_eN_eW_RH_eI_e$, /555/, and $N_eN_ec_eD_ef_e$ shall be replaced by one of the following groups, as appropriate:

0/0/0 - Radar inoperative, or

0//// - Anomalous propagation, or

00000 - No echo visible on radar scope."

3. Amend the List of symbolic figures and figure groups (Manual on Codes, Volume I, p. I-B-4) as follows:

3.1 Add:

"/555/ Data on characteristic change and movement of the echo pattern(s) follow."

3.2 Delete:

"/999/ Ends a significant feature".

4. Amend Section C of the Manual on Codes, Volume I (Specifications of symbolic letters (or groups of letters)) as follows:

4.1 Add

"D_e Direction (true) towards which an echo pattern is moving (Code table 0700)

f_e Speed of movement of echo pattern (Code table 1236)

(FM 20-V)

N_eN_e Sequential number of the 60x60 km square in the radar coordinate grid (Code table 2776)

(FM 20-V)

W_R Type of weather phenomenon or cloud in the 60x60 km square detected by radar (Code table 4530)

(FM 20-V)".

4.2 Delete:

"bbb, et, rr and W_e" and their specifications.

5. Amend Section D of the Manual on Codes, Volume I (Code tables) as follows:

5.1 Add the following code tables:

1236

f_e - Speed of movement of echo pattern

Code figure	
0	0 to 9 km/h
1	10 to 19 km/h
2	20 to 29 km/h
3	30 to 39 km/h
4	40 to 49 km/h
5	50 to 59 km/h
6	60 to 69 km/h
7	70 to 79 km/h
8	80 to 89 km/h
9	90 km/h or more
/	Undetermined

2776

N_eN_e - Sequential number of the 60x60 km square in the radar coordinate grid

					N ↑					
	00	01	02	03	04	05	06	07	08	09
	10	11	12	13	14	15	16	17	18	19
	20	21	22	23	24	25	26	27	28	29
	30	31	32	33	34	35	36	37	38	39
W←	40	41	42	43	44	+ 45	46	47	48	49 →E
	50	51	52	53	54	55	56	57	58	59
	60	61	62	63	64	65	66	67	68	69
	70	71	72	73	74	75	76	77	78	79
	80	81	82	83	84	85	86	87	88	89
	90	91	92	93	94	95 ↓	96	97	98	99
						S				

NOTE: The cross indicates the radar's location

4530

W_R - Type of weather phenomenon or cloud in the 60x60 km square detected by radar

Code figure	
1	Stratiform cloud without precipitation
2	Convective cloud without phenomena
3	Continuous precipitation
4	Showers
5	Showers and continuous precipitation
6	Thunderstorm or thunderstorm and showers
7	Thunderstorm and continuous precipitation
8	Hail
9	Hail and other phenomena
/	Undetermined

5.2 Delete Code tables 1052 and 4535.

A N N E X XII

Annex to Recommendation 13 (CBS-VIII)

WINTEM CODE FORM FM 50-VIII - FORECAST

UPPER-WIND AND TEMPERATURE DATA FOR AVIATION

FM 50-VIII WINTEM - Forecast upper-wind temperature data for aviation

CODE FORM				
Section o				
WINTEM $Y_FY_FG_FG_Fg_Fg_F$				
Section 1				
$L^1_aL^1_aA$	$L^1_oL^1_oL^1_oB$	$L^2_oL^2_oL^2_oB$	.....	$L^i_oL^i_oL^i_oB$
(TROP	$n_tn_tn_t$	$n_tn_tn_t$	.....	$n_tn_tn_t$)
(MAXW	$n_mn_mn_md_md_mf_mf_mf_m$	$n_mn_mn_md_md_mf_mf_mf_m$	.....	$n_mn_mn_md_md_mf_mf_mf_m$)
$\underline{F}n_1n_1n_1$	ddfffSTT	ddfffSTT	.....	ddfffSTT
$\underline{F}n_2n_2n_2$	ddfffSTT	ddfffSTT	.....	ddfffSTT
⋮	⋮	⋮		⋮
$\underline{F}n_kn_kn_k$	ddfffSTT	ddfffSTT	.....	ddfffSTT
$L^2_aL^2_aA$				
(TROP	$n_tn_tn_t$	$n_tn_tn_t$	.....	$n_tn_tn_t$)
(MAXW	$n_mn_mn_md_md_mf_mf_mf_m$	$n_mn_mn_md_md_mf_mf_mf_m$	.....	$n_mn_mn_md_md_mf_mf_m$)
$\underline{F}n_1n_1n_1$	ddfffSTT	ddfffSTT	.....	ddfffSTT
$\underline{F}n_2n_2n_2$	ddfffSTT	ddfffSTT	.....	ddfffSTT
$\underline{F}n_kn_kn_k$	ddfffSTT	ddfffSTT	.....	ddfffSTT
⋮	⋮	⋮		⋮
$L^j_aL^j_aA$				

(TROP	$n_t n_t n_t$	$n_t n_t n_t$	.....	$n_t n_t n_t$)
(MAXW	$n_m n_m n_m d_d d_f f_f f_m$	$n_m n_m n_m d_d d_f f_f f_m$	.....	$n_m n_m n_m d_d d_f f_f f_m$)
$Fn_1 n_1 n_1$	ddfffSTT	ddfffSTT	.....	ddfffSTT
$Fn_2 n_2 n_2$	ddfffSTT	ddfffSTT	.....	ddfffSTT
⋮	⋮	⋮		⋮
$Fn_k n_k n_k$	ddfffSTT	ddfffSTT	.....	ddfffSTT

NOTES

(1) WINTEM is the name of the code used to provide forecast upper-wind and temperature data for aviation.

(2) The forecast data are valid at the points of a rectangular geographical grid.

(3) A WINTEM message is identified by the word WINTEM.

(4) The code form is divided in two sections as follows:

Section number	Contents
0	Identification and time of validity of forecast data
1	Grid point co-ordinates and data groups for tropopause height, level of maximum wind and specified flight levels.

REGULATIONS

50.1

General

50.1.1

The code name WINTEM shall always be included in the message.

50.1.2

When in printed form, the format of the WINTEM message shall present the characteristics of a direct reading data table.

50.2

Section 0

The groups of this section shall constitute the first line of the message.

50.3

Section 1

50.3.1

The geographical grid used shall be rectangular, i.e. that its boundaries shall be delineated by means of two meridians and two parallel circles.

50.3.2

In the message, the latitude of grid points shall always be included at the beginning of a line and they shall follow each other in a regular sequence, starting with the northernmost grid point latitude.

50.3.3

The longitudes of the grid points shall be included only in the first line of Section 1 and they shall be ordered from left to right in a continuous sequence corresponding to an eastward direction.

50.3.4

The n^{th} figure group of a given line of the message, which contains forecast data, shall always refer to the grid point determined by:

(a) the latitude included in the nearest preceding line of the data group;

(b) the n^{th} longitude included on the first line of Section 1.

50.3.5

The maximum number of grid point longitudes included in the first line of Section 1 (i.e. index i of L L L B) shall not exceed 7.

