WORLD METEOROLOGICAL ORGANIZATION

COMMISSION FOR BASIC SYSTEMS

ABRIDGED FINAL REPORT

OF THE

EXTRAORDINARY SESSION

Geneva, 1 - 12 November 1976

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LIST OF PERSONS ATTENDING THE SESSION

1. Officers of the session

O. Lönnqvist	president	
J. Brinkmann	vice-president	

2. Representatives of Members of WMO

M. Andaloussi	principal delegate	Algeria
S. Lebdioui	delegate	
M. Belbachir	delegate	
L. A. Olivieri	principal delegate	Argentina
L. Kletter	principal delegate	Austria
E. De Dycker	principal delegate	Belgium
G. Doumont	delegate	
S. Milouchev	principal delegate	Bulgaria
I. Petrov	delegate	
H. B. Kruger	principal delegate	Canada
W. L. Gutzman	delegate	
F. Molnar	principal delegate	Czechoslovakia
A. Papez	delegate	
E. Carlsen	principal delegate	Denmark
G. Crone-Levin	delegate	
Harb M. S. El Din	principal delegate	Egypt
A. M. El Masry	delegate	
H. M. Zohdy	delegate	
S. N. Venho	principal delegate	Finland
D. Söderman	delegate	
A. Durget	principal delegate	France
F. Duvernet	delegate	
F. Neau	delegate	
J. Pailleux	delegate	
J. Ndong	principal delegate	Gabon

Representatives of Members of WMO (contd.)

E. Peters	principal delegate	German Democratic Republic
K. H. Hartmann	delegate	
J. Brinkmann	principal delegate	Germany, Federal Republic of
W. Bopp	delegate	
T. Mohr	delegate	
J. Lieckfeld	delegate	
S. E. Tandoh	principal delegate	Ghana
J. A. Sam	delegate	
P. Sham Pak	principal delegate	Hong Kong
A. Kapovits	principal delegate	Hungary
N. Kerényi (Mrs.)	delegate	
H. Sigtryggsson	principal delegate	Iceland
S. K. Das	principal delegate	India
A. J. Al-Sultan	principal delegate	Iraq
A. K. Naima	delegate	
P. M. Austin Bourke	principal delegate	Ireland
R. O. Mathews	delegate	
M. Levi	principal delegate	Israel
V. Mastino	principal delegate	Italy
C. Giallombardo	delegate	
M. Bahi Zahiri	principal delegate	Ivory Coast
J. Djigbenou	delegate	
S. Kubota	principal delegate	Japan
J. K. Murithi	principal delegate	Kenya
J. Kastelein	principal delegate	Netherlands
J. P. de Jongh	delegate	
A. A. Neale	principal delegate	New Zealand
J. A. Adejokun	principal delegate	Nigeria
I. O. Emore	delegate	
O. Haug	principal delegate	Norway
J. Michalczewski	principal delegate	Poland

Representatives of Members of WMO (contd.)

M. T. Ferreira Cabrita	principal delegate	Portugal
R. Stoian (Mrs.)	principal delegate	Romania
M. Nowailaty	principal delegate	Saudi Arabia
A. Mutwalli	delegate	
S. Samarkandi	delegate	
F. Jondot	principal delegate	Senegal
M. Medina Isabel	principal delegate	Spain
I. D. T. de Mel	principal delegate	Sri Lanka
O. Lönnqvist	principal delegate	Sweden
L. Moen	delegate	
G. Bleckert	delegate	
M. Haug	principal delegate	Switzerland
A. Jeannet	delegate	
G. Masri Zada	principal delegate	Syrian Arab Republic
H. Trabelsi	principal delegate	Tunisia
Y. Y. Daylan	principal delegate	Turkey
M. Petrossiants	principal delegate	Union of Soviet Socialist Republics
A. D. Chistiakov	delegate	
I. A. Ravdin	delegate	
I. V. Kravchenko	delegate	
N. Bradbury	principal delegate	United Kingdom of Great Britain and Northern Ireland
G. J. Day	delegate	
D. McNaughton	delegate	
D. J. Malone	delegate	
E. Fotso	principal delegate	United Republic of Cameroon
M. E. Mlaki	principal delegate	United Republic of Tanzania
K. R. Johannessen	principal delegate	United States of America
G. D. Cartwright	delegate	
E. B. Fawcett	delegate	
C. A. Spohn	delegate	
J. R. Neilon	delegate	
B. Zavos	delegate	
V. Jurčec (Mrs.)	principal delegate	Yugoslavia
D. Kovačević	delegate	

3. Observers from non-Member countries

M. F. McCarthy	The Holy See
S. S. Makhoalibe	Lesotho
J. F. da Fonseca Silva	S. Tomé e Principe

4. Observers from other international organizations

G. J. Day	Intergovernmental Oceanographic Commission (IOC)
U. Rath	International Civil Aviation Organization (ICAO)
T. Okabe A. Zaccagnini	International Telecommunication Union (ITU)
L. R. Ulrich	International Air Transport Association (IATA)
N. E. Davis	European Space Agency (ESA)
J. Labrousse R. L. Newson	European Centre for Medium-range Weather Forecast (ECMWF)
G. Delorme	Agency for the Safety of Air Navigation in Africa and Madagascar (ASECNA)

5. Lecturers

L. Bengtsson

C. A. Spohn

6. WMO Secretariat

Dr. G. K. Weiss	Representative of the Secretary-General

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GENERAL SUMMARY OF THE WORK OF THE SESSION

1. OPENING OF THE SESSION (Agenda item 1)

1.1 The extraordinary session of the Commission for Basic Systems was held in Geneva from 1 to 12 November 1976. In view of the large number of participants at this session, the opening meeting and plenary meetings were held in La Tour of the International Telecommunication Union building. Committee meetings were held in the WMO Headquarters building. All documents were provided in the four working languages of the Organization and simultaneous interpretation in these languages was provided in all plenary meetings and the working committees.

1.2 The session was opened by the president of the Commission, Dr. O. Lönnqvist, at 10.05 a.m. on 1 November 1976.

1.3 Dr. D. A. Davies, Secretary-General of the World Meteorological Organization, greeted the participants and extended a warm personal welcome to them as well as to the representatives of the international organizations and others who were present. He mentioned that this was the first time that an extraordinary session of CBS had been organized, a session which had become necessary because of the increasing scope and complexity of the activities of the Commission for Basic Systems. Dr. Davies, as regards the documentation for the session, said that a special effort had been made to present each subject in a form which would hopefully facilitate the task of the participants. He mentioned that the major part of the documentation was based on reports of sessions of the working groups of the Commission and on informal planning meetings held to study specific problems. Dr. Davies then referred to the agenda and stressed the importance of the items for the World Weather Watch, but also of those items having reference to the First GARP Global Experiment. He recalled in this respect the considerations of the Executive Committee on the work programme of CBS. Dr. Davies wished the extraordinary session every success and wished the participants a pleasant stay in Geneva.

1.4 Dr. O. Lönnqvist, president of CBS, in his presidential address, reviewed the activities of the Commission since its sixth session. He mentioned the implementation of the recommendations of CBS-VI, resulting in a streamlining of the operation of CBS. He also mentioned the work done by the five working groups and rapporteurs, the results of which were presented to the extraordinary session. Dr. Lönnqvist then mentioned the items on which decisions of the Commission were expected. He recalled that Congress and the Executive Committee had clearly identified the important role which CBS had to play in the planning and implementation of the WWW and to provide the necessary support to the FGGE. The president said that requests had been received from other WMO commissions for decisions on specific items. In addition, he mentioned the growing demands of the community addressed to Meteorological Services all over the world to provide reliable support to the day-to-day life of mankind.

In conclusion, Dr. Lönnqvist welcomed all participants to the extraordinary session and expressed his gratitude to Dr. Davies for making the necessary arrangements for holding the session in Geneva. He wished the participants a happy stay in Geneva and a fruitful session.

1.5 There were 104 participants at the extraordinary session. These included 90 representatives from Members of WMO, three representatives of non-Member countries of WMO, six international organizations and one non-governmental body. 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 extraordinary session. This list was accepted as the first report on credentials and further reports were submitted to the extraordinary 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 Working committees

Two working committees were set up to examine in detail the various agenda items:

(a) Committee A: To consider agenda items 5, 8 and 9. Mr. G. Doumont (Belgium) was elected chairman and Mr. I.A. Ravdin (U.S.S.R.) vice-chairman of the committee;

(b) Committee B: To consider agenda items 4, 6 and 7. Mr. E.B. Fawcett (U.S.A.) was elected chairman and Mr. T. Mohr (Germany, Federal Republic of) vice-chairman of the committee.

Agenda items 10 and 11 were considered by rapporteurs who reported back to plenary through Committee B.

2.3.2 Co-ordination Committee

In accordance with WMO General Regulation 27, a Co-ordination Committee was set up consisting of the president and vice-president of CBS, the chairmen

and vice-chairmen of the two working committees and the representative of the Secretary-General.

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. It decided that the minutes of plenary meetings, which could not be approved during the extraordinary session, could be approved by the president on behalf of the Commission.

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

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

3.2 The Commission considered its future work programme under this item and concluded that the list of "Major tasks of CBS for 1974-1978", developed at its sixth session, should be updated in the light of the work accomplished and new developments. It felt that this list was formidable and that it would be difficult to finalize all the items listed therein during the time period under consideration. It was agreed to assign high priorities to those tasks which would lead to:

(a) Improvements in the operation of the WWW in the reasonably near future;

(b) The timely completion of CBS support for FGGE; and

(c) The preparation of guides and manuals on the GOS, the GDPS and the GTS, which would materially assist Members in improving their services and contributions to the WWW.

The items requiring higher priority were indicated under the respective agenda items.

4. OBSERVING SYSTEM (INCLUDING THE GOS PART OF WWW AND THE REPORT BY THE CHAIRMAN OF THE WORKING GROUP ON THE GOS) (Agenda item 4)

4.1 General

The Commission noted with appreciation the report of the chairman of the Working Group on the Global Observing System, Dr. T. Mohr. It also noted the work accomplished by the working group in the preparation of a draft Guide on the GOS and the elaboration of a proposed monitoring programme for the GOS. The session took note of the progress made in the study of the other tasks allocated to the working group by the Commission at its previous session.

4.2 Guide on the GOS

The Commission examined the draft prepared by the working group for Chapters 1 to 7 of the Guide on the Global Observing System. It noted that Chapters 8 and 9 would be prepared at a later stage and would be subsequently approved by the Commission prior to their insertion into the Guide. It considered that the necessary co-ordination with CIMO in the preparation of the Guide was ensured through the participation of a representative of that Commission in the work of the Working Group on the GOS. It was suggested that provision be made in Chapter 2 of the Guide for the inclusion of hydrological and air-pollution data requirements when adopted by the WMO commissions concerned. As minimum standards of quality control at the observing station and at the NMC have yet to be established, it was agreed that these standards should be elaborated by the working group and co-ordinated with similar standards to be developed by the Working Group on the Global Data-processing System. The session, realizing that the early publication of the Guide would be of great benefit to observers especially before the FGGE, adopted Recommendation 1 (CBS-Ext. (76)).

4.3 Best mix of observing systems

The Commission noted that the study of this subject had already started. However, it recognized that good progress in this field can be achieved only when additional knowledge and experience have been gained (for example, from the FGGE) and urged the working group to keep in mind this important aspect of the GOS.

4.4 Increased use of aircraft meteorological reports

The Commission noted that an Informal Planning Meeting on Automated Aircraft Meteorological Reporting System had been convened in December 1975. In this connexion, the Commission welcomed the promising development of an Aircraft to Satellite Data Relay (ASDAR) type design, and expressed the wish to be kept informed of future progress.

4.5 Monitoring programme for the GOS

The conclusions of the Commission on this subject are given under agenda item 9.

4.6 Volume II of the International Cloud Atlas

The Commission was informed that Volume II of the International Cloud Atlas was out of print and that many orders were still being received. It noted with satisfaction that the revised edition of Volume I had been published. It expressed the opinion that, to satisfy immediate needs, Volume II should be reprinted. In addition, the Commission requested the Secretary-General to submit to the next session of the Commission a proposal for the revision of Volume II which would take account, inter alia, of the conclusions of the CBS Rapporteur on the State of the Sky in the Tropics.

4.7 Future work programme

When discussing the future work programme of the Working Group on the GOS, the Commission felt that the most urgent tasks assigned to the working group by the sixth session of CBS had been completed. In addition, it expressed the view that a number of other important tasks remained to be accomplished amongst which those essential to the FGGE should be given the highest priority. They are indicated below by means of an asterisk. The Commission was also of the opinion that the preparation of the Manual on the Global Observing System should be given an equal priority rank. However, it was recognized that this task could not be completed before the FGGE. Consequently these tasks are set out below in order of priority:

(a)* Development of minimum standards of quality control, jointly with the Working Group on the Global Data-processing System;

(b)* Securing an increased flow of aircraft meteorological reports, in part by the use of automatic observing, reporting and transmitting systems;

(c)* WWW support for FGGE and GARP regional programmes in the field of the GOS;

(d) Preparation of the Manual on the Global Observing System;

(e) Study of the best mix of observing systems;

(f) Study of methods for the reduction of Level I data from automatic weather stations.

5. CODES (INCLUDING THE REPORT BY THE CHAIRMAN OF THE WORKING GROUP ON CODES) (Agenda item 5)

5.1 Report by the chairman of the Working Group on Codes

The Commission noted with appreciation the report by the chairman of the Working Group on Codes, Mr. G. Doumont, and expressed its satisfaction with the important work carried out by the group since CBS-VI. The technical questions raised in the report were examined together with the report of the fourth session of the Working Group on Codes (Geneva, 15-19 March 1976) contained in the documentation for the session. Details concerning the action taken by the Commission on the various problems contained in the reports are given below.

5.2 International codes for dissemination of satellite data

5.2.1 SATEM code

The Commission examined the draft code for reporting satellite upper-air soundings of pressure, temperature and humidity (SATEM) given in the report of the fourth session of the Working Group on Codes. It was noted that this draft code

had been elaborated in consultation with satellite experts and followed the general principles for international meteorological codes. The Commission approved the draft code with small amendments and adopted Recommendation 2 (CBS-Ext.(76)).

5.2.2 SARAD code

The Commission noted the draft code for reporting satellite clear radiance observations (SARAD) elaborated by the Working Group on Codes and examined the draft code in detail. It was agreed that the draft code satisfied the existing requirements for the international exchange of clear radiance data. Recommendation 3 (CBS-Ext.(76)) was adopted.

5.2.3 SATOB code

5.2.3.1 The Commission noted the draft code for reporting satellite observations of wind, surface temperature, clouds and radiation (SATOB) recommended by the Working Group on Codes. It was agreed that this code would provide for the transmission of many types of data obtained from satellites, which might be useful for both operational and research purposes.

5.2.3.2 During consideration of the contents of the code, the Commission noted a proposal for the coding of the position of observations in the sections of the code by means of ten-degree squares instead of geographical co-ordinates. Another suggestion was also made to indicate the position by use of the Marsden squares. It was pointed out that both proposals have substantial economic advantages in the transmission of data. Commenting on these proposals, the chairman of the Working Group on Codes informed the Commission that both proposals had already been considered by the Working Group on the GDPS, which had pointed out that the procedure for numbering Marsden squares was empirical and that their use was consequently undesirable from the standpoint of data processing. The Working Group on the GDPS took the view that a system of square numbering based on an algorithm would be more suitable for automatic processing and might also facilitate manual processing; it would also be more economical than using a system of geographical co-ordinates. The Commission was also informed that the problem of the use of the ten-degree squares to report geographical position was at present under study by the Working Group on Codes and that the preliminary results of an inquiry conducted within the group on the possible ways of numbering the squares showed a considerable divergence of views.

5.2.3.3 The Commission noted this information and examined in detail the possibility of improving the code in the light of various proposals. There was unanimous agreement on the use of a system of $10^{\circ} \times 10^{\circ}$ squares in all of the sections of the code SATOB since this enables the number of groups in the report to be substantially reduced (up to 40-60 per cent).

5.2.3.4 In order to select the best method of coding ten-degree squares, the Commission discussed at considerable length the advantages and disadvantages of seven proposals given in Circular Letter No. WG/C/74-78/23 from the chairman of the Working Group on Codes to the members of the working group. The Commission reached the conclusion that the choice should be made between proposals 2 and 6. The majority of delegates were in favour of proposal 6. In the light of the above decisions, the draft code was revised. Recommendation 4 (CBS-Ext.(76)) was adopted.

5.3 International codes for transmission of data from the FGGE Special Observing System

5.3.1 Code for reporting of upper-level pressure, temperature, humidity and wind from a sonde released by carrier balloons or aircraft (TEMP DROP)

The Commission examined the draft code for reporting of upper-level pressure, temperature, humidity and wind from a sonde released by a carrier balloon or aircraft equipped with dropsondes (TEMP DROP) recommended by the fourth session of the Working Group on Codes. It was noted that the proposed code was based on the existing code FM 36-V TEMP SHIP and contained only minor modifications. The Commission agreed on the proposed code TEMP DROP and adopted Recommendation 5 (CBS-Ext.(76)).

5.3.2 Code for reporting constant-level balloon data (COLBA)

The Commission considered the draft code for reporting constant-level balloon data (COLBA) recommended by the fourth session of the Working Group on Codes and agreed that this code could be used for the transmission of constant-level balloon data. In its further consideration of the regulations and specifications of the code, the Commission felt that there was uncertainty in the interpretation of reports of upper wind from the user's point of view and recommended to the Working Group on Codes that the code be adjusted when the procedures for deriving upper-wind values from constant-level balloon observations are defined. Recommendation 6 (CBS-Ext.(76)) was adopted.

5.3.3 Code for reporting data from drifting buoy systems (DRIBU)

5.3.3.1 The Commission examined the draft code for reporting drifting buoy observations (DRIBU) recommended by the fourth session of the Working Group on Codes. The Commission noted that this draft code followed the general principles adopted by WMO for meteorological codes and agreed that it could be used for the international exchange of data from drifting buoys.

5.3.3.2 As a matter of editing, a proposal was made to change the symbolic figure group in Section 2 of the code from 88888 to 888 and to replace in Section 3 the drifting buoy number by the group containing information on the drifting buoy identifier (see paragraph 5.4 of this report). The Commission agreed with this proposal. Recommendation 7 (CBS-Ext.(76)) was adopted.

5.3.4 In view of the temporary nature of the code forms TEMP DROP, COLBA and DRIBU (intended exclusively for use for the FGGE), the session considered that they should be published as a provisional annex to the Manual on Codes, Volume I, containing the appropriate notes, regulations, specifications and code tables. With regard to the specifications of symbolic letters, they should be limited to those which are not given in Part C of the Manual or to those which are given, but having a different meaning. It was also suggested that coloured paper should be used for this provisional annex in order to draw attention to its existence.

5.4 International identifier system for environmental data buoy stations

5.4.1 The session considered Recommendation 6 (CBS/WGC-IV) in the light of comments received from Member States of IOC and WMO and the Secretariat of ITU and adopted the proposed international identifier system with a few amendments. The Commission held some discussions on the primary purpose and use of the identifier and main conclusions are summarized in the following paragraphs.

5.4.2 It was agreed that the identifier was intended to provide a unique and permanent identifier for each environmental data buoy and that it should be regarded as an identifying number for observing stations at sea in a way similar to the station index numbers for land meteorological stations rather than an identifier of radio stations as defined in Article 19 of the ITU Radio Regulations. In connexion with a question regarding the possible use of the proposed identifier as an identifier or call sign of a radio station aboard environmental data buoys, the session noted the view of ITU that it did not seem to satisfy the conditions specified in Article 19 of the Radio Regulations, particularly with respect to "clearly distinguishing features readily recognized internationally". The Commission was therefore of the opinion that the allocation of such identifiers or call signs could best be dealt with by appropriate national authorities rather than by WMO.

5.4.3 The session considered it necessary to keep a complete record with respect to the allocation and registration of serial numbers of buoys ($n_b n_b n_b$) together with their geographical positions of deployment and operating countries and to circulate this information to all Members of WMO and IOC. It therefore recommended that the Secretary-General be requested to carry out the administrative work relating to the management of the international identifier system.

5.4.4 The session decided to include the buoy identifier in messages for international dissemination and made, in this connexion, necessary provision in the proposed DRIBU code form. It was also agreed that the proposed identifier system would be used both by environmental data buoys transmitting reports directly to shore stations (e.g. on HF bands allocated by WARC for ocean data transmission) and by those transmitting through satellites (e.g. International Data Collection System envisaged by Geostationary Meteorological Satellite Operators).

5.4.5 Recommendation 8 (CBS-Ext.(76)) was adopted.

5.5 Implementation date for the new codes

5.5.1 The Commission, cognizant of the fact that the SATEM, SARAD, SATOB, TEMP DROP, COLBA and DRIBU codes as well as the international identifier system for environmental data buoy stations would be used during the period of the First GARP Global Experiment, agreed that the date of entry into force of these codes should be 1 July 1977. Furthermore, taking into consideration the fact that Members will need time to take the necessary preparatory measures for the issuance and the acceptance of messages in the above-mentioned codes, the Commission requested the president of CBS to invite the President of WMO to approve Recommendations 2, 3, 4, 5, 6, 7 and 8 (CBS-Ext.(76)) on behalf of the Executive Committee in accordance with Regulation 9 (5) of the General Regulations.

5.5.2 The Commission also felt that, during the planning of the FGGE, a need may arise for editorial amendments to the codes and therefore authorized the president of CBS to approve such amendments when necessary.

5.6 Amendments to marine codes

5.6.1 The Commission noted the following amendments to marine codes which had been recommended by the fourth session of the Working Group on Codes:

(a) Revised sea-ice group in code forms FM 21-V SHIP, FM 22-V SHIP and FM 23-V SHRED;

(b) Revised specifications of code table 2100: K - Effect of ice on navigation for use in code FM 44-V ICEAN.

It was also noted that these amendments were developed in the light of the new requirements of the Commission for Marine Meteorology and were submitted in the form of draft specifications to proposed new symbolic letters and draft regulations.

5.6.2 In considering these amendments, the Commission took into account a suggestion made to change the order of the symbolic letters in the proposed sea-ice group, i.e. $z_i c_i S_i D_i b_i$ to read $c_i S_i b_i D_i z_i$. In the course of examining the usefulness of this proposal, it was felt that such a rearrangement would be more convenient for users, since the most objective information would be reported first. Taking into account the proposed amendments and the new requirements stated by CMM, the Commission agreed with the suggestion. Recommendation 9 (CBS-Ext.(76)) was adopted.

5.7 Extension of code FM 82-I SFLOC

On the basis of the proposal made by the fourth session of the Working Group on Codes, the Commission agreed to extend the code FM 82-I SFLOC to include the number of atmospherics observed by the system at the given geographical location during the period of observation. Recommendation 10 (CBS-Ext.(76)) was adopted.

5.8 Amendments to aeronautical codes

5.8.1 The Commission noted the recommendation made by the fourth session of the Working Group on Codes regarding amendments to codes FM 51-V TAF, FM 53-V ARFOR and FM 54-V ROFOR arising from the new ICAO Annex 3 - WMO Technical Regulations /C.3.1/. It was agreed that these amendments constituted an improvement in the existing text of the codes. In considering the revised text of the code TAF, the Commission made editorial simplifications and clarifications in several places and requested the Working Group on Codes to review the note under Regulation 51.3.1 of this code, with a view to making it more precise. Recommendation 11 (CBS-Ext.(76)) was adopted.

5.8.2 The Commission noted the proposals for amendments to the aeronautical codes METAR, SPECI, TAF and ARMET. Recognizing the importance of these codes and as the proposed amendments would lead to substantial changes in the codes, therefore requiring a more detailed study by code experts, the Commission requested the Working Group on Codes to examine these proposals at its next session (planned for 1977).

5.8.3 The Commission noted the work accomplished by the Working Group on Codes in the further development of the GRID code particularly in the parts dealing with meteorological information specific to aviation as requested by Recommendation 13/9 (AN Conf., 8/CAeM Ext. 74). It was agreed that this work should be continued by the working group in close collaboration with CAeM.

5.9 Codes for exchange of data from automatic stations

5.9.1 The Commission noted the decision of the Seventh Congress to devote urgent attention to the development of a suitable code for the international exchange of data from automatic land stations, ships and buoys and discussed this subject at considerable length. It was pointed out that this problem had already been under examination by the Commission for Basic Systems for many years. CSM-V had adopted codes FM 14-V and FM 24-V for use by automatic stations. These codes are quite suitable for reporting data from automatic stations and are included in Volume I of the Manual on Codes.

5.9.2 In view of this, the question was discussed as to whether the use of two different codes for the synoptic surface observations would create difficulties for processing centres. Reference was made to the decision of CBS-VI which recommended the use of the code FM 11-V for the international distribution of all surface synoptic observations from land stations and the codes FM 21-V and other SHIP codes for the distribution of all surface synoptic observations from sea stations, due to the fact that the use of two different codes for the same type of data is not desirable for manual data processing. It was also pointed out that the use of two different codes would be particularly inconvenient for stations automatic for a part of the day, but manned for another part. The opinion was expressed that information reported by automatic weather stations was considerably different from the information reported from the manned stations and, therefore, the existence of two separate codes was well justified.

5.9.3 The attention of the Commission was also drawn to the fact that due to the decision of CBS-VI to refrain from introducing new codes for all synoptic surface observations until after the FGGE, there would be no possibility, at the present time, to elaborate a new code for both manned and automatic stations. On the basis of the discussion, the Commission agreed that a separate code could be used for the international exchange of data from automatic stations.

5.9.4 The Commission further considered the possible ways of improving the existing codes FM 14-V and FM 24-V and, in particular, the proposal to combine the DRIBU code with code FM 24-V to form one code for reporting surface observations from automatic sea stations. During the examination of this problem, it became clear that the purposes of these codes were different and the combination would be difficult, if not impossible. However, the Commission recognized that some improvement might be made to codes FM 14-V and FM 24-V but that it would lead to a substantial revision of the codes which could not be accomplished before the FGGE. The Commission therefore agreed that codes FM 14-V SYNOP and FM 24-V SHIP should be used to report surface observations from automatic weather stations in the present forms until after the FGGE.

5.9.5 As a consequence of the above decision, the Commission reviewed Recommendation 7 (CBS-VI) - Use of code forms for the exchange of synoptic surface observations originating from automatic weather stations, which recommends that preference be given to the use of codes FM 11-V, FM 21-V, FM 22-V, FM 23-V and FM 26-IV over FM 14-V and FM 24-V for the exchange of reports containing observations of automatic weather stations over the GTS, in particular on the MTC. The Commission agreed that this recommendation should not be maintained in force and that Members should be encouraged to use codes FM 14-V and FM 24-V for the international transmission of observations from automatic stations. Furthermore, it was agreed that Members could continue using the codes FM 11-V, FM 21-V, FM 22-V, FM 23-V and FM 26-IV for the exchange of information from automatic weather stations while gradually implementing the codes FM 14-V and FM 24-V.

5.9.6 The Commission recognized the difficulties which might arise from the use of different codes (i.e. both FM 11-V and FM 14-V) for the transmission of data from stations automatic for a part of the day but manned for another part. It was recommended that in this case only one code should be used, preferably FM 11-V. It was also agreed that those stations not using this code should be specifically identified in Volume A of WMO Publication No. 9. The Commission requested the Secretary-General to take appropriate action with Members concerned in order to obtain the necessary information.

5.9.7 The Commission noted that codes FM 14-V and FM 24-V had been published in Volume I of the Manual on Codes in a form which did not conform to the format used in the Technical Regulations. It was therefore agreed that a revised text of the codes should be included in Volume I of the Manual on Codes. Recommendation 12 (CBS-Ext.(76)) was adopted.

5.9.8 The Commission requested that the Working Group on Codes resume a detailed review of the question of a common code for exchanging data from different surface observational configurations, taking into full consideration, inter alia:

(a) The operational characteristics of manned, automatic and mixed stations;

(b) The needs of data-processing programmes;

(c) The needs of data archiving for climatological purposes;

and, in co-operation with experts on the GDPS and the GOS and with CIMO, develop proposals for implementation in the post-FGGE period.

5.10 Amendments to Volume I of the Manual on Codes

The Commission considered the proposal for amendments to Volume I of the Manual on Codes and agreed that the text of the new edition (1974) of the manual needed to be improved. The Commission noted with appreciation the work carried out by Dr. Chistiakov (U.S.S.R.) with respect to the preparation of a draft list of basic principles relating to the structure of codes and the Manual on Codes. However, in

the limited time available, the Commission was unable to consider problems in detail. The Commission therefore requested the Working Group on Codes to study the problem as a matter of urgency.

5.11 Revision of Volume II of the Manual on Codes

The Commission noted the proposal of the Working Group on Codes for the standardization of Volume II of the Manual on Codes and agreed with this proposal. The Commission was also informed that there was already available a draft text of the part of the Manual relating to Region VI. It was agreed that this draft should be finalized on the basis of comments from Members and in conformity with the format of Volume I with a view to using it as a layout for the revision of Volume II by the regional associations.

5.12 Requirements for precipitation and temperature data reported in the 7RRjj group of SYNOP code

The Commission noted the requirements for the international exchange of precipitation and extreme air temperature data for agrometeorological purposes submitted in the documentation for the session. The Commission was informed of the relevant decisions of the twenty-eighth session of the Executive Committee (Geneva, 27 May - 16 June 1976) concerning the use of regional 7RRjj group of synoptic codes for this purpose (reference paragraphs 5.2.9 and 5.2.10 of the general summary of the abridged report of EC-XXVIII). The Commission recognized that there was an urgent need for the international exchange of the amount of precipitation both for meteorology in general and for meteorological applications. The Working Group on Codes was requested by the Commission to review the regional practices of coding the 7RRjj group of the SYNOP code with a view to achieving greater uniformity of observing period and content in the SYNOP reports exchanged globally.

5.13 Modifications to the CLIMAT code

Several amendments to the CLIMAT code have been suggested in order to satisfy agrometeorological requirements. In particular the following proposals have been made:

(a) To include in the report the number of days in the month with precipitation $\geq$ 10 mm in addition to the presently reported days with $\geq$ 1 mm;

(b) To make the optional sunshine group $S_1S_1S_1k_sk_s$ mandatory;

(c) To report extreme weather phenomena.

The Commission noted these proposals but was unable to decide whether they were of a global or of a regional nature. Before entrusting the Working Group on Codes with the task of considering these proposals, the Commission decided to invite CAgM to elucidate this point.

5.14 Future work programme

Discussing the future work programme of the Working Group on Codes, the Commission felt that the problems mentioned in paragraphs 5.8.2, 5.8.3, 5.9.8, 5.10, 5.11 and 5.12 above should have highest priority in the work of the group. In addition it was agreed that the following problems would require further consideration by the group:

(a) Rationalization of the various existing methods of identification used in meteorological messages (jointly with the Working Groups on the GTS and the GDPS);

(b) Development of a new system of meteorological codes based on principles of information theory and automation of data acquisition, transmission and processing (jointly with the Working Groups on the GDPS and the GTS);

(c) Review of the procedures for reporting the geographical positions in codes.

6. METHODS FOR PRESENTATION AND TRANSMISSION OF PROCESSED INFORMATION (Agenda item 6)

6.1 The Commission examined the types of presentation and the arrangements for transmission of processed information. It noted that at present the arrangements for the distribution of products from WMCs and RMCs were inadequate and that the requirements of Members for the reception of output products were not adequately met. The Commission therefore agreed that it would be necessary to pay more attention to the method of presentation of output products, as well as organizing the distribution of output products in a more satisfactory and rational manner.

6.2 The Commission noted that at present the analogue facsimile technique was extensively used for the distribution of output products over the Global Telecommunication System. It was recognized that for the next few years to come, the distribution in analogue facsimile form would have to be maintained, in particular in respect of regional distribution. In this connexion, it was also noted that only a limited number of centres had the capability for conversion of output products in GRID code into pictorial presentation. However, with the expected wider use of grid-point transmissions more centres will be provided with appropriate conversion facilities.

6.3 With respect to the responsibility for conversion of GRID code data, the Commission noted that the WWW plan stipulated that all WMCs/RMCs should have these facilities. Furthermore, Members were invited to set up facilities at their NMCs for receiving GDPS products in alphanumeric form and for their conversion to pictorial form as required for national use and internal distribution.

6.4 With respect to the transmission of output products of WMCs, the Commission noted that a number of segments of the Main Trunk Circuit at present provided the

capability for analogue facsimile transmissions. However, due to the limited capacity of these segments, not all requirements for exchange of GDPS products could be met using analogue facsimile methods. This method also had disadvantages for the operation of the Main Trunk Circuit and, in some cases, might also introduce considerable delays in the reception of products at far destinations. The Commission therefore included in its study programme the development of coded digital facsimile techniques for the transmission of GDPS products on telephone-type circuits. The Working Group on the Global Telecommunication System had already started to develop standards for digital facsimile transmission. In addition, the Working Group on the Global Data-processing System had studied proposals aiming at the general use of alphanumeric techniques for the exchange of processed data. Amongst these proposals was the development of a vector-oriented version of the GRID code form or a special vector code which could solve the problem of exchanging virtually all types of processed documents, including significant weather charts, frontal analyses and forecasts.

6.5 The Commission recognized that very few products were distributed in GRID code form on the GTS and expressed deep concern about the slow progress in taking up use of the GRID code, introduced in 1974, to disseminate processed data. In order to meet the most urgent requirements of Members for these products, the Commission agreed that an increased number of WMC and RMC output products should be transmitted in GRID code form on the MTC and on regional telecommunication networks. In this connexion the Commission took note of the preference list of WMC output products to which highest priority should be given for dissemination in GRID code form given in Part A of Annex I to this report. It was further stressed that WMCs should begin their transmissions of these products as soon as possible. The Commission also noted that dual transmission (i.e. in analogue facsimile and in GRID code) would still have to be maintained for some products in order to meet national requirements. A minimum product list for dual transmission is included in Part B of Annex I to this report.

6.6 Finally, the Commission agreed that the Working Group on the Global Telecommunication System should make appropriate plans for the transmission of output products on the Main Trunk Circuit and its branches, taking into consideration the transmission capability of the various segments and centres on the MTC, as well as requirements of Members concerned. The Commission therefore requested the Secretary-General to obtain a statement of minimum requirements for the receipt of products from the WMCs and RMCs on the Main Trunk Circuit. In this connexion the presentation and mode of transmission should also be indicated. The regional associations should also be consulted in this respect if regional distribution of received products is to be carried out by RTHs on the Main Trunk Circuit and its branches.

6.7 The Commission was also informed about the present and future direct transmission capability from geostationary satellites (WEFAX). The Commission noted that WEFAX transmissions can be received by modified APT equipment. It was informed that over WEFAX channels mainly satellite pictures will be distributed. There are plans by some operators also to distribute some analyses and forecasts over WEFAX channels.

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)

7.1 Report by the chairman of the Working Group on the GDPS

The Commission noted with appreciation the report of the chairman of the Working Group on the GDPS, Mr. E. B. Fawcett. It also took note of the work carried out by the working group since the last session of CBS. Technical matters raised in the chairman's report, together with the report of the third session of the working group and the decisions and conclusions of the Commission, are recorded below.

7.2 Manual on the GDPS

7.2.1 The Commission discussed the preparation of the Manual on the GDPS. It agreed that the Manual should be composed of two volumes, Volume I dealing with global aspects and having the status of a Technical Regulation, and Volume II containing regional aspects which should be elaborated and approved by the regional associations concerned.

7.2.2 The Commission examined the draft text of Volume I of the Manual on the GDPS prepared by the Working Group on the GDPS and introducing some minor amendments. The Commission agreed to the amended text of Volume I of the Manual on the GDPS which is contained in the annex to Recommendation 13 (CBS-Ext.(76)). Recommendation 13 (CBS-Ext.(76)) was adopted.

7.2.3 As regards Volume II of the Manual on the GDPS, the Commission felt that this volume should have a standard layout of the regional GDPS aspects and it therefore requested the Working Group on the GDPS to prepare a layout for Volume II which should be used by regional associations. The Commission requested the working group to submit a draft layout to the next session of CBS.

7.2.4 The Commission felt that a review of the Guide on the GDPS was necessary. It requested its Working Group on the GDPS to undertake this review.

7.3 International GDPS Plan to support the FGGE

7.3.1 The Commission recognized that the GDPS would have a very important role in support of the FGGE. The Commission formulated the International GDPS Plan to support the FGGE, taking into account the latest developments in the FGGE planning, in particular the recommendations of the Inter-governmental Panel on the FGGE and the views expressed at various meetings on FGGE data management. It recognized, however, that the detailed FGGE data-management plan had not yet been completed. Some adjustments may therefore have to be introduced by EC-XXIX in order to ensure consistency with the overall FGGE plan and implementation programme. Recommendation 14 (CBS-Ext.(76)) was adopted.

7.3.2 The Commission reviewed the proposed data formats for international exchange of Level II and Level III data which are attached to the International GDPS Plan to support the FGGE. These formats were proposed by an Informal Planning Meeting of data-processing experts, based on principles elaborated by the Working Group on the GDPS for Level II data and recommendations of the second FGGE Data

Management Meeting. The Commission recognized that the formats for Level II and Level III data sets should, if possible, be identical to the formats to be used during the FGGE. The Commission approved the formats for international data exchange to be used during the FGGE, recognizing that these formats would have to be reviewed in the future by the Working Group on the GDPS before they are fully implemented in the WWW.

7.3.3 The Commission adopted Recommendation 15 (CBS-Ext.(76)) and Recommendation 16 (CBS-Ext.(76)).

7.4 Amendments to Volume II of the Guide on the GDPS

The Commission considered the amendments to Volume II of the Guide on the GDPS proposed by the Working Group on the GDPS. It approved these amendments with some modifications. The approved amendments are given in Annex II to this report.

7.5 Definition of nephanalysis

The Commission for Aeronautical Meteorology requested CBS to review a proposed draft definition of "nephanalysis". The Commission agreed to the following definition, formulated by the Working Group on the GDPS:

"Nephanalysis - the graphical depiction of analysed cloud data on a geographical map."

The Commission requested the president of CBS to so inform the president of CAeM.

7.6 List of stations for global exchange

7.6.1 The Commission reviewed the lists of stations from which surface and upper-air reports are to be exchanged globally as published in Attachment I-3 to the Manual on the Global Telecommunication System. It noted that these lists of stations are regularly updated by the Secretary-General in accordance with the procedures laid down in Part III of Attachment I-2 of the Manual on the GTS (WMO No. 386). (See also paragraph 8.1.4 below.)

7.6.2 The Commission felt that the procedures for updating the lists of stations from which reports are to be exchanged globally referred to above and the arrangements made by the Secretary-General for notification to Members (periodic supplements to the Manual) were effective and were working satisfactorily. It consequently requested the Secretary-General to continue the publication of periodic supplements containing the amendments proposed by Members and approved by the president of the Commission.

