WORLD METEOROLOGICAL ORGANIZATION

COMMISSION FOR SYNOPTIC METEOROLOGY

ABRIDGED FINAL REPORT

OF THE

SECOND SESSION

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ATTENDING THE SECOND SESSION OF THE COMMISSION FOR SYNOPTIC METEOROLOGY

1. Officer of the session

W. Bleeker	President	

2. Representatives of Members of WMO

H.N. Grandoso	principal delegate	Argentina
J.M. Fernandez	delegate	
A.K. Hannay	principal delegate	Australia
L. Dufour	principal delegate	Belgium
L. Ratisbona	principal delegate	Brazil
M. Po E	principal delegate	Burma
U. Hla	delegate	
P.D. McTaggart-Cowan	principal delegate	Canada
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J.H.G. Crone-Levin	principal delegate	Denmark
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W. Hagos	delegate	
P. Leclercq	principal delegate	France
H. Durget	delegate	
R. Mittner	delegate	
H. Ribault	delegate	
M. Pittavino	principal delegate	French Cameroons
H.K. Meyer	principal delegate	Germany, Federal
P. Wüsthoff	delegate	Republic
H.O. Walker	principal delegate	Ghana
F. Dési	principal delegate	Hungary
S. Basu	principal delegate	India
R. Ananthakrishnan	delegate	
K.R. Bharucha	delegate	
P.K. Das	delegate	
N.V. Gadadhar	delegate	

Representatives of Members of WMO (continued)

K.R.D. Iyengar	delegate	
P. Koteswaram	delegate	
P.R. Krishna Rao	delegate	
S.S. Lal	delegate	
S. Mazumdar	delegate	
S. Mull	delegate	
P.R. Pisharoty	delegate	
C. Ramaswamy	delegate	
S.N. Sen	delegate	
P.K. Sen Gupta	delegate	
M. Gilead	principal delegate	Israël
M. Montalto	principal delegate	Italy
H. Ito	principal delegate	Japan
M. Ota	delegate	
J. Sallouhi	principal delegate	Lebanon
S. Frolow	principal delegate	Madagascar and Dependencies
G.H. Klamer	principal delegate	Netherlands
H.C. Bijvoet	delegate	
C.G. Green	principal delegate	New Zealand
P. Thrane	principal delegate	Norway
A.W. Khan	principal delegate	Pakistan
A. Silva de Sousa	principal delegate	Portugal
M. Gherman	principal delegate	Romania
O. Lönnqvist	principal delegate	Sweden
R. Berggren	delegate	
J. Lugeon	principal delegate	Switzerland
J. Haefelin	delegate	
A.W. Kabakibo	principal delegate	Syria
C.V. Bunnag	principal delegate	Thailand
P. Soontarotok	delegate	
M. Inan	principal delegate	Turkey
N. Yesilovali	delegate	
C.T. Logvinov	principal delegate	Union of Soviet Socialist Republics
V.A. Koulakov	delegate	
A.D. Tschistiakov	delegate	

Representatives of Members of WMO (continued)

C.J. Boyden	principal delegate	United Kingdom of
J.A. Burnett	delegate	Great Britain and
J. Harding	delegate	Northern Ireland
C.V. Ockenden	delegate	
P.H. Kutschenreuter	principal delegate	United States of
S.R. Barbagallo	delegate	America
P.R. Drouilhet	delegate	
C.G. Reeves	delegate	
L.W. Snellman	delegate	

3. Representatives of countries non-Members of WMO

A. Parviz Navai	observer	Iran

4. Representatives of international organizations

N.V. Subrahmaniam	observer	IATA
U. Rath	observer	ICAO

5. Invited experts

W. Ortmeyer

6. Speakers, guests, advisers

Lal Bahadur Shastri	Minister, India
R. Schäffer	Adviser, Sweden

7. Representatives of WMO Secretariat

N. Veranneman	Chief, Operations Section
A. Megenine	Technical Officer
V. Sundaram	Technical Officer

8. Secretariat of the session

S. Mazumdar	Executive Secretary
S.K. Gupta	Assistant Executive Secretary

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GENERAL SUMMARY OF THE WORK OF THE SESSION

1.