NOTE: There is no limitation to the number of grid point latitudes included in the message, except for telecommunication reasons.

50.3.6

Whenever the need arises to include more than 7 grid point longitudes in the first line of Section 1, the message shall be split up in parts, each one satisfying Regulation 50.3.5 above.

50.3.7

The data associated with a given grid point shall be included in the following order:

(1) Tropopause height.
(2) Maximum wind level.
(3) Specified flight levels arranged in decreasing order.

50.3.8

Tropopause height and/or maximum wind level data shall be omitted whenever these data are not required for operational purposes.

50.3.9

The number of specified flight levels to be included shall be determined by the issuing centre on the basis of operational requirements.

Specifications of symbolic letters

yy Day of the month (GMT) on which the WINTEM message is valid.

GGgg Time in whole hours (GMT) on which the WINTEM message is valid As a result gg shall always be equal to oo.

LL

Latitude co-ordinates of grid points

LL

A Direction of latitude (N = North
(S = South

LLL

Longitude co-ordinates of grid points
NOTE: i may not exceed 7. See Regulation 50.3.5

LLL

B Direction of longitude (E = East
(W = West

TROP Indicator word: the forecast flight levels that follow on the same line refer to the tropopause height.

MAXW Indicator word: the flight levels and the wind data that follow on the same line refer to the forecast maximum wind level.

F Indicator letter for flight levels numbers nnn , nnn ,....nnn .

nnn Tropopause flight level number. The last figure shall always be zero.

nnn Maximum wind flight level number. The last figure shall always be zero.

nnn

Flight level numbers for specified levels. The last figure shall always be zero.

nnn

dd Wind direction and speed forecast data for the relevant grid point.
fff

S Sign of temperature (P = positive or zero
(M = negative

TT Forecast temperature at the relevant grid point.

A N N E X XIII

Annex to Recommendation 14 (CBS-VIII)

AMENDMENTS TO THE MANUAL ON THE GLOBAL TELECOMMUNICATION SYSTEM, VOLUME I - GLOBAL ASPECTS, PART I - ORGANIZATION OF THE GLOBAL TELECOMMUNICATION SYSTEM

(1) Attachment I-1, paragraph 2:

(i) Add the following new paragraph 2.2:

"2.2 Weather reports from mobile ship stations should be compiled in 10-figure groups, where desirable and appropriate. The ships' call sign should appear alone at the beginning of the report. Thereafter, the groups are simply run together to form 10-figure groups. If a 5-figure group is left over, it is sent as a 5-figure group. If the identifier 333 appears, it will run together with the adjacent five figures to form an 8-figure group. The restoration to 5-figure groups should be carried out not later than at the point of insertion in the GTS - usually at the NMC involved.

Note: The above arrangements do not apply to the parts of ships' weather reports prepared in plain language.

Example:
WLGT 0518499568 7020141498 5231410082 2001640198 5301270282 8323222200 0010320303 3263040907 50805333 8381583360";

(ii) Renumber the present paragraphs 2.2 to 2.5 to become paragraphs 2.3 to 2.6.

(2) Attachment I-1, paragraph 5.4:

Add, at the appropriate places:

.... transmitted "from ships to coastal radio stations" as soon as.....

(3) Attachment I-2:

Add, at the appropriate places:

(i) Segments Moscow-Sofia and Sofia-Prague;

(ii) Branch Paris-Dakar;
Branch Offenbach-Jeddah.

(4) Attachment I-3, paragraph I:

Add:

(i) After Paris under "PRESENT": Niamey (18),

(ii) After Cairo under "TARGET" and "PRESENT": Niamey (18),

(iii) At the appropriate places, under "TARGET" and "PRESENT": Dakar, Jeddah and Sofia.

(5) Figure 1 and Figure 2:

(i) Add everywhere programme 15 is indicated "18",

(ii) Add under Region I: 18. Niamey,

(iii) Add relevant information resulting from the inclusion of Dakar, Jeddah and Sofia (to be included in final text of the report).

(6) Attachment I-3, paragraph II:

(i) Add at the end of sub-paragraph 2(b):

"....., delayed Antarctic observational data to be exchanged up to 24 hours after the time of observation.",

(ii) Sub-paragraph 2(g) should read:

"(g) BATHY and TESAC, as available, up to 30 days after the time of observation".

(iii) Add to sub-paragraph 3:

"(j) All BATHY/TESAC reports, as available".

A N N E X XIV

Annex to Recommendation 15 (CBS-VIII)

AMENDMENTS TO THE MANUAL ON THE GLOBAL TELECOMMUNICATION SYSTEM, VOLUME I - GLOBAL ASPECTS, PART II - METEOROLOGICAL TELECOMMUNICATION PROCEDURES FOR THE GLOBAL TELECOMMUNICATION SYSTEM

1. Delete the last four lines of paragraph 2.3.2.2, starting with "The following ..." and replace by the following text:

"The indicator BBB shall have one of the following forms (a) or (b) as given below:

(a) RTD - for delayed routine weather reports;

COR - for correction to reports;

AMD - for amendments to processed information;

(b) In order that retard (RTD), correction (COR), and amendment (AMD) bulletins may be individually identified, they shall be issued in sequence using (in place of RTD, COR and AMD) the series RRA, RRB, RRC etc., CCA, CCB, CCC etc., and AAA, AAB, AAC etc. and so on through the alphabet.

Note: This change should be implemented by all GTS centres as soon as possible after (but not before) 15 January 1984."

2. Insert following new paragraph 2.3.3 after paragraph 2.3.2.3:

(i) "2.3.3 Format of SYNOP and SHIP bulletins

2.3.3.1 The presentation of bulletins containing SYNOP reports and SHIP reports in the code forms FM 12-VII and FM 13-VII respectively, should be in one of the formats (a or b) as given in ATTACHMENT II-4, paragraph 3.

2.3.3.2 When using format (a), all Sections 1, 2, 3 and 4 shall be consecutively transmitted without any insertion of spaces and slants in the identifier groups of Sections 3 and 4. If format (b) will be used, Sections 1, 2, 3 and 4 shall start at the beginning of a line but identifiers of Sections 3 and 4 shall start with two spaces at the beginning.

Note: For examples of formats (a) and (b), see ATTACHMENT II-4, paragraph 3 - Examples of presentation of formats for SYNOP bulletins."

(ii) Renumber present paragraphs 2.3.3 to 2.3.4 to become paragraphs 2.3.4 to 2.3.5 respectively.