7.6.3 The Commission reiterated that the Secretary-General should be immediately notified of all changes in these lists in order to enable Members to be informed in accordance with the established procedures. Furthermore, it felt that observing stations from the recommended regional basic networks implemented in data-sparse areas should be immediately included in the lists, upon approval by the president of CBS, in order to achieve a more uniform network.

7.6.4 Noting the provisions in 3 (c) of Attachment I-2 to the Manual on the GTS (WMO No. 386), the Commission felt that the coverage of upper-air observations in Region VI was in general satisfactory and no pilot balloon observations from stations in the Region needed to be exchanged globally, except for stations in the south-eastern part of the Region where the areal coverage of observations from radiosonde and radiowind stations was not yet adequate.

7.7 Synoptic stations in Greenland and Iceland

When considering the matter of the threatened reduction of Greenland and Iceland observing stations referred to CBS by the recent extraordinary session of Regional Association VI, the Commission expressed a strong opinion that the loss of these stations would seriously affect weather forecasts throughout the northern hemisphere, and in particular in the North Atlantic and Europe. It noted that the current network (including the stations to be deleted) did not satisfy the minimum network density requirements laid down in the Technical Regulations and recommended in the Guide on the Global Observing System. The Commission agreed that studies of minimum network density requirements over the North Atlantic area should be carried out in a systematic way by use of numerical models and noted that the results of the FGGE should help in determining these requirements. Thus, it strongly felt that ways should be found to continue the operation of these stations at least until the results of the FGGE have been evaluated. In this connexion, the Commission discussed the possibility of using semi-automatic and automatic weather stations to reduce the cost of the present operation. The Commission adopted Recommendation 17 (CBS-Ext.(76)) and considered that its early implementation was required. It therefore requested the president of CBS to arrange through the Secretary-General for the early consideration and possible adoption of this recommendation by the president of WMO on behalf of the Executive Committee in accordance with Regulation 9(5) of the WMO General Regulations.

7.8 Further work programme

When considering the future work programme of the Working Group on the Global Data-processing System, the Commission noted that most of the tasks assigned to the working groups by CBS-VI had been completed. The Commission also noted that the following important tasks remained to be accomplished, namely:

(a) Development of minimum standards of quality control (jointly with the Working Group on the GOS);

(b) Preparation of Volume II of the Manual on the GDPS;

(c) Review of Volume I of the Guide on the GDPS;

(d) Increased use of aircraft meteorological reports (jointly with the Working Group on the GOS);

(e) Study of the best mix of observing systems (jointly with the Working Group on the GOS);

(f) Preparation for the operational use of four-dimensional data assimilation techniques.

8. TELECOMMUNICATION SYSTEM (INCLUDING THE GTS PART OF WWW AND THE REPORT BY THE CHAIRMAN OF THE WORKING GROUP ON THE GTS) (Agenda item 8)

The Commission noted with appreciation the report by the chairman of the Working Group on the Global Telecommunication System, Mr. I. A. Ravdin. 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 seventh session of the CBS Working Group on the GTS. The Commission also noted that the Secretary-General had initiated action on certain conclusions of the working group aiming at improving the operation of the GTS.

8.1 Organization of the Global Telecommunication System

8.1.1 Collection and exchange of basic observational data

8.1.1.1 The Commission noted the information made available to the extraordinary session concerning the collection and exchange on the GTS of basic observational data. From this information it became clear that, notwithstanding considerable efforts of Members of WMO to implement the WWW fully, serious shortcomings still existed in the availability of observational data from different Regions, and in particular from the southern hemisphere and the tropical belt. These shortcomings had also been demonstrated by the results of monitoring surveys conducted by the WMO Secretariat as well as by several Members. The results of these surveys have been published in the WWW Status Reports on Implementation for the past few years.

8.1.1.2 The Commission expressed its great concern about the considerable delays and/or non-availability of observational data from certain parts of the world. It was noted that despite the fact that several WMO constituent bodies had adopted different recommendations on this subject, the state of affairs had hardly improved. This fact was hampering the reliable and efficient work of WMCs and RMCs needing these data.

8.1.1.3 When considering remedial action with a view to improving the situation, the Commission discussed the utilization of inter-regional circuits for the collection and also the injection into the MTC of observational data from other Regions, in particular if this is contrary to the arrangement at present included in the Manual on the GTS concerning the responsibilities of centres on the Main Trunk Circuit and its branches for the transmission of observational data. The Commission was informed that in some cases meteorological information collected by certain RTHs could not be injected by the responsible RTH into the MTC, due to the fact that the main regional circuits were not yet implemented.

8.1.1.4 The Commission reviewed the responsibilities of centres on the MTC and its branches, taking into account the present situation, as described above. Some delegates were of the opinion that the responsibilities of the centres on the MTC and its branches should not be changed.

8.1.1.5 Other delegates, however, felt that the exchange of available observational information should be ensured by all means. If, for reasons beyond the control of an RTH or otherwise, the RTH concerned cannot yet carry out its responsibilities as regards the collection and distribution of all the meteorological information from its zone of responsibility for the efficient performance of the GTS, appropriate interim measures should be made to ensure the regular data flow. The Commission agreed that these measures should ensure that all observational data are available at all the centres concerned in the Region of origin.

8.1.1.6 The Commission agreed that the following problem areas could be mentioned as a result of the discussions:

(a) Shortcomings in the taking of meteorological observations and in the national collection of meteorological information;

(b) Shortcomings in the full implementation of regional meteorological telecommunication networks, as regards both centres and circuits;

(c) Inadequate linking for all the regional meteorological telecommunication networks and centres to the MTC.

It was felt that these shortcomings were clearly noticeable in many Regions.

8.1.1.7 The Commission felt that its president should request the Secretary-General of WMO to make a strong plea to all Members of WMO, either to implement or to assist in the implementation, by all means, of the national and regional telecommunication networks as decided upon by regional associations, in order to meet all the global and regional requirements.

8.1.1.8 The Commission adopted Recommendation 18 (CBS-Ext.(76)).

8.1.1.9 Furthermore, the Commission requested the Secretary-General to prepare for the forthcoming session of the Executive Committee a report containing all the details of the present deficiencies as regards the making and collecting of meteorological observations and their exchange on the GTS, specifying those areas where the most serious difficulties occur.

8.1.1.10 The Commission noted the statement made by the Commission for Agricultural Meteorology that there is an increased requirement for the global exchange of precipitation data using the group 7RRjj of the SYNOP code. It further noted that, although sometimes this information is available at certain centres, in accordance with the present arrangements, these data are not yet exchanged globally. The Delegates of France and the U.S.S.R. expressed their concern about the increase of the traffic loading on the MTC and its branches if this group were exchanged globally. The Commission agreed that whenever these data are available, and if circuit capacity permits, they should be included in the global exchange. The relevant addition was included in Annex XVI to this report.

8.1.1.11 The Commission noted that Members' efforts had resulted in further progress in implementing the MTC. The Commission agreed that it would be useful to reproduce in this report the up-to-date information on the implementation as well as the plans for further implementation of the MTC. This information is given in Annex III to this report.

8.1.2 Functions and responsibilities of the Meteorological Telecommunication Centres

8.1.2.1 The Commission noted that the Seventh World Meteorological Congress had adopted Resolution 3 (Cg-VII) - World Weather Watch - which includes the World Weather Watch plan for 1976-1979, and decided that the functions and responsibilities of WMCs and RTHs in this plan should be enlarged by:

(a) Establishing radio broadcasts, as required, in accordance with regional plans;

(b) Carrying out periodical monitoring of the operation of the WWW (see also under item 9).

8.1.2.2 The Commission considered that it is necessary to enlarge the functions and responsibilities of the meteorological telecommunication centres in accordance with the above-mentioned decision of Seventh Congress.

8.1.2.3 The Commission adopted Recommendation 19 (CBS-Ext.(76)).

8.1.3 Exchange and distribution of processed information

8.1.3.1 The Commission discussed various problems related to the exchange and distribution of processed information, in particular how to accommodate increasing requirements of processed information on the GTS. It noted that analogue facsimile transmissions would still be necessary for the exchange of processed information in pictorial form for some time to come. It also noted that transmissions of processed information in alphanumeric form (grid-point value) on the GTS have now started to some limited extent.

8.1.3.2 The Commission noted that Cg-VII had agreed that the GTS should continue to disseminate Area Forecast System products in accordance with ICAO requirements. The Commission requested the Secretary-General to consult with the Secretary-General of ICAO about the requirements for the dissemination of AFC products on the GTS and bring this information to the attention of Members concerned.

8.1.3.3 The Commission noted that at present no explicit procedures existed in the Manual on the GTS, Volume I - Global Aspects, as regards the responsibility for the exchange and distribution of output products of WMCs, RMCs and AFCs in pictorial or alphanumeric form. The Commission was of the opinion that appropriate amendments should be made to the Manual on the GTS in this respect. The recommended amendments to the text of the Manual on the GTS, Volume I - Global Aspects, were included in Annex XVI to this report.

8.1.4 List of stations from which reports are to be exchanged globally (see also paragraph 7.6)

8.1.4.1 The Commission reviewed the list of stations from which reports are to be exchanged globally, at present contained in Attachment I-3 to the Manual on the GTS, with a view to clarifying the responsibilities for the performance of telecommunication functions of centres located on the MTC and its branches with respect to collection, exchange and distribution of observational data. It was confirmed that all the WMCs and RTHs on the MTC should transmit and receive all data in accordance with the principles established in this respect in the Manual on the GTS and additional information agreed upon regionally or bi- or multilaterally.

8.1.4.2 The Commission noted that each regional association had already adopted a list of CLIMAT and CLIMAT TEMP reporting stations in its Region. It also noted that CLIMAT and CLIMAT TEMP data from the stations included in the above-mentioned lists are to be exchanged globally in accordance with paragraph 3 (h), Part II of Attachment I-2 to the Manual on the GTS. In order to clarify the responsibility of the centres located on the MTC and its branches for the collection, exchange and distribution of CLIMAT and CLIMAT TEMP data, the Commission agreed that the lists of CLIMAT and CLIMAT TEMP reporting stations for all the Regions, which were adopted by the regional associations, should be included in Attachment I-3 to the Manual on the GTS - List of stations from which reports are to be exchanged globally.

8.1.4.3 The Commission was informed that recently, as a result of a request made by the RA VI Working Group on Meteorological Telecommunications, all Members of WMO responsible for preparing CLIMAT and CLIMAT TEMP reports were invited to ensure that these reports are regularly prepared and distributed, in accordance with regional decisions in this respect. Furthermore, Members concerned were urged to adhere to established practices and send a "NIL" message whenever these reports are not available for transmission at the times indicated in the different transmission schedules.

8.1.4.4 The Commission was informed that the list of stations from which reports are to be exchanged globally had been kept up to date, taking into account the latest information of the implementation of the GOS plan. However, some discrepancies between the list and the up-to-date status of the implementation of the GOS plan had been noticed. It was stressed that this list had been and would be used as basic information for carrying out the monitoring of the operation of the GOS and GTS, in accordance with Resolution 4 (Cg-VII), and therefore these discrepancies should be eliminated as far as possible. The Commission agreed that the present action taken by the Secretariat for updating this list should be continued.

8.1.4.5 In this connexion, the view was expressed that it would be useful to include lists of stations for regional distribution in the regional parts (Volume II) of the Manual on the GTS. However, the Commission considered that the information in this respect could be obtained from the Basic Synoptic Networks of Observing Stations (WMO Publication No. 217) and, in some Regions, almost all stations were included in the list of global exchange stations. Nevertheless, the Commission felt that the list of stations for regional exchange should be included in the Manual on the GTS - Volume II.

8.1.5 Configuration and routeing of traffic on the Main Trunk Circuit and its branches

8.1.5.1 The Commission noted the decision of Cg-VII and the Executive Committee concerning the configuration of the MTC and its branches in the WWW plan, namely:

(a) Inclusion of a circuit between Peking and Tokyo as a branch of the MTC;

(b) Deletion of the MTC segment New Delhi-Melbourne;

(c) Inclusion of a circuit between New Delhi and Tokyo as a segment of the MTC in order to close the loop of the MTC in the northern hemisphere.

8.1.5.2 The Commission noted the above changes as well as the necessary amendments which had already been included in the Manual on the GTS. When considering the present configuration of the MTC and its branches the Commission was of the opinion that no further changes should be proposed. It invited the president of CBS to request the Secretary-General to appeal to all Members responsible for the operation of centres on the MTC and its branches to implement fully their respective segments in accordance with the appropriate specifications included in the Manual on the GTS.

8.1.5.3 The Commission further noted that Cg-VII had requested CBS to keep under review the routeing of the MTC and its branches, in consultation with the Secretary-General, with a view to achieving improved operation and increased capacity and to ensuring efficient, reliable and speedy exchange of observational data and processed information to satisfy all requirements of Members of WMO, including those for the FGGE.

8.1.5.4 The Commission discussed the present routeing of traffic on the MTC and its branches, taking into account the present state of implementation of the MTC and its branches. It was felt that appropriate amendments should be made in the relevant table indicating the responsibilities of centres located on the MTC and its branches performing telecommunication functions for the collection, exchange and distribution of observational data. It was felt that the actual presentation was not completely satisfactory as regards the indication "P-Partial". The Commission, therefore, agreed to modify the existing table for the responsibilities of centres on the MTC and its branches for the transmission of observational data, as contained in Attachment I-2 to the Manual on the GTS - Volume I.

8.1.5.5 Furthermore, the Commission reviewed the responsibilities of centres located on the MTC and its branches for the transmission of observational data, as contained in Attachment I-2 to the Manual on the GTS. It felt that these responsibilities should be more clearly specified by indicating all RTHs and their different zones of responsibility for the collection of these data in a routeing diagram, showing the target routeing of observational data on the MTC and its branches.

8.1.5.6 With a view to clarifying the responsibilities of centres, eliminating duplication as far as possible and ensuring that data from all areas are included, the Commission agreed that the target responsibilities, as amended by the session in respect of centres located on the MTC and its branches, should be included in the Manual on the GTS in Attachment I-3.

8.1.5.7 The Commission also agreed to include in the Manual on the GTS - Attachment I-2, a table which would indicate the present responsibilities of centres on the Main Trunk Circuit and its branches for the transmission of observational data. It was also agreed to include in this manual a flow-diagram showing the present routeing of observational data on the Main Trunk Circuit and its branches which will be in force until such time as the WWW in general and the GTS/MTC in particular are fully implemented.

8.1.5.8 The amendments to Attachment I-2 to the Manual on the GTS - Volume I, Global Aspects, are included in Annex XVI to this report.

8.1.6 BATHY/TESAC data exchange

8.1.6.1 The Commission was informed that efforts had been made within WMO and IOC to increase the availability of oceanographic data on a real-time basis and to distribute these data on a global basis to all the WMCs and RTHs on the MTC and its branches.

8.1.6.2 The Commission was of the opinion that there seemed to be some problems relating to the handling and routeing over the GTS of these data as well as the requirements for receiving them. It was noted that certain GTS centres route BATHY/TESAC bulletins on the MTC globally in accordance with the principles prescribed in the Manual on the GTS, while other GTS centres select and relay only relevant bulletins in accordance with the requirements expressed by IOC Member States. It was agreed that there was a need for specifying in the Manual a more explicit procedure for the transmission of BATHY/TESAC data over the MTC and its branches. The Commission therefore requested the Secretary-General to develop in more detail the routeing arrangements for BATHY/TESAC data, particularly over the MTC, but also over the GTS in general, taking into account stated requirements, to ensure the availability of these data at those centres which require them. Furthermore, the Commission felt that regional associations should be invited to include their subject in their study programme. As far as the routeing of BATHY/TESAC bulletins over the MTC and its branches is concerned, the Commission agreed that the IOC requirements should be considered for further distribution of BATHY/TESAC data from WMC/RTHs on the MTC to relevant RTHs and NMCs.

8.1.6.3 It was further agreed that the requirements for receiving these data should be kept updated and the Commission requested the Secretary-General to make the necessary arrangements in this respect.

8.1.6.4 The Commission adopted Recommendation 20 (CBS-Ext.(76)).

8.1.7 Collection of meteorological reports from stations at sea

8.1.7.1 The Commission noted that the Manual on the GTS contained a general section relating to the responsibility of Members for the collection of meteorological reports from stations at sea. The Commission agreed that it would be useful to complement this text by including a text describing arrangements for the collection of ships' weather reports and oceanographic reports (BATHY/TESAC).

8.1.7.2 The Commission was informed that this text, in fact, consolidated relevant regulations and procedures contained at present in Volume D which had undergone a long world-wide operational application and that, when compiling the material, the Secretariat had taken fully into account the comments offered by the presidents and vice-presidents of CBS and CMM, the chairman of the Working Group on the GTS, the CMM members on the Working Group on the GTS and the RA VI Working Group on the Collection of Ships' Weather Reports by Coastal Radio Stations in Region VI. The Commission felt it necessary, however, to highlight the purposes of the two amendments it introduced:

(a) Transmission of weather reports to home coastal radio stations is to be considered as an exceptional measure to facilitate the clearing of these messages (see paragraph 2.5 of Annex XVII to this report);

(b) The maximum time delay for the transmission of delayed reports from ships to coastal radio stations has been extended from 12 to 24 hours after the time of observation (see paragraph 4.4 of Annex XVII to this report) in the southern hemisphere and other data-sparse areas.

8.1.7.3 Recommendation 21 (CBS-Ext.(76)) was adopted.

8.1.7.4 The Commission was informed that at present trials were being made to collect ships' weather reports by satellite interrogation. The Commission noted this information with interest and felt that the development in this area should be followed. The Commission requested the Secretary-General to provide the Working Group on the GTS with all the information that became available on this matter.

8.1.8 FGGE data exchange

8.1.8.1 The Commission considered the information set forth in the report of the seventh session of the Working Group on the GTS about the expected volume of data to be exchanged during the period of the First GARP Global Experiment. It took note of the estimated volume of observational data and processed information and felt that, in general, additional data arising through the FGGE might produce problems on some segments and in some centres of the MTC. In this connexion, for example, the Commission noted that the MTC segment Melbourne - Tokyo could not carry the expected volume as it was not planned to be upgraded by the beginning of the FGGE.

8.1.8.2 Thus the Commission was of the opinion that a much more detailed consideration of the volume and load on the various segments of the MTC and the capability of the centres must be made. The Commission considered that a detailed routeing

plan for the exchange of data during the FGGE needed to be drawn up. It therefore requested the Secretary-General to take, as a matter of urgency, the necessary steps to prepare such a plan and, if necessary, to convene informal meetings for this purpose.

8.2 Procedures for meteorological transmissions on the GTS

8.2.1 General

The Commission reviewed the meteorological telecommunication procedures for the GTS as contained in Part II of Volume I of the Manual on the GTS. In this review it took into consideration the conclusions of the seventh session of the CBS Working Group on the GTS. The Commission also noted the extensive studies on the improvement of the procedures made by the working group aiming at:

(a) Improvement of message format of meteorological messages (routine and non-routine);

(b) Re-routeing procedures in case of outages of the MTC and its branches;

(c) Supplementary procedures for request-for-repetition action.

8.2.2 Improvement of message format of meteorological messages

8.2.2.1 The Commission discussed the improvement of the message format of meteorological messages, in particular improvement of the CLLLL group in the starting line and TTAAii CCCC in the abbreviated heading, taking into account their co-ordination with the $M_i M_i M_j M_j$ group in the text of meteorological messages. The Commission expressed the view that further studies on possible improvements of the format and handling of messages are still required and that such studies should take into account the views of experts in the fields of telecommunications, data processing and codes. These studies would have to take place over a considerable period of time in order to produce the best possible results and to ensure the adoption of a system which would promote an efficient service, and to avoid further major modification for as long a period as possible. Once the new format (which seems likely to involve that major modification) had been approved there would still have to be a period of warning during which the various meteorological services should acquire or develop suitable techniques and/or equipment. The Commission therefore stressed that these major changes (while important in the longer term) could not be finally implemented in less than about four or five years.

8.2.2.2 The Commission discussed problems concerning the present difficulties in the allocation of sufficient catalogue numbers. Increases in the number of meteorological bulletins which will be introduced in the near future will make these difficulties even worse. In particular, anticipated increases resulting from the FGGE data, satellite information, grid-point information, hydrological and other environmental data will make heavy demands on the allocation of additional CLLLL numbers in the fairly near future. The Commission therefore recognized that changes were

urgently required in the allocation of CLLLL numbers and in the abbreviated heading TTAAii CCCC in order to accommodate many new meteorological messages. It also recognized that:

(a) Many automated centres carry out message-switching on the basis of the abbreviated heading, whilst others use the catalogue number and have no immediate plans to change;

(b) The time available to make changes and to have them approved and published before the preliminary phase of the First GARP Global Experiment is now very short; and

(c) It is exceedingly probable that changes in the form and layout of the abbreviated heading of meteorological messages will be required after a few years.

8.2.2.3 The Commission was of the opinion that only those modifications considered essential for the continued operational efficiency of the GTS should be adopted and that, in order to reduce to a minimum the number of amendments required, measures which would involve no changes in the CLLLL number and the abbreviated headings, whenever this was possible, should be formulated.

8.2.2.4 Transmission sequence number "nnn"

The Commission considered the use of the transmission sequence number "nnn" in the starting line which, according to present procedures, is mandatory only if the Alphabet No. 5 is used. The Commission recognized that the use of "nnn" for Alphabet No. 2 would give a uniform format, irrespective of the alphabet used. Although it was noted that some centres were not able to allocate "nnn" in the cyclic manner, but only as a fixed combination of three digits, the Commission nevertheless agreed that the use of "nnn" for Alphabet No. 2 should be mandatory.

8.2.2.5 CL_3 specifications

The Commission reviewed the table of CL_3 specifications included in Attachment II-5 to the Manual on the GTS. The table now provides for the additional categories of traffic in the revised Table A, including considerable additional provision for information in grid-point format and pictorial information in digital form. Provision is also made for the assignment of some CL_3 categories for use nationally or in connexion with bilateral or multilateral agreements.

8.2.2.6 Data designators for alphanumeric information

The Commission agreed to introduce the necessary amendments to the Manual on the GTS, namely, a revised Attachment II-6, Table A - Data designators for alphanumeric information, which contains provision for a number of new categories.

8.2.2.7 Geographical designators (AA) for use in abbreviated headings

The Commission recognized that reports from marine stations may include not only those received from ocean weather stations, automatic fixed marine stations and mobile ships, but also those from stations in several other categories such as mobile drilling rigs, fixed oil- or gas-production platforms, moored or drifting data buoys and so on. The Commission expressed the view that it would be most convenient to recognize the two main categories as:

Reports from ocean weather stations:	W
Reports from mobile ships and other marine stations:	V

The Commission agreed to introduce these changes in Table C of Attachment II-6 to the Manual on the GTS.

8.2.2.8 Identification of observational reports from drilling platforms and oil rigs

The Commission noted that reports from marine stations may involve a number of different categories, including observations from semi-permanent oil- or gas-production platforms and from drilling rigs which may be stationary for periods but which are capable of moving from one position to another. Recognizing that such observations, especially when made in the open sea, may be of considerable value and should be distributed widely, and that (in view of the marine exposure) it may be convenient to arrange for this to be done in bulletins containing observations in one of the forms normally used for observations from ships (e.g. SHIP, SHRED), the Commission gave further consideration to how such reports might be identified. Because these platforms and rigs are often very large and of unusual shape and general layout, it is usually not possible to obtain satisfactory or representative exposures for meteorological instruments for measuring wind, temperature, rainfall, etc. In addition, it may be difficult to maintain a high standard of skill and experience among the observing staff. For these reasons, the Commission agreed that it would be valuable to be able to recognize these special observations easily and authorized the use of the four-letter indicators PLAT (for stationary oil- or gas-production platforms) and RIGG (for drilling rigs capable of movement) in place of ship call-signs in appropriate bulletins.

8.2.2.9 Data designators for processed information in grid-point format and pictorial information in digital form

The Commission noted that there was a need to improve the format of messages for exchange on the GTS, taking into account the views not only of the CBS Working Group on the GTS, but also of experts in the fields of data-processing and codes. However, the Commission recognized that the development and implementation of new procedures would inevitably take some time - certainly several years - and noted that the Working Group on the GTS had recommended the adoption of certain changes in the use of the abbreviated heading (TTAAii) and in the derivation of the catalogue number (CLLLL) to provide for the exchange of information in GRID form and in coded digital facsimile form for which, under the present arrangement, provision is quite inadequate.

8.2.2.10 The proposals submitted by the Working Group on the GTS were studied in detail. It was emphasized that these proposals (which involve certain amendments to the Manual on the GTS and also certain additions or amendments to other publications) were intended primarily to facilitate the distribution of products in GRID and coded digital facsimile form by providing the necessary headings and catalogue numbers to enable this to be carried out effectively over the GTS. The Commission noted that there was no intention, at that stage, of providing a means whereby the contents of a message in GRID or coded digital facsimile form might be completely described by the abbreviated heading of a meteorological message. This information would be provided by the full contents of the message itself. However, particularly in the case of GRID messages, which are expected to increase considerably in numbers in the next few years, there is an urgent need to be able to identify products in the various publications and in the directories and other distribution lists of the GTS.

8.2.2.11 The proposals submitted by the Working Group on the GTS would permit this to be done adequately, at least for the present, by allowing a departure from existing practice as indicated in the Manual on the GTS, Attachment II-6, Table A - Data designators for alphanumeric information. Under the new proposal, the letters G (for information in GRID form) and P (for pictorial information transmitted in digital form) may be followed by any letter of the alphabet. Furthermore, the space in the abbreviated heading reserved for AA (as published in Attachment II-6 of the Manual - Table B - Geographical designators) would include additional information (e.g. time reference of bulletins, etc.) and would be arranged in a somewhat different way. However, it was emphasized that these departures would not cause any difficulties or confusion because the initial letters G or P make it immediately obvious that information in GRID form or pictorial information in digital form is being transmitted and (apart from routeing and storage) this information is dealt with at centres in an entirely different way from other meteorological information regularly exchanged via the GTS.

8.2.2.12 The Commission therefore agreed to the new arrangements and recommended their adoption as soon as possible. The procedure to be followed is that centres issuing information in GRID and coded digital facsimile form will allocate abbreviated headings and catalogue numbers in accordance with the provisions given in the Manual on the GTS (see new paragraph 2.3.2.3 and Table D of Annex XVII to this report) and will make the availability of the products known by suitable entries in WMO Publication No. 9, Volume C, Chapter I - Catalogue of Meteorological Bulletins. The information to be provided will be based on the instructions for the preparation of abbreviated headings for the special cases where TT = G or P, as incorporated in the Manual on the GTS, Attachment II-6, new Table D, and the revised table in Attachment II-5 (specifications for CL_3).

8.2.2.13 It is to be emphasized that the suggested specifications set out in Table D do not represent a formal code. They are for general information and guidance so that originating centres will be free to develop headings and catalogue numbers within a generally accepted framework. However, simply for convenience, it is intended that, where suitable designators have been suggested, they should normally be adopted.

8.2.2.14 The Commission adopted Recommendation 22 (CBS-Ext.(76)).

8.2.2.15 Use of "ii" number in the abbreviated heading

The Commission discussed a proposal made always to use two digits for the "ii" numbers in the abbreviated heading. According to present procedures only one digit need be used for "ii" numbers 1 to 9. The Commission realized that while this proposal might facilitate the operation at some centres, it might also cause re-programming at other centres. There was no general agreement on a preference for one or two digits for "ii" numbers 1 to 9 and the Commission agreed to refer the subject to the Working Group on the GTS for further study.

8.2.3 Re-routeing procedures in case of outages on the MTC and its branches

8.2.3.1 The Commission was informed that Regional Association VI, at its extraordinary session (October 1976), had agreed that procedures for re-routeing of traffic in case of outages of centres and circuits in Region VI should be included in the Manual on the GTS - Volume II, Europe. The Commission noted that this matter had been thoroughly considered by the Working Group on the GTS at its seventh session. The working group felt that the immediate global application of the procedures developed by RA VI would be premature because suitable circuits for re-routeing of traffic in case of outages on the MTC and its branches would not be available in some parts of the world. However, it was of the opinion that the procedures developed by RA VI could be useful as guidance material for re-routeing of traffic in case of outages on the MTC and its branches.

8.2.3.2 The Commission was of the opinion that the procedures for re-routeing of traffic in the case of outages should be developed as early as possible with a view to arriving at standard world-wide procedures. The Commission felt that the study on the re-routeing of the traffic in case of outages on the segments of the MTC and its branches should be made as a whole, taking into account the information of the studies developed in the different Regions. It agreed that further study on the procedures for re-routeing should be continued by the CBS Working Group on the GTS.

8.2.4 Supplementary procedures for request-for-repetition action

8.2.4.1 The Commission noted that RA VI had developed and adopted regional supplementary procedures for request-for-repetition action, namely:

(a) One "request-for-repetition" message shall not contain more than eight requests;

(b) When a reply to a "request for repetition" is made by means of an addressed message the CLLLL number of the requested message shall be included at the beginning of the first line of the text of the addressed message, followed by the abbreviated heading in the second.

8.2.4.2 The Commission considered that the above-mentioned regional procedures could be applicable for use on a world-wide basis. However, the inclusion of these

procedures in the Manual on the GTS - Volume I - Global Aspects - would not be feasible because some difficulties might arise due to the discrepancy between these procedures and the request-for-repetition procedures prescribed in paragraph 2.5 of Part II of the Manual on the GTS - Volume I, in particular the number of requests included in one message would be decided bilaterally between neighbouring centres concerned, as well as the use of "nnn" in a reply to a "request for repetition", which are prescribed in Attachment II-7 to the Manual on the GTS.

8.2.4.3 The Commission was of the opinion that the two points, namely (a) the number of requests included in one message and (b) the inclusion of the CLLLL number of the requested message, should be included in the future study programme on the improvement of the format of non-routine messages by the CBS Working Group on the GTS.

8.3 Technical problems of the Global Telecommunication System

8.3.1 The Commission noted various studies made by the Working Group on the GTS on technical problems related to meteorological telecommunications. Based on the conclusions of the working group, the main subjects were considered by the Commission as summarized in the following paragraphs.

8.3.2 4 800 bit/s modems

8.3.2.1 The Commission reviewed the study made on 4 800 bit/s modems. In this connexion it was noted that CCITT had already adopted Recommendation V.27 for a 4 800 bit/s modem standardized for use on higher-quality telephone circuits (defined in CCITT Rec. M1020, previously Rec. M102) with manual equalizer, and that the CCITT VIth Plenary Assembly (September-October 1976) had adopted Recommendation V.27 bis, which is for a standard 4 800 bit/s modem for use on circuits not necessarily conforming to CCITT Rec. M1020.

8.3.2.2 The Commission noted that a detailed proposal, containing technical characteristics and procedures for transmission at a data-signalling rate of 4 800 bit/s, had been submitted to the Working Group on the GTS by the expert nominated by the U.S.S.R.

8.3.2.3 The Commission recognized the urgent need for introduction of a data-signalling rate of 4 800 bit/s on some segments of the MTC with a view to meeting the additional requirements arising from the FGGE, commencing at the end of 1977. It was felt that the two 4 800 bit/s modems, as described in CCITT Rec. V.27 and V.27 bis, should be accepted for data transmission on the GTS at the signalling rate of 4 800 bit/s.

8.3.2.4 The Commission noted that the introduction of data transmission at 4 800 bit/s and these new modems would require changes of the present text in the Manual on the GTS. However, it was agreed that it was necessary to study technical matters

relating to the introduction of 4 800 bit/s and higher data-signalling rates on the MTC and its branches, and to evaluate the results of the relevant operational trials and tests.

8.3.2.5 The Commission invited the Working Group on the GTS to continue its studies for transmission at 4 800 bit/s, taking into account paragraphs 8.3.2.1 to 8.3.2.4 above.

8.3.3 Error Detection and Correction (EDC) procedures for data transmission at a signalling rate of 4 800 bit/s

8.3.3.1 The Commission considered the question of the EDC procedures to be introduced in connexion with the use of a V.27 modem and V.27 bis modem. Information was given that there had been no operational tests proving the suitability of the present EDC software procedures (used at 2 400 bit/s) for use at the higher signalling rate of 4 800 bit/s. However, from a technical point of view, it was thought that with slight modifications the present EDC software procedures could be adapted for use at a signalling rate of 4 800 bit/s. The Commission was of the opinion that the only realistic solution to the problem in terms of the near future was to make such modifications.

8.3.3.2 The Commission agreed that centres which were willing to increase the signalling rate up to 4 800 bit/s in the near future should try to use the modified EDC software procedures for this purpose.

8.3.3.3 In this connexion, the Commission was informed that the International Organization for Standardization (ISO) had developed High Level Data Link Control (HDLC) procedures, which could be taken as guidance in developing future WMO standards. However, it also noted that final adoption by the ISO of these types of procedure was unlikely to be reached before the middle of 1977. The Commission agreed that the studies in developing future EDC procedures for the GTS should be continued, taking into account the development of the HDLC procedures.

8.3.4 Operational procedures for medium-/high-speed (1 200/2 400 bit/s) data transmission

8.3.4.1 The Commission reviewed the present operational procedures for medium-/high-speed (1 200/2 400 bit/s) data transmission for the GTS as included in the Manual on the GTS, Volume I, Part II. It agreed that the present EDC procedures - software and hardware - for data transmission at 1 200/2 400 bit/s did not give rise to any major difficulties in the operation of the GTS. It was therefore felt that no changes in the procedures were called for at present.

8.3.4.2 The Commission noted that the existing procedures for data-to-facsimile switching on circuits operating on a shared data/facsimile mode basis needed to be improved in order to increase the total throughput of the circuit. It agreed to refer the study of this question to the Working Group on the GTS.

8.3.5 Coded digital facsimile transmission

8.3.5.1 The Commission took note of the section of the final report of the seventh session of the Working Group on the GTS which deals with coded digital facsimile transmission and agreed that the use of this mode of transmission on the MTC was particularly desirable for the following reasons:

(a) To provide for the operation of the MTC as a fully digital system;

(b) To facilitate the relay of pictorial information between the centres on the MTC and its branches as well as selective distribution on a regional basis;

(c) To provide for an increased amount of traffic on the MTC and speed up the distribution of processed information.

8.3.5.2 The Commission noted with satisfaction that some Members had already carried out tests using several different coding techniques suitable for transmission over high-quality lines, normal-quality lines and high-frequency radio circuits. The Commission encouraged Members to continue with this development work, using a set of standard meteorological charts as described in the report of the working group. The Commission requested the Secretary-General to make the necessary arrangements to keep the chairman of the Working Group on the GTS advised of the progress in this respect.

8.3.5.3 The Commission noted that there was a need to be able to transmit documents by coded digital facsimile including half-tones, e.g. cloud pictures from satellites. It also noted that some systems for this purpose had already been developed and manufactured, and that CCITT had started to study the question of the standardization. However, the Commission was of the opinion that considerable further development was required.

8.3.5.4 The Commission invited its Working Group on the GTS to continue the studies on coded digital facsimile techniques as a high-priority matter.

8.3.6 Requirements for relay of analogue facsimile transmission over the GTS

8.3.6.1 The Commission reviewed the requirements for relay of analogue facsimile transmissions over the GTS, in the light of experience gained so far by the different centres. In particular, the following two matters were considered:

(a) Store-and-forward operations and through-switching;

(b) Data/facsimile switching procedures.

8.3.6.2 As regards through-switching, the Commission was of the opinion that this method did not provide a practical solution for improving relay of analogue facsimile transmissions on the MTC, due to the fact that the MTC is operated on a data/facsimile time-shared basis, and that sequential segments might be operating at any time in completely different transmission modes.

8.3.6.3 The Commission considered that the best available techniques, at present, would be the digitization store-and-forward method and therefore urged all centres concerned to attempt to use this method of operation, in order to speed up the relay of analogue facsimile transmissions on the MTC.

8.3.6.4 The Commission felt that the questions related to the relay of analogue facsimile transmission should be further studied.

8.3.7 Grid-point transmission of processed information

8.3.7.1 The Commission noted that the transmission of processed information in GRID code was already being carried out on a very limited scale. When discussing the application of GRID-code transmission on the GTS, it was noted that its alphanumeric format made it particularly suitable for direct input to a meteorological data-processing computer. From the telecommunication point of view, this type of information in alphanumeric form can easily be handled on the GTS as normal message traffic.

8.3.7.2 However, the Commission felt that widespread use of the GRID transmission mode would require the introduction of additional capabilities for conversion from the GRID form into pictorial charts. This capability would be required to provide users, both locally and at other centres, with processed information in a convenient form.

8.3.7.3 In this connexion the Commission noted that Recommendation 3 (CBS-VI) - Conversion of products in alphanumeric (GRID code) form into pictorial form - recommended:

> "(1) That Members operating WMCs/RMCs be invited to equip their respective centres with appropriate facsimile facilities for the conversion of processed data in alphanumeric (GRID code) form into pictorial form for regional distribution, as soon as possible;"

From the information available, it appeared that little progress had been made in the implementation of the above recommendation. The Commission agreed that the Working Groups on GDPS and GTS should continue to study the equipment requirements and procedures for the conversion, organization and facilities required at WWW centres (see also paragraph 6).

8.3.8 Technical characteristics and specifications

8.3.8.1 The Commission reviewed the text in the Manual on the GTS, Part III - Technical characteristics and specifications for the Global Telecommunication System - with a view to introducing the necessary changes outlined below.

Circuit characteristics of the MTC and its branches

8.3.8.2 The Commission felt that it would be desirable to make reference in the Manual on the GTS to the maintenance requirements of circuits used for data transmission. In this connexion reference was made to the CCITT Recommendations V.2 and

V.50 to V.55 inclusive. It also felt that the information contained in these recommendations could be used by Meteorological Services in their discussions with the national telecommunication administrations concerning the desirable standards of maintenance of the circuits used for data transmission.

Characteristics of transmissions over the MTC and its branches

8.3.8.3 The Commission noted that the introduction of data transmission at a signalling rate of 4 800 bit/s on the MTC, the use of 4 800 bit/s modems and EDC procedures for data transmissions at 4 800 bit/s called for changes in Part III of the Manual. It was agreed to include the additions in the relevant text of the Manual on the GTS as required.

8.3.8.4 It was felt that some indication of the methods used for transmission of data and analogue facsimile on the same circuits should be provided in the Manual on the GTS. At present the following two methods are being used on circuits forming part of the GTS:

(a) Facsimile/data are transmitted on a time-sharing basis;

(b) Data are transmitted at low speed simultaneously with facsimile on telephone-type channels on a frequency-sharing basis.

The Commission agreed to mention the above possibility in the relevant part of the Manual on the GTS.

8.3.8.5 The Commission felt that the transmission characteristics for data transmission up to 1 200 bit/s on HF ISB circuits should be included in the Manual on the GTS as valuable guidance to Members planning to introduce such transmissions. It was agreed to include the necessary additions in the relevant text of the Manual on the GTS.