GENERAL

The Government of India invited the commission to hold its second session in New Delhi during 1958. After consultation with the Secretary-General this invitation was accepted by the president of the commission and the period for the session was fixed as 21 January - 17 February 1958. The meetings took place in the Conference Building of the Ministry of Works, Housing and Supply, Vigyan Bhavan, where excellent facilities were available. In spite of the heavy agenda, it was possible to finish the session on 15 February, two days before the scheduled time. Professor W. Bleeker presided during the session. Mr. S. Basu was elected vice-chairman for the session.

At the inaugural meeting delegates were welcomed by the Minister for Transport and Communications, Mr. Lal Bahadur Shastri, by the Director General of Observatories, Mr. S. Basu and the president. The addresses of welcome are recorded in the minutes.

At the final plenary meeting, the president thanked, on behalf of the commission, the Government of India for its hospitality and its assistance to the session, all those who had contributed to the success of the session, and particularly the chairmen of committees, the technical officers of the Secretariat of WMO and the staff which was placed at the disposal of the session by the Indian Government. The retiring president was thanked by Mr. S. Basu and Mr. P.D. McTaggart-Cowan.

Mr. P.H. Kutschenreuter was elected president; Mr. S.N. Sen was elected vice-president.

2.

ATTENDANCE

Thirty-five Members sent delegations to the session. The number of Members represented on the commission is 64; the quorum was therefore 22. Quorum difficulties were not encountered at any time during the session.

The Secretary-General had sent invitations to directors of all non-Member countries; Iran accepted the invitation, and Mr. A. Parviz-Navai attended the session as observer. Dr. Ortmeyer (Potsdam) attended the session as observer, after invitation by the president of CSM. Mr. U. Rath of the ICAO Regional Office in Bangkok and Mr. N.V. Subramaniam of IATA represented their organizations.

Messrs. N.L. Veranneman, A.M. Megenine and V. Sundaram attended the session in their capacity of staff members of the WMO Secretariat; they acted as the technical secretariat of the commission.

A full list of those present is given on page IX.

A list of the titles of the documents of the session is given on page 198.

3.

PROCEDURES

The session adhered to the Rules of Procedures as established in the General Regulations. The working languages of the session were English and French.

4.

WORK PROGRAMME AND RESULTS

The agenda of the commission was heavy. Most items originated from other technical commissions and from regional associations. It was extremely fortunate that the Working Group on meteorological transmissions had met in Paris from 14 to 26 October 1957 and had prepared a number of recommendations on telecommunications matters.

The final agenda is given on page XII . All agenda items were discussed. As may be seen from the comments on the agenda items, a number of items did not lead to any recommendations or resolutions.

Eighty-nine recommendations and 13 resolutions were adopted. This number may seem unreasonably high. The commission could have combined into one recommendation the various recommendations on code matters, also those on revision of Technical Regulations and those on the establishment of working groups. This was not done as it was felt that in separate recommendations the reasons for changes could be explained better and that it was preferable not to overburden the secretariat of the session.

The programme which, as a result of the session, is now before the commission in its third period of activity, is extensive. Seven working groups were set up to study various items. Elaborate assistance from the Secretariat will be necessary. That will certainly have financial implications. Financial assistance will also be necessary for further activities of the working groups. It is sincerely hoped that the Executive Committee and Congress will find ways and means to help the commission to execute its task properly, so that the general enthusiasm of the commission and its willingness to contribute to the realization of the principles set out by WMO in Article 2 of the Convention will not be discouraged.

5.

DISCUSSIONS OF THE AGENDA ITEMS

5.1

Opening of the session (Agenda item 1)

Reference is made to paragraph 1 above.

5.2

Consideration of the report on credentials (Agenda item 2)

The credentials of all the delegations present at the session were considered in good order.