3. Attachment II-4, add the following new paragraph 4:

EXAMPLES OF PRESENTATION OF FORMATS

FOR SYNOP BULLETINS

(a) All Sections 1, 2, 3 and 4 shall be consecutively transmitted without any insertion of spaces and slants in the identifier groups of Sections 3 and 4;

Example:

```
ZCZC 007 17200
SMRS10 RUMS 220600
AAXX 22061
26298 21/50 82503 11054 21058 40333 57010 71022 8807/ 333 21068
69902=
26477 21335 82503 11049 21052 40247 57004 77777 886// 333 21049
69902 88706=
26781 31296 82301 11050 21060 40248 52004 71022 887// 333 21057
88706=
26997 21450 80000 11068 21/86 40310 52009 72070 886// 333
60002 88712=
27595 22997 93008 11077 21196 40158 52010 333 21191 69932=
27612 31950 20000 11132 21145 40233 52002 71000 80001 333 21141=
27731 22998 62902 11119 21154 40234 52013 80002 333 21117 69902=
27947 32998 23602 11148 21178 40217 52020 80002=
27962 22997 03404 11136 21171 40197 52027 333 21126 69992=

NNNN
```

(b) Sections 1, 2, 3 and 4 shall start at the beginning of a line but identifiers of Sections 3 and 4 shall start with two spaces at the beginning;

Example:

```
ZCZC 055 18700
SMDD1 ETPD 110600
AAXX 11061
09393 32996 31704 10015 21027 40244 57005 83030
  333 20015 34101=
09543 32950 11401 11018 21034 40274 53002 81030
  333 21018 3/103 41999=
09184 32960 71905 10038 21006 40215 56003 8707/
  333 20038 31003=
09385 32960 51704 10018 21018 40243 5/005 83046
  333 20017 34000=

NNNN
```

4. Amend paragraph 2.8.1 as follows:

"2.8.1 Reports from ships and other marine stations in the SHIP code form start with the call sign of the ship, or with a suitable alternative designator."

5. Replace present paragraph 2.12 by the following new text:

"2.12 Data communication protocols for the Global Telecommunication System.

2.12.1 The transmission protocols for use on the GTS shall be the software system, hardware system, the Link Access Procedures Balanced Class (LAPB) and other elements of procedures as specified in CCITT Recommendation X.25 and, for HF radio transmissions, the ARQ procedures conforming to CCIR Recommendation 342-2.

2.12.2 The transmission procedures for the software and hardware systems are given in Attachment II-8 and for HF radio transmissions in Part III, paragraph 2.3.1.2.

2.12.3 The methods and elements of CCITT Recommendation X.25 procedures to be used in the GTS are as outlined below, references being made to the Yellow Book of CCITT, VIIth Plenary Assembly, Volume VIII, Fascicle VIII.2:

2.12.3.1 Physical layer (CCITT Recommendation X.25, physical level, paragraph 1/ISO layer 1)

The provisions given in CCITT Recommendation X.25, paragraph 1 shall be applied to point-to-point circuits and the interface between the data terminal equipment (DTE) and data circuit terminating equipment (DCE).

2.12.3.2 Link layer (CCITT Recommendation X.25, link level, paragraph 2/ISO layer 2)

The following provisions shall be applicable only to point-to-point circuits between centres of the GTS.

Frame structure: The frame format shall be as described in Table 1/X.25, with the following parameters:

Address field : one octet;

Control field : one octet.

Note: The extended control field of 2 octets or more needs further study.

Information field : 259 octets shall be used

131 octets optional subject to bilateral agreement between centres concerned.

Elements of procedure: The elements of procedure shall be as described in paragraph 2.3 of CCITT Recommendation X.25. CMDR and SARM in Table 3/X.25 shall not be used.

Description of the procedures: The description of the procedures shall be as described in paragraphs 2.4.1, 2.4.2, 2.4.3, 2.4.5, 2.4.6, 2.4.9, 2.4.10, and 2.4.11 of CCITT Recommendation X.25.

It is recommended that WMCs and RTHs should take the role of DTE or DCE and NMCs should take the role of DTE, by bilateral agreement between centres concerned.

System parameters shall be as follows:

Timer T 1 : T 1 transmission time for 3 frames + two-way signal propagation time over the link + maximum time for processing one frame in a specific receiving centre.

Note: Examples of values of Timer T 1 with processing time of 10 milliseconds are as follows:

Cable links	:	9600 bit/s 0.4 s
		4800 bit/s 0.8 s
		2400 bit/s 1.6 s
Satellite links	:	9600 bit/s 1.2 s
		4800 bit/s 1.6 s
		2400 bit/s 2.4 s

Maximum number of transmissions N 2 should be 10

Number of outstanding frames K : $2 \leq K \leq 7$

2.12.3.3 Network layer (CCITT Recommendation X.25, packet level, paragraphs 3, 4.2 to 4.6, 6.1, 6.3, 6.5 and 6.6/ISO layer 3)

The packet level of CCITT Recommendation X.25 shall be used between two adjacent centres only in accordance with the procedures for permanent virtual circuit (PVC) service and with packet format as given in Figure 5/X.25 (Modulo 8).

The maximum length of the user data field shall be 256 octets or optionally 128 octets.

Window size W : $2 \leq W \leq 7$ depending on type of communication circuit and system equipment.

Note: The establishment of permanent virtual circuits (PVC) between non-adjacent centres needs further study.

2.12.4 Transport layer (ISO layer 4)

A packet shall only contain the data from a single message. Every message shall start with a new packet and the complete message shall be divided into a number of packets. The final packet shall be of a varying length and shall contain the final part of the message.

Notes: 1. The complete definition and procedures of the transport layer are under study.

2. References to ISO layers are made from the Draft International Standard ISO/DIS 7498 (1982).

A N N E X XV

Annex to Recommendation 16 (CBS-VIII)

AMENDMENTS TO THE MANUAL ON THE GLOBAL TELECOMMUNICATION SYSTEM, VOLUME I, PART III - TECHNICAL CHARACTERISTICS AND SPECIFICATIONS FOR THE GLOBAL TELECOMMUNICATION SYSTEM

1. Amend paragraph 8 to read as follows:

"8. Technical characteristics of equipment for coded digital facsimile transmission.

8.1 The technical characteristics given below shall be applied to meteorological coded transmission facilities used for international exchange of pictorial information.

8.1.1 Scanning track

The message area shall be scanned in the same direction in the transmitter and receiver. Viewing the message area in a vertical plane, the picture elements should be processed as if the scanning direction were from left to right with subsequent scans adjacent and below the previous scan.

8.1.2 Preferred standard

8.1.2.1 The following dimensions applying to an ISO A4 document shall be used:

(a) 1728 black-and-white picture elements along the scan line length of 215 mm ± 1%;

(b) a normal resolution and a higher resolution of 3.85 line/mm ± 1% and 7.7 line/mm ± 1% respectively in vertical direction.

8.1.2.2 Different lengths of the scanning line could be used, the reproduction bearing the same proportion as the original with a ratio "R" defined as follows:

$$R = \frac{\text{Actual scan line length (mm)}}{215 \text{ mm}}$$

In this respect the dimensions should be the following:

(a) 1728 black and white picture elements along the scan line length of 215 x R mm ± 1%;

(b) a normal resolution and a higher resolution of $\frac{3.85}{R}$ line/mm ± 1% and $\frac{7.7}{R}$ ± 1% respectively in vertical direction.

For example, a scan line length of 456 mm (corresponding to the active sector of an analogue facsimile scanning) should be used with a vertical resolution of 1.82 and 3.63.