Technical characteristics of equipment for facsimile (analogue) transmissions

8.3.8.6 The Commission felt that in analogue facsimile transmissions, the scanning density should be more accurately given in the Manual on the GTS. It was agreed to include the necessary changes in the relevant text of the Manual.

8.3.8.7 Taking into account the present development in respect of facsimile equipment, it was felt necessary to update the existing text of the Manual on analogue facsimile. The Commission requested the Secretary-General, in consultation with the president of CBS and the chairman of the Working Group on the GTS, to propose appropriate amendments to the Manual on the GTS based on the new definitions of the CCITT in respect of facsimile transmissions.

8.3.8.8 The Commission adopted Recommendation 23 (CBS-Ext.(76)).

8.3.9 Guide on the automation of Meteorological Telecommunication Centres

8.3.9.1 The Commission recalled that one of its major tasks for the period 1974-1978 was the preparation of guidance material for automation of meteorological telecommunication centres. It noted that a draft Guide had been prepared by a consultant and had been considered by the seventh session of the Working Group on the GTS. This session of the working group made some comments on the draft Guide and proposed certain additional information to be included in the Guide.

8.3.9.2 The Commission was informed that the revision of the draft Guide had been completed, bearing in mind the views of the Working Group on the GTS. Taking into account the views expressed by the Commission, in respect of typical examples of block diagrams and schematic layout, it was agreed that some modifications should be made to the relevant chapters before the Guide is issued. The Commission authorized the president of the Commission, in consultation with the chairman of the Working Group on the GTS, to approve the text of the Guide.

8.3.9.3 The Commission adopted Recommendation 24 (CBS-Ext.(76)).

8.4 Priority items on the work programme of the Working Group on the GTS

The Commission reviewed the tasks on the work programme of the Working Group on the GTS. It agreed that the following tasks should have the highest priority:

- Assistance by the GTS to the FGGE, GARP, IGOSS and AFC programmes;
- Coded digital facsimile transmission;
- Grid-point transmission of processed information on the GTS and conversion of products from GRID code form to pictorial form in conjunction with the Working Group on the GDPS;
- Technical characteristics and procedures for transmission with a data-signalling rate higher than 2 400 bit/s, in particular 4 800 bit/s;
- Technical problems in the distribution of satellite information on the GTS; collection of observational data by means of satellites and relay of pictorial and alphanumeric data via satellites;
- Monitoring the operation of the GTS.

9. MONITORING OF THE OPERATION OF THE WWW (Agenda item 9)

9.1 The Commission based its discussion of monitoring of the operation of the WWW on four documents, namely, three submitted by the GOS, GTS and GDPS working groups respectively on the monitoring of their WWW sub-system, and one by the Secretary-General on the overall monitoring operations of the WWW during the period 1977-1979.

9.2 The Commission felt that a plan for monitoring the operation of the WWW should be introduced at an early date. In particular the monitoring scheme is urgently needed to identify deficiencies and help in improving the present performance to attain efficient operation of the WWW before the beginning of the FGGE. An efficient WWW system is vital to the success of operational meteorology as well as of the FGGE.

9.3 The Commission considered that important factors to be monitored should include the availability at every centre of timely and usable observational data and processed information in order to meet the needs of Members concerned. The Commission agreed that a plan for monitoring the operation of the WWW should contain detailed procedures on the implementation of the monitoring programme for the GOS, GDPS and GTS; however, the plan should integrate the individual WWW sub-system requirements into an overall scheme.

9.4 The Commission adopted Recommendation 25 (CBS-Ext.(76)).

9.5 Furthermore, the Commission was of the opinion that an important element of an effective monitoring programme is motivation and a determination to participate, particularly at the local level. Personnel at this level should be made aware of the importance of the meteorological information they provide. As a minimum they should know that their meteorological information has arrived at the point of use in due time, in the correct format and of acceptable quality.

9.6 In addition to motivation, another active ingredient for a monitoring programme to be successful in real time is an active "feedback" system between the WWW centres, i.e. quick reaction between centres concerned to eliminate shortcomings revealed by the results of monitoring.

9.7 The non-real-time monitoring component will allow a statistical evaluation of the overall operation of the World Weather Watch. It will complement the real-time monitoring and identify the persistent deficiencies and shortcomings of the World Weather Watch. In particular, it will allow the evaluation of the regularity and timeliness of the collection, exchange and distribution of meteorological information. The results of the non-real-time monitoring will be used by the Secretary-General, who will draw the attention of Members to the need for assuming full responsibility concerning operation of the WWW, as stipulated in the WMO Convention, WWW plan, Technical Regulations and their annexes.

9.8 Technical and financial assistance may be used for eliminating deficiencies, in particular operation and maintenance problems in developing countries. The VAP and other technical assistance programmes, within the provisions of the applicable regulations, should be considered for this purpose. The Commission therefore requested the Secretary-General to draw the attention of the Executive Committee to the need for assistance, particularly for establishing and maintaining upper-air stations and telecommunication facilities in developing countries in order that they can both participate in and benefit from the WWW.

9.9 The Commission agreed that pilot projects to test the various elements of a monitoring plan for the WWW would be very desirable. These pilot projects should be based on the priority items as outlined in the plan. They would test the

progressive implementation of the monitoring plan and would also provide experience for the further development of detailed procedures and guidelines. An initial pilot project should start early in the FGGE build-up phase and be completed well before the beginning of the FGGE. The Commission requested the Secretary-General to approach Members with a view to obtaining their views on their willingness to participate in such pilot projects. On the basis of replies received, the Secretary-General should prepare a project plan and submit it to the Executive Committee for approval.

9.10 The Commission noted the need for detailed procedures, including preparation of lists of checks for GOS, GDPS and GTS to be applied to examine the quality and completeness of meteorological information received at both manually operated and automated centres. The Commission requested the president of the Commission to arrange to prepare, in consultation with the Secretary-General, further detailed procedures including examples of the lists of checks to be included in the plan for monitoring the operation of the WWW.

10. REVIEW OF TECHNICAL REGULATIONS OF INTEREST TO CBS (Agenda item 10)

10.1 The Commission did not undertake an overall review of the Technical Regulations, but confined its attention to a number of points referred to it by Seventh Congress, and to proposals made to it, as requiring urgent action, by working groups of the Commission and by the Secretary-General.

10.2 Seventh Congress (abridged report, general summary, paragraphs 2.4.11 to 2.4.14) had requested the Commission:

- To draft a definition of the term "meteorological bulletin";
- To rationalize the paragraph in the Technical Regulations which deals with the system of scales for weather charts;
- To reflect in the Technical Regulations the revised responsibilities of WMCs, RMCs and NMCs in the World Weather Watch plan;
- To formulate proposals for the revision of the Technical Regulations as a consequence of the proposed adoption of the Manual on the Global Data-processing System.

Proposals were approved under each of these headings.

10.3 The Commission formulated other proposals which would:

(a) Raise to the status of standard practices and procedures the regulations which define the responsibilities of Members to implement regional basic synoptic networks and to distribute climatological data;

(b) Treat more fully of meteorological satellite systems in Chapter A.1.1 of the Technical Regulations.

10.4 The Commission took the opportunity to propose the deletion from Volume I of the Technical Regulations of the definitions of certain terms no longer appearing in the text.

10.5 The Commission recognized that some of the proposals which it had put forward for the amendment of the Technical Regulations consisted of temporary measures to cover the interval until a general review of the Technical Regulations takes place at the seventh session of the Commission prior to Eighth Congress. It decided that this general review should include, in particular, consideration of:

(a) A restructuring of Chapter A.1.1 so that the paragraphs referring to meteorological satellites might be fitted into an orderly and logical sequence;

(b) A revision of Chapter A.2 in order to eliminate unnecessary duplication with Annex IV (Manual on the Global Data-processing System, Volume I).

10.6 The Commission adopted Recommendation 26 (CBS-Ext.(76)) concerning the proposed amendments to the Technical Regulations. Details of the amendments proposed are given in Annex XXI to this report.

11. REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE COMMISSION AND RELEVANT EXECUTIVE COMMITTEE RESOLUTIONS (Agenda item 11)

11.1 In accordance with the current practice, the Commission examined those resolutions and recommendations which it adopted prior to the present extraordinary session and which were still in force. This review also included inter-sessional recommendations adopted by correspondence in the field of codes and telecommunications.

11.2 The Commission decided to cancel a number of recommendations related to action already taken and completed. However, it agreed to maintain in force Resolutions 1 to 6 (CBS-VI) and Recommendations 3, 6 and 20 (CBS-VI). Resolution 1 (CBS-Ext.(76)) was adopted.

11.3 The Commission then examined the Executive Committee's resolutions within the field of activity of CBS and decided to take no action during the extraordinary session on this subject.

12. SCIENTIFIC LECTURES AND DISCUSSIONS (Agenda item 12)

One afternoon was devoted to the scientific lectures and to discussions thereof. The meeting was presided over by Dr. J. Brinkmann, vice-president of the Commission. The presentations were as follows:

- A film on advances in the understanding of weather systems from satellites, presented by Dr. Clifford A. Spohn (U.S.A.);

- The interpretation of large-scale numerical weather prediction in terms of weather for local forecasting purposes, by Dr. L. Bengtsson (ECMWF);

- A film on GATE, introduced by Dr. J.L. Rasmussen from the WMO Secretariat.

13. DATE AND PLACE OF THE SEVENTH SESSION (Agenda item 13)

13.1 The Commission was informed by the principal delegates of the U.S.A. to the session that the United States of America was prepared to host the next session of CBS at Washington, D.C., in October/November 1978. The Commission noted this invitation with appreciation and agreed that the date and place of its seventh session would be determined later, in accordance with Regulation 179 of the WMO General Regulations.

14. CLOSURE OF THE SESSION (agenda item 14)

14.1 The president of the Commission, Dr. O. Lönnqvist, in his closing address reviewed the major results accomplished by the session. He thanked all participants for the hard work done and the spirit of friendly co-operation which had characterized the whole session. The president also expressed his thanks to the chairmen and vice-chairmen of the committees, to the ad hoc groups and to the rapporteurs. Finally he thanked the Secretary-General of WMO for the arrangements made for the session and the staff who supported the work of the session.

14.2 Dr. M. Petrossiants (U.S.S.R.), on behalf of all participants, congratulated the president for the excellent manner in which he had presided the session and wished him further success in leading the work of the Commission. Mr. A.J. Al-Sultan (Iraq) supported and associated himself with the expression of thanks addressed to the president of the Commission, to participants and to the WMO Secretariat.

14.3 The session closed at 12.30 p.m. on 12 November 1976.

RESOLUTION ADOPTED BY THE SESSION

Res. 1 (CBS-Ext.(76)) - REVIEW OF THE PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE COMMISSION FOR BASIC SYSTEMS

THE COMMISSION FOR BASIC SYSTEMS,

CONSIDERING that Resolution 7 (CBS-VI) should be reviewed,

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

DECIDES:

(1) To keep in force Resolutions 1, 2, 3, 4, 5 and 6 (CBS-VI);

(2) To keep in force Recommendations 3, 6 and 20 (CBS-VI);

(3) To reproduce in this report* the texts of the resolutions and recommendations which are kept in force.

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* See Annex IV.

RECOMMENDATIONS ADOPTED BY THE SESSION

Rec. 1 (CBS-Ext.(76)) - PUBLICATION OF THE GUIDE ON THE GLOBAL OBSERVING SYSTEM

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Resolution 2 (CBS-VI) - Working Group on the Global Observing System,

(2) Paragraph 4 of the final report of the third session of the CBS Advisory Working Group,

(3) The draft Guide on the GOS,

CONSIDERING:

(1) That the CBS Advisory Working Group decided that the preparation of the Guide is a matter of urgency,

(2) That the Guide should be published as soon as possible in a form permitting its further updating so that it can be available to observers sufficiently in advance of the FGGE,

(3) That its publication would be of great help in the accomplishment of the other tasks allocated to the Working Group on the GOS and will therefore permit the early preparation of the chapters of the Guide still missing,

RECOMMENDS that the Secretary-General be requested to publish the first seven chapters of the Guide on the Global Observing System in the four official languages of the Organization in loose-leaf form as soon as possible;*

AUTHORIZES the president of the Commission to approve amendments to the Guide, as necessary.

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* The Guide on the GOS is being published separately.

Rec. 2 (CBS-Ext.(76)) - CODE FOR REPORTING SATELLITE UPPER-AIR SOUNDINGS OF PRESSURE, TEMPERATURE AND HUMIDITY (SATEM)

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Recommendation 2 (EC/PMS-I) - Codes for exchange of meteorological satellite data,

(2) Paragraph 3.2.7 of the general summary of the abridged report of EC-XXVI,

(3) Paragraphs 3.1.3 and 3.1.4 of the general summary of the report of the third session of the Advisory Working Group of CBS,

CONSIDERING that there is an urgent need for the development of international codes for the distribution of satellite information in alphanumeric form,

RECOMMENDS:

(1) That the code for reporting satellite upper-air soundings of pressure, temperature and humidity (SATEM) given in the annex* to this recommendation be introduced for international use, as from 1 July 1977;

(2) That this code be included in Volume I of WMO Publication No. 306 - Manual on Codes.

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* See Annex V.

Rec. 3 (CBS-Ext.(76)) - CODE FOR REPORTING SATELLITE CLEAR RADIANCE OBSERVATIONS (SARAD)

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Recommendation 2 (EC/PMS-I) - Codes for exchange of meteorological satellite data,

(2) Paragraph 3.2.7 of the general summary of the abridged report of EC-XXVI,

(3) Paragraphs 3.1.3 and 3.1.4 of the general summary of the report of the third session of the Advisory Working Group of CBS,

CONSIDERING that there is an urgent need for the development of international codes for the distribution of satellite information in alphanumeric form,

RECOMMENDS:

(1) That the code for reporting satellite clear radiance observations (SARAD) given in the annex* to this recommendation be introduced for international use as from 1 July 1977;

(2) That this code be included in Volume I of WMO Publication No. 306 - Manual on Codes.

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* See Annex VI.

Rec. 4 (CBS-Ext.(76)) - CODE FOR REPORTING SATELLITE OBSERVATIONS OF WIND, SURFACE TEMPERATURE, CLOUDS AND RADIATION (SATOB)

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Recommendation 2 (EC/PMS-I) - Codes for exchange of meteorological satellite data,

(2) Paragraph 3.2.7 of the general summary of the abridged report of EC-XXVI,

(3) Paragraphs 3.1.3 and 3.1.4 of the general summary of the report of the third session of the Advisory Working Group of CBS,

CONSIDERING that there is an urgent need for the development of international codes for the distribution of satellite information in alphanumeric form,

RECOMMENDS:

(1) That the code for reporting satellite observations of wind, surface temperature, clouds and radiation (SATOB) given in the annex* to this recommendation be introduced for international use as from 1 July 1977;

(2) That this code be included in Volume I of WMO Publication No. 306 - Manual on Codes.

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* See Annex VII.

Rec. 5 (CBS-Ext.(76)) - CODE FOR REPORTING UPPER-LEVEL PRESSURE, TEMPERATURE, HUMIDITY AND WIND FROM A SONDE RELEASED BY CARRIER BALLOONS OR AIRCRAFT (TEMP DROP)

THE COMMISSION FOR BASIC SYSTEMS,

NOTING the report of the second session of the Intergovernmental Panel on the FGGE, GARP Special Report No. 17, paragraph 3.7,

CONSIDERING that there is an urgent need for international codes for transmission of data from the FGGE special observing system,

RECOMMENDS that the code for reporting upper-level pressure, temperature, humidity and wind from a sonde released by carrier balloons or aircraft (TEMP DROP) given in the annex* to this recommendation be introduced as from 1 July 1977 for international use during the First GARP Global Experiment;

REQUESTS the Secretary-General to arrange for the publication of the code.

* See Annex VIII.

Rec. 6 (CBS-Ext.(76)) - CODE FOR REPORTING CONSTANT-LEVEL BALLOON DATA (COLBA)

THE COMMISSION FOR BASIC SYSTEMS,

NOTING the report of the second session of the Intergovernmental Panel on the FGGE, GARP Special Report No. 17, paragraph 3.7,

CONSIDERING that there is an urgent need for international codes for transmission of data from the FGGE special observing system,

RECOMMENDS that the code for reporting constant-level balloon data (COLBA) given in the annex* to this recommendation be introduced as from 1 July 1977 for international use during the First GARP Global Experiment;

REQUESTS the Secretary-General to arrange for the publication of the code.

* See Annex IX.

Rec. 7 (CBS-Ext.(76)) - CODE FOR REPORTING DATA FROM DRIFTING BUOYS (DRIBU)

THE COMMISSION FOR BASIC SYSTEMS,

NOTING the report of the second session of the Intergovernmental Panel on the FGGE, GARP Special Report No. 17, paragraph 3.7,

CONSIDERING that there is an urgent need for international codes for transmission of data from the FGGE special observing system,

RECOMMENDS that the code for reporting data from drifting buoys (DRIBU) given in the annex* to this recommendation be introduced as from 1 July 1977 for international use during the First GARP Global Experiment;

REQUESTS the Secretary-General to arrange for the publication of the code.

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* See Annex X.

Rec. 8 (CBS-Ext.(76)) - INTERNATIONAL IDENTIFIER SYSTEM FOR ENVIRONMENTAL DATA BUOY STATIONS

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Resolution 6 of the Fourth Joint Session of the IOC Working Committee for IGOSS and the WMO Executive Committee Panel of Experts on Meteorological Aspects of Ocean Affairs,

(2) Recommendation 6 (CBS/WGC-IV),

CONSIDERING the need for providing:

(1) A unique and permanent identifier for each environmental data buoy for operational purposes,

(2) An appropriate index for the storage and retrieval of data originating from these buoys,

RECOMMENDS that the international identifier system for environmental data buoy stations given in Part A of the annex* to this recommendation be used for stationary and drifting buoys as from 1 July 1977, in accordance with the general guidelines, as specified in Part B of the annex* to this recommendation;

REQUESTS the Secretary-General, in consultation with IOC as required:

(1) To arrange for the promulgation of the international identifier system;

(2) To carry out the administrative work relating to the management of the international identifier system.

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* See Annex XI.

Rec. 9 (CBS-Ext.(76)) - AMENDMENTS TO MARINE CODES

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) The abridged final report of CBS-VI, general summary, paragraph 8.8,

(2) The new CMM requirements for reporting procedures for the ice group in codes FM 21-V SHIP, FM 22-V SHIP and FM 23-V SHRED,

CONSIDERING that there is a need for revision of the ice group in marine codes,

RECOMMENDS that amendments to codes FM 21-V SHIP, FM 22-V SHIP and FM 23-V SHRED given in the annex* to this recommendation be implemented from 1 January 1979;

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

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* See Annex XII.

Rec. 10 (CBS-Ext.(76)) - EXTENSION OF CODE FM 82-I SFLOC

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) The high value placed by users upon SFLOC reports,

(2) The code form FM 82-I SFLOC,

CONSIDERING:

(1) That knowledge of the number of atmospherics attributed to a location is significant with regard to accuracy of location and, to some extent, with regard to the number of lightning return strokes occurring in that vicinity,

(2) That advances in technique now make alternative systems possible,

RECOMMENDS:

(1) That a new code table 2836 (n_f - Number of atmospherics observed at the location that follows), as defined in the annex* to this recommendation, be introduced;

(2) That the group $99x_4a_iA_i$ given in FM 82-I be replaced by $9n_fx_4a_iA_i$;

(3) That the symbolic figure groups available for use with FM 82-I be extended to include:

66611 - Indicates that atmospherics are located by means of a network of several arrival-time stations operating on the same individual atmospherics;

66666 - Indicates that atmospherics are located by means of a single-station range-bearing technique;

and that the specification for direction-finding system be simplified to read:

66600 - Indicates that atmospherics are located by means of a network of several direction-finders operating on the same individual atmospherics;

(4) That the code changes recommended above be implemented from 1 January 1978;

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

* See Annex XIII.

Rec. 11 (CBS-Ext.(76)) - AMENDMENTS TO CODES FM 51-V TAF, FM 53-V ARFOR AND FM 54-V ROFOR

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Paragraph 6.2.10 of the ICAO Annex 3/WMO Technical Regulations /C.3.1/,

(2) Volume I of the Manual on Codes,

CONSIDERING that there is a need for the improvement of some regulations in codes FM 51-V, FM 53-V and FM 54-V,

RECOMMENDS that the modified code FM 51-V TAF and amendments to codes 53-V ARFOR and FM 54-V ROFOR given in the annex* to this recommendation be implemented from 1 January 1978;

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

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* See Annex XIV.

Rec. 12 (CBS-Ext.(76)) - REVISION OF THE NOTES ON CODES FM 11-V, FM 14-V AND FM 24-V

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Paragraph 3.2.5.4 of the general summary of the abridged report of Cg-VII,

(2) Recommendation 16 (CBS-VI) - Editorial revision of the notes in Volume I of the Manual on Codes,

RECOMMENDS that the revised text of the notes on codes FM 11-V, FM 14-V and FM 24-V given in the annex* to this recommendation should replace the corresponding text now appearing in Volume I of the Manual on Codes from 1 January 1978;

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

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* See Annex XV.

Rec. 13 (CBS-Ext.(76)) - VOLUME I OF THE MANUAL ON THE GDPS

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Annex I to the abridged final report of CBS-VI,

(2) Paragraph 2.4.14 of the general summary of the report of Cg-VII,

CONSIDERING that there is a need for standardization of practices and procedures concerning the GDPS,

RECOMMENDS:

(1) That Volume I of the Manual on the GDPS, given in the annex* to this recommendation, become Annex IV to the WMO Technical Regulations;

(2) That as Annex IV to the WMO Technical Regulations, Volume I of the Manual on the GDPS should come into force as soon as possible, but not later than 1 July 1978;

REQUESTS the Secretary-General:

(1) To take the necessary steps to publish the Manual on the Global Data-processing System in its final form;

(2) To update this Manual by supplements, as required.

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* Volume I of the Manual on the GDPS is being published separately.

Rec. 14 (CBS-Ext.(76)) - INTERNATIONAL GDPS PLAN TO SUPPORT THE FGGE

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) The existing requirements for the WWW systems laid down in the various FGGE publications,

(2) That these requirements, in some cases, exceed the agreed data requirements specified in Volume I of the Manual on the GDPS,

(3) The report of the third session of the WMO Executive Committee Intergovernmental Panel on the FGGE, general summary, paragraph 3.6.6,

CONSIDERING that successful fulfilment of these requirements will necessitate detailed WWW planning before the FGGE as well as additional efforts during the Experiment,

RECOMMENDS to the Executive Committee the adoption of the International GDPS Plan to Support the FGGE, given in the annex* to this recommendation, as a basic programme;

AUTHORIZES the president of the Commission to approve changes to the International GDPS Plan when necessary;

REQUESTS the Secretary-General to take necessary steps for the plan to be distributed in a convenient form to all Members and Organizations concerned, well in advance of the build-up year of the FGGE.

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* The International GDPS Plan to Support the FGGE is being published separately.

Rec. 15 (CBS-Ext.(76)) - FORMATS FOR INTERNATIONAL EXCHANGE OF LEVEL II DATA SETS

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) The existing requirements for the WWW systems laid down in the various FGGE publications,

(2) The report of the third session of the WMO Executive Committee Inter-governmental Panel on the FGGE, general summary, paragraph 3.6.6,

(3) The report of the Informal Planning Meeting on Formats for the International Data Exchange,

CONSIDERING that there is an urgent need for the establishment of generally accepted formats for the international exchange of Level II data sets during the FGGE,

RECOMMENDS:

(1) That the formats for the international exchange of Level II data sets, given in the annex* to this recommendation, be introduced for international data exchange during the First GARP Global Experiment;

(2) That these formats be included as an attachment to the International GDPS Plan to Support the FGGE;

AUTHORIZES the president of CBS to approve amendments to the formats for international data exchange as necessary;

REQUESTS the Secretary-General to arrange for the publication of the formats as soon as possible, but not later than the start of the build-up year for the FGGE.

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* The formats for the international exchange of Level II data sets are being published separately.

Rec. 16 (CBS-Ext.(76)) - FORMATS FOR INTERNATIONAL EXCHANGE OF LEVEL III DATA SETS DURING THE FGGE

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) The existing requirements for the WWW systems laid down in the various FGGE publications,

(2) The report of the third session of the WMO Executive Committee Inter-governmental Panel on the FGGE, general summary, paragraph 3.6.6,

(3) The report of the Informal Planning Meeting on Formats for the International Data Exchange,

CONSIDERING that there is an urgent need for the establishment of generally accepted formats for the international exchange of Level III data sets during the FGGE,

RECOMMENDS:

(1) That the formats for the international exchange of Level III data sets, given in the annex* to this recommendation, be introduced for international data exchange during the First GARP Global Experiment;

(2) That these formats be included as an attachment to the International GDPS Plan to Support the FGGE;

AUTHORIZES the president of CBS to approve amendments to the formats for international data exchange as necessary;

REQUESTS the Secretary-General to arrange for the publication of the formats as soon as possible, but not later than the start of the build-up year for the FGGE.

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* The formats for the international exchange of Level III data sets during the FGGE are being published separately.

Rec. 17 (CBS-Ext.(76)) - GREENLAND AND ICELAND MINIMUM NETWORK REQUIREMENT

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) The request from Ext.76-RA VI to determine the minimum observation network needed in Greenland and Iceland to meet the requirements of meteorological services in general and aeronautical meteorological services in particular with due regard to the need for the utmost economy in respect of observing stations jointly financed,

(2) That a proposal is before ICAO (Recommendations 3 and 4 of the ICAO Special North Atlantic Panel) for considerable reduction of the Greenland and Iceland jointly financed observation networks, and

CONSIDERING:

(1) The importance of the observations from this area of intense meteorological activity,

(2) That the network density, particularly as regards the Greenland stutions, is already far below the recommended standards,

(3) That further reductions would seriously affect the efficiency of forecasting services for general meteorological purposes as well as for aeronautical purposes throughout the northern hemisphere,

RECOMMENDS:

(1) That the existing number of upper-air and surface stations in Greenland and Iceland be maintained as a minimum network required for either or both of the two forecasting purposes specified in the request presented by RA VI, at least until the results of the FGGE have been evaluated (not earlier than 1982) on, inter alia, the density and other aspects of observation networks;

(2) That, in the meantime, consideration be given to the possibility of reducing operational costs through the introduction of semi-automatic and/or automatic observation equipment or facilities at stations where this may be practicable.

Rec. 18 (CBS-Ext.(76)) - IMPLEMENTATION OF THE WORLD WEATHER WATCH

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Technical Regulation /A.1.1/3.1.4,

(2) Resolution 3 (Cg-VII) - World Weather Watch,

(3) The shortcomings identified by the Secretary-General during the various surveys of the operation of the WWW, the results of which are given in the Eighth Status Report on Implementation, Annex I, Tables (a) and (b), and the action taken by the Secretary-General with the Members concerned,

(4) The serious shortcomings in:

Region I (several parts in the region)

Region II (the south-eastern and south-western parts)

Region III (the northern and central parts)

Region IV (the southern part)

Region V (the southern part)

Region VI (the south-eastern part)

due to parts of the GOS and GTS not yet being fully implemented,

CONSIDERING the difficulties certain Members will continue to have in establishing the non-implemented observing stations and telecommunication facilities according to the WWW plan, in obtaining skilled operators and acquiring the necessary equipment and appropriate spare parts and necessary consumables,

RECOMMENDS that the Executive Committee request the Secretary-General to approach the governments of Members at the highest possible level in order to bring the present deficiencies again to their attention and to ask for urgent remedial action before the commencement of FGGE;

REQUESTS the Secretary-General to approach the president of regional associations concerned with a view to their taking all the necessary steps to overcome the deficiencies in their Regions as soon as possible.

Rec. 19 (CBS-Ext.(76)) - AMENDMENTS TO THE MANUAL ON THE GLOBAL TELECOMMUNICATION SYSTEM, VOLUME I - GLOBAL ASPECTS, PART I - ORGANIZATION OF THE GLOBAL TELECOMMUNICATION SYSTEM

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Resolution 3 (Cg-VII) - World Weather Watch,

(2) The World Weather Watch plan for 1976-1979 (WMO-No. 418),

RECOMMENDS:

(1) 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;

(2) The earliest possible implementation of the amendments given in the annex* to this recommendation, but this not later than 1 July 1977;

REQUESTS the Secretary-General to make the appropriate changes, as given in the annex* to this recommendation, to 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 XVI.

Rec. 20 (CBS-Ext.(76)) - EXCHANGE OF BATHY/TESAC DATA OVER THE GLOBAL TELECOMMUNICATION SYSTEM

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) The report of the Preparatory Meeting of Governmental Experts on the BATHY/TESAC Operational Programme (Geneva, March 1976),

(2) The IGOSS General Plan and Implementation Programme 1977-1982 as approved by Resolution 5 (EC-XVIII),

(3) IOC/WMO Guide to Operational Procedures for the Collection and Exchange of Oceanographic Data (BATHY and TESAC),

(4) The principle prescribed in the Manual on the GTS that BATHY/TESAC data shall be exchanged on the MTC and its branches on a global basis,

CONSIDERING the need for the complete and rapid distribution of BATHY/TESAC data to centres requiring them,

RECOMMENDS that BATHY/TESAC data be disseminated expeditiously on the GTS in accordance with the requirements stated by WMO and IOC Member States;

INVITES regional associations to study, as necessary, the arrangements for the distribution of BATHY/TESAC data within the Regions;

REQUESTS the Secretary-General to develop in more detail the routeing arrangements for BATHY/TESAC data on the MTC, and the GTS in general, with a view to ensuring the availability of these data at centres requiring them, and for this purpose to carry out periodical monitoring of the flow of these reports.

Rec. 21 (CBS-Ext.(76)) - AMENDMENTS TO THE MANUAL ON THE GLOBAL TELECOMMUNICATION SYSTEM, VOLUME I - GLOBAL ASPECTS, PART I - ORGANIZATION OF THE GLOBAL TELECOMMUNICATION SYSTEM

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) The abridged report of Sixth Congress, general summary, paragraph 2.6.2, concerning the gradual transfer of the regulatory material appearing in various volumes of WMO Publication No. 9 and qualifying as Technical Regulations into appropriate manuals,

(2) The Manual on the GTS, Volume I - Global Aspects, Part I, paragraph 2.7, entitled "Responsibility for reception of meteorological reports from stations at sea",

CONSIDERING the need to make the Manual on the GTS complete and self-contained by including a text describing arrangements for the collection of ships' weather reports and oceanographic reports (BATHY/TESAC),

RECOMMENDS:

(1) That the text given in Part A of the annex* to this recommendation be included in the Manual on the Global Telecommunication System as Attachment I-4 to Part I of Volume I;

(2) That the resulting editorial amendments given in Part B of the annex* to this recommendation be introduced in paragraph 2.7, Part I, Volume I of the Manual on the Global Telecommunication System;

(3) That the amendments given in the annex* to this recommendation be implemented as soon as possible but not later than 1 July 1977.

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* See Annex XVII.

Rec. 22 (CSB-Ext.(76)) - 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 that there is a need to modify the specifications of CL_3 in the starting line as well as the data designators and the geographical designators in the abbreviated heading, taking into account new code forms which will be introduced in the near future,

RECOMMENDS:

(1) The approval of the amendments to the Manual on the Global Telecommunication System - Part II, Meteorological Telecommunication Procedures for the Global Telecommunication System, given in the annex* to this recommendation;

(2) That the amendments given in the annex* to this recommendation be implemented as soon as possible but not later than 1 July 1977;

REQUESTS the Secretary-General to include the amendments as given in the annex* to this recommendation in the Manual on the Global Telecommunication System - Part II, Meteorological Telecommunication Procedures for the Global Telecommunication System.

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* See Annex XVIII.

Rec. 23 (CBS - Ext.(76))- 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 3 (Cg-VII) - World Weather Watch,

(2) Manual on the Global Telecommunication System, Volume I - Global Aspects,

CONSIDERING the need to review the technical characteristics and specifications for the Global Telecommunication System to meet the requirements of Members and the World Weather Watch,

RECOMMENDS:

(1) That the Manual on the Global Telecommunication System, Volume I - Global Aspects, Part III - Technical characteristics and specifications for the Global Telecommunication System, be amended, as given in the annex* to this recommendation;

(2) That the amendments given in the annex* to this recommendation be implemented as soon as possible but not later than 1 July 1977;

REQUESTS the Secretary-General of WMO to include the amendments given in the annex* to this recommendation in Volume I, Part III, of the Manual.

* See Annex XIX.

Rec. 24 (CBS-Ext.(76)) - GUIDE ON THE AUTOMATION OF METEOROLOGICAL TELECOMMUNICATION CENTRES

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Resolution 3 (Cg-VII) - World Weather Watch,

(2) The Manual on the Global Telecommunication System,

CONSIDERING that the availability of guidance material for the automation of meteorological telecommunication centres will be of great assistance to those who are considering automation of their centres,

RECOMMENDS that a Guide on the Automation of Meteorological Telecommunication Centres be published;

AUTHORIZES the president of CBS, in consultation with the chairman of the Working Group on the GTS, to approve the text of the Guide;

REQUESTS the Secretary-General to publish the Guide in at least one official language of the Organization not later than April 1977 and in other official languages as required.

Rec. 25 (CBS-Ext.(76)) - PLAN FOR MONITORING THE OPERATION OF THE WWW

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Resolution 4 (Cg-VII) - Monitoring of the operation of the WWW,

(2) Resolution 4 (EC-XXVII) - Monitoring of the operation of the WWW,

(3) Paragraph 3.1.6 of the general summary of the abridged report of EC-XXVIII,

CONSIDERING:

(1) That a plan for monitoring the operation of the WWW should form part of the WWW programme in order to achieve full implementation and effective operation of the WWW,

(2) The urgent need for the introduction of procedures for monitoring the operation of the WWW prior to the beginning of the FGGE,

(3) That the success of the FGGE is dependent on an effective WWW,

RECOMMENDS:

(1) That the text of the plan for monitoring the operation of the WWW given in the annex* to this recommendation be published as an attachment to the Manual on the GTS and the Manual on the GDPS and a chapter of the Guide on the GOS;

(2) That Members do their utmost to implement the provisions made in the plan given in this annex* as part of their contribution to the WWW;

(3) That Members introduce as the highest priority regular monitoring of observational data, as indicated in paragraph 15(1) to (5) of the plan, as soon as possible and, in any case, not later than June 1978;

REQUESTS the Secretary-General to take appropriate action for the implementation of the plan for monitoring the operation of the WWW as a matter of urgency;

AUTHORIZES the president of the Commission to approve amendments to the plan and add details to it as necessary, within the framework of the plan.

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* See Annex XX.

Rec. 26 (CBS-Ext.(76)) - AMENDMENTS TO THE TECHNICAL REGULATIONS

THE COMMISSION FOR BASIC SYSTEMS,

CONSIDERING:

(1) The need, expressed by Seventh Congress, to reflect in the Technical Regulations the new responsibilities of WMCs, RMCs and NMCs,

(2) Other requirements for the amendment of the Technical Regulations referred to the Commission by Seventh Congress,

(3) Proposals for urgent amendments made to the Commission by others,

RECOMMENDS to the Executive Committee that the amendments to the Technical Regulations contained in the annex* to this recommendation be adopted.

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* See Annex XXI.

ANNEX I

Annex to paragraph 6.5 of the general summary

Part A

PREFERENCE LIST OF WMC OUTPUT PRODUCTS TO WHICH HIGHEST PRIORITY SHOULD BE GIVEN FOR DISSEMINATION IN GRID CODE FORM

I. Analyses

Surface pressure (or 1000 mb height) 850 mb height 500 mb height 300 mb height 100 mb* height	0000, 1200 GMT

Area coverage: hemispheric

II. Forecasts

Surface pressure (or 1000 mb geopotential)	H + 12 (0000, 1200 GMT), H + 24 (0000, 1200 GMT), H + 36 (0000, 1200 GMT), H + 48 (0000, 1200 GMT), H + 72 (once daily), H + 96 (once daily), H + 120 (once daily)
850 mb geopotential	H + 12 (0000, 1200 GMT), H + 24 (0000, 1200 GMT), H + 36 (0000, 1200 GMT), H + 48 (0000, 1200 GMT)
500 mb geopotential	H + 12 (0000, 1200 GMT), H + 24 (0000, 1200 GMT), H + 36 (0000, 1200 GMT), H + 48 (0000, 1200 GMT), H + 72 (once daily), H + 96 (once daily), H + 120 (once daily)
300 mb geopotential	H + 12 (0000, 1200 GMT), H + 24 (0000, 1200 GMT), H + 36 (0000, 1200 GMT), H + 48 (0000, 1200 GMT)
100 mb* geopotential	H + 12 (0000, 1200 GMT), H + 24 (0000, 1200 GMT), H + 36 (0000, 1200 GMT), H + 48 (0000, 1200 GMT)

Area coverage: hemispheric

* From those WMCs which are prepared to transmit it.

NOTE: The order given in this list does not indicate the priority for dissemination.

*

* *

Part B

MINIMUM PRODUCT LIST FOR TRANSMISSION IN BOTH ALPHANUMERICAL AND PICTORIAL FORM

I. Analyses

Surface 500 mb One of 300, 250 or 200 mb Nephanalyses as available	Based on 0000 and 1200 GMT data

II. Forecasts

24 hr 500 mb 24 hr surface 48 hr 500 mb 48 hr surface	based on 0000 and 1200 GMT data
72 hr 500 mb 72 hr surface	based on 0000 or 1200 GMT data

One of 300, 250 or 200 mb (24-hr) based on 0000 and 1200 GMT data

A N N E X II

Annex to paragraph 7.4 of the general summary

AMENDMENTS TO PLOTTING MODEL IN VOLUME II OF THE GUIDE ON THE GDPS

Chapter I

Item 1.2.2.1 - The plotting model

Page I.5:

TT(tT) should read TT(. t_T).

Item 1.2.2.2 - Rules for plotting the individual elements - Monochromatic system

Page I.7:

Amend the text to read as follows:

"A calm should be indicated by a circle drawn around the station circle:

A missing wind speed should be indicated by placing an "x" at the end of the wind shaft in lieu of the wind barbs. Wind direction is indicated in the usual manner, e.g. x——o.
When the wind direction is missing, no wind data should be plotted."

Delete the following text:

"Missing wind data

Missing wind data are indicated by the following method:

Missing wind speed x——o

Missing wind direction 

Missing wind direction and speed 

Missing wind direction is indicated by the letter D followed by the reported wind speed in figures.

Missing wind direction and speed are indicated by the letters DF.

These indications are inserted directly over the station circle, under the position of the C_N cloud, and within a frame, in order to avoid confusion with PPP."

Page I.8:

Tenth line: replace "sea station" by "coastal station or ship".