5.3

Adoption of the agenda (Agenda item 3)

During the second plenary meeting a few items were added to the provisional agenda. The approved final agenda is found on page XII.

5.4

Establishment of committees (Agenda item 4)

The Credentials Committee consisted of Messrs. Lugeon (chairman), Lönnqvist, Po E.

The Nominations Committee consisted of Messrs. McTaggart-Cowan, Logvinov, Thrane, Soliman, Green, Hiroshi Ito.

Three committees were established for the examination of the various agenda items, namely :

Committee A : Codes, specifications and graphical representation (chairman : Mr. McTaggart-Cowan)

Committee B : Communications (chairman : Mr. Leclercq)

Committee C : Miscellaneous (chairman : Mr. Kutschenreuter).

Each of the committees formed its own drafting committee consisting of the chairman, the vice-chairman and the Secretariat officer who took part in its work. Provisional drafts were submitted to the president for finalization.

The Co-ordination Committee consisted of the president, the vice-chairman of the session, the chairmen of Committees A, B and C, and Mr. Veranneman and Mr. Mazumdar.

5.5

Report of the president of the commission (Agenda item 5)

The report was accepted. The commission paid special attention to paragraphs 5, 6 and 8 of the report.

In paragraph 5, the president mentioned that one Member had expressed some unhappiness with the procedure of adopting recommendations between sessions. Particular difficulty existed with regard to the term "urgent", as, e.g., occurring in General Regulations of WMO, and as also often used in recommendations of other constituent bodies. The commission was, however, satisfied that the Executive Committee had developed procedures adequate to safeguard the interests of the Members.

In paragraph 6, the president mentioned collaboration with the Secretariat and the need for more assistance. While noting that the Secretariat had assisted the president of the commission greatly during the inter-session period, the session agreed unanimously that it would be highly beneficial to the commission if the Secretariat were placed in a position to increase its participation in the work of the commission.

The commission requested the president to insert in the final report that it considered that the assistance which the Secretariat could give to the commission was thought to embrace the following :

(a) Assistance to the president :

  (i) to present him with proper analyses of problems arising between sessions and to suggest solutions;

  (ii) to prepare drafts for circular letters to the commission;

  (iii) to prepare drafts of documents required for sessions;

(b) Assistance to the commission :

  (i) to prepare drafts of publications (guides, manuals, etc.) in the field of the commission;

  (ii) to conduct periodical surveys of telecommunication techniques and developments of interest to meteorology and to follow carefully the requirements of meteorological telecommunications;

  iii) to assist the working groups of the commission by carrying out inquiries on their behalf, to prepare the required documentation for their sessions and to participate in the session's work.

The importance of meteorological telecommunications was also high-lighted.

While the commission realized that expansion of the Secretariat's staff engaged in the work of CSM would be required, it felt that it was beyond its competence to go further than stating its requirements. It adopted Recommendation 88 (CSM-II) on the subject.

In paragraph 8, the president drew the attention to the serious consequences resulting from the instrumental errors of radiosonde observations. The commission agreed that the need for comparability between different types of radiosonde remained an urgent one and that the quality of the radiosonde observations as a whole needed improvement. The commission felt confident, however, that Members are aware of the continuing need for instrument development and in this context Resolution 10 (CIMO-II) was noted with satisfaction. In view of these considerations, it was felt that no recommendation was necessary on this subject.

6.

REPORTS BY CHAIRMEN OF WORKING GROUPS ESTABLISHED BY THE COMMISSION (Agenda item 6)

6.1

Telecommunications (Agenda item 6.1)

The main activities of the working group during the period of activity under review were incorporated in the report of the first session of the working group (Paris, 14 - 26 October 1957) which was submitted to the session as Doc. CSM-II/71. This report served as a basis for the discussion on various agenda items (Items 9.2, 13, 15, 16 and 21).