8.1.3 Other standards

Equipment for coded digital facsimile may be used with the following characteristics:

(a)	Useful line length	:	456 mm
(b)	Number of picture elements per line	:	1728, 3456
(c)	Horizontal resolution	:	3.79, 7.58 lines/mm
(d)	Vertical resolution	:	(1) 3.79 lines/mm (IOC 576) (2) 1.89 lines/mm (IOC 288).

8.1.4 Transmission time per total coded scan line

The minimum transmission times of the total coded scan line shall preferably be:

128, 64, 32, 16, 8, 0 milliseconds.

8.1.5 Transmission rate

The transmission rate over a point-to-point circuit shall be:

2400, 4800, 7200, 9600 bit/s.

8.2 Coding scheme

The code for digital facsimile transmission shall be determined by CCITT Recommendation T.4 - Standardization of Group 3 facsimile apparatus for document transmission, paragraph 4.1 and Tables 1/T.4 and 2/T.4."

2. Add new paragraph 9 to read as follows:

"9. Technical characteristics for the exchange of non-coded digital facsimile.

9.1 For the transmission of non-coded digital facsimile the terminal transmitting and receiving equipment should comply with WMO standards for analogue facsimile, using analogue-to-digital converters.

9.2 The remote control signals should conform to the WMO standard (paragraph 7.2 above) and be transmitted through direct conversion into digital form.

9.3 The scanning frequency, index of co-operation and data signalling rate on a discrete channel should be as follows:

Scanning frequency signalling (lines/min)	Number of picture elements in a full line	IOC rate (bit/s)	Data
60)	2400		2400
120)	1200	288	2400
240)	1200		4800
60)	2400		2400
120)	2400	576	4800
240)	1800		7200"

3. The following text to be added at the end of paragraph 2.2.1.6 of the Manual on the GTS, Volume I, Part III:

"This modem provides the splitting up of the total of 9600 bit/s in any combination of multiplexed channels with the signalling rates of 7200 bit/s, 4800 bit/s and 2400 bit/s. When multiplexed channels are used, channel A should be used for digital facsimile exchange."

A N N E X XVI

Annex to Recommendation 17 (CBS-VIII)

AMENDMENTS TO THE MANUAL ON THE GLOBAL TELECOMMUNICATION SYSTEM,

VOLUME I - GLOBAL ASPECTS - MAIN TELECOMMUNICATION NETWORK

PART I - Organization of the Global Telecommunication System

1. Paragraphs 2.1 and 2.2

Omit paragraph 2.1 and word paragraph 2.2 as follows:

"2.2 The World Meteorological Centres (as regards telecommunications) and the Regional Telecommunication Hubs shall be responsible for:

(a) Collecting the observational data originating in their zone of responsibility and transmitting such data in the appropriate form and at the appropriate speed on the Main Telecommunication Network, either directly or through the appropriate WMC/RTH;

(b) Relaying selectively on the circuits of the Main Telecommunication Network, as internationally agreed and in the appropriate form, the meteorological information which they receive from these circuits and/or from RTHs not situated on the Main Telecommunication Network;

(c) Transmitting over the Main Telecommunication Network, either directly or through a designated RTH, as internationally agreed and in the appropriate form, the meteorological information processed by the WMC or RMC associated to them;

(d) [Existing sub-paragraph (c) with a change to "Main Telecommunication Network"];

(e) [Existing sub-paragraph (d)];

(f) [Existing sub-paragraph (e)];

(g) [Existing sub-paragraph (f)]."

2. Section 3

The title of Section 3 should be worded as follows:

"3. Functions and characteristics of the networks of the GTS".

3. Paragraph 3.1

Paragraphs 3.1, 3.1.1, 3.1.2, and 3.1.3 should be worded as follows:

"3.1 The Main Telecommunication Network;

3.1.1 The Main Telecommunication Network shall be an integrated system of circuits linking together the WMCs and designated Regional Telecommunication Hubs. The circuits which directly link WMCs and/or RTHs situated on the Main Telecommunication Network may, at the request of Members concerned, be designated as circuits of the Main Telecommunication Network;

Note : The names of these centres, together with a diagram indicating the routeing of the Main Telecommunication Network, are given in Attachment I-2.

3.1.2 The Main Telecommunication Network shall be engineered in such a way that the traffic originating from each centre (WMC, designated RTH) will be routed selectively towards the addressee centre(s). Each centre on the Main Telecommunication Network shall ensure selective relay of the traffic which it receives towards the circuit(s) which it serves.

3.1.3 The Main Telecommunication Network shall have the function of providing an efficient, reliable communication service between the designated centres, in order to ensure:

(a) Rapid and reliable exchange of observational data required for making analyses and prognoses to meet the GDPS requirements;

(b) Exchange of processed information between the World Meteorological Centres, including data received from meteorological satellites ;

(c) Transmission of additional processed information produced by the WMCs, to meet the requirements of RMCs and NMCs;

(d) Transmission, when feasible, of other observational data and processed information required for inter-regional exchange.

Note: Responsibilities for the performance of telecommunication functions of centres located on the Main Telecommunication Network, with respect to collection, exchange and distribution of observational data, are given in Attachment I-3."

PART III - Technical characteristics and specifications for the Global Telecommunication System

1. Paragraph 1

The title of paragraph 1 should be worded as follows:

"1. Circuit characteristics of the Main Telecommunication Network".

2. Paragraph 1.1

Replace paragraph 1.1 by the following paragraph:

"1.1 The configuration of the Main Telecommunication Network shall be an integrated ensemble of circuits and centres/hubs forming a meshed network. It shall operate on a round-the-clock basis."

3. Paragraph 1.2

Replace paragraph 1.2 by the following paragraph:

"1.2 The World Meteorological Centres and the designated Regional Telecommunication Hubs shall be the centres/hubs of the Main Telecommunication Network."

4. Paragraph 1.3

Replace paragraph 1.3 by the following paragraph:

"The circuits of the Main Telecommunication Network shall be four-wire telephone-type circuits or other circuits suitable for medium-speed data links. Where necessary, they may be HF radio channels. The circuits shall be operated on a full duplex basis."

5. Paragraph 1.4

Replace paragraph 1.4 with the following paragraph:

"1.4 Four-wire telephone-type circuits shall conform to CCITT Recommendations M.1020, M.1025 or M.1040, depending on the characteristics required by the relevant CCITT recommendations concerning the modems used. They should be routed over land-line systems or satellite links."

6. Paragraph 1.5

Delete paragraph 1.5.

7. Paragraph 1.6

Replace paragraph 1.6 with the following paragraph:

"1.6 Additional low-speed channels, including a backward supervisory channel, may be established in both directions of a full duplex circuit by agreement between centres/hubs."

8. Paragraph 1.7

Change the beginning of the paragraph as follows:

"Where a circuit of the Main Telecommunication Network is of necessity ....".

9. Paragraph 1.10

Delete paragraph 1.10.

10. Paragraph 2

The title of paragraph 2 should be worded as follows:

"2. Characteristics of transmissions over the Main Telecommunication Network".