Page I.9:

Replace TT(tT) by TT(. t_T).

Item 1.2.2.3 - Rules for plotting the individual elements - Polychromatic system

Page I.13

Delete TT(t_T) and VV under Red.

Item 1.5.2 - Rules for plotting the individual elements

Page I.26:

A_i: Replace the table for A_i by the following table:

	0	1	2	3	4	5	6	7	8	9
Ai										

A N N E X III

Annex to paragraph 8.1.1.11 of the general summary

SUMMARY OF IMPLEMENTATION AND FUTURE PLANS OF THE MAIN TRUNK CIRCUIT AND ITS BRANCHES

(September 1976)

Segment	Present operational status	Future plans (Year of implementation)
Moscow-Prague	Cable, 1 200 bit/s data/FAX channel with hardware error detection and correction procedure	-
Prague-Offenbach	Cable, 1 200 bit/s data/FAX channel with hardware error detection and correction procedure	-
Offenbach-Paris	Cable, 2 400 bit/s data/FAX channel with software error detection and correction procedure	-
Paris-Bracknell	Cable, 2 400 bit/s data/FAX channel with software error detection and correction procedure	-
Bracknell-Washington	Satellite, 2 400 bit/s data/FAX channel with software error detection and correction procedure	-
Washington-Tokyo	Cable, 2 400 bit/s data channel with software error detection and correction procedure	Cable, 2 400 bit/s data channel (including CDF) with software error detection and correction procedure (1977)
Tokyo-Melbourne	Cable/satellite, one 75-baud channel	2 400 or 4 800 bit/s data FAX channel with software error detection and correction procedure (not before 1979)

Segment	Present operational status	Future plans (Year of implementation)
Tokyo-New Delhi	Satellite, one 50-baud channel	200-baud channel (April 1977) 2 400 bit/s data/FAX channel with software error detection and correction procedures (end 1977)
New Delhi-Cairo	Satellite/cable, one 50-baud channel	HF/ISB, 2 x 50-baud ARQ channels and one FAX channel (1977) HF/ISB, 1 200 bit/s data channel with special error detection and correction procedure and one FAX channel (1977 or later)
New Delhi-Moscow	HF/ISB, 4 x 50-baud ARQ channels and one FAX channel	HF/ISB, 1 200 bit/s data channel with special error detection and correction procedure and one FAX channel (end 1976)
Cairo-Moscow	HF, one 50-baud ARQ channel	HF/ISB, 1 200 bit/s data channel with special error detection and correction procedure and one FAX channel (1977 or later)
Nairobi-Cairo	HF/ISB, 2 x 50-baud channels and one FAX channel	HF/ISB, 2 x 50-baud ARQ channels and one FAX channel (later)
Nairobi-Offenbach	Satellite, 2 x 50-baud data channels and FAX channel	2 x 75-baud data channels and one FAX channel (to be considered)
Brasilia-Washington	HF/ISB, one 50-baud channel	HF/ISB, 1 x 75-baud channel (1976) and one satellite data/FAX channel (not before 1978)
Peking-Tokyo	-	5 x 75-baud channels (1976). To be upgraded later to medium-/high-speed data transmission

ANNEX IV

Annex to Resolution 1 (CBS-(Ext.76))

RESOLUTIONS AND RECOMMENDATIONS ADOPTED PRIOR TO THE EXTRAORDINARY SESSION (1976) OF CBS AND MAINTAINED IN FORCE

Res. 1 (CBS-VI) - 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 (CSM-V) - Advisory Working Group of the Commission for Synoptic Meteorology,

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 re-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 co-ordination of the activities of the four major working groups in CBS (GOS, GDPS, GTS and Codes);

(d) 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 GOS, GDPS, GTS and Codes

K. A. Khalil (Egypt)

P. S. Pant (India).

Res. 2 (CBS-VI) - WORKING GROUP ON THE GLOBAL OBSERVING SYSTEM

THE COMMISSION FOR BASIC SYSTEMS,

NOTING Resolution 3 (CSM-V) - Working Group on the Global Observing System,

CONSIDERING that further studies and planning should be undertaken to meet, to the maximum extent possible, the observational requirements of WWW, GARP, AFCS, IGOSS and other international programmes such as the Earthwatch,

DECIDES:

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

(a) To follow closely the progress of the implementation of the GOS and, as necessary, to formulate recommendations with a view to improving the performance of the GOS, including ways and means for its monitoring;

(b) To develop a Guide on GOS;

(c) To make studies and recommendations on the following items:

(i) Specifications of observational data requirements for the various networks and scales of meteorological phenomena;

(ii) Design of the future Global Observing System in close relation to the development of four-dimensional data-assimilation techniques;

(iii) More effective utilization of aircraft reports in a mixed observing system;

(iv) Mixture of various observing techniques in the light of new requirements and evaluation of data accuracies and compatibilities;

(v) New observing technology and methods for inclusion in the GOS;

(vi) Problems relating to the initial processing of level I data;

(vii) Relevant aspects of quality-control procedures applied at observing stations;

(d) To consider and, as necessary, make recommendations on observational data requirements for the GOS as put forward by international programmes such as GARP, AFCS, IGOSS and Earth-watch;

(e) To take action on matters referred to the working group by the president;

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

(a) An expert designated by each regional association;

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

(c) 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 group;

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

(3) To select, in accordance with Regulation 31 of the General Regulations, Dr. R. Czelnai (Hungary) as chairman of the working group.

Res. 3 (CBS-VI) - WORKING GROUP ON THE GLOBAL DATA-PROCESSING SYSTEM

THE COMMISSION FOR BASIC SYSTEMS,

NOTING Resolution 5 (CSM-V) - Working Group on the Global Data-processing System,

CONSIDERING that there is a need for continuation of the Working Group on the Global Data-processing System,

DECIDES:

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

(a) In order to achieve the most rational and economical GDPS possible, to formulate recommendations on, and to keep under continuous study, the following items, taking into account 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;

(iii) Organization of the GDPS to determine whether changes are desirable and possible;

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

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

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

(vii) Consideration of matters relating to real-time and non-real-time quality control, storage and retrieval of data and products within the GDPS;

(viii) 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 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 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;

(c) 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;

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

(e) To develop a Manual on the GDPS;

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

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

(h) To act upon matters referred to the working group by the president;

(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. E. B. Fawcett (U.S.A.) as chairman of the working group.

Res. 4 (CBS-VI) - WORKING GROUP ON THE GLOBAL TELECOMMUNICATION SYSTEM

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Resolution 6 (CSM-V) - 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 1976-1979, 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 telecommunication system,

DECIDES:

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

(a) To study and to formulate recommendations 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 communication space techniques including meteorological satellites, and to formulate appropriate recommendations;

(c) To formulate for meteorological transmissions, proposals on international standardization of operating practices, procedures, equipment and related questions, including format and schedules;

(d) To follow closely the progress of 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 Civil Aviation Organization, the Inter-Governmental Maritime Consultative Organization and other international organizations concerned, on matters pertaining to meteorological telecommunications;

(h) 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;

(i) To undertake any appropriate task in accordance with the directives given by the Commission for Basic Systems, or by its president;

(j) To advise the president of the Commission for Basic Systems on meteorological telecommunication matters as necessary;

(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. I. A. Ravdin (U.S.S.R.) as chairman of the working group.

Res. 5 (CBS-VI) - WORKING GROUP ON CODES

THE COMMISSION FOR BASIC SYSTEMS,

NOTING Resolution 2 (CSM-V) - Working Group on Codes,

CONSIDERING:

(1) That there is a continuing need for the review of international codes,

(2) That the working programme of the CBS for the coming four years will very probably imply the development of new codes,

DECIDES:

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

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

(f) To initiate a study of a new generation of codes based on the principles of information theory and suited to the automation of data acquisition, transmission and processing;

(g) To co-ordinate its work on the development of new codes and improvement 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. 6 (CBS-VI) - RAPPORTEUR ON THE STATE OF THE SKY IN THE TROPICS

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Paragraph 4.2.1 of the general summary of the abridged final report of CSM-V,

(2) The work performed by the Rapporteur on Reporting the State of the Sky in the Tropics in refining and testing a code and sets of cloud photographs for use in the tropical part of Region IV;

CONSIDERING that clouds illustrated in the International Cloud Atlas do not include some states of the sky peculiar to the tropics;

DECIDES:

(1) To appoint a Rapporteur on the State of the Sky in the Tropics with the following terms of reference:

Through co-operation with experts in other regions,

(a) To collect annotated photographs of clouds and state of sky which are widely representative of tropical regions;

(b) To select the most representative photographs of tropical clouds, in particular those not described by existing codes for eventual inclusion in the International Cloud Atlas;

(c) To propose, if possible, a classification of the morphology of the cloud systems observed in the tropical sky;

(d) To prepare, if possible, sets of photographs taken at approximately the same time from satellites and aircraft above the clouds and from the surface;

(e) To investigate to what extent cloud codes adequately describe the state of the sky in the tropics;

(f) To submit a report of his work to the president of CBS no later than 1 July 1977;

(2) To invite Mr. R. L. Holle (U.S.A.) to serve as Rapporteur on the State of the Sky in the Tropics.

* * *

Rec. 3 (CBS-VI) - CONVERSION OF PRODUCTS IN ALPHA-NUMERIC (GRID CODE) FORM INTO PICTORIAL FORM

THE COMMISSION FOR BASIC SYSTEMS,

NOTING:

(1) Paragraph 117 of the WWW plan for 1972-1975,

(2) Recommendation 46 (73-CBS) - Code form for the transmission of processed data for grid points for digital form,

(3) Paragraph 3.1.6.1 of the general summary of the abridged report of EC-XXIV,

CONSIDERING:

(1) The need for reducing the time of transmission of processed information on telecommunication circuits, and that this need may be met by the use of the GRID 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 therefore necessary to have facilities, at appropriate centres, for the conversion of processed data in alpha-numeric form into pictorial form,

(4) That such conversion facilities are in general, most suitably located at World Meteorological Centres and Regional Meteorological Centres,

RECOMMENDS:

(1) That Members operating WMCs/RMCs be invited to equip their respective centres with appropriate facilities for the conversion of processed data in alpha-numeric (GRID code) form into pictorial form for regional distribution, as soon as possible;

(2) That until the conversion facilities become available at all the centres concerned, facsimile and other types of transmissions should be continued as appropriate to meet the requirements of Members.

Rec. 6 (CBS-VI) - AIRCRAFT WEATHER REPORTS

THE COMMISSION FOR BASIC SYSTEMS,

NOTING Technical Regulations [12.1.] 2.3 and [12.2.] 2.3,

CONSIDERING the increased need for aircraft weather reports for analyses and prognoses,

RECOMMENDS:

(1) That efforts should be continued for making available an increased number of aircraft weather reports to processing centres;

(2) That at all stages of distribution, the elimination of aircraft reports should be kept to a minimum;

(3) That whenever practicable, WMCs and RMCs should apply quality control procedures prior to transmission of aircraft weather reports on the GTS;

REQUESTS the Secretary-General to invite ICAO and CAeM to take action on RECOMMENDS (1) and (2) as appropriate.

Rec. 20 (CBS-VI) - REPORTING OF PARTS B AND D OF FM 36.E - TEMP SHIP BY VOLUNTARY OBSERVING SHIPS

THE COMMISSION FOR BASIC SYSTEMS,

NOTING Recommendation 12 (CSM-V) - Reporting of Parts B and D of FM 36.D - TEMP SHIP by voluntary observing ships,

CONSIDERING:

(1) That Parts A and C are most readily used by meteorological centres for processing,

(2) That information contained in Parts A and C allows a check of the data,

RECOMMENDS that the voluntary observing ships making upper-air observations may exclude Parts B and D of the code form FM 36.E from the transmission of upper-air messages to coastal radio stations when operational difficulties are encountered.

ANNEX V

Annex to Recommendation 2 (CBS-Ext.(76))

CODE FOR REPORTING SATELLITE UPPER-AIR SOUNDINGS OF PRESSURE, TEMPERATURE AND HUMIDITY (SATEM)

FM 86 - VI Ext. SATEM - Report of satellite remote upper-air soundings of pressure, temperature and humidity

C O D E F O R M :

Part A

Section 1	$M_iM_iM_jM_j$	YYGG/	$I_1I_2I_2I_3I_4$
Section 2	222	$QL_aL_aL_oL_o$	$(N_cN_cP_cP_cP_c$
Section 3	(333	$P_AP_An_Ln_Lq$	$P_1P_1t_{L_1}t_{L_1}t_{L_1}$
			$P_2P_2t_{L_2}t_{L_2}t_{L_2}$
			. . . . .
			$P_nP_nt_{L_n}t_{L_n}t_{L_n})$
Section 4	(444	$P_AP_An_Ln_Lq$	$P_1P_1w_{L_1}w_{L_1}w_{L_1}$
			$P_2P_2w_{L_2}w_{L_2}w_{L_2}$
			. . . . .
			$P_nP_nw_{L_n}w_{L_n}w_{L_n})$
Section 5	(555	$s_nT_oT_oT_tT_t$	$(P_tP_tP_tI_5A_t))$

Part B

Section 1	$M_iM_iM_jM_j$	YYGG/	$I_1I_2I_2I_3I_4$
Section 2	222	$QL_aL_aL_oL_o$	$(N_cN_cP_cP_cP_c$
Section 5	(555	$s_nT_oT_oT_tT_t$	$(P_tP_tP_tI_5A_t))$

Section 6	(666	$P_1P_1P_nP_nU_p$	$n_UA_TTTT_a$
			$n_UA_TTTT_a$
		$P_1P_1P_nP_nU_p$	$n_UA_TTTT_a$
			. . . . .)
Section 7	(777	$P_1P_1P_nP_nU_p$	n_UA_wwww
			n_UA_wwww
			. . . . .)

Part C

Section 1	$M_iM_iM_jM_j$	YYGG/	$I_1I_2I_2I_3I_4$
Section 2	222	$QL_aL_aL_oL_o$	
Section 3	333	$P_AP_An_Ln_Lq$	$P_1P_1t_{L_1}t_{L_1}t_{L_1}$
			$P_2P_2t_{L_2}t_{L_2}t_{L_2}$
			. . . . .
			$P_nP_nt_{L_n}t_{L_n}t_{L_n}$

Part D

Section 1	$M_iM_iM_jM_j$	YYGG/	$I_1I_2I_2I_3I_4$
Section 2	222	$QL_aL_aL_oL_o$	
Section 6	666	$P_1P_1P_nP_nU_p$	$n_UA_TTTT_a$
			$n_UA_TTTT_a$
			. . . . .

N O T E S :

(1) SATEM is the name of the code for reporting satellite remote upper-air soundings of pressure, temperature and humidity.

(2) A SATEM report is identified by M_iM_i = VV.

(3) The SATEM code form consists of four parts as follows:

Part	Identifier letters (M_jM_j)	Isobaric surfaces
A	AA	up to and including 10 mb surface
B	BB	
C	CC	above the 10 mb surface
D	DD	

Each part can be transmitted separately.

(4) The code form is divided into a number of sections as follows:

Section number	Indicator figure or symbolic figure group	Contents
1	-	Identification, input data and processing
2	222	Position data and cloud data
3	333	Data for thickness between given reference level and identified standard isobaric surfaces
4	444	Data for precipitable water content between given reference level and identified standard isobaric surfaces
5	555	Data for tropopause and surface temperature
6	666	Data for (mean) temperature between non-standard pressure levels
7	777	Data for precipitable water between non-standard pressure levels

REGULATIONS:

86.1

General

86.1.1

The code name SATEM shall not be included in the report.

86.1.2

Parts A and B shall contain data, in so far as available, only for levels up to and including the 10 mb level. A report for Part A shall consist of Sections 1 and 2 plus one or more Sections 3, 4 and 5. A report for Part B shall consist of Sections 1 and 2 plus one or more Sections 5, 6 and 7.

86.1.3
Parts C and D shall contain data, in so far as available, only for levels above the 10 mb level, up to and including the 0.1 mb level.

86.2

Parts A and C
86.2.1

Section 1

86.2.1.1
The identification of the satellite shall be reported by means of I_1 and I_2I_2.
86.2.1.2
The type of sensor used shall be indicated by means of I_3. The type of processing performed shall be indicated by means of I_4. The code tables for I_3 and I_4 will vary with each type of satellite.
86.2.1.3
Satellite operators shall therefore inform the WMO Secretariat, as early as possible before launch, of the proposed tables for I_3 and I_4 for each satellite to be launched. The Secretariat shall then inform all countries by suitable advance information of the specifications of the tables for I_3 and I_4, and shall include this information in WMO Publication No. 411.

86.2.2

Section 2

86.2.2.1
The geographical location of the sounding shall be indicated by means of the group $QL_aL_aL_oL_o$.
86.2.2.2
When included in Section 2 of Part A, the group $N_cN_cP_cP_cP_c$ shall contain data on the cloud cover in the area of the sounding. To describe cloud layers the group shall be repeated as required.
86.2.2.3
The group $N_cN_cP_cP_cP_c$ shall be included in the report whenever the information on cloud cover (including nil when appropriate) is available and reliable.

86.2.3

Section 3

Section 3 shall contain the thickness between a standard reference level given by the pressure indicator P_AP_A and the standard isobaric surfaces indicated by $P_1P_1 \ldots P_nP_n$.

86.2.4

Section 4

Section 4 shall contain the amount of precipitable water in a layer between a standard reference level indicated by P_AP_A and the standard isobaric surfaces indicated by $P_1P_1 \ldots P_nP_n$.

86.3

Parts B and D

86.3.1

Section 2

Regulation 86.2.2.2 shall apply, mutatis mutandis, to Part B.

86.3.2

Section 6

Section 6 shall contain mean temperature data for one or more specified layers indicated by pressure indicators P_1P_1 and P_nP_n. Each of these layers shall be divided from P_1P_1 into adjacent sub-layers of variable thicknesses (n_u multiplied by U_p mb), as required by the vertical locations of temperature measurement.

N O T E: A redundancy check can be performed on each layer P_1P_1 and P_nP_n of Section 6. The sum of code figures n_u for the layer, multiplied by the unit layer (indicated by U_p), must be equal to the pressure difference between P_1P_1 and P_nP_n.

Specifications of symbolic letters

All of the symbols in the code form have the meanings and specifications given in the code form definitions in Volume I of the Manual on Codes except for the following:

A_T Index of accuracy of layer mean air temperature data (supplied by operator I_1).

A_t Index of accuracy of tropopause data (supplied by operator I_1).

A_w Index of accuracy of precipitable water in the layer (supplied by operator I_1).

I_1 Indicator figure for name of country, or international agency which operates the satellite (code table 1701).

I_2I_2 Indicator figure for satellite name (supplied by operator I_1).

(1) Even decades for geostationary satellites.

(2) Odd decades for polar-orbiting satellites.

I_3 Indicator for instrument data used in processing (supplied by operator I_1).

I_4 Indicator figure for data-processing technique used (supplied by operator I_1).

I_5 Indicator for data-processing techniques used to identify tropopause level (supplied by operator I_1).

N_cN_c Percentage of cloud cover, as determined by the sounding instruments. Clear sky shall be coded 00, total cloud cover 99.

n_Ln_L Number of layers for which the thickness or precipitable water is reported.

n_u Number of unit thicknesses in sub-layer.

P_AP_A Pressure at standard reference levels in tens of millibars up to and at the 20 mb surface (1000 mb = 00) and in tenths of millibars at the 10 mb surface and above (10 mb = 00).

$P_cP_cP_c$ Pressure in whole millibars, at the average cloud top, of the cloud cover as determined by the sounding instruments.

P_1P_1 ... P_nP_n Pressures at specified isobaric surfaces in tens of millibars in Parts A and B of SATEM (1000 mb = 00, 10 mb = 01), and in tenths of millibars in Parts C and D of SATEM.

q Relative confidence figure in tens of per cent as an overall quality measure of the thickness values. High figures mean high relative confidence.

T_oT_o Temperature of the surface (land, water, ice, etc.).

$t_{L_1}t_{L_1}t_{L_1}$ ... $t_{L_n}t_{L_n}t_{L_n}$ Thicknesses in geopotential decametres of layers between P_AP_A and respectively P_1P_1 ... P_nP_n (thousands figure omitted).

U_p Unit thickness of sub-layers in millibars (code table 4242).

www Amount in millimetres of precipitable water in a layer.

$w_{L_1}w_{L_1}w_{L_1}$ ... $w_{L_n}w_{L_n}w_{L_n}$ Amount in millimetres of precipitable water in a layer between P_AP_A and respectively P_1P_1 ... P_nP_n.

Code table 1701

I_1 - Indicator figure for name of country or international agency which operates the satellite

Code figure

0	European Community
1	Japan
2	U.S.A.
3	U.S.S.R.
4	Reserved
5	Reserved

6 7 8 9	Reserved

Code table 4242

U_p Unit of thickness of sub-layers in millibars

Code figure	
0	Not used
1	0.1 mb
2	1.0 mb
3	2.0 mb
4	5 mb
5	10 mb
6	20 mb
7	30 mb
8	50 mb
9	100 mb

A N N E X VI

Annex to Recommendation 3 (CBS-Ext.(76))

CODE FOR REPORTING SATELLITE
CLEAR RADIANCE OBSERVATIONS (SARAD)

FM 87-VI Ext. SARAD - Report of satellite clear radiance observations

C O D E F O R M:

SECTION 1	$M_iM_iM_jM_j$	YYGG/	$I_1I_2I_2I_3I_4$			
SECTION 2	222	$QL_aL_aL_oL_o$	$(N_cN_cP_cP_cP_c)$			$//A_2A_2A_2$
SECTION 3	$6c_1c_1c_nc_n$	$1uR_1R_1R_1$	$2uR_2R_2R_2$	.....	.....	$nuR_nR_nR_n$

N O T E S:

(1) SARAD is the name of the code for reporting satellite clear radiance.

(2) A SARAD report is identified by M_iM_i = WW.

(3) The code form is divided into a number of sections as follows:

Section number	Indicator figures or symbolic figure groups	Contents
1	-	Identification, date and time
2	222	Position, optional cloud information and zenith angle
3	6	Clear radiance data

R E G U L A T I O N S

87.1

General

The code name SARAD shall not be included in the report.

87.2

Section 1

Regulation 86.2.1 shall apply.

87.3

Section 2

Regulations under 86.2.2 shall apply.

87.4

Section 3

87.4.1

Section 3 shall contain clear radiance data corresponding to the sounding identified by means of Section 1 for filter channel numbers arranged in the order of decreasing spectral wave length.

87.4.2

When clear radiance values are not available for filter channel numbers smaller than a given filter channel number, the clear radiance values relative to the filter channels for which no data are available shall not be included in the report. The lowest filter channel number for which data are included shall in all cases be indicated by means of c_1c_1 in group $6c_1c_1c_nc_n$.

87.4.3

When clear radiance values are not available for filter channel numbers greater than a given filter channel number, the clear radiance values relative to the filter channels for which no data are available shall not be included in the report. The highest filter channel number for which data are included shall in all cases be indicated by means of c_nc_n in group $6c_1c_1c_nc_n$.

87.4.4

When use is made of Regulations 87.4.2 and 87.4.3 to report abbreviated soundings, data for all filter channel numbers between c_1c_1 and c_nc_n shall be included in the report.

87.4.5

If the number of filter channels in operation exceeds a multiple of 10, the serial indicator figure preceding the clear radiance values in the report shall be reset to 1, 2, etc.

SPECIFICATION OF SYMBOLIC LETTERS

$A_2A_2A_2$	Zenith angle in tenths of a degree.
c_1c_1 ... c_nc_n	Number of filter channel which corresponds to the data included in the first (to $R_1R_1R_1$) and in the last (to $R_nR_nR_n$) positions. (1) Filter channel numbers range from 01 to a value determined by the instrumental characteristics.
I_1 I_2I_2 I_3 I_4 N_cN_c $P_cP_cP_c$	See SATEM code (FM 86-VI Ext.).
$R_1R_1R_1$ $R_2R_2R_2$ ... $R_nR_nR_n$	Radiance values, expressed in ergs with a scale factor as given by u.
u	Scale factor indicator. (Code table 4200)

A N N E X VII

Annex to Recommendation 4 (CBS-Ext.(76))

CODE FOR REPORTING SATELLITE OBSERVATIONS OF WIND, SURFACE TEMPERATURE, CLOUDS AND RADIATION (SATOB)

FM 88-VI Ext. SATOB - Report of satellite observation of wind, surface temperature, cloud, humidity and radiation

C O D E F O R M:

SECTION 1	$M_iM_iM_jM_j$	YYGGg	$I_1I_2I_2$//					
SECTION 2	(222	$B_1B_2B_3nn$	$U_{La}U_{Lo}U_{La}U_{Lo}$/	$P_cP_cT_cT_cT_a$	ddfff	$P_cP_cT_cT_cT_a$	ddfff	
		.....	.....	.....	.....	.....	.....	
		.....	.....	.....	.....	.....	.....	
			.....	.....	.....	.....	.....)	
SECTION 3	(333	$B_1B_2B_3nn$	$U_{La}U_{Lo}P_eP_e$/	ddfff				
		.....	.....	.....				
		.....	.....	.....)				
SECTION 4	(444	$B_1B_2B_3nn$	$U_{La}U_{Lo}T_sT_sT_a$					
		.....	.....					
		.....	.....)					
SECTION 5	(555	$B_1B_2B_3nn$	$U_{La}U_{Lo}P_dP_d$/	$N_cN_cT_cT_cT_a$				
		.....	.....	.....				
		.....	.....	.....)				
SECTION 6	(666	$B_1B_2B_3nn$	$U_{La_1}U_{Lo_1}U_{La_2}U_{Lo_2}U_{La_3}$	$U_{Lo_3}U_{La_4}U_{Lo_4}U_{La_5}U_{Lo_5}$	$H_1H_2H_3H_4H_5$			
		.....	.....	.....	.....			
		.....	.....	.....	.....)			
SECTION 7	(777	P_bP_b///	$B_1B_2B_3nn$	$U_{La_1}U_{Lo_1}U_{La_2}U_{Lo_2}U_{La_3}$	$U_{Lo_3}U_{La_4}U_{Lo_4}U_{La_5}U_{Lo_5}$	$U_1U_2U_3U_4U_5$		
		.....	.....	.....	.....	.....		
		.....	.....	.....	.....	.....)		
SECTION 8	(888	$B_1B_2B_3nn$	$U_{La_1}U_{Lo_1}U_{La_2}U_{Lo_2}$/	$1uF_LF_LF_L$	$2uF_iF_iF_i$	$3uF_sF_sF_s$		
				.....	.....	.....)		

N O T E S:

(1) SATOB is the name of the code for reporting a satellite observation of wind, surface temperature, cloud, humidity and radiation.

(2) A SATOB report is identified by M_iM_i = YY.

(3) The code form is subdivided into a number of sections as follows:

Section number	Symbolic group	Contents
1	-	Time and identification data
2	222	Data for wind and cloud temperatures at specified pressure levels
3	333	Data for wind at specified pressure levels
4	444	Data for surface temperatures
5	555	Data for clouds
6	666	Data for maximum cloud-top altitude
7	777	Data for troposphere humidity
8	888	Data for radiation balance

(4) It is recommended that within each section, a report should be confined to one geographical area. Proper transmission of each report is thereby ensured and the amount of data to be transmitted to individual users is reduced.

R E G U L A T I O N S:

88.1

General

88.1.1

The code name SATOB shall not be given in the report.

88.1.2

The report shall consist of Section 1 plus Section 8 or Section 1 plus one or more of Sections 2 to 7.

88.1.3

The data shall be arranged in ten-degree squares.

88.2

Section 1

Section 1 shall indicate the satellite name and the time of the observation, except when regulation 88.9.2 applies.

88.3

Section 2
Section 2 shall be included in the report when data on cloud temperature and winds computed from cloud movement are available.

88. 4

Section 3
Section 3 shall be included in the report when data for wind computed from cloud motion are available, while cloud temperature data are not available.

88.5

Section 4
Section 4 shall be included in the report when surface temperature data are available.

88.6

Section 5
Section 5 shall contain data giving the individual percentage cloud cover of the various cloud layers and the temperature at the top of each layer. If available the pressure at the top of the layer (in tens of millibars) shall be given by P_dP_d. If pressure is not available P_dP_d shall be coded as //.

88.7

Section 6
Section 6 shall be included in the report when data on maximum cloud-top altitude are available.

88.8

Section 7
Section 7 shall be included in the report when humidity data from a given level up to the tropopause are available. The group P_bP_b/// shall specify the lower level.

88.9

Section 8

88.9.1

Section 8 shall be included in the report when data for total radiation (for 24 hours) are available (outgoing: long-wave and short-wave; incoming: short-wave).

88.9.2

When Section 8 is included in the report GGg in Section 1 shall be coded as a series of solidi (///), while YY refers to the day over which the total radiation is integrated.

SPECIFICATIONS OF SYMBOLIC LETTERS

$B_1B_2B_3$ Number designating a 10° x 10° square in a geographical grid, i.e. formed by the intersection of two meridians and two parallel circles. These four lines correspond to geographical co-ordinates which are in

pairs of consecutive multiples of 10° and can therefore be expressed as follows:

$l_a \times 10°$, $(l_a + 1) \times 10°$ (latitude)

$l_o \times 10°$, $(l_o + 1) \times 10°$ (latitude)

In the above expressions, l_a and l_o are positive integers that may vary between 0 and 8 and between 0 and 17 respectively. Both latitudes are either N or S and both longitudes are either E or W.

The square number is obtained by using the specifications below:

B_1 = octant of the globe (code table 3300)

$B_2 = l_a$

B_3 = units figure of integer l_o.

(1) That corner of square $B_1B_2B_3$ which corresponds to the geographical co-ordinates $l_a \times 10°$ and $l_o \times 10°$ is used as a reference point to obtain the co-ordinates of any point lying inside the square:

(a) To the nearest degree, by adding up to 9° to the co-ordinates of the corner in question;

(b) To the nearest tenth of a degree, by adding up to 9.9° to the co-ordinates of the corner in question;

(2) Points lying on the 180° meridian will be encoded by using $B_2 = 8$ and $B_1 = 1$ in the northern hemisphere and $B_1 = 6$ in the southern hemisphere.

(3) Each Pole will be encoded by $B_2 = 9$, $B_3 = 0$ and $B_1 = 1$ for the North Pole and $B_1 = 6$ for the South Pole.

(4) Between 80° latitude and each of the Poles, the squares are reduced to triangles which nevertheless are covered by the above system.

(5) The numbering system of squares is given in Code table 0363 (This table will be reproduced in Volume I of the Manual on Codes.)

$F_L F_L F_L$ Outgoing long-wave radiation in Joules integrated over 24 hours.

$F_i F_i F_i$ Incoming short-wave radiation in Joules integrated over 24 hours.

$F_s F_s F_s$ Outgoing short-wave radiation in Joules integrated over 24 hours.

H_1 Maximum altitude of cloud tops (code table 1545) corresponding to the first point out of 5 indicated by means of $U_{La} U_{Lo}$.

H_2, H_3, H_4, H_5 — As for H_1, but corresponding to the second, third, fourth and fifth points.

nn — Number of points in ten-degree square.

P_bP_b — Pressure, in tens of millibars, at the base of the reported humid layer.

P_cP_c — Pressure level, in tens of millibars, derived from a conversion of cloud temperature and related to the level where cloud displacement was observed.

P_dP_d — Pressure level, in tens of millibars, derived from a conversion of cloud temperature.

P_eP_e — Estimated pressure, in tens of millibars, where cloud displacement was observed.

T_a — Approximate tenth value and sign of temperature (code table 3931)

(1) When the temperature is computed to the nearest whole degree Celsius, code figure 0 or 1 is used for T_a, as appropriate.

T_cT_c — Whole degrees (Celsius) of temperature of cloud top at pressure estimated from infra-red observations of cloud fields.

(1) This value is used to derive the pressure level P_2P_2 in Section 2.

T_sT_s — Whole degrees (Celsius) of surface temperature (over sea areas, this is the sea-surface temperature).

U_1 — Average relative humidity in tens of per cent of the layer between the pressure level indicated by P_bP_b and the level of the tropopause at the first of the 5 points indicated by $U_{La_1}U_{Lo_1}$.

U_2, U_3, U_4, U_5 — As for U_1, but corresponding to the second, third, fourth and fifth points.

Code table 1545

H_1 - Maximum altitude of cloud tops

Code figure	
0	Cloud tops not above 3 000m
1	Cloud tops above 3 000m but not above 4 500m
2	Cloud tops above 4 500m but not above 6 000m
3	Cloud tops above 6 000m but not above 7 500m
4	Cloud tops above 7 500m but not above 9 000m
5	Cloud tops above 9 000m but not above 10 500m
6	Cloud tops above 10 500m but not above 12 000m
7	Cloud tops above 12 000m but not above 13 500m
8	Cloud tops above 13 500m but not above 15 000m
9	Cloud tops above 15 000m

A N N E X VIII

Annex to Reccommendation 5 (CBS-Ext.(76))

CODE FOR REPORTING UPPER-LEVEL PRESSURE, TEMPERATURE, HUMIDITY AND WIND FROM A SONDE RELEASED BY CARRIER BALLOONS OR AIRCRAFT (TEMP DROP)

TEMP DROP - Upper-level pressure, temperature, humidity and wind report from a sonde released by carrier balloons or aircraft

C O D E F O R M:

Part A

SECTION 1	$M_iM_iM_jM_j$	YYGGId	$99L_aL_aL_a$	$Q_cL_oL_oL_oL_o$	$MMMU_{La}U_{Lo}$
SECTION 2	$99P_oP_oP_o$	$T_oT_oT_{ao}D_oD_o$	$d_od_of_of_of_o$		
	$P_1P_1h_1h_1h_1$	$T_1T_1T_{a1}D_1D_1$	$d_1d_1f_1f_1f_1$		
	.....	.....	.....		
	$P_nP_nh_nh_nh_n$	$T_nT_nT_{an}D_nD_n$	$d_nd_nf_nf_nf_n$		
SECTION 3	$88P_tP_tP_t$ or 88999	$T_tT_tT_{at}D_tD_t$	$d_td_tf_tf_tf_t$		
SECTION 4	$77P_mP_mP_m$ or $66P_mP_mP_m$ or 77999	$d_md_mf_mf_mf_m$	$(4v_bv_bv_av_a)$		

Part B

SECTION 1	$M_iM_iM_jM_j$	YYGG/	$99L_aL_aL_a$	$Q_cL_oL_oL_oL_o$	$MMMU_{La}U_{Lo}$
SECTION 5	$n_on_oP_oP_oP_o$	$T_oT_oT_{ao}D_oD_o$			
	$n_1n_1P_1P_1P_1$	$T_1T_1T_{a1}D_1D_1$			
	.....	.....			
	$n_nn_nP_nP_nP_n$	$T_nT_nT_{an}D_nD_n$			

SECTION 6	21212	$n_o n_o P_o P_o P_o$	$d_o d_o f_o f_o f_o$
		$n_1 n_1 P_1 P_1 P_1$	$d_1 d_1 f_1 f_1 f_1$
		.....	.....
		$n_n n_n P_n P_n P_n$	$d_n d_n f_n f_n f_n$

Part C

SECTION 1	$M_i M_i M_j M_j$	YYGGId	$99L_a L_a L_a$	$Q_c L_o L_o L_o L_o$	$MMMU_{La} U_{Lo}$

SECTION 2	$P_1 P_1 h_1 h_1 h_1$	$T_1 T_1 T_{a1} D_1 D_1$	$d_1 d_1 f_1 f_1 f_1$
	.....	.....	.....
	$P_n P_n h_n h_n h_n$	$T_n T_n T_{an} D_n D_n$	$d_n d_n f_n f_n f_n$
SECTION 3	$88P_t P_t P_t$ or 88999	$T_t T_t T_{at} D_t D_t$	$d_t d_t f_t f_t f_t$
SECTION 4	$77P_m P_m P_m$ or $66P_m P_m P_m$ or 77999	$d_m d_m f_m f_m f_m$	$(4v_b v_b v_a v_a)$

Part D

SECTION 1	$M_i M_i M_j M_j$	YYGG/	$99L_a L_a L_a$	$Q_c L_o L_o L_o L_o$	$MMMU_{La} U_{Lo}$

SECTION 5	$n_1 n_1 P_1 P_1 P_1$	$T_1 T_1 T_{a1} D_1 D_1$
	.....	.....
	$n_n n_n P_n P_n P_n$	$T_n T_n T_{an} D_n D_n$

SECTION 6	21212	$n_1 n_1 P_1 P_1 P_1$	$d_1 d_1 f_1 f_1 f_1$
		.....	.....
		$n_n n_n P_n P_n P_n$	$d_n d_n f_n f_n f_n$

N O T E S :

(1) TEMP DROP is the name of the code for an upper-level pressure, temperature, humidity and wind report from a sonde released by a carrier balloon or aircraft equipped with dropsondes.

(2) TEMP DROP is identified by $M_i M_i$ = XX.

(3) The code form consists of four parts as follows:

Part	Identifier letters (MjMj)	Isobaric surfaces
A	AA	Up to and including the 100 mb surface
B	BB	
C	CC	Above the 100 mb surface
D	DD	

Each part can be transmitted separately.

(4) The code form is divided into a number of sections as follows:

Section number	Indicator figures or symbolic figure groups	Contents
1	-	Identification and position data
2	-	Data for standard isobaric surfaces
3	88	Data for tropopause level(s)
4	66 or 77	Data for maximum wind level(s) and data for vertical wind shear
5	-	Data for significant levels, with respect to temperature and/or relative humidity
6	21212	Data for significant levels with respect to wind

REGULATIONS:

1.

General

1.1

The code name TEMP DROP shall not be included in the report.

1.2

Parts A and B shall contain data, in so far as available, only for levels up to and including the 100 mb level.

1.3

Parts C and D shall contain data, in so far as available, only for levels above the 100 mb level.

1.4

The instructions regarding Parts A and B of the report with respect to the inclusion of data up to and including 100 mb and regarding Parts C and D with respect to the inclusion of data above 100 mb shall not be contravened. For example, if data at or below 100 mb are not included in either Part A or B, as appropriate, they shall not be included in Part C or D. In this instance the non-included data shall be transmitted separately in the form of a correction report.

2.

Parts A and C

2.1

Section 1

2.1.1

The carrier balloon or aircraft position shall be indicated by means of the group $99L_aL_aL_a \quad Q_cL_oL_oL_oL_o \quad MMMU_{La}U_{Lo}$.

2.2

Section 2 - Standard isobaric surfaces

2.2.1

In Section 2, the data groups for the surface level and the standard isobaric surfaces of 1000, 850, 700, 500, 400, 300, 250, 200, 150 and 100 mb in Part A and 70, 50, 30, 20, 10 mb in Part C shall appear in ascending order with respect to altitude.