6.2

Networks (Agenda item 6.2)

The activities of the Working Group on networks were reported in document CSM II/51, which served as a basis for the discussions on agenda item 10. The main contents of this document refer to the results of the session of the working group (De Bilt, 19 - 30 March 1957) in which the theoretical basis for the attack of the network problem was established. The commission recommended (Recommendation 72 (CSM-II)) the publication of this report as a Technical Note.

7.

OBSERVATIONAL REQUIREMENTS FOR SYNOPTIC METEOROLOGY (Agenda item 7)

7.1

Visibility (Agenda item 7.1)

The problem of reporting visibility was debated at length in the light of the separate requirements of synoptic meteorology and aviation. There are at present two main methods of reporting visibility, the minimum visibility and the visibility index, the first one being the internationally recognized

concept. While the commission fully agreed that one should aim at a single type of visibility observation, there was no indication that uniformity could be achieved without further investigation of the merits of different methods. It was regretted, moreover, that there seemed to be a difference between ICAO and IATA as to the aeronautical requirements, and it was hoped that this could be eliminated.

Discussion of the differences between minimum visibility and visibility index led to the question of how frequently there actually were marked directional differences of visibility, and how readily and accurately these could be estimated. The session recommended certain tests, which it is hoped will enable the commission to take a final decision on the subject at its third session (see Recommendation 15 (CSM-II)).

7.2

Definition of the terms used to describe the intensity of meteorological phenomena (Agenda item 7.2)

The discussions of this item revealed two entirely opposed schools of thought. According to one, there should be a direct relation between the qualifying terms of the intensity of a specific meteorological phenomenon and the local climatological data. According to the other, there should be for each phenomenon one absolute world-wide scale so that in all parts of the world, for example, moderate rain would mean the same amount of precipitation per time unit. The meeting expressed preference for the second approach on the basis of synoptic considerations; it agreed that the first approach was essential for national use. As it was obvious that the question required further study, it was decided to set up a CSM working group to examine the problem, limiting its study to those meteorological phenomena which are qualified in Code 92 - Present Weather, Volume B of WMO publication No. 9. In view of the above, it was agreed that the working group should not be given a too rigid set of instructions.

It appeared, during the discussion, that it would probably be necessary to increase the number of qualifying terms for some of the phenomena. This may mean a revision of the 'ww' code table but it was agreed that this problem of coding should be kept separate from the intensity criteria study. The group was, however, requested to pay due attention to the plotting aspects of the qualifying terms.

The conclusions of the meeting are contained in Resolution 10 (CSM-II).

7.3

Elevation of a station to be indicated in Volume A of WMO publication No. 9. TP.4 (Agenda item 7.3)

The commission examined the "height" data at present given in respect of observing stations in Volume A of WMO publication No. 9. It considered that these data were not entirely adequate for the purpose of synoptic meteorology,

and it recommended certain changes, expressing preference for H_p (station elevation) over H_z (elevation of the zero point of the barometer), which means that less frequent changes in Volume A are to be expected. The commission also agreed that geodynamic metres should not be used any longer in Volume A (see Recommendation 62 (CSM-II)).

Some resulting changes to two paragraphs of the Technical Regulations are recommended in Recommendation 66 (CSM-II).

7.4

Definition of gust (Agenda item 7.4)

Gusts and gustiness were discussed purely from the synoptic point of view. It was decided that the commission's efforts should be directed to developing criteria for reporting gusty winds, i.e. gustiness rather than attempting to define a gust. There were wide differences of opinion regarding the usefulness of reporting gusty winds. Because of these differences, and an equally wide difference of opinion on the best definition of gusty winds, it was concluded that the establishment of criteria for reporting gusty winds on a world-wide basis was premature, and that more experience should be gained before attempting to establish such criteria. It was agreed that such criteria should be as simple as possible so that the observer would have time to apply the criteria during the limited time available while taking the observations. The commission invites in Rec. 77 (CSM-II) Members to try out criteria on the basis of some simple rules which are given for guidance.