11. Paragraph 2.1

Delete paragraph 2.1.

12. Paragraph 2.2.1.2

Replace paragraph 2.2.1.2 by the following paragraph:

"2.2.1.2 A data-signalling rate of 1200, 2400, 4800 or 9600 bit/s shall be used for data transmission as agreed by the related centres."

13. Paragraph 2.2.1.4

The first sentence of the paragraph should be worded as follows:

"For data transmission at a data-signalling rate of 2400 bit/s, the characteristics of the modem shall be those specified in CCITT Recommendation V.26."

14. Paragraph 2.2.1.10

Replace paragraph 2.2.1.10 by the following paragraph:

"2.2.1.10 A backward supervisory channel shall be established exclusively for error control where one of the error-protection methods called "software procedures" and "hardware procedures" is used. The data-signalling rate of this channel shall be 75 bit/s and the mode of operation asynchronous."

15. Paragraph 2.2.1.11

Delete paragraph 2.2.1.11.

16. Paragraph 2.2.2

After paragraph 2.2.2, insert a new paragraph 2.2.3 worded as follows:

"2.2.3 The characteristics of digital coded and non-coded facsimile transmissions should be in accordance with the standards given in Sections 8 and 9 below, respectively."

17. Paragraph 2.2.3

Replace paragraph 2.2.3 with the following paragraph:

"2.2.3 When a circuit is utilized for the transmission on a shared basis of alphanumerical data and facsimile, one of the following methods should be used:

(a) Facsimile and alphanumerical data transmitted on a time-sharing basis;

(b) Alphanumerical data transmitted at low speed simultaneously with analogue facsimile on a frequency-sharing basis;

(c) Alphanumerical data transmitted simultaneously with digital coded or non-coded facsimile over channels obtained by digital multiplexing."

18. Paragraph 2.3.1.3

After paragraph 2.3.1.3, insert a new paragraph 2.3.1.4 worded as follows:

"2.3.1.4 The transmitters and receivers shall be operated in ISB mode in accordance with relevant CCIR recommendations."

19. Paragraph 2.3.3

Delete paragraph 2.3.3.

20. Paragraph 3

(a) In the title and first sentence of paragraph 3, replace the words "Main Trunk Circuit and its branches" by "Main Telecommunication Network";

(b) Make the following amendments:

(h) Delete the word "analogue",

(i) Delete the word "analogue".

(c) After sub-paragraph (i), insert a new sub-paragraph (j) worded as follows:

"(j) Conversion between digital coded facsimile, digital non-coded facsimile and analogue facsimile transmissions, as required."

A N N E X XVII

Annex to Recommendation 18 (CBS-VIII)

AMENDMENTS TO THE MANUAL ON THE GTS, VOLUME I - GLOBAL ASPECTS,

PART I - ORGANIZATION OF THE GLOBAL TELECOMMUNICATION SYSTEM

INCLUSION OF SEISMIC BULLETINS IN THE GLOBAL EXCHANGE PROGRAMME

Attachment I - 3

II Principles for the establishment of the exchange programme for observational data on the Main Trunk Circuit and its branches.

1. Type of information.

Add "(n) Seismic data (level I)" after (m) BATHY, TESAC.

2. Frequency of exchanges.

Add "(h) Seismic data (level I), as available" after (g) BATHY and TESAC, as available.

RECOMMENDATIONS OF THE COMMISSION FOR BASIC SYSTEMS

ADOPTED PRIOR TO ITS EIGHTH SESSION AND MAINTAINED IN FORCE

Rec. 20 (CBS-VII) - CONVERSION OF PRODUCTS IN ALPHANUMERIC (GRID/GRAF CODE) FORM INTO PICTORIAL FORM

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Recommendation 3 (CBS-VI)

(2) The existing GRID code FM 47-V,

(3) Recommendation 5 (CBS-VII) - Abbreviated code for the transmission of processed data in the form of grid-point values, FM 49-VII GRAF,

CONCERNING:

(1) The need to reduce the time of transmission of processed information on telecommunication circuits, and that this need may be met by the use of the GRID/GRAF code form instead of the analogue facsimile form,

(2) That many non-computerized NMCs, continue to wish to receive output products of WMCs and RMCs in pictorial form,

(3) That it is necessary to have facilities, at appropriate centres, for the conversion of processed data in alphanumeric form into pictorial form,

RECOMMENDS:

(1) That Members operating NMCs be invited to equip their respective centres with appropriate facilities for the conversion of processed data in alphanumeric (GRID/GRAF code) form into pictorial form as soon as possible;

(2) That Members operating WMCs/RMCs be invited to equip their respective centres with appropriate facilities for the conversion of processed data in alphanumeric (GRID/GRAF code) form into pictorial form for regional distribution, as soon as possible;

(3) That until the conversion facilities become available at all the centres concerned, facsimile and other type of transmission should be continued as appropriate to meet the requirements of Members.

Rec. 12 (CBS-Ext(80)) - COMPILATION OF METEOROLOGICAL REPORTS CONTAINING SURFACE OBSERVATIONS - FM 12-VII an FM 13-VII

THE COMMISSION FOR BASIC SYSTEMS,

NOTING Resolution 5 (EC-XXXI) - Common code for reporting surface observations from different types of surface station,

Considering that the efficient operation of the Global Telecommunication System for handling meteorological reports containing surface observations FM 12-VII and FM 13-VII should be ensured,

RECOMMENDS that meteorological telecommunication centres (WMCs, RMCs, RTHs and NMCs) which, presently, are not capable of separating the regional section of the report from the global section, should compile bulletins for international exchange containing reports in which the global and regional sections of the code for surface observations, FM 12-VII and FM 13-VII, are included;

REQUESTS the Secretary-General to urge Members to spare no efforts to complete all the necessary arrangements to implement the procedures mentioned above well in advance with a view to ensuring the worldwide introduction of the procedures for compilation of bulletins containing surface observations FM 12-VII and FM 13-VII for both global and regional distribution as from 1 January 1982.

LIST OF DOCUMENTS

I. "DOC" Series

Doc. No.	Title	Agenda item	Submitted by
1	Provisional agenda	2.2	-
2	Explanatory memorandum relating to the provisional agenda	2.2	-
3	Telecommunication system (including the GTS part of WWW the report by the chairman of Working Group on the GTS)	9	Chairman of the CBS Working Group on the Global Telecommuncation System
	Final report of the tenth session of the CBS Working Group on the Global Telecommunication System		
	ADD. 1 ADD. 2		
4	Review of previous resolutions and recommendations of the Commission and relevant Executive Committee resolutions	13	Secretary-General
5	Codes (including the report of the chairman of the Working Group on Codes)	8	Chairman of the CBS Working Group on Codes
	Final report of the sixth session of the CBS Working Group on Codes		
	CORR. 1		
6	Codes (including the report of the chairman of the Working Group on Codes)	8	Secretary-General
	Definition of terms used in the Manual on Codes, Volume I		
7	Telecommunication System (including the GTS part of WWW and the report by the chairman of the Working Group on the GTS)	9	Chairman of the working group
	Report by the chairman of the Working Group on the GTS		