2.2.2

When the geopotential of a standard isobaric surface is lower than the altitude of the surface level, the air temperature - humidity group for that standard isobaric surface shall be included. Solidi (/////) shall be reported for these groups. The wind groups for these levels shall be included as specified by the value reported for symbol I_d.

2.2.3

When wind data are available for all levels, the wind group shall be included for each level as indicated in the symbolic code form. If wind data are not available for all levels, the procedures given below shall be followed:

(a) When wind data are missing for one or more standard isobaric surfaces but are available for other standard isobaric surfaces below and above the level of missing wind data, the wind group(s), i.e. $d_n d_n f_n f_n f_n$, shall be coded by means of solidi (/////);

(b) When wind data are missing for a standard isobaric surface and are also missing for all succeeding standard isobaric surfaces up to the top of the sounding, the wind group shall be omitted for all these levels and the symbol I_d reported accordingly.

2.3

Section 3 - Tropopause level(s)

2.3.1

When more than one tropopause is observed, each shall be reported by repeating Section 3.

2.3.2

When no tropopause data are observed, the group 88999 shall be reported for Section 3.

2.4

Section 4 - Maximum wind level(s) and vertical wind shear

2.4.1

When more than one maximum wind level is observed, each shall be reported by repeating Section 4.

2.4.2

When no maximum wind level is observed, the group 77999 shall be reported for Section 4.

2.4.3

Indicator figures 77 shall be used when data for maximum wind levels occurring within the sounding are reported. Indicator figures 66 shall be used when data for the top of the sounding, where the wind speed is the highest observed throughout the sounding, are reported.

2.4.4

Group ($4v_bv_bv_av_a$)

Group $4v_bv_bv_av_a$ shall be included only if data for vertical wind shear are computed and required.

3.

Parts B and D

3.1

Section 5 - Significant levels with respect to temperature and/or relative humidity

3.1.1

The reported significant data alone shall make it possible to reconstruct the air temperature and relative humidity curves within the limits of the criteria specified. Significant levels shall be selected as follows:

(a) The lowest and highest levels of soundings;

(b) Bases and tops of inversions and isothermal layers which are at least 20 mb thick or are characterized by a substantial change in relative humidity provided that the base of the layer occurs below the 200 mb level or below the first tropopause, whichever is higher;

(c) Levels which are necessary to ensure that the temperature obtained by linear interpolation (on a T-log p or essentially similar diagram) between adjacent significant levels shall not depart from the observed temperature by more than 1°C below the 300 mb level or the first tropopause, whichever is reached first, and by more than 2°C above this level.

3.1.2

Significant levels determined in accordance with Regulation 3.1.1 shall, in so far as possible, be the actual levels at which the prominent changes in the lapse rates of air temperature or relative humidity occur.

3.1.3

When a significant level and a standard isobaric surface coincide, data for that level shall be reported in Parts A and B (or C and D, as appropriate).

3.1.4

In Part B, the successive significant levels shall be numbered 00 (surface level), the first level 11, the second level 22, ... etc. ...99, 11, 22, ... etc. In Part D, the first level above 100 mb shall be numbered 11, the second 22, ... etc. ...99, 11, 22, ...etc. The code figure 00 for $n_o n_o$ in Part B shall never be used to indicate any other than surface level.

3.1.5

In Parts B and D, a layer for which data are missing shall be indicated by reporting the boundary levels of the layer and a level of solidi (/////)to indicate the layer of missing data. The boundary levels are the levels closest to the bottom and top of the layer for which observed data are available. The boundary levels are not required to meet "significant level" criteria. The boundary levels and the missing data level groups will be identified by appropriate nn numbers. For example:

$33P_3P_3P_3$	$T_3T_3T_{a3}D_3D_3$
44///	/////
$55P_5P_5P_5$	$T_5T_5T_{a5}D_5D_5$

where the levels 33 and 55 are the boundary levels and 44 indicates the layer for which data are missing.

3.2

Section 6 - Significant levels with respect to wind

Significant levels shall be chosen so that the data from them alone shall make it possible to reconstruct the wind profile with sufficient accuracy for practical use.

SPECIFICATIONS OF SYMBOLIC LETTERS:

D_tD_t	Dew-point depression at the tropopause level. (Code table 0777)
D_oD_o	Dew-point depression at standard isobaric surfaces or at significant levels, starting with surface level.
D_1D_1	
...	
D_nD_n	

$d_t d_t$ — True direction (rounded off to the nearest 5°), in tens of degrees, from which the wind is blowing at the tropopause level.

$d_o d_o$
$d_1 d_1$
...
$d_n d_n$ — True direction (rounded off to the nearest 5°), in tens of degrees, from which the wind is blowing at specified levels starting with surface level.

$f_m f_m f_m$ — Maximum wind speed, in metres per second or knots.
(1) See Note (1) under YY.

$f_t f_t f_t$ — Wind speed, in metres per second or knots, at the tropopause level.
(1) See Note (1) under YY.

$f_o f_o f_o$
$f_1 f_1 f_1$
$f_2 f_2 f_2$
—
$f_n f_n f_n$ — Wind speed, in metres per second or knots, at specified levels starting with surface level.
(1) See Note (1) under YY.

$h_1 h_1 h_1$
$h_2 h_2 h_2$
...
$h_n h_n h_n$ — Geopotential of the standard isobaric surfaces P_1P_1, P_2P_2,...P_nP_n in standard geopotential metres and tens of standard geopotential metres. The geopotential shall be reported in whole standard geopotential metres up to, but not including, 500 mb and in tens of standard geopotential metres at 500 mb and higher, omitting if necessary the thousands or tens of thousands digits.

(1) Geopotentials of surfaces below the sea-level shall be reported by adding 500 to the absolute value of the geopotential.

I_d — Indicator used to specify the hundreds of millibars figure (in Part A) or tens of millibars figure (in Part C reports) of the pressure relative to the last standard isobaric surface for which the wind is reported. (Code table 1734)

(1) When wind data are missing for one or more isobaric surfaces but are available for other isobaric surfaces below or above, a group (or groups) of solidi shall be included for the missing data.

(2) The wind group shall be omitted in the case of those isobaric surfaces for which no data are available, provided wind data are not available for any still higher surface.

(3) Code figure I_d = 0 shall refer to the 1000 mb level.

(4) When wind data are not available for any standard isobaric surfaces (either in Part A or in Part C), I_d shall be reported by means of a solidus (/).

(5) The wind group relating to the surface level shall be included in the report; when the corresponding wind data are not available, this group shall be coded /////.

(6) If wind data are available up to and including the 250 mb level, the wind group relating to the 200 mb level shall also be included in the report and coded as ///// except when the 250 mb level is the highest standard isobaric surface reached by the sounding. The same rule shall apply to the 150 mb level with regard to the 100 mb level.

$L_aL_aL_a$ Latitude in tenths of a degree.

(1) Tenths shall be obtained by dividing the number of minutes by 6, disregarding the remainder.

$L_oL_oL_oL_o$ Longitude in tenths of a degree.

(1) See Note (1) under $L_aL_aL_a$.

M_iM_i Identification letters of the report. (Code table 2582)

M_jM_j Identification letters of the part of the report. (Code table 2582)

MMM Number of Marsden square in which the station is situated at the time of observation. (Code table 2590)

n_on_o
n_1n_1
...
n_nn_n

Number of level, starting with surface level

(1) Surface level shall be coded n_on_o = 00.

P_1P_1
P_2P_2
...
P_nP_n

Pressure of standard isobaric surfaces (1000 mb = 00) in units of tens of millibars up to and at the 100 mb surface, and in whole millibars above the 100 mb surface.

$P_mP_mP_m$ — Pressure at the maximum wind level, in whole millibars when this level occurs up to and at 100 mb level, and in tenths of a millibar above 100 mb.

Q_c — Quadrant of the globe. (Code table 3333)

T_{at} — Approximate tenths value and sign (plus or minus) of the air temperature at the tropopause level. (Code table 3931)

T_{ao}
T_{a1}
...
T_{an}

Approximate tenths value and sign (plus or minus) of the air temperature at specified levels starting with surface level. (Code table 3931)

T_tT_t — Air temperature in whole degrees Celsius, at the tropopause level.

(1) This temperature, measured in degrees and tenths, is not rounded off to the next whole degree; only the whole degrees are indicated by T_tT_t. The tenths of this temperature are indicated by means of T_{at}.

T_oT_o
T_1T_1
...
T_nT_n

Tens and unit digits of air temperature not rounded off, in degrees Celsius, at specified levels starting with surface level.

(1) The tenths of the temperature, which is measured in degrees and tenths, shall be indicated by means of T_{ao}, T_{a1}... T_{an}.

U_{La} — Units digit in the reported latitude.

U_{Lo} — Units digit in the reported longitude.

v_av_a — Absolute value of the vector difference between the maximum wind and the wind blowing at 1 km above the level of maximum wind, in units indicated by YY.

$v_b v_b$ Absolute value of the vector difference between the maximum wind and the wind blowing at 1 km below the level of maximum wind, in units indicated by YY.

YY Day of the month (GMT), with 01 indicating the first day, 02 the second day, etc., on which the actual time of observation falls.

(1) YY is used to indicate the unit of wind speed in addition to indicating the day of the month. When wind speeds are given in knots, 50 is added to YY. When the speed is given in metres per second, YY is not modified.

A N N E X IX

Annex to Recommendation 6 (CBS-Ext.(76))

CODE FOR REPORTING CONSTANT-LEVEL BALLOON DATA (COLBA)

COLBA - Upper-air report from a constant-level balloon

C O D E F O R M :

$M_i M_i M_j M_j$

YYGGg 99$L_a L_a L_a$ Q$L_c L_o L_o L_o L_o$

$P_a P_a P_a$ TT ddfff

($4H_a H_a H_a H_a$)

61616 69696

$D_c D_c D_c D_c$

NOTES: (1) COLBA is the name of a code for an upper-air report from a constant-level balloon.

(2) A COLBA report is identified by $M_i M_i M_j M_j$ = IIXX.

R E G U L A T I O N S :

1.

General

1.1

The code name COLBA shall not be included in the report.

1.2

The identifier group $M_i M_i M_j M_j$ shall be included as the first line of the text of a meteorological bulletin of COLBA reports. Individual reports in the bulletin shall not contain the group $M_i M_i M_j M_j$.

1.3

The group $4H_aH_aH_aH_a$ shall be reported only if the altitude of the balloon can be determined.

1.4

The groups 61616 . . . . . 69696 shall indicate additional groups which may be developed to show the status (engineering parameters) of the balloon.

1.5

The balloon number $D_cD_cD_cD_c$ shall be added.

SPECIFICATIONS OF SYMBOLIC LETTERS

dd — True direction (rounded off to the nearest 5°), in tens of degrees, from which the wind is blowing.

$D_cD_cD_cD_c$ — The balloon number.

fff — Wind speed, in metres per second or knots.

(1) See Note (1) under YY.

$H_aH_aH_aH_a$ — Altitude of a constant-level balloon, in tens of metres.

$L_aL_aL_a$ — See specification for TEMP DROP.

$L_oL_oL_oL_o$ — See specification for TEMP DROP.

$P_aP_aP_a$ — Pressure of the level at which the balloon is flying, in millibars.

TT — Absolute value of air temperature in whole degrees Celsius at the pressure indicated by $P_aP_aP_a$.

(1) The sign of temperature shall be disregarded, i.e. -57°C shall be coded as 57.

ANNEX X

Annex to Recommendation 7 (CBS-Ext.(76))

CODE FOR REPORTING DATA FROM DRIFTING BUOYS (DRIBU)

DRIBU - Report of a drifting buoy observation

C O D E F O R M :

SECTION 1	$M_i M_i M_j M_j$				
	YYMMJ	$GGgg i_w$	$Q_c L_a L_a L_a L_a$		$L_o L_o L_o L_o L_o$
	(1PPPP)	($2 s_n T_w T_w T_w$)	(3ddff)		($4 s_n$TTT)
SECTION 2	(888	$z_o z_o T_o T_o T_o$	$z_1 z_1 T_1 T_1 T_1$	.....	$z_n z_n T_n T_n T_n$
		999zz	$z_1 z_1 T_1 T_1 T_1$	.....	$z_n z_n T_n T_n T_n$)
		(00000)			
	61616 69696				
SECTION 3	333	$A_1 b_w n_b n_b n_b$			

N O T E S :

(1) DRIBU is the name of the code for reporting drifting buoy observations.

(2) A DRIBU report, or a bulletin of reports, is identified by $M_i M_i M_j M_j$ = ZZXX.

(3) The code form is divided into three sections:

Section number	Symbolic figure group	Contents
1		Identification and position data, surface pressure and sea-surface temperature and (optional) wind and air temperature
2	888	Temperature at significant depths follows
3	333	Drifting buoy identifier follows

R E G U L A T I O N S :

1.

General

1.1

The code name DRIBU shall not be included in the report.

2.

Section 1

2.1

Each individual DRIBU report, even if included in a bulletin of such reports, shall contain as the first group the identification group $M_i M_i M_j M_j$.

2.2

Each of the optional groups in Section 1 shall be included whenever the necessary parameter is measured and available.

3.

Section 2

3.1

This section shall be included whenever measurements in depth are available.

3.2

The selected significant depths:

(a) Shall be sufficient to reproduce basic features of the temperature profile;
(b) Shall define the top and 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.

3.3

The group 00000 shall be included only when the temperature at the lowest depth of the sounding, which is reported in the last temperature group, is actually the bottom layer temperature.

3.4

The groups 61616 .....69696 shall indicate additional groups which may be developed to show the status (engineering or technical parameters) of the buoy.

4.

Section 3

4.1

The buoy identifier shall be added.

4.2

In the case of drifting buoys 500 shall be added to the original $n_b n_b n_b$ number.

SPECIFICATION OF SYMBOLIC LETTERS :

A_1	WMO regional association area in which buoy has been deployed (1 - Region I, 2 - Region II, etc..)
b_w	Sub-area belonging to the area indicated by A_1 (see geographical map on page 112)
i_w	Wind indicator (Code table 1855)
$L_a L_a L_a L_a$	Latitude in degrees and minutes.
$L_o L_o L_o L_o$	Longitude in degrees and minutes.
$n_b n_b n_b$	Type and serial number of buoy.

$T_oT_oT_o$
$T_1T_1T_1$
.....
$T_nT_nT_n$

Temperature in tenths of a degree, at specified depths starting with sea surface.
(1) For negative temperature, 500 shall be added to the absolute value of the temperature in tenths of degree Celsius.

$T_wT_wT_w$ Sea-surface temperatures in tenths of a degree Celsius, its sign being given by s_n.

zz Hundreds of metres of depth, e.g. zz = 01:100 m, zz = 02:200 m, etc.

z_oz_o
z_1z_1
...
z_nz_n

Significant depths in metres, starting with the surface.

A N N E X XI

Annex to Recommendation 8 (CBS-Ext.(76))

Part A

INTERNATIONAL IDENTIFIER SYSTEM FOR
ENVIRONMENTAL DATA BUOY STATIONS

1. Symbolic form of the identifier: $A_1 b_w n_b n_b n_b$

2. Specifications of symbolic letters

A_1 WMO Region in which the buoy has been deployed.

b_w Sub-area belonging to the area indicated by A_1.

$n_b n_b n_b$ Type and serial number of buoy.

3. Code tables

3.1

A_1	WMO Region in which the buoy has been deployed
1	Region I
2	Region II
3	Region III
4	Region IV
5	Region V
6	Region VI
7	Antarctic (south of 60°S)

3.2

b_w	Sub-area belonging to the area indicated by A_1
1	
2	
'	See appended geographical map
'	
9	

Regulation

Serial numbers to buoys within each maritime sub-area identified by A_1 and b_w shall be allotted from the series 000 up to 499, but in the case of drifting buoys, 500 shall be added to the original $n_b n_b n_b$ number.

Examples

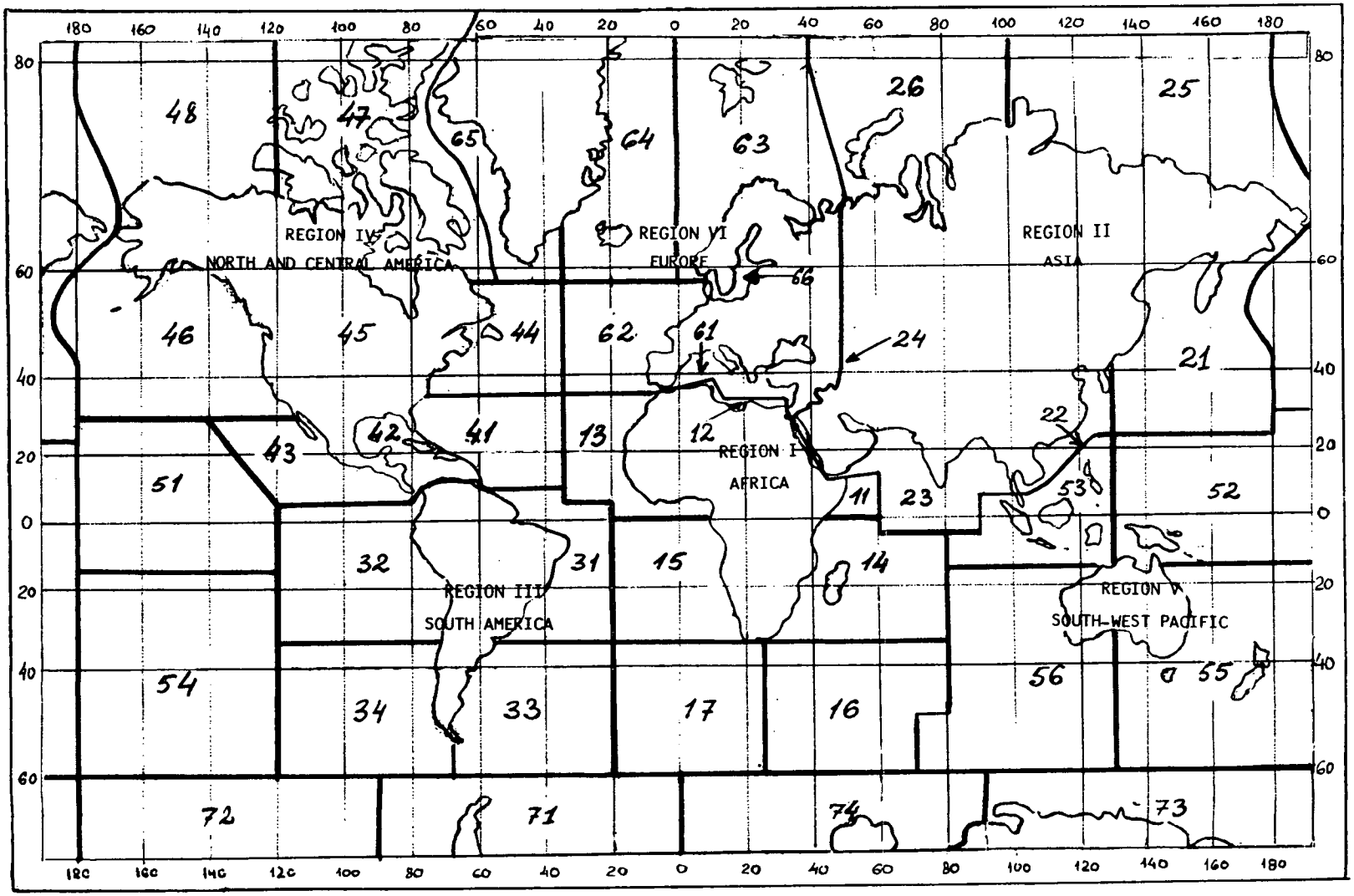
14015 = 15th buoy, deployed in sub-area 4 in Region I, stationary.

46673 = 173rd buoy, deployed in sub-area 6 in Region IV, drifting.

*

* *

CHART OF WATER AREAS (A_1b_w) FOR USE IN ASSIGNING BUOY IDENTIFIERS



Part B

GENERAL GUIDELINES FOR THE USE OF AN INTERNATIONAL IDENTIFIER SYSTEM FOR ENVIRONMENTAL DATA BUOY STATIONS

1. The primary objective of the system is to provide environmental data buoy stations with an identifying number in a way similar to the "station index number" of land meteorological stations for both operational and storage and retrieval purposes.

2. The identifier may be used by environmental data buoys transmitting reports directly to shore stations (e.g. on HF bands allocated by WARC for ocean data transmission) and by those transmitting reports through satellites (e.g. international data-collection system envisaged by geostationary meteorological satellite operators); it may also be used by automatic stations established on floating ice.

3. In the case of drifting buoys, a buoy will retain the original identifier applicable to the WMO Region and sub-area in which it was set adrift.

4. The identifier should be included in messages for international dissemination and therefore be added to reports originated from environmental data buoys, e.g. DRIBU and those buoy reports disseminated over the GTS in FM 63-V BATHY code form.

5. The administrative work relating to the management of the international identifier system should be carried out by the WMO Secretariat, as necessary, in consultation with the IOC Secretariat, as follows:

(a) The WMO Secretariat to allocate to interested Members a block or blocks of serial numbers ($n_b n_b n_b$) to be used by their environmental buoy stations;

(b) Members deploying and operating environmental data buoys to register with the WMO Secretariat the serial numbers actually assigned to individual stations together with their geographical positions of deployment;

(c) The WMO Secretariat to inform all concerned of the allocation of the serial numbers and registration made by individual Members; this work may be combined, as appropriate, with the regular information service on environmental data buoys as requested by Resolution 6 (EC-XXVIII).

A N N E X XII

Annex to Recommendation 9 (CBS-Ext.(76))

AMENDMENTS TO MARINE CODES

SEA ICE GROUP FOR INCLUSION IN CODES FM 21-V SHIP, FM 22-V SHIP and FM 23-V SHRED

Replace the group (ICE + { plain language / or / c_2KD_ire }) by the group

(ICE + { plain language / or / $c_iS_ib_iD_iz_i$ }).

SPECIFICATION OF SYMBOLIC LETTERS:

c_i - Concentration or arrangement of sea ice

Code figure			
0	No sea ice in sight		
1	Ship in open lead more than 1.0 nautical mile wide, or ship in fast ice with boundary beyond limit of visibility		
2	Sea ice present in concentrations less than 3/10 (3/8), open water or very open pack ice	Sea ice concentration is uniform in the observation area	Ship in ice or within 0.5 nautical miles of ice edge
3	4/10 to 6/10 (3/8 to less than 6/8), open pack ice		
4	7/10 to 8/10 (6/8 to less than 7/8), close pack ice		
5	9/10 or more, but not 10/10 (7/8 to less than 8/8), very close pack ice		
6	Strips and patches of pack ice with open water between	Sea ice concentration is not uniform in the observation area	
7	Strips and patches of close or very close pack ice with areas of lesser concentration between		

8	Fast ice with open water, very open or open pack ice to seaward of the ice boundary	Sea ice concentration is not uniform in the observation area	Ship in ice or within 0.5 nautical miles of ice edge
9	Fast ice with close or very close pack ice to seaward of the ice boundary		
/	Unable to report, because of darkness, lack of visibility, or because ship is more than 0.5 nautical mile away from ice edge.		

S_i - Stage of development

Code figure	
0	New ice only (frazil ice, grease ice, slush, shuga)
1	Nilas or ice rind, less than 10 cm thick
2	Young ice (grey ice, grey-white ice), 10-30 cm thick
3	Predominantly new and/or young ice with some first-year ice
4	Predominantly thin first-year ice with some new and/or young ice
5	All thin first-year ice (30-70 cm thick)
6	Predominantly medium first-year ice (70-120 cm thick) and thick first-year ice (>120 cm thick) with some thinner (younger) first-year ice
7	All medium and thick first-year ice
8	Predominantly medium and thick first-year ice with some old ice (usually more than 2 metres thick)
9	Predominantly old ice
/	Unable to report, because of darkness, lack of visibility or because only ice of land origin is visible or because ship is more than 0.5 nautical mile away from ice edge.

b_i - Ice of land origin

Code figure	
0	No ice of land origin
1	1-5 icebergs, no growlers or bergy bits
2	6-10 icebergs, no growlers or bergy bits
3	11-20 icebergs, no growlers or bergy bits
4	Up to and including 10 growlers and bergy bits - no icebergs
5	More than 10 growlers and bergy bits - no icebergs
6	1-5 icebergs with growlers and bergy bits
7	6-10 icebergs with growlers and bergy bits
8	11-20 icebergs with growlers and bergy bits
9	More than 20 icebergs with growlers and bergy bits - a major hazard to navigation
/	Unable to report - because of darkness, lack of visibility or because only sea ice is visible.

D_i - Bearing of principal edge

Code figure	
0	Ship in shore or flaw lead
1	Principal ice edge towards NE
2	" " " " E
3	" " " " SE
4	" " " " S
5	" " " " SW

6	Principal ice edge towards W
7	" " " " NW
8	" " " " N
9	Not determined (ship in ice)
/	Unable to report - because of darkness, lack of visibility or because only ice of land origin is visible.

z_i - Present ice situation and trend of conditions over preceding 3 hours

Code figure			
0	Ship in open water with floating ice in sight		
1	Ship in easily penetrable ice; conditions improving		Ship in ice
2	Ship in easily penetrable ice; conditions not changing		
3	Ship in easily penetrable ice; conditions worsening		
4	Ship in ice difficult to penetrate; conditions improving		
5	Ship in ice difficult to penetrate; conditions not changing		
6	Ice forming and floes freezing together	Ship in ice difficult to penetrate and conditions worsening	
7	Ice under slight pressure		
8	Ice under moderate or severe pressure		
9	Ship beset		
/	Unable to report - because of darkness or lack of visibility.		

REVISED REPORTING PROCEDURES FOR THE ICE GROUPS IN SHIP AND SHRED CODE FORMS

Revised coding regulations under FM 21-V SHIP

21.15

Groups (ICE + { plain language / or / $c_i S_i b_i D_i z_i$ })

21.15.1

The reporting of sea ice and ice of land origin in SHIP or SHRED shall not supersede the reporting of sea ice and icebergs in accordance with the International Convention for the Safety of Life at Sea.

21.15.2

The group $c_i S_i b_i D_i z_i$ shall be reported whenever sea ice and/or ice of land origin are observed from the ship's position at the time of observation, unless the ship is required to report ice conditions by means of a special sea-ice code.

21.15.3

When an ice edge is crossed or sighted between observation hours it shall be reported as a plain-language addition in the form "Ice Edge Lat. Long." (with position in degrees and minutes).

21.15.4

If the ship is in the open sea reporting an ice edge, the concentration c_i and stage of development S_i shall be reported only if the ship is close to the ice (i.e. within 0.5 nm).

21.15.5

The situation in which the ship is in open lead more than 1.0 nautical mile wide shall be coded as $c_i = 1$ and $D_i = 0$. The situation in which the ship is in fast ice with ice boundary beyond limit of visibility shall be coded as $c_i = 1$ and $D_i = 9$.

21.15.6

If no sea ice is visible and the code group is used to report ice of land origin only, the group shall be coded as $0/b_i/0$; e.g., 0/2/0 would mean 6-10 icebergs in sight, but no sea ice.

21.15.7

In coding concentration or arrangement of sea ice (code c_i), that condition shall be reported which is of the most navigational significance.

21.15.8

The bearing of the principal ice edge reported shall be to the closest part of that edge.

Revised coding regulations under FM 22-V SHIP

22.9

Groups (ICE + { plain language / or / $c_i S_i b_i D_i z_i$ })

Regulations 21.15.1 to 21.15.8 inclusive shall apply.

Revised coding regulations under FM 23-V SHRED

23.8

Groups (ICE + { plain language / or / $c_i S_i b_i D_i z_i$ })

Regulations 21.15.1 to 21.15.8 inclusive shall apply.

EXPLANATORY NOTE TO BE INCLUDED UNDER FM 21-V SHIP

(with cross-references under FM 22-V SHIP and FM 23-V SHRED)

(6) The requirements for sea-ice reporting are as follows:

Symbolic code letter c_i

(a) The purpose of the first digit (0) is to establish in relation to Code z_i (Code figure 0) and Code b_i whether the floating ice that is visible is only ice of land origin.

(b) The possible variations in sea-ice concentration and arrangement within an area of observation are almost infinite. However, the field of reasonably accurate observation from a ship's bridge is limited. For this reason, and also because minor variations are of temporary significance, the choice of concentrations and arrangements has been restricted for reporting purposes to those representing significantly different conditions from a navigational point of view. The digits 2-9 have been divided into two sections depending on:

(i) Whether sea-ice concentration within the area of observation is more or less uniform (digits 2-5); or

(ii) Whether there are marked contrasts in concentration or arrangement (digits 6-9).

Symbolic code letter S_i

(a) This table represents a series of increasing navigational difficulty for any given concentration - i.e. if the concentration is, for example, 8/10ths, then new ice would hardly have any effect on navigation while predominantly old ice would provide difficult conditions requiring reductions in speed and frequent course alterations;

(b) The correlation between the stage of development of sea ice and its thickness is explained in the Guide to Instrument and Observing Practices.

Symbolic code letter b_i

(a) This code provides a scale of increasing navigational hazard;

(b) Growlers and bergy bits, being much smaller and lower in the water than icebergs, are more difficult to see either by eye or radar. This is especially so if there is a heavy sea running. For this reason digits 4 and 5 represent more hazardous conditions than digits 1 to 3.

Symbolic code letter D_i

There is no provision in this code for the reporting of distance from the ice edge. It will be assumed by those receiving the report that the bearing has been given to the closest part of the ice edge. From the reported code figures for concentration and stage of development it will be clear whether the ship is in ice or within 0.5 nautical miles of the ice edge. If the ship is in open water and more than 0.5 nautical miles from the ice edge, the ice edge will be assumed to be aligned at right-angles to the bearing which is reported.

Symbolic code letter z_i

(a) The purpose of this element in the code is to establish:

(i) Whether the ship is in pack ice or is viewing floating ice (i.e. sea ice and/or ice of land origin) from the open sea; and

(ii) A qualitative estimate, dependent on the sea-ice navigation capabilities of the reporting ship, of the penetrability of the sea ice and of the recent trend in conditions;

(b) The reporting of the conditions represented by figures 1-9 in the above table can be used to help in the interpretation of reports from the two code tables (concentration c_i and stage of development S_i).

REVISION OF SPECIFICATIONS FOR CODE TABLE 2100 - EFFECT OF ICE ON NAVIGATION

1. Delete the present specifications of code figures 1-5 inclusive and replace by the following:

Code figure	
1	Navigation slightly impeded for unstrengthened ships
2	Navigation difficult for unstrengthened ships and slightly impeded for strengthened ships
3	Navigation difficult for strengthened ships
4	Navigation very difficult for strengthened ships
5	Navigation possible for strengthened ships only with icebreaker assistance.

2. Retain the current specifications of code figures 0 and 6-9 inclusive.

ANNEX XIII

Annex to Recommendation 10 (CBS-Ext.(76))

EXTENSION OF CODE FM 82-I SFLOC

Code table 2836

n_f - Number of atmospherics observed by the system at the geographical locations that follow, during a ten-minute period within the hour immediately preceding the time of the report.

Code figure	Number of atmospherics
0	1
1	2 or 3
2	4 to 8
3	9 to 15
4	16 to 24
5	25 to 35
6	36 to 48
7	49 to 63
8	64 to 80
9	81 or more
/	Not specified

A N N E X XIV

Annex to Recommendation 11 (CBS-Ext.(76))

AMENDMENTS TO CODES FM 51-V TAF, FM 53-V ARFOR AND FM 54-V ROFOR

FM 51-VI Ext. TAF Aerodrome forecast

C O D E F O R M:

TAF CCCC $G_1G_1G_2G_2$ dddff/f_mf_m

$$\begin{cases} \text{VVVV} \\ \text{or} \\ \underline{\text{CAVOK}} \end{cases} \quad w'w' \quad N_sCCh_sh_sh_s$$

$(0G_FG_FT_FT_F)$ $(6I_ch_ih_ih_it_L)$ $(5Bh_Bh_Bh_Bt_L)$ PROB C_2C_2

$$\text{TTTTT} \quad \begin{cases} GGG_eG_e \\ \text{or} \\ GG \end{cases}$$

N O T E S:

(1) TAF is the name of the code for an aerodrome forecast.

(2) Owing to:

(a) The unavoidable limitations in the definition of some of the elements, for example: VVVV and $h_sh_sh_s$,

(b) The variability of these elements over very short intervals of time and space, and

(c) The present inadequacies of forecast techniques,

the specific value of any element given in forecasts should be understood to be necessarily approximate, and the value of the element in question should accordingly be interpreted as representing the most probable mean

of a range of values which the element may assume during the period of the forecast concerned and over the area or in the airspace concerned. Similarly, when the time of occurrence or of change of an element is given in a forecast (as indicated by GGG_eG_e or by GG), this time should be interpreted as representing the most probable mean of a range of times.

(3) The groups enclosed in brackets, which contain meteorological information, are used in accordance with regional air navigation agreements.

(4) Aerodrome forecasts are dealt with in WMO Publication No. 49 - Technical Regulations /C.3.1/.

R E G U L A T I O N S:

51.1

General

51.1.1

The code name TAF shall appear as a prefix to individual coded aerodrome forecasts in cases where the message contains only one forecast.

51.1.2

The code name TAF shall be included on the first line of the text of a meteorological bulletin of several coded forecasts. In this case, each individual forecast in the bulletin shall not contain the code name TAF.

51.1.3

The description of forecast conditions shall contain at least information about wind, visibility, weather and cloud.

51.1.4

The forecast shall cover the period G_1G_1 to G_2G_2. If any element is expected to change significantly during this period one or more sets of change groups TTTTT GGG_eG_e shall be added after the complete description of the conditions prevailing before the change. Each set shall be followed by the modified forecast(s).

51.1.5

The group w'w' and/or the group $N_sCCh_sh_sh_s$ shall be omitted if the corresponding element(s) is (are) expected to be absent or not significant. However, after change groups elements shall be omitted if they are not expected to differ significantly from the preceding values they possessed in the coded forecast (see Regulation 51.5.1 and 51.6.3).

51.2

Group CCCC

51.2.1

ICAO location indicators shall be used.

51.2.2

When the same forecast in a TAF bulletin applies to more than one aerodrome, a separate forecast shall be issued for each aerodrome concerned. Only one indicator CCCC shall prefix each coded forecast.

51.3

Group dddff/$f_m f_m$

51.3.1

The mean direction and speed of the forecast wind shall be indicated by dddff.

N O T E: The term "mean direction and speed" is used in the sense of Regulation 15.4.1.

51.3.2

Regulation 15.4.2 shall apply.

51.3.3

When it is forecast that the maximum wind speed will exceed the mean speed by 5 ms^{-1} (10 knots) or more, the maximum wind speed shall be indicated by adding /$f_m f_m$ immediately after dddff.

N O T E: If after a change group the wind is reported again, /$f_m f_m$ should be included, or not, in accordance with these same criteria.

51.3.4

Regulation 15.4.4 shall apply.

51.4

Group VVVV

When the horizontal visibility is forecast not to be the same in different directions, the shortest distance shall be given for VVVV.

N O T E: See Regulation 51.7.

51.5

Group w'w'

51.5.1

If conditions are forecast which cannot be expressed by means of code table 4678, the group w'w' shall not be used. If conditions expressed by means of code table 4678 are forecast to end, the abbreviation WX NIL shall be used after the change group.

N O T E: See Regulation 51.11.1.

51.5.2

Regulation 15.7.1 shall apply.

N O T E: See Regulation 51.7.

51.6

Group $N_s CCh_s h_s h_s$

51.6.1

This group shall be repeated as often as necessary to indicate the forecast general cloud distribution. The order of the cloud groups shall be such that the lowest base is given first, the next higher base second, etc.

51.6.2

In any cloud group, N shall be the total amount of cloud that the forecaster expects to be at the level given by $h_s h_s h_s$.

51.6.3

When clear sky is forecast, the cloud group shall not be used except after a change group when the abbreviation SKC shall be used. When N_s = 1 to 9, cloud groups shall always be used.

51.6.4

When in the first cloud group N_s = 9 is forecast, this group shall be coded $9//h_s h_s h_s$, where $h_s h_s h_s$ shall be the vertical visibility.

N O T E: See Regulation 51.7.

51.7

Code word CAVOK

When it is expected that the following conditions will apply simultaneously, the code word CAVOK shall be included in place of the groups VVVV, w'w' and $N_sCCh_sh_sh_s$:

(a) Visibility: 10 km or more;

(b) No cloud below 1 500 metres or below the highest minimum sector altitude, whichever is greater, and no cumulonimbus;

(c) No precipitation, thunderstorm, shallow fog or low drifting snow.

51.8

Group ($0G_FG_FT_FT_F$)

To indicate forecast temperature(s) at the time(s) indicated by G_FG_F, one or more groups $0G_FG_FT_FT_F$ shall be used, if required.

51.9

Group ($6Ich_ih_ih_it_L$)

51.9.1

If required, this group shall be repeated as often as necessary to indicate more than one type or more than one layer of icing.

51.9.2

If the thickness of the layer for any one type of icing is greater than 2 700 metres, the group shall be repeated and the case indicated in the second group shall coincide with the top of the layer as given in the preceding group.

51.10

Group ($5Bh_Bh_Bh_Bt_L$)

Regulations 51.9.1 and 51.9.2 regarding icing shall equally apply to turbulence.

51.11

Change groups TTTTT GGG_eG_e (or GG).

51.11.1

These groups shall be used, as indicated in Regulation 51.1.4, when, during the period G_1G_1 to G_2G_2, a change in some or all the elements forecast is expected to occur at some intermediate time GG or during the period GG to G_eG_e. Such groups shall not be introduced until all the data groups necessary to describe the elements forecast in the period G_1G_1 to GG have been given. The change groups shall be followed by a description of all the elements for which a change is forecast to occur rapidly at GG, or temporarily, intermittently or gradually during the period GG to G_eG_e. When an element is not described in data groups which follow the change groups, the description of this element for the period between G_1G_1 and GG shall be considered to remain valid.

51.11.2

The groups GRADU GGG_eG_e shall indicate a change beginning at GG and continuing at an approximately constant rate throughout the period GG to G_eG_e.

51.11.3

The groups RAPID GG shall be used instead of GRADU GGG_eG_e if the change(s) is(are) expected to take place during a period lasting less than half an hour.

N O T E: The conditions described after the groups GRADU GGG_eG_e or the groups RAPID GG are those expected to prevail from G_eG_e (or GG when RAPID GG is appropriate) until G_2G_2 unless a further change is expected, in which case another set of change groups must be used.

51.11.4

The groups TEMPO GGG_eG_e shall be used when the modified forecast condition is expected in each instance to last less than one hour and, if expected to recur, will not in the aggregate cover more than half of the forecast period during which the phenomenon is expected to occur, i.e. the period indicated by GGG_eG_e.

N O T E: If the modified forecast condition is expected to last one hour or more Regulation 51.11.2 or 51.11.3 applies; i.e. the change groups GRADU GGG_eG_e or RAPID GG must be used at the beginning and end of the period during which conditions are expected to depart from those forecast prior to GG.

51.11.5

The groups INTER GGG_eG_e shall be used if the changes are expected to occur frequently for short periods of time, i.e. more frequently than those which would be indicated by TEMPO, the conditions fluctuating between those forecast before GG and those described after the groups INTER GGG_eG_e.

N O T E: The groups following the change groups TEMPO GGG_eG_e or INTER GGG_eG_e describe the conditions expected to prevail during the temporary or intermittent departures from the conditions expected before GG. If the conditions expected after G_eG_e differ significantly from those prevailing before GG a further set of change groups (GRADU GGG_eG_e or RAPID GG) must be used.

51.12

Group PROB C_2C_2

51.12.1

In order to indicate the probability of occurrence of an alternative value of a forecast element, the group PROB C_2C_2 shall be placed after that element, and be followed by the alternative value.

51.12.2

A probability statement may also be related to the part of a forecast introduced by a change group. In this case the group PROB C_2C_2 shall be placed immediately before the change groups.

51.13

Amended aerodrome forecast

An amended aerodrome forecast in code form shall be identified by the use of the prefix TAF AMD in place of TAF, and it shall cover the whole remaining validity period of the original TAF.

*

* *

CONSOLIDATED LIST OF OTHER AMENDMENTS

1. ARFOR and ROFOR

Reg. 53.4.2 and Reg. 54.4.1 need to be changed and new Regs. have to be added as follows:

ARFOR Reg.	ROFOR Reg.	Text to be inserted	
	54.4.1	Reg. 53.4.1 shall apply	
	54.4.2	(no change)	
	54.4.3	Regs. 53.4.2 to 53.4.8 inclusive shall apply	
53.4.2		Text of 51.11.1	
53.4.3		Text of 51.11.2	
53.4.4		Text of 51.11.3	
53.4.5		Text of 51.11.4	(*)
53.4.6		Text of 51.11.5	
53.4.7		Text of 51.11.6	
53.4.8		Text of 51.11.7	

(*) As presently in force, i.e. referring to $9i_3nnn$

2. Page I-C-4

Specification of C_2 : delete "FM 51-V" from inside brackets.

Page I-C-5

Introduce new specification

C_2C_2 Probability in per cent rounded off to whole tens.

(FM 51-V)

(1) C_2C_2 cannot exceed 50 = 50 per cent. (If the probability of occurrence of ..... etc.) (same text as Note (1) under C_2).

3. Page I-C-10

Specification of F_t: delete "FM 51-V" from inside brackets.

4. Page I-C-12

Specification of G_p: delete "FM 51-V" from inside brackets.

5. Page I-C-13

New specification:

G_eG_e Time of ending of sub-period of forecast in whole hours GMT.

(FM 51-V)

6. Page I-C-19

Specification of i_3: delete "FM 51-V" from inside brackets.

7. Page I-C-21

Specifications of L_aL_a and of L_oL_o: delete "FM 51-V" from inside brackets.

8. Page I-C-25

Specification of nnn: delete "FM 51-V" from inside brackets.

9. Page I-C-28

Specification of $P_2P_2P_2$: delete last part of text after the comma: ", or altimeter setting (QNH) in whole millibars (FM 51-V)".

10. Page I-C-36

Specification of TTTTT: amend text as follows:

TTTTT: Change indicators of trend-type landing forecasts (GRADU, RAPID, INTER, TEMPO, TEND) and of aerodrome forecasts (GRADU, RAPID, INTER, TEMPO)

(FM 15-V, FM 16-V, FM 51-V)

(1) Specifications ..... etc. ..... (unchanged)

11. Page I-D-52 - Code table 1864

$91P_2P_2P_2$: Delete last part of the text: "or forecast lowest QNH (FM 51-V) .....period."

12. Page I-D-53 - Code table 1864

$91P_2P_2P_2$: Delete sub-paragraph (ii) altogether.

13. Page I-B-3

WX NIL: Amend the text to read as follows:

"WX NIL Abbreviation indicating that significant weather conditions, expressed by means of code table 4678, are forecast to end (FM 15-V, FM 16-V, FM 51-V)."

A N N E X XV

Annex to Recommendation 12 (CBS-Ext. (76))

REVISION OF THE NOTES ON CODES FM 11-V, FM 14-V, FM 21-V, FM 22-V, FM 23-V, FM 24-V AND FM 26-IV

CODE FORM FM 11-V SYNOP

1. Replace Notes (1) and (2) on page I-A-10 of Volume I of the Manual on Codes by the new Notes (1) to (4) below:

N O T E S:

(1) The code form FM 11-V SYNOP is used for reporting surface synoptic observations from a land station, whether manned or automatic. However, the code form FM 14-V SYNOP, rather than the code form FM 11-V SYNOP, should be used when the land station at which the observations are made is permanently automatic.

(2) Land stations which are sometimes manned and sometimes operated automatically always draw up their reports in a single code, preferably FM 11-V.

(3) The automatic land weather stations which use the code form FM 14-V SYNOP are listed in Volume A of WMO Publication No. 9.

(4) A SYNOP report coded in FM 11-V, or a bulletin of these reports, is identified by the symbolic letters $M_i M_i M_j M_j$ = MMXX.

2. Renumber present Notes (3) and (4) on page I-A-10 of Volume I of the Manual on Codes as (5) and (6) respectively.

CODE FORM FM 14-V SYNOP

1. Replace the Notes given under this code form on page I-A-21, Volume I of the Manual on Codes, by the Notes and Regulations set out below:

N O T E S:

(1) The code form FM 14-V SYNOP is used for the reporting of synoptic surface observations from an automatic land weather station. This code form, rather than the code form FM 11-V, should be used when the land station at which the observations are made is permanently automatic.

(2) Land stations which are sometimes manned and sometimes operated automatically always draw up their reports in a single code, preferably FM 11-V.

(3) The automatic land weather stations which use the code form FM 14-V SYNOP are listed in Volume A of WMO Publication No. 9.

(4) A SYNOP report coded in FM 14-V, or a bulletin of these reports, is identified by the symbolic letters $M_i M_i M_j M_j$ = AAXX.

(5) Except for the group Oddff, which is always included in all reports, the groups with numerical indicators may be included or omitted under the conditions stated in the regulations set out below. The omission of some of them is indicated by an appropriate code figure of the group $s_t i_R NV^+h$.

(6) In principle, the observing criteria used in FM 14-V should agree as far as possible with those given under FM 11-V, except where the observing conditions prescribed for FM 14-V require otherwise.

(7) At the end of reports in code form FM 14-V, coast stations may include the groups relating to sea-surface temperature and waves used in the code form FM 24-V SHIP.

R E G U L A T I O N S:

14.1

General

14.1.1

The code name SYNOP shall not be included in the report.

14.1.2

In a meteorological bulletin of SYNOP reports coded in FM 14-V which were made at the same time, the groups $M_i M_i M_j M_j$ YYGGi$_u$ shall be included only as the first line of the text.

14.1.3

Regulation 11.1.3 shall apply to the code form FM 14-V.

14.2

Group YYGGi$_u$

Regulation 11.2 shall apply.

14.3

Group $s_t i_R NV^+ h$

14.3.1

The group $s_t i_R NV^+ h$ shall be included.

N O T E S:

(1) For the use of s_t, see Regulation 14.5.1.2.

(2) For the use of i_R, see Regulation 14.11.2.

14.3.2

Visibility V^+

Regulation 11.4.1 shall apply to the coding of V^+, as appropriate.

14.4

Group Oddff

14.4.1

The group Oddff shall be included in all reports from automatic weather stations.

14.4.2

Regulations 11.3.2.1 and 11.3.2.3 shall apply to this group as appropriate.

14.5

Group $1w^+w^+WW$

14.5.1

Omission of the group

14.5.1.1

Omission of the group $1w^+w^+WW$ shall be considered when neither present weather nor past weather can be expressed by code figures other than 00.

14.5.1.2

The code figure s_t shall indicate whether or not the group $1w^+w^+WW$ is included in the report.

14.5.1.3

The decision whether or not to include the group $1w^+w^+WW$ in reports from automatic weather stations shall be taken at the national level.

N O T E: See Note (1) on Code table 3852.

14.5.2

Present weather w^+w^+

If more than one of the figures from 00 to 19 of Code table $4677^+w^+w^+$ are applicable to describe present weather, the highest figure shall be selected.

N O T E: See Notes (1) to (4) to Code table $4677^+w^+w^+$.

14.5.3

Past weather WW

14.5.3.1

The period covered by WW shall exclude the ten-minute period preceding the time of observation, which is covered by w^+w^+.

The period covered by w^+w^+ and WW together shall be:

6 hours for observations at 0000, 06000, 1200 and 1800 GMT;
3 hours for observations at 0300, 0900, 1500 and 2100 GMT;
2 hours for intermediate observations if taken every two hours;
1 hour for hourly observations.

14.5.3.2

The code figure for WW shall be selected in such a way that WW and w^+w^+ together give as complete a description as possible of the weather in the time interval concerned. For example, if the type of weather undergoes a complete change during the time interval concerned, the code figure selected for WW shall describe the weather prevailing before the type of weather indicated by w^+w^+ began.

14.5.3.3

If more than one figure of the WW code is applicable to describe past weather, the highest figure shall be selected.

14.5.4

Weather phenomena

14.5.4.1

When fog or ice fog is not deeper than about two metres on land or ten metres at sea, it shall be reported as shallow fog or shallow ice fog.

14.5.4.2

A thunderstorm shall be regarded as being at the station from the time thunder is first heard, whether or not lightning is seen or precipitation is occurring at the station, until the time of the last audible thunder. The cessation shall be considered as confirmed when thunder is not heard for 10-15 minutes after the last audible thunder.

14.5.4.3

Visibility criteria, if used, for reporting lithometeors and blowing snow or blowing spray shall be fixed nationally.

14.5.4.4

For a squall to be reported, the following conditions shall be observed: a sudden increase of wind by at least 8 m/s, the speed rising to 20 m/s or more and lasting at least one minute.

14.6

Group $2s_nTTT$

14.6.1

The group $2s_nTTT$ shall be included whenever the air temperature is measured and available.

14.6.2

When the data are not available as a result of a temporary instrument failure, automatic weather stations programmed to transmit this group shall, by national decision, include it in their reports in form 2////.

14.7

Group $3s_nT_dT_dT_d$

14.7.1

The group $3s_nT_dT_dT_d$ shall be included whenever the dew-point temperature is available.

N O T E : It is recommended that the dew-point (and not the frost-point) temperature shall be included in synoptic surface reports when the vapour pressure is lower than the saturated water vapour pressure of 0°C.

14.7.2

The group 39UUU shall replace the group $3s_nT_dT_dT_d$ in reports from automatic weather stations when dew-point temperature is not available from these stations and humidity of the air is measured.

14.7.3

Regulation 14.6.2 shall apply either to group $3s_nT_dT_dT_d$ or to group 39 UUU.

14.8

Group $4P_oP_oP_oP_o$

Regulations 11.8.1, 11.8.2 and 14.6.2 shall apply (see also Notes (1) and (2) under Regulation 11.5.1.2).

14.9

Group 5PPPP

14.9.1

Regulation 11.5.1.2 shall apply.

N O T E: See Notes (1) and (2) under Regulation 11.5.1.2.

14.9.2

By regional decision, a high-level station which cannot give pressure at mean sea-level to a satisfactory degree of accuracy shall report the geopotential height of an agreed standard pressure level, reporting the group 5PPPP in the form $5a^{+}_{3}hhh$.

14.9.3

High-level stations which can calculate the pressure at mean sea-level and the geopotential height of a standard pressure level shall report pressure reduced to mean sea-level in the group 5PPPP.

N O T E: Such stations may, in addition, use the group $5a^{+}_{3}hhh$.

14.9.4

Regulation 14.6.2 shall apply to group 5PPPP and/or to group $5a^{+}_{3}hhh$.

14.10

Group $6a^{+}p_{v}p_{v}p_{v}$

14.10.1

The group $6a^{+}p_{v}p_{v}p_{v}$ shall be included to report, if available, either the three-hour pressure tendency preceding the observation or, in tropical areas, by regional decision, the 24-hour pressure change. Where, under a regional agreement, it is required to report both the three-hour pressure tendency and the 24-hour pressure change, the group $6a^{+}p_{v}p_{v}p_{v}$ shall be repeated.

N O T E: Information on these regional agreements is given in Volume II of the Manual on Codes.

14.10.2

Regulation 14.6.2 shall apply to this group.

14.11

Group $7RRRt_R$

14.11.1

The group $7RRRt_R$ shall be included in the report only when there has been measurable precipitation during the 6 hours preceding the observation time.

14.11.2

The code figure i_R shall indicate whether or not the group $7RRRt_R$ has been omitted, and why.

14.11.3

In the event of a temporary instrument failure or of absence of precipitation, the decision to include or to omit the group $7RRRt_R$ in reports from automatic weather stations shall be taken at the national level.

14.12

Group $8N_hC_LC_MC_H$

14.12.1

This group shall be omitted when there are no clouds (i.e., N = 0) and when the sky is indiscernible (i.e., N = 9).

14.12.2

This group shall also be omitted from the reports of automatic weather stations not equipped to report these data.

2. Amend code tables 1600 and 1819 as follows:

Code table 1600

h - Height above ground of the base of the lowest cloud seen

Code figure	
0	0 to 50 m
1	50 to 100 m
2	100 to 200 m
3	200 to 300 m
4	300 to 600 m
5	600 to 1 000 m
6	1 000 to 1 500 m
7	1 500 to 2 000 m
8	2 000 to 2 500 m
9	2 500 m or more, or no clouds
/	Height of base of cloud not known or base of clouds at a level lower and tops at a level higher than that of the station

N O T E S:

(1) A height exactly equal to one of the values at the ends of the ranges shall be coded in the higher range; e.g., a height of 600 m shall be reported by code figure 5.

(2) Due to the limitation in range of the cloud-sensing equipment used by an automatic station the code figures reported for h could have one of the three following meanings:

(a) The actual height of the base of the cloud is within the range indicated by the code figure; or

(b) The height of the base of the cloud is greater than the range indicated by the code figure but cannot be determined due to instrumental limitations; or

(c) There are no clouds vertically above the station.

Code table 1819

i_R - Indicator for inclusion of precipitation group

Code figure	
0	The group 7RRRt_R <u>is not</u> included in the report because there has been no precipitation during the preceding 6 hours

Code figure

1 * The group 7RRRt_R is included in the report because there has been measurable precipitation in the preceding 6 hours

/ The group 7RRRt_R is not included in the report because it was not possible to measure the amount

* Automatic weather stations for which precipitation is coded automatically may use this code figure even if there has been no precipitation or in the event of temporary instrument failure.

CODE FORM FM 21-V

1. Replace Notes (1) and (2) on page I-A-34 of Volume I of the Manual on Codes by the new Notes (1), (2) and (3) below:

(1) The code form FM 21-V SHIP is used for reporting surface synoptic observations from a sea station, whether manned or automatic. However, the code form FM 24-V SHIP, rather than the code form FM 21-V SHIP, should be used when the sea station at which the observations are made is permanently automatic.

(2) Sea stations which are sometimes manned and sometimes operated automatically always draw up their reports in a single code, preferably FM 21-V.

(3) A SHIP report coded in FM 21-V, or a bulletin of these reports, is identified by the symbolic letters $M_iM_iM_jM_j$ = NNXX.

2. Renumber the present Notes (3), (4) and (5) on page I-A-34 of Volume I of the Manual on Codes as (4), (5) and (6) respectively.

CODE FORM FM 22-V

Replace Notes (1) and (2) on page I-A-40 of Volume I of the Manual on Codes by the new Notes (1) and (2) below:

(1) The code form FM 22-V SHIP is used for reporting surface synoptic observations from a sea station, whether manned or automatic, in abbreviated form. However, the code form FM 24-V SHIP, rather than the code form FM 22-V SHIP, should be used when the sea station at which the observations are made is permanently automatic.

(2) A SHIP report coded in FM 22-V, or a bulletin of these reports, is identified by the symbolic letters $M_iM_iM_jM_j$ = NNXX.

CODE FORM FM 23-V

Replace the text of Note (1) on page I-A-43 by the following:

(1) The code form FM 23-V SHRED is used for reporting surface synoptic observations from a sea station, whether manned or automatic, in reduced form. However, the code form FM 24-V SHIP, rather than the code form FM 23-V SHRED, should be used when the sea station at which the observations are made is permanently automatic.

CODE FORM FM 24-V SHIP

Replace the notes to this code form on page I-A-46 of Volume I of the Manual on Codes by the following notes and regulations:

N O T E S:

(1) The code form FM 24-V SHIP is used for the reporting of synoptic surface observations from an automatic sea weather station. The code form, rather than the code form FM 21-V, should be used when the sea station at which the observations are made is permanently automatic.

(2) Sea stations which are sometimes manned and sometimes operated automatically always draw up their reports in a single code, preferably FM 21-V.

(3) A SHIP report coded in FM 24-V, or a bulletin of these reports, is identified by the symbolic letters $M_iM_iM_jM_j$ = BBXX.

(4) Except for the group Oddff, which is always included in all reports, the groups with numerical indicators may be included or omitted under the conditions stated in the regulations set out below. The omission of some of them is indicated by an appropriate code figure of the group $s_t i_R NV^+h$.

(5) In principle, the observing criteria used in FM 24-V should agree as far as possible with those given under FM 21-V, except where the observing conditions prescribed for FM 24-V require otherwise.

REGULATIONS

24.1

General

24.1.1

The code name SHIP shall not be included in the report.

24.1.2

In a meteorological bulletin of SHIP reports coded in FM 24-V, the group $M_iM_iM_jM_j$ shall be included only as the first line of the text.

24.1.3

Regulation 21.1.3 shall apply to the code FM 24-V.

24.1.4

The bracketed groups to be included in a report shall be determined by the Member who operates the automatic station.

24.2

Group YYGGi

Regulation 11.2 shall apply.

24.3

Group $s_t i_R NV^+ h$

24.3.1

The group $s_t i_R NV^+ h$ shall always be included.

N O T E S:

(1) For the use of s_t, see Regulation 14.5.1.2.

(2) For the use of i_R, see Regulation 14.11.2.

24.3.2

Visibility V^+

Regulation 11.4.1 shall apply to the coding of V^+, as appropriate.

24.4

Group Oddff

24.4.1

The group Oddff shall be included in all reports from automatic weather stations.

24.4.2

Regulations 11.3.2.1 and 11.3.2.3 shall apply to this group as appropriate.

24.5

Group $1w^+w^+WW$

24.5.1

Omission of the group

24.5.1.1

Omission of the group $1w^+w^+WW$ shall be considered only when neither present weather nor past weather can be expressed by code figures other than 00.

24.5.1.2

The code figure s_t shall indicate whether or not the group $1w^+w^+WW$ is included in the report.

24.5.1.3

The decision whether or not to include the group $1w^+w^+WW$ in reports from automatic weather stations shall be taken at the national level.

N O T E: See Note (1) to Code table 3852.

24.5.2

Present weather w^+w^+

Regulation 14.5.2 shall apply.

N O T E: See Notes (1) to (4) to Code table $4677^+w^+w^+$.

24.5.3

Past weather WW

24.5.3.1

Regulations 14.5.3.1 to 14.5.3.3 inclusive shall apply.

24.5.4

Weather phenomena

Regulations 14.5.4.1 to 14.5.4.4 inclusive shall apply.

24.6

Group $2s_nTTT$

Regulations 14.6.1 and 14.6.2 shall apply.

24.7

Group $(3s_nT_dT_dT_d)$

24.7.1

Regulation 14.7.1 shall apply.

N O T E: It is recommended that the dew-point (and not the frost-point) temperature shall be included in synoptic surface reports when the vapour pressure is lower than the saturated water vapour pressure of 0°C.

24.7.2

Regulation 14.7.2 shall apply.

24.7.3

Regulation 14.6.2 shall apply either to group $2s_nT_dT_dT_d$ or to group 39UUU.

24.8

Group 5PPPP

24.8.1

The group 5PPPP shall indicate air pressure reduced to mean sea-level.

24.8.2

Regulation 14.6.2 shall apply.

24.9

Group $(6a^+p_vp_vp_v)$

24.9.1

Mobile sea stations and, in non-tropical areas, fixed sea stations shall report in this group, when used (see Regulation 24.1.4), the three-hour pressure tendency.

24.9.2

The use of this group by fixed sea stations in tropical areas to report 24-hour pressure change shall be determined by regional decision. Where, under a regional agreement, it is required to report both the three-hour pressure tendency and the 24-hour pressure change, the group shall be repeated.

N O T E: Information on these regional agreements is given in Volume II of the Manual on Codes.

24.9.3

Regulation 14.6.2 shall apply.

24.10

Group ($7RRRt_R$)

24.10.1

The group $7RRRt_R$, when used (see Regulation 24.1.4), shall be included only when it has been possible to measure precipitation and there has been precipitation during the six hours preceding the observation time.

24.10.2

Regulations 14.11.2 and 14.11.3 shall apply.

24.11

Group ($8N_hC_LC_MC_H$)

Regulations 14.12.1 and 14.12.2 shall apply.

24.12

Group ($9I_sE_sE_sR_s^+$)

The group ($9I_sE_sE_sR_s^+$) shall be included in the report whenever ice accretion on the station is measured.

24.13

Groups ($s_wT_wT_wT_wn_w$ $P_wP_wH_wH_wP_w$ $P_wH_wH_wd_wd_w$ ($P_wP_wH_wd_wd_w$))

24.13.1

The code figure for n_w shall indicate the number of wave groups that follow (0, 1, 2 or 3).

24.13.2

The first four code figures of the first wave group shall be used to report wind waves. When swell cannot be detected the final P_w in this group shall be reported as /.

24.13.3

When swell can be distinguished from wind waves, the predominant swell system shall be reported by the six code figures following the figures for wind waves.

24.13.4

When a second swell system is observed, it shall be reported by the third wave group. This group shall be omitted if a second swell system cannot be detected or if reporting of this swell system is not required.

24.13.5

If there is a swell with no wind waves, the first wave group shall be reported as $0000P_w$.

24.13.6

When it is impossible to distinguish between wind waves and swell, one wave group shall be reported in the form $P_wP_wH_wH_w/$ and n_w shall be coded 6.

24.13.7

A confused sea shall be reported by the first wave group in the form $//H_wH_w/$.

24.13.8

When the sea is calm and there is no significant swell (periods of sea and swell each less than 0.5 second and heights each less than 0.25 metre), the wave groups shall be omitted and n_w shall be coded 0.

24.13.9

If the wave groups are not included for any other reason than the one given in Regulation 24.13.8, and the group $s_nT_wT_wT_wn_w$ is included, n_w shall be coded /.

CODE FORM FM 26-IV

Replace the text of the note on page I-A-47 of Volume I of the Manual on Codes by the following:

"The code form FM 26-IV SPESH is used for a special report from a sea station whether manned or automatic. However, the code form FM 24-V SHIP, rather than the code form FM 26-IV SPESH, should be used when the sea station at which the observations are made is permanently automatic.

A N N E X XVI

Annex to Recommendation 19 (CBS-Ext.(76))

AMENDMENTS TO THE MANUAL ON THE GLOBAL TELECOMMUNICATION SYSTEM, VOLUME I - GLOBAL ASPECTS

PART I - ORGANIZATION OF THE GLOBAL TELECOMMUNICATION SYSTEM

(1) Page I-3: In paragraph 2.1, insert after (d) the following sub-paragraphs (e) and (f):

(e) Establishing radio broadcasts, as required, in accordance with regional plans;

(f) Carrying out periodical monitoring of the operation of the GTS of the WWW.

(2) Page I-3: in paragraph 2.2, insert after (d) the following sub-paragraphs (e) and (f):

(e) Establishing radio broadcasts, as required, in accordance with regional plans;

(f) Carrying out periodical monitoring of the operation of the GTS of the WWW.

(3) Page I-5: After paragraph 2.9.3 insert the following new section 2.10:

2.10 Responsibilities for exchange and distribution of processed meteorological information

2.10.1 The GTS should be capable of exchanging and distributing the output products of WMCs and RMCs as well as AFCs, as required.

2.10.2 The exchange of output products (including satellite data) between centres should be carried out on point-to-point circuits in pictorial or alphanumeric form (e.g. grid-point values).

(4) Attachment I-2

Pages I-13/I-14: Replace by the material contained in Appendix I to this annex (Table: Target responsibilities of centres on the Main Trunk Circuit and its branches, for the transmission of observational data; Figure 1: Target routeing of observational data on the Main Trunk Circuit and its branches)

New pages I-14a/I-14b/I-14c: Insert the material contained in Appendix II to this annex (Table: Present responsibilities of centres on the Main Trunk Circuit and its branches, for the transmission of observational data; Figure 2: Present routeing of observational data on the Main Trunk Circuit and its branches)

Page I-16: At the end of paragraph 3(d), add the following sub-paragraph (iii):

(iii) Synoptic surface observation reports from land stations exchanged on the MTC and its branches shall include:

In FM 11-V: All groups up to and including $T_dT_dj_aj_pj_p$:

- Plus groups 99_{ppp} and $6P_oP_oP_oP_o$ if conditions apply;
- Plus group 7RRjj if available and circuit capacity permits;

In FM 14-V: All groups available up to and including group $8N_hC_LC_MC_H$.

*

* *

Appendix I

ATTACHMENT I-2

TARGET RESPONSIBILITIES OF CENTRES ON THE MAIN TRUNK CIRCUIT AND ITS BRANCHES, FOR THE TRANSMISSION OF OBSERVATIONAL DATA

The target responsibilities of centres performing telecommunication functions and located on the Main Trunk Circuit and its branches for the collection, exchange and distribution of observational data

These are given in the following table and diagram:

WMC and RTH	Collection of observational data from the zones of responsibility of the following RTHs
Melbourne	Melbourne (51), Wellington (52)
Tokyo	Tokyo (25), Bangkok (26)
Washington	Washington (41)
Bracknell	Bracknell (61)
Paris	Paris (63), Rome (66)
Offenbach	Offenbach (64), Norrköping (62), Vienna (68)
Prague	Prague (67)
Moscow	Moscow (65), Norrköping (62), Sofia (69), Khabarovsk (24), Novosibirsk (23), Tashkent (22)
Cairo	Cairo (11), Algiers (16), Dakar (15), Kano (14)
New Delhi	New Delhi (27), Jeddah (29), Tehran (21)
Brasilia	Brasilia (31), Buenos Aires (32), Maracay (33)
Nairobi	Nairobi (12), Pretoria (13)
Peking	Peking (28)

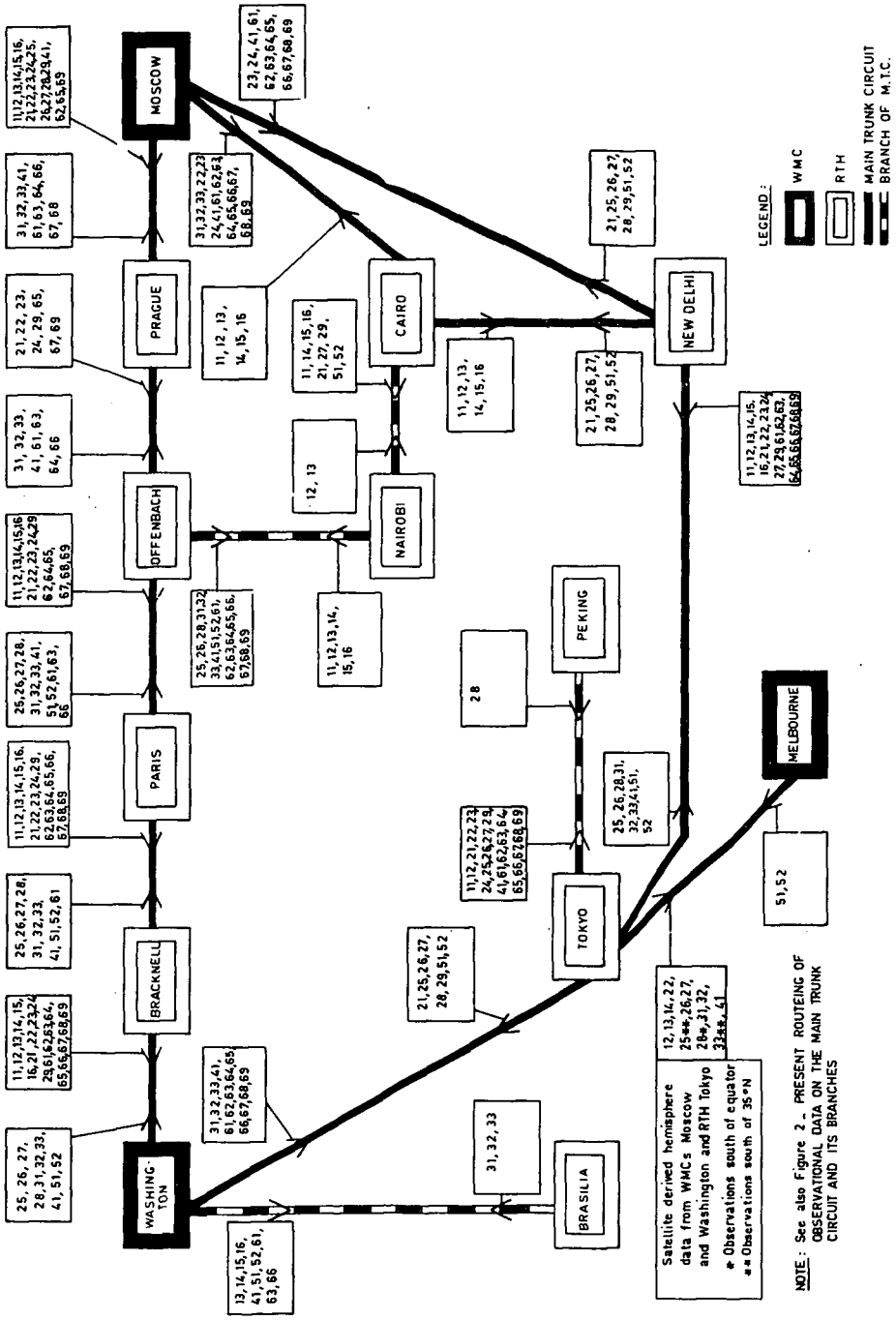


Figure 1 — Target routeing of observational data on the Main Trunk Circuit and its branches

Region I

11. Cairo
12. Nairobi
13. Pretoria
14. Kano
15. Dakar
16. Algiers

Region II

21. Tehran
22. Tashkent
23. Novosibirsk
24. Khabarovsk
25. Tokyo + satellite data
26. Bangkok
27. New Delhi
28. Peking
29. Jeddah

Region III

31. Brasilia
32. Buenos Aires + Antarctic data
33. Maracay

Region IV

41. Washington + Antarctic data + satellite data

Region V

51. Melbourne
52. Wellington + Antarctic data

Region VI

61. Bracknell
62. Norrköping
63. Paris
64. Offenbach + satellite data
65. Moscow + Antarctic data + satellite data
66. Rome
67. Prague
68. Vienna
69. Sofia

*

* *

Appendix II

ATTACHMENT I-2 (contd.)

PRESENT RESPONSIBILITIES OF CENTRES ON THE MAIN TRUNK CIRCUIT AND ITS BRANCHES, FOR THE TRANSMISSION OF OBSERVATIONAL DATA

The present responsibilities of centres performing telecommunication functions and located on the Main Trunk Circuit and its branches for the collection, exchange and distribution of observational data

These are given in the following table and diagram:

WMC and RTH	Collection of observational data from the zones of responsibility of the following RTHs
Melbourne	Melbourne (51), Wellington (52)
Tokyo	Tokyo (25), Bangkok (26)
Washington	Washington (41)
Bracknell	Bracknell (61)
Paris	Paris (63), Rome (66), Algiers (16), Dakar (15)
Offenbach	Offenbach (64), Norrköping (62), Vienna (68)
Prague	Prague (67)
Moscow	Moscow (65), Norrköping (62), Sofia (69), Khabarovsk (24), Novosibirsk (23), Tashkent (22)
Cairo	Cairo (11), Algiers (16), Dakar (15), Kano (14), Jeddah (29)
New Delhi	New Delhi (27), Jeddah (29), Tehran (21)
Brasilia	Brasilia (31), Buenos Aires (32), Maracay (33)
Nairobi	Nairobi (12), Pretoria (13)
Peking	Peking (28)

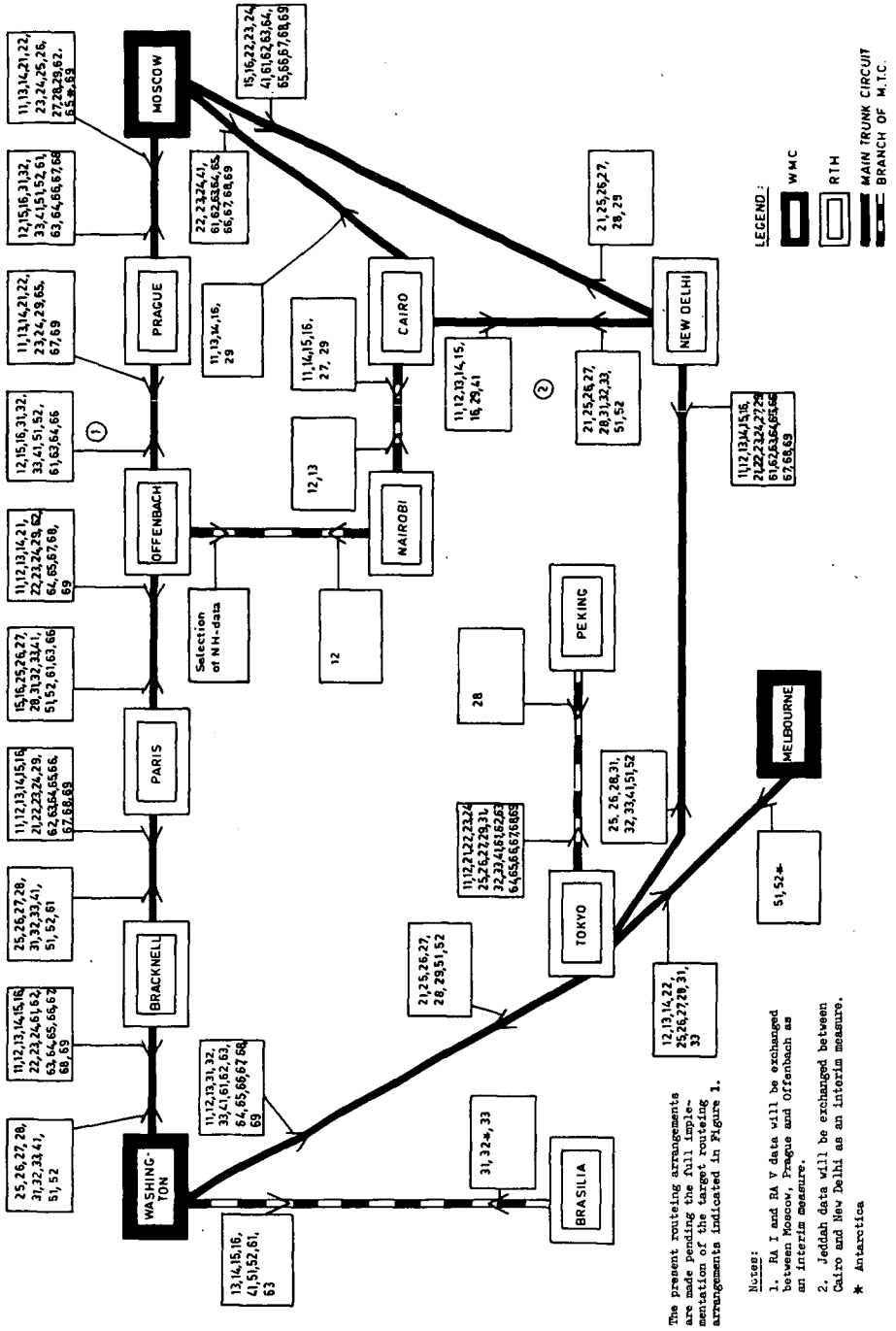


Figure 2 — Present routeing of observational data on the Main Trunk Circuit and its branches

Region I

11. Cairo
12. Nairobi
13. Pretoria
14. Kano
15. Dakar
16. Algiers

Region II

21. Tehran
22. Tashkent
23. Novosibirsk
24. Khabarovsk
25. Tokyo + satellite data
26. Bangkok
27. New Delhi
28. Peking
29. Jeddah

Region III

31. Brasilia
32. Buenos Aires + Antarctic data
33. Maracay

Region IV

41. Washington + Antarctic data + satellite data

Region V

51. Melbourne
52. Wellington + Antarctic data

Region VI

61. Bracknell
62. Norrköping
63. Paris
64. Offenbach + satellite data
65. Moscow + Antarctic data + satellite data
66. Rome
67. Prague
68. Vienna
69. Sofia

*

* *

ANNEX XVII

Annex to Recommendation 21 (CBS-Ext.(76))

AMENDMENTS TO THE MANUAL ON THE GLOBAL TELECOMMUNICATION SYSTEM, VOLUME I - GLOBAL ASPECTS

PART I - ORGANIZATION OF THE GLOBAL TELECOMMUNICATION SYSTEM

Part A

AMENDMENTS TO SECTION 2.7: RESPONSIBILITY FOR RECEPTION OF METEOROLOGICAL REPORTS FROM STATIONS AT SEA

Page I-4

Paragraph 2.7: In the title, replace the word "reception" by "collection".

Paragraph 2.7.1: In the first line, replace the word "reception" by "collection".

Add the following NOTE after the paragraph:

NOTE: The list of coastal radio stations accepting ships' weather reports is published in WMO Publication No. 9, Volume D, Part B.

Paragraph 2.7.4: Amend the NOTE to read:

NOTE: Details of these procedures are given in Attachment I-4. Additional special procedures adopted by regional associations are given in Volume II of the Manual.

Page I-5

Add a new paragraph 2.7.11 to read:

2.7.11 Members should arrange that the word METEO is employed as the first word in the address of ships' weather reports.

Renumber paragraphs 2.7.11 to 2.7.15 to read 2.7.12 to 12.7.16 respectively.

*

* *

ANNEX XVII

Part B

ATTACHMENT I-4

ARRANGEMENTS FOR THE COLLECTION OF SHIPS' WEATHER REPORTS AND OCEANOGRAPHIC REPORTS (BATHY/TESAC)

1. *Zones for the collection of ships' weather reports*

Oceanic and sea areas are divided first into WMO Regions and the Antarctic and then, within each Region, into a small number of zones determined by the regional associations concerned in accordance with the following principles:

(*a*) As a rule, zones should be linked to RTHs responsible for the international dissemination of the reports collected by coastal radio stations in the zone;

(*b*) By way of exception, zones pertaining to one Region may extend into the sea area of an adjacent Region, if so agreed between the two regional associations concerned;

(*c*) Along the border line, between two Regions, zones pertaining to each Region may overlap each other, if so agreed between the two regional associations concerned.