Doc. No.	Title	Agenda item	Submitted by
8	Data-processing System - Codes (including the report of the chairman of the Working Group on Codes)	7 & 8	Secretary-General
	ADD. 1		
9	Codes (including the report of the chairman of the Working Group on Codes)	8	Chairman
	Report of the chairman of the Working Group on Codes		
10	Report by the president of the Commission	3	President of CBS
11	Observing System - Data-processing System - Telecommunication System - Monitoring of the operation of the WWW	6, 7, 9 and 10	Secretary-General
	The eleventh status report on the implementation of the WWW		
12	Telecommunication System	9	Secretary-General
	Use of the GTS for exchange of seismic data		
13	Draft WWW plan for the period 1984-1987	5	Secretary-General
14	WMO education and training activities related to CBS	11	Secretary-General
15	Telecommunication System	9	Secretary-General
	Amendments to the Manual on the Global Telecommunication System		
	CORR. 1		
16	Integrated WWW System Study	4	Secretary-General
	Main trends in the development of the WWW		
	CORR. 1		

Doc. No.	Title	Agenda item	Submitted by
17	Monitoring of the operation of the WWW	10	Secretary-General
	ADD. 1 ADD. 2		
18	Observing System (including the GOS part of WWW and the report by the chairman of the Working Group on the GOS)	6	Secretary-General
	ADD. 1		
19	Data-processing System (including the GDPS part of WWW and the report by the chairman of the Working Group on the GDPS)	7	Secretary-General
	ADD. 1		
20	Codes (including the report of the chairman of the Working Group on Codes)	8	Secretary-General
	WINTEM code form for reporting upper wind and temperature forecasts		
21	Integrated WWW System Study	4 & 5	Secretary-General
	Draft WWW plan for the period 1984-1987		
22	Integrated WWW System Study	4	Secretary-General
	Review of the status of the Integrated WWW System Study		
23	Data-processing System (including the GDPS part of WWW and the report by the chairman of the Working Group on the GDPS)	7	Chairman of the working group
	Report by the chairman of the Working Group on the GDPS		
24	Integrated WWW System Study	4 & 5	Canada
	Draft WWW plan for the period 1984-1987		

Doc. No.	Title	Agenda item	Submitted by
	Automated shipboard aerological programme (ASAP)		
25	Observing System (including the GOS part of WWW and the report by the chairman of the Working Group on the GOS)	6	Chairman of the working group
	Report of the chairman of the CBS Working Group on the Global Observing System		
	ADD. 1		
26	Codes (including the report by the chairman of the Working Group on Codes)	8	U.S.S.R.
	Codes for reporting ground radar weather observation		
27	Codes (including the report by the chairman of the Working Group on Codes)	8	U.S.S.R.
	Reporting of cloud data in code forms FM 35-V TEMP and FM 36-V TEMP SHIP		
28	Codes (including the report by the chairman of the Working Group on Codes)	8	U.S.S.R.
	Revision of the Manual on Codes, Volume I		
29	Codes (including the report by the chairman of the Working Group on Codes)	8	U.S.S.R.
	Inadvisability of introducing substantial structural changes to the code forms FM 12-VII SYNOP and FM 13-VII SHIP		
30	Telecommunication System (including the GTS part of WWW and the report by the chairman of the Working Group on the GTS)	9	Secretary-General

Doc. No.	Title	Agenda item	Submitted by
	Reception of meteorological information by entities not part of national Meteorological Services		
31	Codes (including the report by the chairman of the Working Group on Codes)	8	France
	Amendment to code forms FM 12-VII SYNOP and FM 13-VII SHIP		
32	Codes (including the report by the chairman of the Working Group on Codes)	8	U.S.A.
	Implementation data for code changes		
33	Contributions of CIMO to the Integrated WWW System Study	4	President of CIMO
34	Observing System (including the GOS part of the WWW and the report of the chairman of the Working Group on the GOS)	6	President of CIMO
	Clarification of requirement statements		
35	Codes (including the report by the chairman of the working group on codes)	8	Belgium
	Inclusion of the wind indicator i_w in messages		
36	Telecommunication System (including the GTS Part of WWW and the report by the Chairman of the working group on the GTS)	9	Chairman of the working group
	Amendments to the Manual on the GTS		
37	Observing system (including the GOS part of the WWW and the report of the chairman of the working group on the GOS)	6	Saudi Arabia

Doc. No.	Title	Agenda item	Submitted by
	Aircraft to Satellite Data Relay (ASDAR)		
38	Codes (including the report of the chairman of the working group on codes) MAFOR code (FM 61-IV)	8	Saudi Arabia
39	Telecommunication system Integrated global ocean services system future requirements for Data transmission	9	President of CBS
40	Codes (including the report of the chairman of the working group on codes) Proposal for amendment to code form DRIBU	8	Norway

II. "PINK" series

1 REV. 1	Opening of the session Organization of the session Report by the President of the Commission REV. 1, ADD. 1	1, 2, 3	President of CBS
2	Report of Committee A to Plenary on item 6 Observing system (including the GOS part of WWW and the report by the chairman of the working group on the GOS)	6	Chairman of Committee A
3	Report of Committee B to Plenary on item 7 Data-processing system (including the GDPS part of WWW and the report by the chairman of the working group on the GDPS) CORR. 1	7	Chairman of Committee B

Doc. No.	Title	Agenda item	Submitted by
4	Report of Committee A to Plenary on item 8 Codes (including the report by the chairman of the working group on codes)	8	Chairman of Committee A
5	Report of Committee B to Plenary on item 9 Telecommunication system (including the GTS part of WWW and the report by the chairman of the working group on the GTS) CORR. 1	9	Chairman of Committee B
6	Report of Committee B to plenary on item 9 Telecommunication system (including the GTS part of WWW and the report by chairman of the working group on the GTS)	9	Chairman of Committee B
7	Report of Committee B to Plenary on item 9 Telecommunication system (including the GTS part of WWW and the report by the chairman of the working group on the GTS) CORR. 1	9	Chairman of Committee B
8	Report of Committee B to Plenary on item 13 Review of previous resolutions and recommendations of the Commission and relevant executive committee resolutions	13	Chairman of Committee B
9	Election of officers Report of the Nomination Committee	15	Chairman of the Nomination Committee
10	Report of Committee B to Plenary on item 10 Monitoring of the Operation of the WWW	10	Chairman of Committee B

Doc. No.	Title	Agenda item	Submitted by
11	Report to Plenary on item 14 Scientific lectures and discussions	14	Vice-president
12	Report of Committee B to Plenary on item 11 WMO education and training activities related to CBS	11	Chairman of Committee B
13	Report of Committee A to Plenary on item 4 Integrated WWW system study	4	Chairman of Committee A
14	Report of Committee A to Plenary on item 5 Draft WWW plan for the period 1984-1987	5	Chairman of Committee A
15	Election of officers	15	Vice-president

W O R L D M E T E O R O L O G I C A L O R G A N I Z A T I O N

Supplement to WMO Publication No. 611

Abridged final report of the eighth session of the Commission for Basic Systems

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Decisions of the Executive Council on the abridged final report of the eighth session of the Commission for Basic Systems

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This document should be considered as a guide to the status of the decisions adopted at the eighth session of the Commission for Basic Systems.