The zones for the collection of ships' weather reports, as agreed by regional associations and the Executive Committee, are shown in Figure 1.

2. *Transmission of ships' weather reports to coastal radio stations*

2.1 Weather reports from mobile ship stations should be transmitted to a coastal radio station as soon as possible after the time of observation.

2.2 Weather reports from mobile ship stations should (without special request) be transmitted from the ship to the nearest coastal radio station situated in the zone in which the ship is navigating.

2.3 If it is difficult, due to radio propagation conditions or other circumstances, to contact promptly the nearest coastal radio station in the zone in which the ship is navigating, the weather messages should be cleared by applying the following procedures in the order given below:

(*a*) Transmission to any other coastal radio station in the zone in which the ship is navigating;

(*b*) Transmission to any coastal radio station in an adjacent zone within the same Region;

(*c*) Transmission to any coastal radio station in any other zone within the same Region;

(*d*) Transmission to a coastal radio station in an adjacent zone in a neighbouring Region or, failing that, to any other station in a neighbouring Region;

(*e*) Transmission to another ship or an ocean weather station with the function or willing to act as a relay station.

2.4 In zones situated along the border line between two Regions, the order of the procedures for the transmission of ships' weather reports to coastal radio stations, as laid down in sub-paragraphs (*a*), (*b*), (*c*), (*d*) and (*e*) of paragraph 2.3 above, may be interchanged *subject to agreement between the two regional associations involved.* Any agreement reached on this matter should specify the limits of the area concerned.

2.5 Members may issue instructions to their mobile ship stations to the effect that their weather reports may be transmitted via one of their home coastal radio stations designated for the collection of reports from the zone, if the application of such procedures may facilitate the efficient contact with coastal radio stations and the clearing of weather messages.

3. *Criteria and performance of coastal radio stations accepting ships' weather reports*

3.1 Members should ensure that the coastal radio stations designated to receive ships' weather messages satisfy the following criteria:

(*a*) Accept ships' weather reports free of charge to the ship;

(*b*) For the purpose of receiving ships' weather reports:

(*i*) Keep a continuous 24-hour watch; or

(*ii*) Keep a watch for at least 30 minutes beginning at 0000, 0600, 1200 and 1800 GMT daily; watch should also be kept for a similar minimum time at the beginning of the nearest "single-operator period" following those standard synoptic hours; *

(*iii*) Keep watch for shorter periods (stations with limited hours of operation) than those mentioned under (*ii*) above (when these stations are considered of particular value).

3.2 If any particular coastal radio station is shown consistently to fail to accept promptly ships' weather reports or if the subsequent retransmission is deficient, the president of the regional association concerned should take steps with a view to improving the situation and, if such action does not succeed, action should be taken to remove that station from the list of designated coastal radio stations.

3.3 Members whose ships repeatedly encounter difficulties in clearing ships' weather reports with coastal radio stations in certain reporting areas should communicate promptly with the Members concerned giving full particulars as to dates and times; the presidents of the Commission for Basic Systems and the Commission for Marine Meteorology and the Secretary-General should also be informed.

4. *Additional procedures for single-operator ships:*

Owing to the difficulties resulting from fixed radio watch hours, single-operator ships, in making weather observations and in transmitting messages, should be guided by the procedures in the order given below.

4.1 When operational difficulties on board ship make it impracticable to make and/or transmit a surface synoptic observation at a main standard time (0000, 0600, 1200 and 1800 GMT), the actual time of observation should be as near as possible to the main standard time to ensure transmission of a message to a coastal radio station before the radio officer goes off duty. Alternatively, in special cases, observations may be taken one full hour earlier than the main standard time and be timed accordingly (i.e. 2300, 0500, 1100 or 1700 GMT respectively). However, it is emphasized that these departures should be regarded only as an exception.

4.2 When an observation is made at 0300, 0900, 1500, or 2100 GMT, in order to ensure its transmission to a coastal radio station, the observation at the next main standard synoptic time, i.e. 0600, 1200, 1800 or 0000 GMT should be made for climatological purposes and, if possible, transmitted as indicated in 4.3 below.

* A table showing the international watchkeeping hours on board ships is given in Figure 2.

4.3 Observations made at any of the standard times 0000, 0600, 1200 and 1800 GMT should be transmitted even after a period of delay after the time of observation and:

(*a*) In most parts of the world they should be transmitted up to 12 hours after the time of observation if it is not possible to do so earlier;

(*b*) In the southern hemisphere and other areas where few ships' weather reports are available, they should be transmitted up to 24 hours after the time of observation.

It is important that this procedure be followed even if an observation for a more recent time is also being transmitted.

5. *Collection of oceanographic reports* (BATHY *and* TESAC)

5.1 BATHY and TESAC reports should be transmitted to METEO or METOCEAN addresses through specified coastal radio stations.

NOTE: The list of coastal radio stations accepting BATHY and TESAC reports free of charge to ships together with their radio addresses is given in WMO Publication No. 9, Volume D, Part B and IOC Manuals and Guides Series No. 3 "Guide to Operational Procedures for the Collection and Exchange of Oceanographic Data (BATHY and TESAC)".

5.2 The abbreviation OBS should be included as a paid service indicator before the address in BATHY and TESAC messages transmitted from observing ships to coastal radio stations.

5.3 BATHY and TESAC reports should be transmitted separately from meteorological (surface or upper-air) reports. They should be transmitted to a specified coastal radio station at times which do not interfere with the transmission of meteorological reports, avoiding as far as possible the following periods:

2330 GMT – 0200 GMT
0530 GMT – 0800 GMT
1130 GMT – 0400 GMT
1730 GMT – 2000 GMT

*

* *

Notes to Figure 1

(1) While Zone II–C should comprise the northern part of the Sea of Japan and other portions of the North Pacific in Region II, and Zone II–B should comprise the southern part of the Sea of Japan and the southern part of the Pacific in Region II, a strict boundary has not been defined between Zones II–B and II–C.

(2) For the collection of ships' weather reports, Region III is a single zone. Ships navigating in Region III should therefore transmit their weather reports through the nearest convenient coastal radio station within the Region. As a temporary measure, ships plying in the Pacific waters of the Region should continue to clear their weather reports through the coastal radio station Balboa-NBA, if unable to contact other HF coastal radio stations within Region III.

(3) No subdivision of Regions IV and V into zones has been found necessary. Ships navigating in Region IV or V should therefore transmit their weather reports through the nearest convenient coastal radio station within the Region concerned.

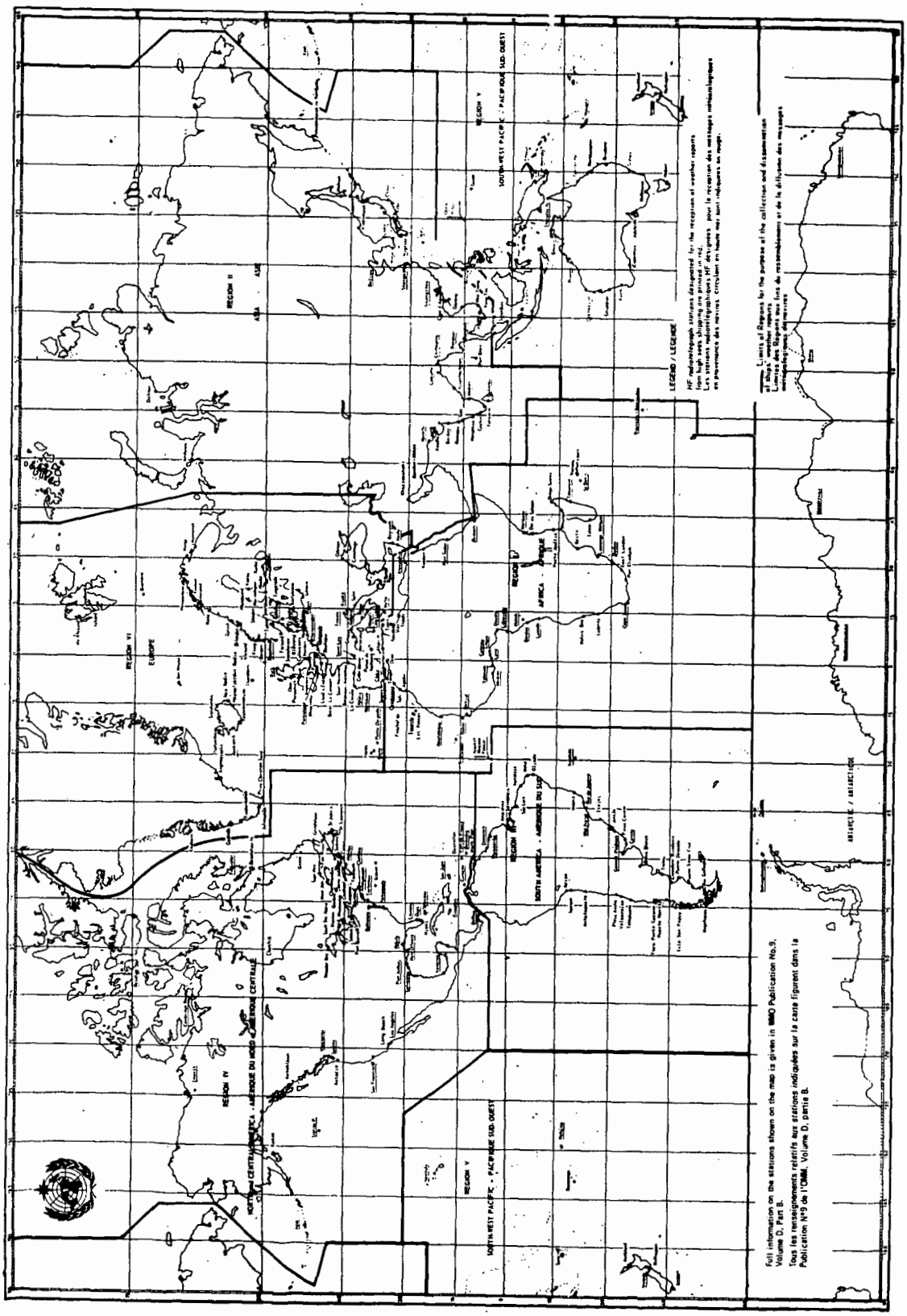


Figure 1 - Broad outline of zones for the collection and dissemination of ships' weather reports and designated coastal radio stations (as included in Volume D at present)

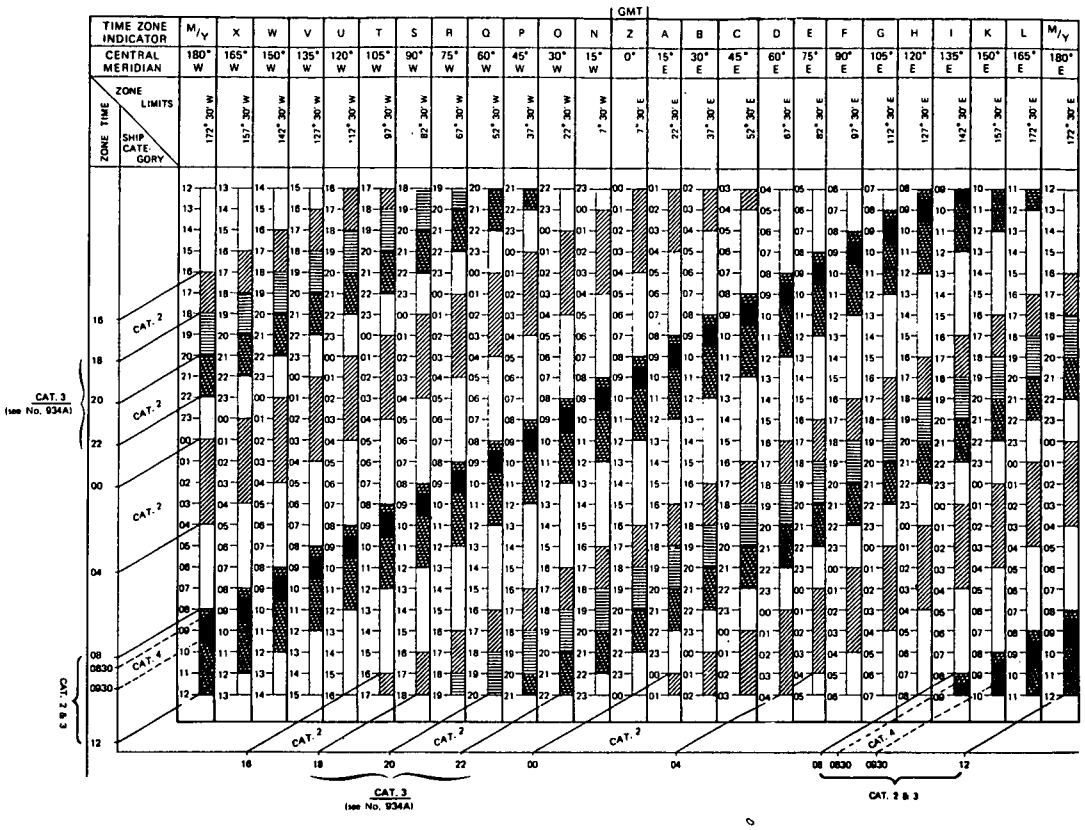


Figure 2 — Time zones and hours of service of ship stations

NOTES: (*a*) The above figure indicates the *fixed* and *elected* hours of service maintained by ships of the second and third categories in terms of zone time. (The hours of service shown exclude those which are determined by the administration, master, or person responsible.)

The *fixed* hours of watch are shown thus:

(I) For ships of the second category:

(II) For ships of the second and third categories:

(III) For ships of the third category, period over which two continuous hours of service may be elected:

(*b*) Also shown (in black) is the specific service period 0830–0930 that ships of the fourth category are encouraged to provide.

A N N E X XVIII

Annex to Recommendation 22 (CBS-Ext.(76))

AMENDMENTS TO THE MANUAL ON THE GLOBAL TELECOMMUNICATION SYSTEM,
VOLUME I - GLOBAL ASPECTS

PART II

METEOROLOGICAL TELECOMMUNICATION PROCEDURES
FOR THE GLOBAL TELECOMMUNICATION SYSTEM

(1) Page II.3: In paragraph 2.3.1.1 (a), delete the brackets enclosing →↑ nnn.

(2) Page II.5: Add the following new paragraph:

2.3.2.3 For transmission of processed information in grid-point format and pictorial information in digital form the symbols shall have the following meanings:-

TTAAii = $T_1T_2A_1A_2ii$

T_1 = G indicates that the text is in grid-point format

= P indicates that the text is pictorial information in digital form

T_2 = Data designator (see Attachment II-6, Table D, Part I)

A_1 = Geographical area designator (Table D, Part II)

A_2 = Reference time designators (Table D, Part III)

ii = Level designators (Table D, Part IV)

Other symbols in the abbreviated heading (CCCC, YYGGgg, and BBB) shall have the same meanings as given in paragraph 2.3.2.2.

(3) Page II.9: Amend the title of paragraph 2.8 to read as follows:

2.8 Procedures applicable to the transmission of reports from ships and other marine stations

(4) Page II.9: Amend paragraph 2.8.1 to read as follows:

2.8.1 Reports from ships and other marine stations in the SHIP, SHED and SPESH code forms shall be prefaced by the call sign of the ship or by a suitable alternative identifier.

(5) Page II.9: Add new paragraph 2.8.4:

2.8.4 In the case of stationary production platforms or movable drilling rigs, the identifier PLAT or RIGG respectively shall be placed at the beginning of the first line of each report.

(6) Page II.9: Renumber and reverse the positions of paragraphs 2.8.2 and 2.8.3.

(7) Page II.38: Attachment II.5 - Replace the table by the table given in Appendix I.

(8) Pages II.40 to II.42: Attachment II.6 - Replace Table A (data designators for alphanumeric information) by the new Table A given in Appendix II.

(9) Page II.48: Attachment II.6 - Replace Table C (Geographical designators (AA) for use in abbreviated headings TTAAii CCCC YYGGgg for bulletins containing ships' weather reports including reports from automatic marine stations) by the new Table C given in Appendix III.

(10) Page 48 (a) onwards: Attachment II.6 - Insert Table D given in Appendix IV (TTAAii for use in the abbreviated headings of bulletins containing processed information in grid-point format and pictorial information in digital form).

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Appendix I

CL_3 SPECIFICATIONS

Main classification of data	L_3 / C	Detail of classification of bulletin content									
		0	1	2	3	4	5	6	7	8	9
Addressed messages	0	BB	RR	AA	MM						
Surface data for global exchange	1	SM/SI[1] SN[1]				SS	SE	NO[2]	SO	CO	CS/CH
Surface data for *other exchanges*	2	SM	SI	SN	SA	SP	SD/SB/SC SF/SX	ST/SR SU/SV	SE	CO	CS/CH
Upper-air data	3	US	UK	UL	UE	UZ/UC	UP	UG	UH/UQ	UT/UR/UA UN/UX	CE/CU
Analyses	4	AS	AU	AH		AR/AX	AI			For national use or by bilateral or multilateral agreement	
Forecasts	5	FS	FU	FT/FC	FB/FA FH/FR FZ/FF/FQ	FE/FJ[3] FM/FP FW/FX	FG				
Warnings	6	WH	WS	WT	WW/WO	WE					
Satellite data	7	TU	TB	TC	TR	TS					
Grid-point value messages	8	G	G	G	G	G	G	G	G	G	G
Pictorial information	9	P	P	P	P	P	P	P	P	P	P

NOTES: [1] To be used only for selected SYNOP and SHIP reports at intermediate or non-standard hours included in global exchanges, subject in each case to the approval of the president of CBS.

[2] METNO/WIFMA messages.

[3] To be used also for IUWD (URSIGRAMS and World Day messages) bulletins.

Appendix II

TABLE A

Data designators for alphanumeric information

Data type and description	*Code form (name)*	$M_iM_iM_jM_j$	*Telecommunication identification* TT	CL_3
Surface data — S				
Synoptic reports	FM 11–V (SYNOP)	MMXX	SM (Main synoptic hours)	10
	FM 14–V (SYNOP)	AAXX		20
	FM 21–V (SHIP)	NNXX	SI (Intermediate hours)	10 *
	FM 22–V (SHIP)	NNXX		21
	FM 23–V (SHRED)	NNXX	SN (Non-standard hours)	10 *
	FM 24–V (SHIP)	BBXX		22
Drifting buoy reports	(DRIBU)	ZZXX	SS	14
Aviation routine reports	FM 15–V (METAR)		SA	23
Special weather reports	FM 16–V (SPECI) FM 26–IV (SPESH)		SP	24
Atmospherics reports	FM 81–I (SFAZI) FM 82–I (SFLOC) FM 83–I (SFAZU)		SF	25
Radar reports	FM 20–V (RADOB)	FFAA, FFBB, GGAA, GGBB	SD (Parts A and B) SB (Part A) SC (Part B)	25
Seismic data			SE	15 27
Oceanographic data	FM 63–V (BATHY)	JJXX	SO	17
	FM 64–V (TESAC)	KKXX		
Hydrological (river) reports	FM 67–VI (HYDRA)	HHXX	SR	26
Snow depth			SU	26
Sea-ice information			ST	26
Lake-ice information			SV	26
Miscellaneous surface data			SX	25
Upper-air data — U				
Upper wind reports	FM 32–V (PILOT)	PPAA, PPBB PPCC, PPDD	UP (PART A) UG (PART B)	35 36
	FM 33–V (PILOT SHIP)	QQAA, QQBB QQCC, QQDD	UH (PART C) UQ (PART D)	37 37

NOTE: UI (Parts A and B) and UY (Parts C and D): If CL_3 provision is required it should be obtained from the section of the CL_3 table available for national and bi-lateral use.

* To be used only for selected SYNOP and SHIP reports at intermediate or non-standard hours included in *global exchanges*, subject in each case to the approval of the president of CBS.

Table A *(continued)*

Data type and description	*Code form (name)*	$M_iM_iM_jM_j$	*Telecommunication identification* TT	CL_3
Upper-level pressure	FM 35–V (TEMP)	TTAA, TTBB	US (PART A)	30
		TTCC, TTDD	UK (PART B)	31
	FM 36–V (TEMP SHIP)	UUAA, UUBB	UL (PART C)	32
		UUCC, UUDD	UE (PART D)	33
NOTE: UM (Parts A and B) and UF (Parts C and D): If CL_3 provision is required it should be obtained from the section of the CL_3 table available for national and bi-lateral use.				
Upper-level pressure, temperature, humidity and wind from a sonde released by carrier balloon or aircraft	(TEMP DROP)	XXAA, XXBB XXCC, XXDD	UZ	34
Constant-level balloon data	(COLBA)	IIXX	UC	34
Aircraft reports	FM 41–IV (CODAR)	LLXX	UT	38
	(RECCO)		UR	38
	(AIREP)		UA	38
Rocketsonde data	FM 39–VI (ROCOB)	RRXX	UN	38
	FM 40–VI (ROCOB SHIP)	SSXX		
Miscellaneous upper-air data			UX	38
Climatic data — C				
Monthly means (surface)	FM 71–VI (CLIMAT)		CS	19 29
	FM 72–VI (CLIMAT SHIP)		CH	19 29
Monthly means (oceanic areas)	(NACLI) (CLINP) FM 73–VI (SPCLI) (CLISA) (INCLI)		CO	18 28
Monthly means (upper-air)	FM 75–VI (CLIMAT TEMP)		CU	39
	FM 76–VI (CLIMAT TEMP SHIP)		CE	39
Analyses — A				
Coded analyses	FM 45–IV (IAC)		AS (Surface)	40
			AU (Upper-air)	41
	FM 46–IV (IAC FLEET)		AS (Surface)	40
Thickness analyses			AH	42
Radar analyses			AR	44
Miscellaneous analyses			AX	44
Ice analyses	FM 44–V (ICEAN)		AI	45

Table A *(continued)*

Data type and description	*Code form (name)*	$M_iM_iM_jM_j$	*Telecommunication identification* TT	CL_3
Forecasts — F				
Coded forecasts	FM 45–IV (IAC)		FS (Surface)	50
			FU (Upper-air)	51
	FM 46–IV (IAC FLEET)		FS (Surface)	50
Aerodrome forecasts	FM 51–V (TAF)		FT (VT > 12 hr)	52
			FC (VT ≦ 12 hr)	52
Aviation forecasts				
Area	FM 53–V (ARFOR)		FA	53
Route	FM 54–V (ROFOR)		FR	53
Upper winds and temperature	FM 48–V (ARMET)		FB	53
Hydrological forecasts	FM 68–VI (HYFOR)		FG	55
Other forecasts			FB	53
Shipping forecasts				
Area	FM 61–IV (MAFOR)		FZ	53
IAC FLEET	FM 46–IV (IAC FLEET)		FF	53
Other forecasts			FQ	53
Upper-air thickness prognoses			FH	53
Extended forecasts			FE	54
Radio warning service (including IUWD data)			FJ	54
Temperature extreme forecasts			FM	54
Public forecasts			FP	54
Winter sports forecasts			FW	54
Miscellaneous forecasts			FX	54
Warnings — W				
Hurricane warnings			WH	60
SIGMET			WS	61
Tropical cyclone warnings			WT	62
Warning and weather summary			WW	63
Other warnings			WO	63
TSUNAMI			WE	64
Satellite data — T				
Satellite location data			TB	71
Satellite vertical temperature soundings	FM 86–VI Ext. (SATEM)	VVAA, VVBB VVCC, VVDD	TU	70
Synoptic interpretation of satellite cloud data	FM 85–VI (SAREP)	CCAA, CCBB DDAA, DDBB	TC	72

Table A *(continued)*

Data type and description	*Code form (name)*	$M_iM_iM_jM_j$	*Telecommunication identification* TT	CL_3
Clear radiance data	FM 87–VI Ext. (SARAD)	WWXX	TR	73
Satellite observations of surface temperature, winds, clouds and radiation	FM 88–VI Ext. (SATOB)	YYXX	TS	74
Grid-point value messages — G				
Information in grid-point format	}		G	80–89
Notices				
METNO/WIFMA			NO	16
Addressed messages				
Service messages			BB	00
Requests for repetition messages			RR	01
Administrative messages			AA	02
Data messages			MM	03
Pictorial information in digital form	}		P	90–99

* * *

Appendix III

TABLE C

Geographical designators (AA) for use in abbreviated headings
TTAAii CCCC YYGGgg
for bulletins containing ships' weather reports including reports from automatic marine stations

Instructions for the proper use of geographical designators for bulletins containing ships' weather reports including reports from automatic marine stations

1. The first letter of "AA" will denote the nature of the ship or automatic marine station:
   For ocean weather stations: W
   For mobile ships and other marine stations: V
2. The second letter of "AA" will denote the Regions from which the reports contained in the bulletins originate:

Region I (Africa)	A
Region II (Asia)	B
Region III (South America)	C
Region IV (North and Central America)	D
Region V (South-West Pacific)	E
Region VI (Europe)	F
South of 60°S	J
More than one Region	X

3. Whenever practicable, separate bulletins should be prepared to avoid the use of the letter "X".

*

* *

Appendix IV

TABLE D

TTAAii for use in the abbreviated headings of bulletins containing processed information in grid-point format and pictorial information in digital form

NOTE: It is to be emphasized that the suggested specifications set out in Table D do not represent a formal code. They are for general information and guidance so that originating centres will be free to develop headings and catalogue numbers within a generally accepted framework. However, simply for convenience, it is intended that, where suitable designators have been suggested, they should normally be adopted.

PART I — Data designators (T_2)

Instructions for the proper application of the data designators

1. The designators specified in this table should be used to the greatest extent possible to indicate the type of data contained within the text of the bulletin.

2. Where more than one data type is contained in the text, the designators for only one of the data types should be used.

3. When the table does not contain a suitable designator for the data type, an alphabetic designator which is not assigned in the table should be used.

Designator	*Data type*
D	Thickness (relative topography)
E	Precipitation
H	Height
P	Pressure
R	Relative humidity
T	Temperature
V	Vertical motion
W	Wind

PART II — Geographical area designators (A_1)

Instructions for the proper application of the geographical area designators

1. The designators specified in this table should be used to the greatest extent possible to indicate the geographical area of the data contained within the text of the bulletin.

2. Where the geographical area of the data does not correspond exactly with the designator, the designator for the area most closely approximating that of the data may be used.

3. When the table does not contain a suitable designator for the geographical area, an alphabetic designator which is not assigned in the table should be used.

Designator	*Geographical area*
A	0° - 90°W northern hemisphere
B	90°W-180° ,, ,,
C	180° - 90°E ,, ,,
D	90°E - 0° ,, ,,
E	0° - 90°W tropical belt
F	90°W-180° ,, ,,
G	180° - 90°E ,, ,,
H	90°E - 0° ,, ,,
I	0° - 90°W southern hemisphere
J	90°W-180° ,, ,,
K	180° - 90°E ,, ,,
L	90°E - 0° ,, ,,
M . . . Z	Not assigned

PART III — Reference time designators (A_2)

Instructions for the proper application of the reference time designators

1. The designators specified in this table should be used to the greatest extent possible to indicate the reference time of data contained within the text of the bulletin.

2. When the table does not contain a suitable designator for the reference time, an alphabetic designator which is not assigned in the table should be used.

Designator	*Reference time*	
A	Analysis (00 hours)	
B	6 hours forecast	
C	12 ,, ,,	
D	18 ,, ,,	
E	24 ,, ,,	
F	30 ,, ,,	
G	36 ,, ,,	
H	42 ,, ,,	
I	48 ,, ,,	
J	60 ,, ,,	
K	72 ,, ,,	
L	84 ,, ,,	
M	96 ,, ,,	
N	108 ,, ,,	
O	120 ,, ,,	(5 days)
P	132 ,, ,,	
Q	144 ,, ,,	
R	156 ,, ,,	
S	168 ,, ,,	(7 days)
T	10 days ,,	
U	15 ,, ,,	
V	30 ,, ,,	
W ..... Z	Not assigned	

PART IV — Level designators (ii)

Instructions for the proper application of the level designators

1. The designators specified in this table should be used to the greatest extent possible to indicate the level of the data contained within the text of the bulletin.

2. When data at more than one level are contained in the text, the designator for only one of the levels should be used.

3. When the table does not contain a suitable designator for the level, an alphabetic designator which is not assigned in the table should be used.

Designator	*Level*
99	1000 mb level
98	Surface of the earth or ocean
97	Level of the tropopause
96	Level of the maximum wind
95–91	Not assigned

Otherwise, the designator given is the hundreds and tens digits of the millibar level in the atmosphere, e.g. 70 = 700 mb level; 03 = 30 mb level.

A N N E X XIX

Annex to Recommendation 23 (CBS-Ext.(76))

AMENDMENTS TO THE MANUAL ON THE GLOBAL TELECOMMUNICATION SYSTEM - VOLUME I - GLOBAL ASPECTS

PART III

TECHNICAL CHARACTERISTICS AND SPECIFICATIONS FOR THE GLOBAL TELECOMMUNICATION SYSTEM

Amendments to paragraph 2 - Characteristics of transmissions over the Main Trunk Circuit and its branches

(1) Page III.2, paragraph 2.2.1.2:

Replace the existing text by the following new text:

2.2.1.2 A data-signalling rate of 1 200 bit/s or 2 400 bit/s shall be used for data transmission as agreed by the related centres. The use of a data-signalling rate of 4 800 bit/s is permitted, if agreed by the related centres.

(2) Page III.2, paragraph 2.2.1.5:

(a) Insert the following new paragraph 2.2.1.5:

2.2.1.5 For data transmission at a signalling rate of 4 800 bit/s, the characteristics of the modem shall be those specified in CCITT Recommendation V.27 and/or CCITT Recommendation V.27 bis as agreed by the related centres.

(b) Renumber present paragraphs 2.2.1.5 to 2.2.1.9 to read 2.2.1.6 to 2.2.1.10.

(3) Page III.2: Insert a new paragraph 2.2.3:

2.2.3 When a four-wire telephone-type circuit is utilized for the transmission on a shared basis of data and analogue facsimile one of the following two methods should be used:

(a) Facsimile and data transmitted on a time-sharing basis;

(b) Data transmitted at low speed simultaneously with facsimile on a frequency-sharing basis.

(4) Page III.2: Insert a new paragraph 2.2.1.3:

2.3.1.3 For data transmission over HF circuits at a signalling rate of 600/1 200 bit/s, ISB or SSB modes should be used together with a

method for transforming a data rate at 600/1 200 bit/s to multi-channel operation at 100 bit/s per channel. The voice frequency channel arrangements for multi-channel HF radio circuit should be based on CCIR Recommendation 436. Use should be made of error control equipment, and also effective directional transmitting and receiving antennae, the latter having provision for dual space diversity reception.

NOTE: Attachment III-1 shows a diagram of the HF radio circuit for data transmission at a signalling rate of 600/1 200 bit/s.

Amendment to paragraph 3 - Engineering of WMCs and RTHs on the Main Trunk Circuit and its branches

(5) Page III-3: At the end of the paragraph (after (j)), insert the following note:

NOTE: Maintenance requirements of telephone-type circuits used for data transmission are set forth in relevant CCITT Recommendations. See Attachment III-2,

Amendments to paragraph 7 - Technical characteristics of equipment for facsimile (analogue) transmissions

(6) Page III-4, paragraph 7.1.4.1:

Replace the existing text by the following new text:

7.1.4.1 The scanning density shall be equal to:

3.8 lines/mm (Index 576); and
1.9 line/mm (Index 288).

(7) Page III-6, paragraph 7.3.4:

Replace the existing text by the following new text:

7.3.4 Contrast ratio for picture signals and control signals for black and white shall be the same in any one transmission and shall be between 12 and 25 dB.

Attachment III-1

(8) Page III-9: Insert Attachment III-1 contained in Appendix I to this annex.

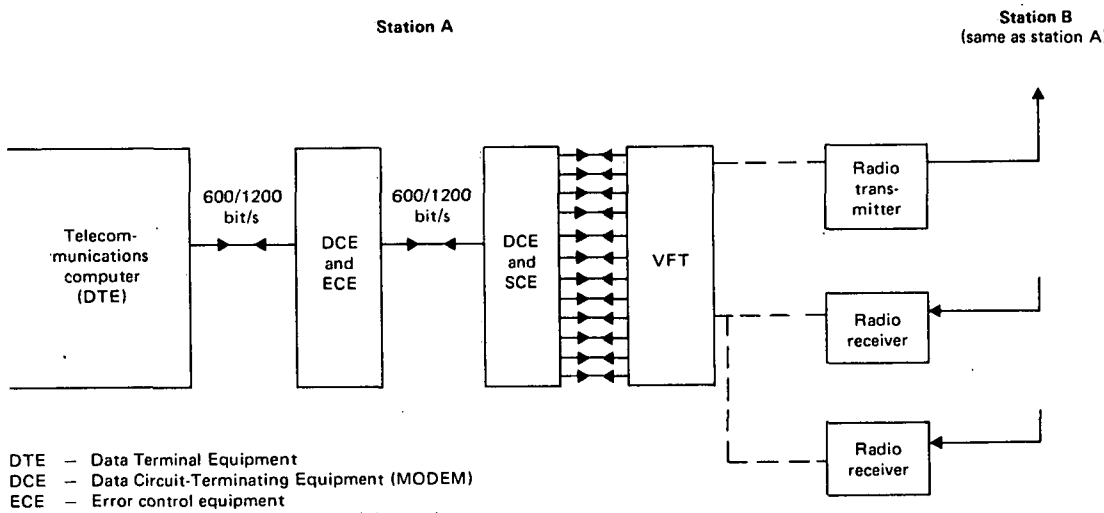
Attachment III-2

(9) Page III-10: Insert Attachment III-2 contained in Appendix II to this annex.

Appendix I

ATTACHMENT III-1

BLOCK DIAGRAM FOR AN HF RADIO CIRCUIT USED FOR DATA TRANSMISSIONS AT A SIGNALLING RATE OF 600/1200 BIT/S



DTE – Data Terminal Equipment
DCE – Data Circuit-Terminating Equipment (MODEM)
ECE – Error control equipment
SCE – Speed conversion equipment 600/1200 bit/s to 6/12 channels at 100 bit/s and vice versa
VFT – Voice-frequency multi-channel telegraph system (C.C.I.R. Recommendation 436)

Appendix 2

ATTACHMENT III-2

CCITT RECOMMENDATIONS DEALING WITH TECHNICAL CHARACTERISTICS AND MAINTENANCE OF TELEPHONE-TYPE CIRCUITS USED FOR DATA TRANSMISSION

CCITT Rec. V.2 - Power levels for data transmission over telephone lines;

" " V.50 - Standard limits for transmission quality of data transmission;

" " V.51 - Organization of the maintenance of international telephone-type circuits used for data transmission;

" " V.52 - Characteristics of distortion and error-rate measuring apparatus for data transmission;

" " V.53 - Limits for the maintenance of telephone-type circuits used for data transmission;

" " V.54 - Loop-test devices for modems;

" " V.55 - Impulsive noise-measuring instrument for data transmission.

NOTE: The full texts of these CCITT Recommendations are given in the CCITT Orange Book, Volume VIII.

A N N E X XX

Annex to Recommendation 25 (CBS-Ext.(76))

PLAN FOR MONITORING THE OPERATION OF THE WWW

INTRODUCTION

1. By Resolution 4 (Cg-VII), the Commission for Basic Systems was requested by Seventh Congress to study and develop, in consultation with the Secretary-General, detailed procedures for monitoring the operation of the WWW.

OBJECTIVES

2. The objectives of the monitoring effort are to improve the performance of the WWW, in particular to increase the efficiency and effectiveness of the operation of the WWW Global Observing System (GOS), Global Data-processing System (GDPS) and Global Telecommunication System (GTS) on a national, regional and global level. Recent studies have shown that the quantity, quality and timeliness of meteorological information in many parts of the world do not meet the needs of the users. Because of the importance of meteorological information for operational purposes, and the importance of the WWW to the success of the First GARP Global Experiment (FGGE), there is an urgent need to improve the present performance. Thus the WWW monitoring programme will fall naturally into:

(a) An immediate programme which must be accomplished before the FGGE; and

(b) A long-term programme incorporating experiences obtained during the FGGE, leading to a greatly improved performance of the WWW.

3. An important objective of any monitoring activity must include provision for the identification of deficiencies and also for corrective action to improve the efficiency and effectiveness of the WWW. Success is measured in terms of how many deficiencies are corrected.

4. In accordance with the decision of Seventh Congress, the following items should be included in the monitoring programme:

(a) Regularity of observations;

(b) Quality of observational data and correct coding;

(c) Completeness and timeliness of collection of observational data at the NMC concerned;

(d) Adherence to WMO standard codes and telecommunication procedures;

(e) Collection of observational data at RTHs and WMCs;

(f) Exchange of data and processed information on the regional telecommunication networks and the Main Trunk Circuit and its branches;

(g) Evaluation of the observations and processed information received at NMCs, RMCs and WMCs in respect of their data needs.

BASIC COMPONENTS

5. Real-time monitoring

Real-time monitoring is the term used to describe monitoring which is carried out quickly enough to allow remedial action to be taken in time to be of value in day-to-day meteorological work. Ideally, it should be carried out within the times specified in the appropriate manuals and guides in respect of the maximum acceptable time delays for the receipt of meteorological information, but in practice it is still valuable if it can be carried out before similar subsequent information is received.

In view of the short time available, action on the real-time monitoring should be restricted to departures from the normal, e.g. bulletins or observations which are not received in time, obvious or suspected errors, and so on. Thus real-time monitoring requires the provision of information about:

- Bulletins not received by specified time;
- Observations not received by specified time, or which are incorrect or suspect, or cannot be interpreted with confidence;
- Inadequacies in receipt of processed information.

6. Non-real-time monitoring

The purpose of non-real-time monitoring is to keep under review the general performance of the WWW and to identify shortcomings which may persist after carrying out the real-time monitoring. Non-real-time monitoring requires the preparation of summaries and various statistics which become available after a certain time, which may vary from a few hours to several months.

7. Follow-up action for co-ordination and assistance

In the real-time mode, the initial corrective action will be immediate and will be taken at the centres concerned or at the point of observation. In the non-real-time mode, the follow-up action will be taken by the Members concerned to remedy any deficiencies with respect to the WWW plan. In some cases, this might involve obtaining advice on the procedures for obtaining external assistance and information on the maintenance and operation of their WWW facilities. In addition, the Secretary-General will take action, as indicated in paragraph 20.

ASPECTS OF IMPLEMENTATION

8. The plan for monitoring the operation of the WWW will be introduced progressively using a modular approach.

9. In the short term, the adoption of a modular approach will facilitate the implementation of the scheme by allowing the monitoring initially of one type of data,

for example upper-air information. Other meteorological information regularly exchanged on the GTS will be included at a later date. Monitoring for timeliness, quality and meteorological content can also be implemented modularly. The modular concept applies in both the real- and non-real-time modes. In the non-real-time mode, surveys on the operation of the WWW will be carried out for many types of data - surface, upper-air, ship, aircraft, satellite, processed information, etc. Rather than defer the monitoring activities until a centre is able to do everything, it will be acceptable to begin monitoring with only one or two data types and gradually build up the capability. (For priorities, see paragraph 15.)