DECISIONS RECORDED IN THE GENERAL SUMMARY OF THE WORK OF EC-XXXV

3. WORLD WEATHER WATCH PROGRAMME (Agenda item 3)

3.2 Report of the eighth session of CBS

3.2.1 The Executive Council noted with appreciation the report of the eighth session of CBS and recorded its decisions on the recommendations developed at the session in Resolution 4 (EC-XXXV).

3.2.2 The Executive Council endorsed the action taken by the President of WMO, in accordance with the authority given to him in WMO General Regulation 9(5), in approving one recommendation which was established by the eighth session of CBS. This recommendation dealt with amendments to the Technical Regulations and had also to be submitted to Ninth Congress.

3.2.3 The Executive Council considered Recommendation 13(CBS-VIII) - WINTEM Code and, taking into account CAeM's minor proposed amendments to meet a requirement for reporting data at 2.5° mesh interval in some regions of the globe, decided to adopt the substance of the recommendation and these proposals as contained in its Resolution 5 (EC-XXXV).

3.2.4 The Executive Council noted that the modifications to code forms FM 63-V BATHY, FM 64-V TESAC and DRIBU in Recommendation 9 (CBS-VIII) need to be published and distributed to ships' masters and that the date proposed by CBS of 1 July 1983 would be inadequate. Therefore, it was decided that the introduction of this modification should come into force on 1 July 1984.

3.2.5 The Executive Council noted with approval the detailed work programme of CBS and its working groups for the period 1983-1986 and the priority items, as drawn up at CBS-VIII. It also noted that the appropriate financial provisions for the implementation of this work programme during the ninth financial period of WMO were considered by Ninth Congress. The relevant budgetary provisions for 1984 were made under agenda item 12.

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RESOLUTIONS

4 (EC-XXXV) - REPORT OF THE EIGHTH SESSION OF THE COMMISSION FOR BASIC SYSTEMS

THE EXECUTIVE COUNCIL,

HAVING CONSIDERED the abridged final report of the eighth session of the Commission for Basic Systems,

DECIDES:

(1) To note the report;

(2) To note Resolutions 1 to 8 (CBS-VIII);

(3) To take action on the recommendations as follows:

Recommendation 1 (CBS-VIII) - Automated Shipboard and Land-based Upper-air Systems

Recommendation 2 (CBS-VIII) - Aircraft to Satellite Data Relay Programme (ASDAR)

(a) Approves these recommendations;

(b) Requests the Secretary-General:

(i) To bring these recommendations to the attention of all Members to implement them as appropriate;

(ii) To arrange for the preparation and distribution of a detailed planning report on technical and operational aspects of NAVAID-based observing systems;

(iii) To arrange for the implementation of the measures in Recommendation 2 (CBS-VIII) and distribute the "ASDAR Implementation Plan" to Members not later than the beginning of 1984;

Recommendation 3 (CBS-VIII) - Amendments to the Manual on the GDPS, Volume I

Recommendation 4 (CBS-VIII) - Non-real-time functions of data-processing centres

(a) Approves these recommendations;

(b) Requests the Secretary-General to arrange for the necessary amendments to be included in Volume I of the Manual on the Global Data-processing System.

Recommendation 5 (CBS-VIII) - Proposed amendments to the Technical Regulations

(a) Endorses the President's approval of this recommendation in accordance with Regulation 9(5) of the WMO General Regulations;

(b) Notes that the amendments were included in the consolidated document on Technical Regulations submitted to Ninth Congress;

(c) Requests the Secretary-General to include the amendments as decided by Ninth Congress in the Technical Regulations;

Recommendation 6 (CBS-VIII) - Minor improvements to FM 12-VII SYNOP and FM 13-VII SHIP

Recommendation 7 (CBS-VIII) - Editorial Revision of the Manual on Codes, Volume I

Recommendation 8 (CBS-VIII) - Revision of the Structure of the Manual on Codes, Volume I

Recommendation 9 (CBS-VIII) - Modifications to code forms FM 63-V BATHY, FM 64-V TESAC and DRIBU

Recommendation 10 (CBS-VIII) - Implementation date for changes to the Manual on Codes

Recommendation 11 (CBS-VIII) - Modification to Regulations to FM 35-V TEMP and FM 36-V TEMP SHIP

Recommendation 12 (CBS-VIII) - Amendment to Section 1, Part B, of Code form FM 20-V RADOB

(a) Approves these recommendations;

(b) Decides that the principle to the effect that all code changes are introduced on 1 January, except when special or urgent requirements justify a departure from this principle, be deleted from the Manual on Codes;

(c) Decides that the modifications in Recommendation 9 (CBS-VIII) come into force on 1 July 1984;

(d) Requests the Secretary-General:

(i) To arrange that the necessary amendments be introduced in the Manual on Codes, Volume I;

(ii) To assist the CBS Working Group on Codes in its task of the revision of the structure of the Manual on Codes, Volume I;

Recommendation 13 (CBS-VIII) - WINTEM code form FM 50-VIII - Forecast upper-wind and temperature data for aviation

The decision on this recommendation is contained in Resolution 5 (EC-XXXV).

Recommendation 14 (CBS-VIII) - Amendments to the Manual on the GTS, Volume I - Global Aspects, Part I - Organization of the Global Telecommunication System

Recommendation 15 (CBS-VIII) - Amendments to the Manual on the GTS, Volume I - Global Aspects, Part II - Meteorological Telecommunication Procedures for the Global Telecommunication System

Recommendation 16 (CBS-VIII) - Amendments to the Manual on the GTS, Volume I - Global Aspects, Part III - Technical Characteristics and Specifications for the Global Telecommunication System

Recommendation 17 (CBS-VIII) - Amendments to the Manual on the GTS - Main Telecommunication Network

Recommendation 18 (CBS-VIII) - Amendments to the Manual on the GTS, Volume I - Global Aspects, Part I - Organization of the Global Telecommunication System - Inclusion of seismic bulletins in the global exchange programme

(a) Approves these recommendations;

(b) Decides that the amendments in Recommendation 17 (CBS-VIII) come into effect on 1 January 1984;

(c) Decides that the amendments in Recommendation 18 (CBS-VIII) be implemented as soon as possible but not later than 1 December 1983;

(d) Authorizes the Secretary-General, with respect to Recommendation 17 (CBS-VIII) to make any consequent purely editorial amendments, in consultation with the president of CBS as regards Volume I, and the presidents of regional associations as regards the respective parts of Volume II of the Manual on the Global Telecommunication System;

(e) Requests the Secretary-General to arrange for the necessary amendments to be included in Volume I of the Manual on the Global Telecommunication System;

Recommendation 19 (CBS-VIII) - Review of the resolutions of the Executive Committee based on previous recommendations of the Commission for Basic Systems

(a) Notes the recommendation;

(b) Action on this recommendation will be taken by EC-XXXVI when reviewing its previous resolutions;

REQUESTS the Secretary-General to bring the above decision to the attention of all concerned.

5 (EC-XXXV) - WINTEM CODE FORM FM 50-VIII FORECAST UPPER-WIND AND TEMPERATURE DATA FOR AVIATION

THE EXECUTIVE COUNCIL,

NOTING:

(1) Recommendation 13 (CBS-VIII) - WINTEM code form FM 50-VIII - Forecast upper-wind and temperature data for aviation,

(2) Comments by the president of CAeM,

CONSIDERING that there is a need to report data at 2.5° mesh intervals in some regions of the globe,

DECIDES:

(1) That the code FM 50-VIII - WINTEM given in the annex to this resolution be available for the exchange of forecast upper-wind and temperature as from 1 November 1983;

(2) That the ARMET code shall cease to be used for international exchange of upper air forecasts as from 1 November 1984;

REQUESTS the Secretary-General to arrange for the inclusion of the WINTEM code form FM 50-VIII in Volume I of the Manual on Codes and the deletion of the ARMET code from the Manual, at the appropriate date.

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Annex to Resolution 5 (EC-XXXV)

WINTEM CODE FORM FOR FORECAST UPPER-WIND AND TEMPERATURE DATA FOR AVIATION

CODE FORM

Section o

WINTEM yyGGgg
FFFFFF

Section 1

LLi¹A aaa	LLLiB 000	LLLiB 000	.....	LLLiB 000
(TROP	nnn ttt	nnn ttt	.....	nnn ttt)
(MAXW	nnnddfff mmmmmmmm	nnnddfff mmmmmmmm	.....	nnnddfff mmmmmmmm)
Fnnn 111	ddfffSTT	ddfffSTT	.....	ddfffSTT
Fnnn 222	ddfffSTT	ddfffSTT	.....	ddfffSTT
⋮	⋮	⋮	⋮	⋮
Fnnn RRR	ddfffSTT	ddfffSTT	.....	ddfffSTT
LLi²A aaa				
(TROP	nnn ttt	nnn ttt	.....	nnn ttt)
(MAXW	nnnddfff mmmmmmmm	nnnddfff mmmmmmmm	.....	nnnddfff mmmmmmmm)
Fnnn 111	ddfffSTT	ddfffSTT	.....	ddfffSTT
Fnnn 222	ddfffSTT	ddfffSTT	.....	ddfffSTT
⋮	⋮	⋮	⋮	⋮
Fnnn RRR	ddfffSTT	ddfffSTT	.....	ddfffSTT
⋮	⋮	⋮	⋮	
LLiⁿA aaa				
(TROP	nnn ttt	nnn ttt	.....	nnn ttt)
(MAXW	nnnddfff mmmmmmmm	nnnddfff mmmmmmmm	.....	nnnddfff mmmmmmmm)
Fnnn 111	ddfffSTT	ddfffSTT	.....	ddfffSTT
Fnnn 222	ddfffSTT	ddfffSTT	.....	ddfffSTT
⋮	⋮	⋮	⋮	⋮
Fnnn RRR	ddfffSTT	ddfffSTT	.....	ddfffSTT

NOTES

(1) WINTEM is the name of the code used to provide forecast upper-wind and temperature data for aviation.

(2) The forecast data are valid at the points of a rectangular geographical grid.

(3) A WINTEM message is identified by the word WINTEM.

(4) The code form is divided in two sections as follows:

Section number	Contents
0	Identification and time of validity of forecast data
1	Grid point co-ordinates and data groups for tropopause height, level of maximum wind and specified flight levels.

REGULATIONS

50.1

General

50.1.1

The code name WINTEM shall always be included in the message.

50.1.2

When in printed form, the format of the WINTEM message shall present the characteristics of a direct reading data table.

50.2

Section 0

The groups of this section shall constitute the first line of the message.

50.3

Section 1

50.3.1

The geographical grid used shall be rectangular, i.e. that its boundaries shall be delineated by means of two meridians and two parallel circles.

50.3.2

In the message, the latitude of grid points shall always be included at the beginning of a line and they shall follow each other in a regular sequence, starting with the northernmost grid point latitude.

50.3.3

The longitudes of the grid points shall be included only in the first line of Section 1 and they shall be ordered from left to right in a continuous sequence corresponding to an eastward direction.

50.3.4

The n^{th} figure group of a given line of the message, which contains forecast data, shall always refer to the grid point determined by:

(a) the latitude included in the nearest preceding line of the data group,

(b) the n^{th} longitude included on the first line of Section 1.

50.3.5

The maximum number of grid point longitudes included in the first line of Section 1 (i.e. index i of $L_{o}^{i}L_{o}^{i}L_{o}^{i}(B)$) shall not exceed 7.

NOTE: There is no limitation to the number of grid point latitudes included in the message, except for telecommunication reasons.

50.3.6

Whenever the need arises to include more than 7 grid point longitudes in the first line of Section 1, the message shall be split up in parts, each one satisfying Regulation 50.3.5 above.

50.3.7

The data associated with a given grid point shall be included in the following order:

(1) Tropopause height.
(2) Maximum wind level.
(3) Specified flight levels arranged in decreasing order.

50.3.8

Tropopause height and/or maximum wind level data shall be omitted whenever these data are not required for operational purposes.

50.3.9

The number of specified flight levels to be included shall be determined by the issuing centre on the basis of operational requirements.

Specifications of Symbolic letters

yy_{FF}	Day of the month (GMT) on which the WINTEM message is valid.
$GGgg_{FFFF}$	Time in whole hours (GMT) on which the WINTEM message is valid As a result gg_{FF} shall always be equal to oo.
LLl_{aaa} ... LLl_{aaa}	Latitude co-ordinates of grid points, where l^{j}_{a} is tenths of degree of latitude (l^{j}_{a} = zero or 5(five))
A	Direction of latitude (N = North (S = South
$LLLl_{oooo}$ ... $LLLl_{oooo}$	Longitude co-ordinates of grid points, where l^{i}_{o} is tenths of degree of longitude (l^{i}_{o} = zero or 5 (five)) NOTE: i may not exceed 7. See Regulation 50.3.5
B	Direction of longitude (E = East (W = West
TROP	Indicator word: the forecast flight levels that follow on the same line refer to the tropopause height.
MAXW	Indicator word: the flight levels and the wind data that follow on the same line refer to the forecast maximum wind level.
F	Indicator letter for flight levels numbers nnn_{111}, nnn_{222}, ...nnn_{RRR}.
nnn_{ttt}	Tropopause flight level number. The last figure shall always be zero.
nnn_{mmm}	Maximum wind flight level number. The last figure shall always be zero.

nnn
|||
|
|
nnn
RRR

Flight level numbers for specified levels. The last figure shall always be zero.

dd
fff

Wind direction and speed forecast data for the relevant grid point.

S — Sign of temperature (P = positive or zero
(M = negative

TT — Forecast temperature at the relevant grid point.