10. The progressive implementation of the monitoring programme will be consistent with the priorities laid down in paragraphs 15 and 16. The monitoring will be conducted by both manual and automatic techniques.

11. The most urgent need for monitoring the operation of the WWW is highlighted by the FGGE's requirements for the maximum data to be available during its operational phase. Early review of the results of the monitoring and of the monitoring procedures before the build-up phase of the FGGE will be required so that corrective action can be taken prior to the operational phase of the FGGE. During the FGGE, a very rapid response to, and correction of , deficiencies as they occur will be required.

12. In the longer term, monitoring forms a routine part of the WWW, building on the experience gained during the FGGE and on the general operation of the WWW.

13. The implementation of the monitoring plan involves all three sub-systems of WWW. Thus, in the context of monitoring, the GOS is responsible for ensuring that the observations are made according to the prescribed standards, are encoded correctly and are presented for transmission at the times laid down; in addition, the GOS responds in timely fashion to requests for checks, corrections, etc. The GTS is responsible for ensuring the regular flow of meteorological information, both raw and processed. This involves keeping a close watch on the receipt and transmission of information, generating requests for missing bulletins and other products when necessary, checking telecommunication formats, arranging for the re-routeing of traffic in case of outages and other diffficulties, and so on. The GDPS provides processed information for timely distribution and also has an important role in the quality control of data.

DEFINITIONS AND STANDARDS

14. In the monitoring context the terms used and the minimum standards to be attained should be as defined in the Manual on the Global Telecommunication System, the Manual on Codes, the Manual on the Global Data-processing System and relevant parts of the Technical Regulations. Pending the issue of a Manual on the Global Observing System, the Guide on the GOS will provide useful guidance to Members.

PRIORITIES

15. The monitoring scheme should concentrate, in the order of priority given below, on the establishment of checks on the following information:

(a) TEMP and TEMP SHIP (up to at least 300 mb);

(b) PILOT and PILOT SHIP (up to at least 300 mb - especially in the tropics);

(c) SYNOP (global exchange);

(d) SHIP and AIREP/CODAR (global exchange);

(e) CLIMAT and CLIMAT TEMP;

(f) All other observational data and processed information, regularly exchanged.

Monitoring of satellite data presents a special case. There are only a few operators and their standards for monitoring, including quality control of satellite data, are already high. Therefore, no additional procedures for the monitoring of satellite data are proposed at this time.

16. In implementing this monitoring plan, it is important to establish the capability for quick responses at the observing points and at all centres to requests for checks and repetitions in real time. It will also be found useful to give particular attention to the following elements of the monitoring plan:

(a) Ensuring the correct telecommunication formats of messages in the GTS;

(b) Ensuring the correct coding of messages and reports;

(c) Ensuring the timely availability of data;

(d) Ensuring the quality of the meteorological content of messages.

RESPONSIBILITIES

17. The basic responsibilities for monitoring the operation of the WWW rest with Members.

18. The responsibilities for carrying out the real-time and non-real-time monitoring activities are given in Attachments A and B. An essential part of the monitoring plan is that information should be exchanged between adjacent centres on the GTS in order that telecommunication problems in particular may readily be identified. It is important that every WWW centre (NMCs, RMCs, RTHs and WMCs) make a contribution to the overall monitoring effort. Obviously, centres having a multiple role (e.g. WMC and NMC combined) will make more than one contribution.

19. The frequency with which monitoring reports should be prepared and/or exchanged is illustrated in the following table:

Every day	- Every centre carries out continuous real-time monitoring;
At intervals of not more than one month	- NMCs should prepare a summary of relevant information on monitoring for use on a national and international level as appropriate;
At least once every three months	- RTHs/RMCs send a summary of monitoring information to their associated NMCs;

At least once every three months	- RTHs/RMCs send a summary of monitoring information to adjacent RTHs which supply them with data;
Once every six months	- WMCs send a summary of monitoring information to adjacent RTHs/RMCs.

Reports called for at intervals of three months or more should always be forwarded to the Secretary-General in an agreed format for further action.

As regards contents, see Attachment B.

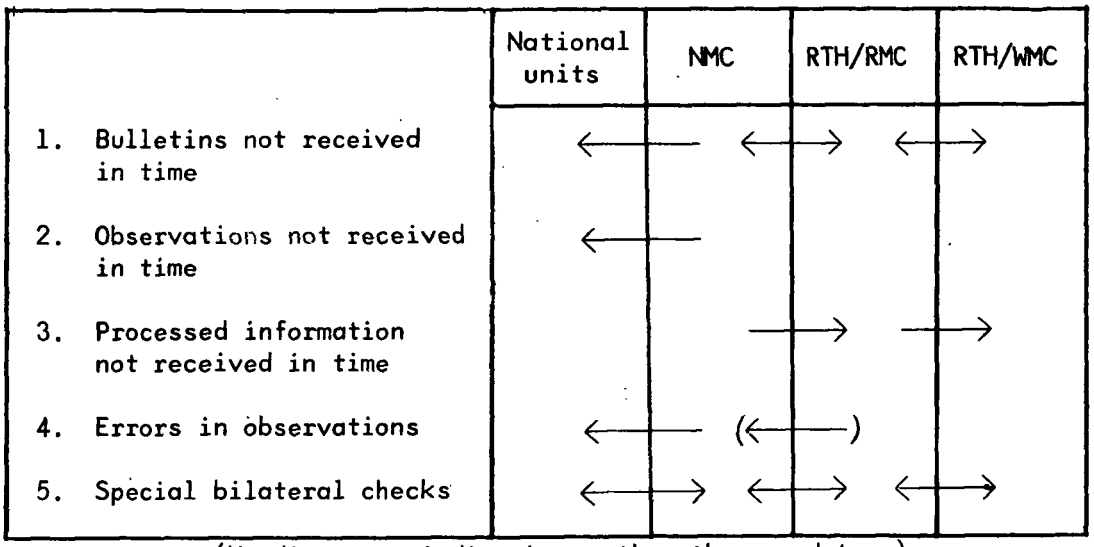
20. The Secretary-General will carry out the necessary analysis of the non-real-time monitoring reports from the WWW centres to identify the level — global, regional or national — at which deficiences occur. The Secretary-General will co-ordinate and advise on assistance necessary to rectify the deficiences revealed from the results of the monitoring.

*

* *

Attachment A

REAL-TIME MONITORING



(Headings are indicative rather than mandatory)

NOTES

1. Bulletins not received in time are bulletins which appear on the transmission schedule and have not been received by a time agreed bilaterally between two adjacent centres.

2. Observations not received in time are observations which appear in the published contents of the bulletins listed for transmission but which have not been received by the time agreed.

3. Processed information not received in time refers to data not received by the time agreed but known to be in the transmission schedule.

4. Errors in observations are errors detected or suspected in the coding and/or meteorological content of messages.

5. Special bilateral checks are checks on any of the previous elements 1-4 or other elements which may have been arranged temporarily or on a more continuous basis by the centres concerned.

Legend

1. National units is understood in this context to be national observing, collecting and dissemination systems.

2. The arrows indicate the direction in which messages concerning monitoring will normally be sent. Thus, for example, messages concerning suspected errors in observations will normally be sent only by NMCs to the observing network - unless a special bilateral agreement has been made between an NMC and an appropriate RMC to carry out real-time quality control on its behalf. To cover this possibility, an entry in parentheses has been made under RMC.

Attachment B

NON-REAL-TIME MONITORING

	NMC	RTH/RMC	WMC
1. Bulletins not received	x	x	x
2. Bulletins received late	x	x	x
3. Observations not received	x	x	x
4. Observations received late	x	x	x
5. Processed information not received	x	x	
6. Processed information received late	x	x	
7. Non-adherence to telecommunication format	x	x	x
8. Completeness of observational data	x	x	x
9. Quality of observational data	x	x	x
10. Deficiencies in processed information	x	x	x
11. Statistical verification of numerical weather prediction	x	x	x
12. Special bilateral or multilateral checks	x	x	x
13. Notes on recurrent problems	x	x	x
14. Monitoring reports	x	x	x

(Headings are indicative rather than mandatory)

NOTES

1. Bulletins not received are bulletins scheduled for transmission but not received.

2. Bulletins received late are bulletins received later than the time periods specified by WMO or agreed bilaterally.

3. Observations not received are observations scheduled for transmission but not received.

4. Observations received late are defined in a similar way as "bulletins received late" in Note 2 above.

5. Processed information not received is products in alpha-numeric or pictorial form scheduled for transmission but not received.

6. Processed information received late is defined in a similar way as "bulletins received late" in Note 2 above.

7. Non-adherence to telecommunication format refers to errors made consistently or frequently by transmitting stations which interfere with the regular transmission of messages.

10. Deficiencies in processed information are shortcomings (e.g. data missing, messages garbled, facsimile products unreadable) which seriously interfere with the operational value of the products.

11. Statistical verification of numerical weather prediction would be supplied only by centres having a special interest in, and capability for, this type of information.

12. Special bilateral or multilateral checks means supplementary checks arranged between two or more centres by mutual agreement, on either a temporary or a continuous basis, to deal with special problems.

13. Notes on recurrent problems indicate areas of difficulty not covered by Notes 1-13 inclusive.

14. Monitoring reports are reports in the format to be developed by the Secretary-General, in consultation with the president of CBS and the chairmen of the appropriate working groups.

Legend

The crosses in the various columns indicate the centres at which these functions would normally be carried out.

A N N E X XXI

Annex to Recommendation 26 (CBS-Ext.(76))

PROPOSED AMENDMENTS TO THE TECHNICAL REGULATIONS

(1) Under "Definitions" in Volume I and, following consultation with ICAO, in Volume II of the Technical Regulations, insert the following:

> Meteorological bulletin. That part of the meteorological message comprising an appropriate heading and a text of meteorological information.

(2) Delete the definitions of the following terms from Volume I of the Technical Regulations:

- Hemisphere broadcast
- Regional broadcast
- Subregional broadcast
- Territorial broadcast
- Territorial transmission

A.1 THE GLOBAL OBSERVING SYSTEM

(3) Amend Regulation /A.1.1./ 1.2 to read as follows:

> Members shall implement the regional basic synoptic networks .

(4) Insert the following new Regulation /A.1.1./ 8:

> /A.1.1./ 8 Meteorological satellite systems
>
> /A.1.1./ 8.1 Members, as appropriate, should establish and maintain, individually or jointly, meteorological satellite systems composed of satellites in near-polar and geostationary orbits, and the necessary ground components.
>
> /A.1.1./ 8.2 Meteorological satellites should be equipped to provide data which, independently or in conjunction with surface-based

observations, can be used to derive the following quantitative and qualitative information:

(a) Vertical profiles of temperature and humidity;

(b) Temperatures of sea surface, 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) Radiance balance data.

A.2 THE GLOBAL DATA-PROCESSING SYSTEM

(5) If the Manual on the Global Data-processing System is approved by EC-XXIX, insert the following paragraph:

/A.2.1./ 1.3

The Global Data-processing System shall be established and operated in accordance with procedures and practices set out in Annex IV (Manual on the Global Data-processing System, Volume I).

(6) Delete Regulations /A.2.1/2 to /A.2.1/2.3.1 inclusive and

insert the following:

/A.2.1./ 2

Functions of centres

/A.2.1./ 2.1

Each Member responsible for a World Meteorological Centre should ensure that its centre performs the following:

(a) Real-time functions

(i) Preparation of surface and upper-air meteorological analyses and analyses of sea-surface temperature, as a rule twice per day for as much of the globe as practicable;

(ii) Preparation of surface and upper-air meteorological forecasts and forecasts of sea-surface temperature, for periods of at least up to four days for as much of the globe as practicable, the frequency of issue depending on the period of validity;

(iii) Preparation of warnings of important meteorological phenomena, for example storm warnings, based on pertinent information such as satellite data;

(iv) Providing the above analyses, forecasts and warnings promptly to appropriate centres on the Global Telecommunication System for transmission to Members;

(v) Independent real-time quality control of the Level II and Level III data, defined in Note (3) below;

(vi) Carrying out periodical monitoring of the operation of the WWW.

(b) Non-real-time functions:

(i) Storage and retrieval of basic observational data and processed information needed for large-and planetary-scale research and applications, and making these available to Members on request;

(ii) Development and research concerning the operations, in particular testing and application of new technology;

(iii) Regular exchange with other centres of data and information on techniques and procedures used;

(iv) Providing opportunities for training of personnel in data processing.

/A.2.1./ 2.1.1

World Meteorological Centres should make optimum use of satellite information, numerical methods and computer techniques.

/A.2.1./ 2.2

Members responsible for Regional Meteorological Centres should ensure that their centre(s) perform(s) the following:

(a) Real-time functions:

(i) Preparation of surface and upper-air meteorological analyses up to four times a day for specific areas;

(ii) Preparation of surface and upper-air meteorological forecasts for specific areas for periods up to 72 hours, the frequency of issue depending upon the period of validity;

(iii) Preparation of warnings of significant weather phenomena such as storm warnings, based on appropriate information, such as satellite data;

(iv) Providing the above analyses, forecasts and warnings promptly to appropriate centres on the Global Telecommunication System for transmission to Members;

(v) Independent real-time quality control of the Level II and Level III data, defined in Note (3) below;

(vi) Carrying out periodical monitoring of the operation of the WWW.

(b) Non-real-time functions:

(i) Storage and retrieval of basic observational data and processed information needed to discharge the real-time responsibilities of the RMC and making these available to Members on request;

(ii) Development and research into refinement and applications of new data-processing technology and techniques;

(iii) Regular exchange with other interested centres of information on techniques and procedures used and of results achieved;

(iv) Providing opportunities for training of personnel in manual and automated techniques.

/A.2.1./ 2.2.1

Regional Meteorological Centres should make optimum use of satellite information and, where appropriate, of numerical methods and computer techniques.

/A.2.1./ 2.3

Each Member shall ensure that it has a National Meteorological Centre adequately staffed and equipped to enable it to play its part in the World Weather Watch.

/A.2.1./ 2.3.1

Each Member should ensure that its National Meteorological Centre performs the following:

(a) Real-time functions:

(i) Preparation of surface and upper-air meteorological analyses and forecasts, as needed to meet national requirements for provision of meteorological services to all users;

(ii) Preparation of warnings of hazardous weather phenomena (e.g. occurrence of gales, severe precipitation, tropical cyclones, etc.), to meet national and international obligations;

(b) Non-real-time functions:

(i) Storage and retrieval of observational data and processed information to meet international and national requirements;

(ii) Research concerning the operations to meet national requirements.

/A.2.1./ 2.3.2

Each Member shall designate a National Meteorological Centre, or other appropriate centre, to be responsible for meteorological checking of information collected before transmission on the Global Telecommunication System.

NOTES:

(1) It is for each Member to decide, in the light of its own capabilities and needs, the extent to which it will wish to receive and use products of World and Regional Meteorological Centres.

(2) The telecommunication functions of National Meteorological Centres are specified in the Manual on the GTS.

(3) DEFINITION OF DATA LEVELS

In discussing the operation of the GDPS it is convenient to use the following classification of data levels which have been introduced in connexion with the data-processing system for GARP:

Level I: Primary data. These in general are instrument readings expressed in appropriate physical units and referred to Earth co-ordinates. Examples are: radiances or positions of constant-level balloons, etc. but not raw telemetry signals. Level I data still require conversion to the meteorological parameters specified in the data requirements.

Level II: Meteorological parameters obtained directly from many kinds of simple instruments, or derived from the Level I data (e.g. average winds from successive positions of constant-level balloons).

Level III: Initial state parameters. Internally consistent data sets, in grid-point form, obtained from Level II data by applying established initialization procedures.

Both Level II and Level III data will be available for normal operational use in the GDPS and for special experimental use, such as for FGGE.

(7) Delete Regulation /A.2.2./ 2.1.2, and insert the following:

/A.2.2./ 2.1.2

The scales along the standard parallels should be as follows for weather charts:

(a)	Covering the world	1:40 000 000
	Alternative....	1:60 000 000
(b)	Covering a hemisphere	1:40 000 000
	Alternatives...	1:30 000 000
		1:60 000 000
(c)	Covering a large part of a hemisphere or hemispheres	1:20 000 000
	Alternatives...	1:30 000 000
		1:40 000 000
(d)	Covering a portion of a continent or an ocean or both	1:10 000 000
	Alternatives...	1:20 000 000
		1:15 000 000
		1: 7 500 000

(8) If the Manual on the Global Data-processing System is approved by EC-XXIX, amend Regulation /A.2.2./ 2.1.4 to read as follows:

/A.2.2./ 2.1.4

The symbols used for the pictorial representation of observational data and for analysis and prognosis of weather charts should be those set out in Annex IV (Manual on the Global Data-processing System, Volume I, Attachment II-4).

(9) If the Manual on the Global Data-processing System is approved by EC-XXIX,

delete Appendix E "International symbols" used for graphic representation of data on weather charts and for analyses on weather charts."

(10) Delete Regulation /A.2.4./ 3.1.1 and insert the following:

/A.2.4./ 3.1.1

Each Member shall arrange for the distribution of the climatological data for a selection of its stations, in accordance with the provisions of Annex II (Manual on Codes, Publication No. 306) and Annex III (Manual on the Global Telecommunication System). The data shall be available as soon as possible after the end of the month.

/A.2.4/ 3.1.1.1

The climatological data referred to in Regulation /A.2.4./ 3.1.1 above should be available not later than the fifth day of the following month.

(11) Renumber Regulation /A.2.4/ 3.1.1.1 to read /A.2.4/ 3.1.1.2.

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	Codes (including the report by the chairman of the Working Group on Codes) Final report of the fourth session of the CBS Working Group on Codes	5	Chairman of the working group
4	Data-processing system (including the GDPS part of WWW and the report by the chairman of the Working Group on the GDPS) Final report of the third session of the CBS Working Group on the GDPS	7	Chairman of the working group
5	Data-processing system Report by the chairman of the Working Group on the GDPS	7	Chairman of the working group
6	Observing system Report by the chairman of the Working Group on the GOS	4	Chairman of the working group
7	Report by the chairman of the Working Group on the GTS	8	Chairman of the working group
8	Observing system Draft Guide on the GOS	4	Chairman of the working group
9	Codes Report of the chairman of the Working Group on Codes	5	Chairman of the working group

Doc. No.	Title	Agenda item	Submitted by
10	Data-processing system (including the GDPS part of WWW and the report by the chairman of the Working Group on the GDPS) Monitoring of the operation of the WWW Report of the Rapporteur on Monitoring of the GDPS	7, 9	Chairman of the working group
11	Observing system GOS monitoring programme	4, 9	Chairman of the working group
12	Review of previous resolutions and recommendations of the Commission and relevant Executive Committee resolutions	11	Secretary-General
13	Codes (including the report by the chairman on the Working Group on Codes) Aeronautical meteorological codes	5	Secretary-General of ICAO
14	Report by the president of the Commission ADD. 1	3	President of CBS
15	Methods for presentation and transmission of processed information	6	Secretary-General
16	Codes Comments on Recommendation 6 (CBS/WGC-IV) - International location identifier system for environmental data buoy stations ADD. 1	5	Secretary-General
17	Codes Telecommunication system (including the GTS part of the WWW and the report of the Working Group on the GTS) Requirements for precipitation and temperature data reported in the 7RRjj group of SYNOP for agrometeorological purposes	5, 8	President of CAgM

Doc. No.	Title	Agenda item	Submitted by
18	Codes Telecommunication system Monitoring of the operations of the World Weather Watch Requirements for an exchange of CLIMAT data for agrometeorological purposes	5, 8, 9	President of CAgM
19	Review of Technical Regulations of interest to CBS	10	Secretary-General
20	Telecommunication system (Including the GTS part of WWW and the report by the chairman of the Working Group on the GTS) Final report of the seventh session of the CBS Working Group on the Global Telecommunication System CORR. 1 (English only)	8, 9	Chairman of the working group
21	Codes Telecommunication system Requirements for precipitation and temperature data as reported in the 7RRjj group of SYNOP code	5, 8	United States of America
22	Data-processing system (including the GDPS part of WWW and the report by the chairman of the Working Group on the GDPS) Telecommunication system (including the GTS part of WWW and the report by the chairman of the Working Group on the GTS) Matters referred to CBS by Ext.76-RA VI	7, 8	Secretary-General
23	Monitoring of the operation of the WWW	9	Secretary-General

Doc. No.	Title	Agenda item	Submitted by
24	Data-processing system (including the GDPS part of WWW and the report by the chairman of the Working Group on the GDPS) Formats for the international exchange of Level II and III data sets	/	Secretary-General
25	Telecommunication system Exchange of CLIMAT and CLIMAT TEMP information	8	Hydrometeorological Service of the U.S.S.R.
26	Codes Review of basic shortcomings in Volume I of the Manual on Codes, 1974 edition, and basic principles governing the structure of codes and the Manual on Codes	5	Hydrometeorological Service of the U.S.S.R.
27	Codes Amendments to marine codes	5	Hydrometeorological Service of the U.S.S.R.
28	Codes The coding of ten-degree (10° x 10°) squares and reporting of geographical co-ordinates in the SATOB code	5	Hydrometeorological Service of the U.S.S.R.
29	Telecommunication system Meteorological telecommunication procedures	8	ASECNA
30	Codes Code FM-48 VARMET	5	ASECNA
31	Observing system Synoptic stations in Greenland	4	Iceland
32	Telecommunication system (including the GTS part of WWW and the report by the chairman of the Working Group on the GTS) GTS - Proposed new TTAA(ii) for processed information in numerical form (grid-point form)	8	Chairman of the Working Group on Codes

Doc. No.	Title	Agenda item	Submitted by
	II. "PINK" series		
1	Report to plenary on items 1, 2 and 3 Opening of the session Organization of the session Report by the president of the Commission	1, 2, 3	President of the Commission
2	Report of Committee B to plenary on item 4 Observing system	4	Chairman of Committee B
3	Report of Committee B to plenary on item 7 Data-processing system	7	Chairman of Committee B
4	Draft report of Committee A to plenary on item 5 Codes (including the report by the chairman of the Working Group on Codes)	5	Chairman of Committee A
5	Report of Committee B to plenary on item 6 Methods for presentation and transmission of processed information	6	Chairman of Committee B
6	Report of Committee A to plenary on item 5 Codes (including the report of the chairman of the Working Group on Codes)	5	Chairman of Committee A
7	Report to plenary on item 12 Scientific lectures and discussions	12	Vice-president of the Commission
8	Report of Committee B to plenary on item 4 Observing system	4	Chairman of Committee B

Doc. No.	Title	Agenda item	Submitted by
9	Report of Committee B to plenary on item 7 Data-processing system	7	Chairman of Committee B
10	Draft report of Committee A to plenary on agenda item 8 Telecommunication system (including the GTS part of the WWW and the report by the chairman of the Working Group on the GTS)	8	Chairman of Committee A
11	Report of Committee B to plenary on item 10 Review of Technical Regulations of interest to CBS	10	Chairman of Committee B
12	Report of Committee A to plenary on item 8 Telecommunication system (including the GTS part of WWW and the report by the chairman of the Working Group on the GTS)	8	Chairman of Committee A
13	Report of Committee B to plenary on item 11 Review of previous resolutions and recommendations of the Commission and relevant Executive Committee resolutions	11	Rapporteur Mrs. V. Jurčec
14	Report of Committee A to plenary on item 8 Telecommunication system	8	Chairman of Committee A
15	Report of Committee A to plenary on item 5 Codes (including the report of the chairman of the Working Group on Codes)	5	Chairman of Committee A
16	Report of Committee A to plenary on item 5 Codes (including the report of the chairman on the Working Group on Codes)	5	Chairman of Committee A

Doc. No.	Title	Agenda item	Submitted by
17	Report of Committee A to plenary on item 5 Codes (including the report of the chairman of the Working Group on Codes)	5	Chairman of Committee A
18	Report of Committee B to plenary on item 7 Data-processing system (including the GDPS part of WWW and the report of the chairman of the Working Group on the GDPS)	7	Chairman of Committee B
19	Report of Committee A to plenary on item 9 Monitoring of the operation of the WWW	9	Chairman of Committee A
20	Report of Committee A to plenary on item 5 Codes (including the report of the chairman of the Working Group on Codes)	5	Chairman of Committee A
21	Report of Committee A to plenary on item 5 Codes (including the report of the chairman of the Working Group on Codes)	5	Chairman of Committee A

WORLD METEOROLOGICAL ORGANIZATION

Supplement to WMO Publication No. 457

Abridged Final Report of the Extraordinary Session of the Commission for Basic Systems

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Decisions of the Executive Committee on the Abridged Final Report of the Extraordinary 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 extraordinary session of the Commission for Basic Systems.

A. DECISIONS RECORDED IN THE GENERAL SUMMARY OF THE WORK OF EC-XXIX (Relevant extracts)

3.1.1 Report of the president of CBS and report of the extraordinary session (1976) of CBS

3.1.1.1 The Executive Committee noted with appreciation the report of the president of CBS. It also noted the report of the extraordinary session (1976) of CBS and recorded its decision on the recommendations developed at this session in Resolution 3 (EC-XXIX).

3.1.1.2 The Executive Committee also noted with approval the updating of the work programme of CBS, established at its sixth session, for the period 1974-1978 and the assignment of high priorities to those tasks which would lead to:

(i) Improvements in the operation of the WWW in the reasonably near future;

(ii) The timely completion of CBS support for FGGE; and

(iii) The preparation of Guides and Manuals on GOS, GDPS and GTS which will materially assist Members in improving their services and contributions to the WWW.

3.1.1.3 The Executive Committee 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 certain recommendations which were established by the extraordinary session of CBS. These recommendations dealt with meteorological codes, some of which will have to be used during the FGGE, and with matters of an urgent nature related to the Global Data-processing System as well as the Global Telecommunication System. This enabled the early distribution of this information to all concerned.

....

3.1.1.5 The Executive Committee approved the plan for monitoring the operation of the WWW developed by the extraordinary session (1976) of CBS. The Committee felt that the implementation of this monitoring plan was essential for the efficient operation of the WWW, as well as for the success of the FGGE. It therefore decided on the action programme for its early implementation, as outlined below.

(i) Members should introduce the monitoring plan at the earliest possible date, in particular the real-time monitoring as prescribed in the monitoring plan;

(ii) The present activities of the Secretariat for monitoring the operation of the GOS and GTS on the non-real-time basis should continue and these activities will be incorporated into the non-real-time monitoring as prescribed in the monitoring plan;

(iii) The pilot projects as agreed by the CBS should be carried out in order to test the various elements of the monitoring plan, during the build-up phase of the FGGE; further development of detailed procedures of the monitoring will be worked out by the CBS Working Groups on the GOS, GDPS and GTS as appropriate, from the experience to be obtained from the results of the pilot projects;

(iv) Co-ordination meetings between RTHs/WMCs and associated NMCs should be held in order to remove the existing deficiencies in the operation of the GTS;

(v) Missions of experts (qualified personnel) should be arranged to assist in operating and maintaining the upper-air observation equipment and telecommunication equipment, in particular the electronic equipment, as well as on-the-spot training.

3.1.1.6 The Executive Committee noted that the extraordinary session of CBS proposed amendments to the Technical Regulations, Volume I, resulting mainly from the establishment of the Manual on the GDPS. In view of the urgent nature of those amendments, the Executive Committee decided to approve them, in conformity with Congress VI and Congress VII decisions, as regards approval of Manuals and corresponding amendments to Volume I of the Technical Regulations.

....

3.1.2.10 The Executive Committee considered that whilst all of the programmes of WMO are of great importance, the improvement of the operation of the World Weather Watch is of highest priority. The Executive Committee therefore requested the Secretary-General to prepare proposals for improving the implementation of the World Weather Watch and solutions to the present deficiencies, and to submit these proposals for consideration by the thirtieth session of the Executive Committee. The Executive Committee also invited the Regional Associations and CBS to keep the World Weather Watch Plan and its implementation under continuous review, in particular in respect to the GOS and GTS, with a view to updating them as often as required by changing conditions. Resolution 4 (EC-XXIX) was adopted.

....

3.1.3 Procedures for the preparation of the WWW Plan for the period 1980-1983

The Executive Committee recalled the Seventh Congress decision (Resolution 3 (Cg-VII)) which requested the Executive Committee to submit a report to the Eighth Congress giving proposals for the continuation and further development of the WWW during the eighth financial period. The Executive Committee discussed the possible mechanism for the preparation of the draft WWW Plan for 1980-1983 in the limited time available before Eighth Congress. It was decided that the Secretary-General should

prepare a draft plan in consultation with the appropriate WMO constituent bodies and EC Panels, to be submitted to the thirtieth session of the Executive Committee, for consideration and to give guidelines for the preparation of the final draft by the seventh session of CBS, scheduled to meet in November 1978. The Executive Committee requested the President of WMO to submit the final draft prepared by CBS, on behalf of the Executive Committee, to Eighth Congress.

B. RESOLUTIONS

Resolution 3 (EC-XXIX)

REPORT OF THE EXTRAORDINARY SESSION (1976) OF THE COMMISSION FOR BASIC SYSTEMS

THE EXECUTIVE COMMITTEE,

HAVING CONSIDERED the abridged final report of the extraordinary session of the Commission for Basic Systems,

DECIDES:

(1) To note the report;

(2) To note Resolution 1 (CBS-Ext.(76));

(3) To take action on the recommendations as follow:

Recommendation 1 (CBS-Ext.(76)) - Publication of the Guide on the Global Observing System

(a) Approves this recommendation;

(b) Requests the Secretary-General to publish the first seven chapters of the Guide on the Global Observing System, in accordance with this recommendation as soon as possible;

(c) Authorizes the president of CBS to approve amendments to the Guide as necessary.

Recommendation 2 (CBS-Ext.(76)) - Code for reporting satellite upper-air soundings of pressure temperature and humidity (SATEM)

Recommendation 3 (CBS-Ext.(76)) - Code for reporting satellite clear radiance observations (SARAD)

Recommendation 4 (CBS-Ext.(76)) - Code for reporting satellite observations of wind, surface temperature, clouds and radiation (SATOB)

Recommendation 5 (CBS-Ext.(76)) - Code for reporting upper-level pressure, temperature, humidity and wind from a sonde released by carrier balloons or aircraft (TEMP DROP)

Recommendation 6 (CBS-Ext.(76)) - Code for reporting constant-level balloon data (COLBA)

Recommendation 7 (CBS-Ext.(76)) - Code for reporting data from drifting buoys (DRIBU)

Recommendation 8 (CBS-Ext.(76)) - International identifier system for environmental data buoy stations

Recommendation 19 (CBS-Ext.(76)) - Amendments to the Manual on the Global Telecommunication System, Volume I - Global Aspects (Part I)

Recommendation 21 (CBS-Ext.(76)) - Amendments to the Manual on the Global Telecommunication System, Volume I - Global Aspects (Part I)

Recommendation 22 (CBS-Ext.(76)) - Amendments to the Manual on the Global Telecommunication System, Volume I - Global Aspects (Part II)

Recommendation 23 (CBS-Ext.(76)) - Amendments to the Manual on the Global Telecommunication System, Volume I - Global Aspects (Part III)

(a) Endorses the President's approval of these recommendations in accordance with Regulation 9 (5) of the WMO General Regulations;

(b) Confirms that the above code forms come into force on 1 July 1977;

(c) Confirms that the above amendments to the Manual on the Global Telecommunication System be implemented as soon as possible but not later than 1 July 1977;

(d) Requests the Secretary-General:

(i) To include the codes included in Recommendations 2, 3 and 4 (CBS-Ext.(76)) in Volume I of WMO Publication No. 306 - Manual on Codes;

(ii) To publish the codes included in Recommendations 5, 6 and 7 (CBS-Ext.(76)) for use during the First GARP Global Experiment;

(iii) To arrange, as a matter of urgency, in consultation with IOC, as required:

- for the promulgation of the international identifier system, included in Recommendation 8 (CBS-Ext.(76)),

- to carry out the administrative work relating to the management of the international identifier system;

(iv) To include the amendments included in Recommendations 19, 21, 22 and 23 (CBS-Ext.(76)) in Volume I - Global Aspects of the Manual on the Global Telecommunication System.

Recommendation 9 (CBS-Ext.(76)) - Amendments to marine codes

(a) Approves this recommendation;

(b) Decides that the above amendments to marine codes come into force on 1 January 1979;

(c) Requests the Secretary-General to arrange for the necessary amendments to be included in Volume I of the Manual on Codes.

Recommendation 10 (CBS.Ext.(76)) - Extension of Code FM 82-1 SFLOC

Recommendation 11 (CBS-Ext.(76)) - Amendments to Codes FM 51-V TAF, FM 53-V TAFOR and FM 54-V ROFOR

Recommendation 12 (CBS-Ext. (76)) - Revision of the notes on Codes FM 11-V, FM 14-V and FM 24-V

(a) Approves these recommendations;

(b) Decides that the above extension, amendments and revision of the notes concerning the different code forms come into force on 1 January 1978;

(c) Requests the Secretary-General to arrange for the necessary amendments to be included in Volume I of the Manual on Codes.

Recommendation 13 (CBS-Ext.(76)) - Volume I of the Manual on the GDPS

(a) Approves this recommendation;

(b) Decides that Volume I of the Manual on the GDPS constitutes Annex IV to the WMO Technical Regulations and should come into force on 1 July 1978;

(c) Requests the Secretary-General:

(i) To publish the Manual on the Global Data-processing System,

(ii) To up-date this Manual by supplements, as required.

Recommendation 14 (CBS-Ext.(76)) - International GDPS plan to support the FGGE

Recommendation 15 (CBS-Ext.(76)) - Formats for international exchange of Level II data sets

Recommendation 16 (CBS-Ext.(76)) - Formats for international exchange of Level III data sets during the FGGE

(a) Endorses the President's approval of these recommendations in accordance with Regulation 9(5) of the WMO General Regulations;

(b) Authorizes the president of CBS to approve changes to the International GDPS Plan and to the formats for international data exchange, as necessary;

(c) Requests the Secretary-General:

(i) To distribute the International GDPS Plan to support the FGGE in a convenient form to all Members and organizations concerned as soon as possible prior to the "build-up" year of the FGGE;

(ii) To arrange for the publication of the formats as soon as possible, but not later than the start of the "build-up" year of the FGGE.

Recommendation 17 (CBS-Ext.(76)) - Greenland and Iceland minimum network requirement

(a) Approves the recommendation;

(b) Requests the Secretary-General:

(i) To bring the recommendation to the attention of Denmark and Iceland with the request to make every possible effort to avoid reduction of the surface and upper-air observations in the network, and

(ii) To assist these Members in their efforts to maintain the approved basic synoptic surface and upper-air networks for forecasting purposes; (see also Resolution 2 (EC-XXIX)).

Recommendation 18 (CBS-Ext.(76)) - Implementation of the World Weather Watch

Approves this recommendation.

Recommendation 20 (CBS-Ext.(76)) - Exchange of BATHY/TESAC data over the Global Telecommunication System

(a) Approves this recommendation;

(b) Decides that BATHY/TESAC data be disseminated expeditiously on the GTS in accordance with the requirements stated by WMO and IOC Member States;

(c) Invites regional associations to study, as necessary, the arrangements for the distribution of BATHY/TESAC data within the Regions;

(d) Requests the Secretary-General:

(i) To develop in more detail, in co-ordination with the president of CBS, the routeing arrangements for BATHY/TESAC data on the Main Trunk Circuit, and the GTS in general, with a view to ensuring the availability of these data at centres requiring them;

(ii) To carry out periodical monitoring of the flow of these reports, and bring the results to the attention of the president of CBS.

Recommendation 24 (CBS-Ext.(76)) - Guide on the Automation of Meteorological Telecommunication Centres

Endorses the President's approval of this recommendation in accordance with Regulation 9(5) of the WMO General Regulations.

Recommendation 25 (CBS-Ext.(76)) - Plan for monitoring the operation of the WWW

Approves this recommendation.

Recommendation 26 (CBS-Ext.(76)) - Amendments to the Technical Regulations

(a) Approves this recommendation in conformity with Cg-VI and Cg-VII decisions as regards approval of Manuals and corresponding amendments to Volume I of the Technical Regulations;

(b) Requests the Secretary-General to incorporate the proposed amendments in Volume I of the Technical Regulations.

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Resolution 4 (EC-XXIX)

WORLD WEATHER WATCH IMPLEMENTATION AND FURTHER PLANNING

THE EXECUTIVE COMMITTEE,

NOTING:

(1) Resolution 3 (Cg-VII) - World Weather Watch,

(2) That considerable progress has been achieved in the implementation of the World Weather Watch Plan since its inception in 1967,

(3) That the World Weather Watch Plan for the period 1976-1979 has not been implemented to the extent desired,

CONSIDERING:

(1) That there are still critical centres and services which have not yet been established, as well as there being still shortcomings in the implementation of the GOS and the GTS, in particular in the tropical belt and the southern hemisphere,

(2) That from time to time new implementation problems arise requiring revision of the World Weather Watch Plan,

(3) That the continuing development of new technology makes it urgently necessary to find rapid and definite solutions to scientific, organizational and technical questions,

(4) That the World Weather Watch Programme continues to have a very high priority amongst the WMO programmes,

DEEMS IT NECESSARY:

(1) To continue the progress towards an improved World Weather Watch implementation,

(2) To review the planning and implementation procedures of the WMO, with a view to improving the organizational and technical structure and finding adequate solutions to the different problems,

REQUESTS the Secretary-General:

(1) To monitor closely the progress in the implementation of the World Weather Watch;

(2) To prepare a list of specific problems relating to the Global Observing System, the Global Data-processing System and the Global Telecommunication System, to which priority attention must be given;

(3) To propose to Members measures for the solution of the problems referred to in "REQUESTS (2)" above, as well as any organizational matters needing improvement;

(4) To investigate the possibilities of further collaboration with the various international organizations whose activities are to a certain extent connected with the improvement of the implementation of the World Weather Watch;

(5) To submit a report on the items (1) to (4) above, as well as the review of the WWW planning and implementation procedures, for consideration by the thirtieth session of the Executive Committee;

INVITES the Regional Associations and CBS to keep the World Weather Watch Plan and its implementation under continuous review, in particular the GOS and GTS, with a view to updating them as often as required by changing conditions;

URGES:

(1) Members concerned to do their utmost for the implementation of critical World Weather Watch facilities and services through national resources and, if this is not possible, seeking assistance through the UNDP and the Voluntary Assistance Programme, or bilateral assistance;

(2) Members to urgently consider contributing or increasing their contribution to the Voluntary Assistance Programme and giving assistance to the WMO by the secondment of staff, in particular electronic experts.