7.5

Pressure reduction (Agenda item 7.5)

A multitude of methods of pressure reduction used by Members are published in WMO Technical Note No. 7. Recently, Mr. L.P. Harrison in his quality as chairman of the former CIMO Working Group on pressure reduction has again discussed the factors relating to the reduction problem. The session understood that the Executive Committee had referred the matter to CSM for obtaining a final proposal regarding the method best suited to meet the requirements of the synopticians. It was unanimously agreed that a proper decision on the subject could only be taken if the various methods had first been tried out in actual practice by some meteorological services and appropriate measures to this effect were taken, including the setting up of a working group to select the pressure reduction methods to be tried out and to report the results of the trials before the end of 1959. It was considered that the trials could be carried out on either past or on current data but preferably on current data. The actual manner in which the various methods should be checked by participating services should be left to their own choice. The conclusions of the meeting are contained in Resolution 9 (CSM-II).

7.6

Extrapolation of sounding for geopotential calculations (Agenda item 7.6)

The commission, when studying this item, agreed that, with a view to increasing the usefulness of upper-air data for synoptic purposes, it appeared desirable not only to encourage a limited extrapolation of sounding for geopotential calculation, but also to recommend the use of a uniform procedure. While there existed already an agreed procedure of extrapolation for publication purposes established by CAe and the Executive Committee, it seemed highly appropriate to recommend a similar procedure for synoptic meteorology.

The commission also agreed that extrapolation should not be restricted to the standard isobaric surfaces as specified in paragraph 7.4.1.2 of the Technical Regulations, but the extrapolation procedure should also be used for the non-standard isobaric surfaces of 150, 70, 50, 30, 20 and 10 mb for which meteorological services may wish to draw upper-air charts in accordance with Recommendation 18 (CSM-II).

The commission decided that it was not essential to indicate in TEMP reports whether the data of the last transmitted level were obtained from extrapolation or not, since this would be apparent by the absence or presence of a temperature value for such a level.

7.7

Procedures for the issue and exchange of information from ocean station vessels (Agenda item 7.7)

The commission considered the proposal submitted by the Netherlands to the effect that ocean weather ships should be requested to transmit meteorological information every hour or every 1 1/2 hours in the full SYNOP form or in an abbreviated form. While agreeing that the transmission of synoptic reports on an hourly basis would be preferable from the synoptic point of view and would do away with the necessity of sending special reports, the meeting did not feel justified in adopting this as a minimum requirement and it was of the opinion that the provisions contained in paragraph 3 of Rec. 2 (CSM-II) concerning special reports from ships (see discussions of item 8.7) were adequate to meet the synoptic requirements, so that no further action on that agenda item was necessary.

7.8

Geopotential of 1000 mb in synoptic reports (Agenda item 7.8)

The session considered the Canadian proposal to add in surface synoptic reports a group giving the 1000 mb geopotential. During the discussion, consideration was also given to the possibility of mean sea level pressure maps being replaced by 1000 mb geopotential maps.

It was pointed out that the 1000 mb constant pressure chart is used in upper-air analyses. The reporting of 1000 mb geopotential would therefore be of

assistance to the analysts and useful in machine methods of analysis. In view of the work of reporting and transmitting the data, it was considered that these should not be included as an additional item in synoptic reports. On the question of whether the 1000 mb geopotential should replace mean sea level pressure in synoptic reports, it was noted that this would mean that sea level maps could then no longer be drawn. There are, however, certain features of mean sea level charts which might not be discovered in the 1000 mb maps.

The commission concluded that no action should be taken at this time but suggested that Members study the proposal and that it be included on the agenda for the third session of the Commission for Synoptic Meteorology.

8.

CODE FORMS AND TABLES OF SPECIFICATIONS (Agenda item 8)

It is suggested that the code forms and codes developed by the CSM at its second session and the additions, corrections and deletions to Volume B of WMO publication No. 9 should be brought into force on 1 January 1960 (see Recommendation 31 (CSM-II)).

8.1

Systems of code forms and codes (Agenda item 8.1)

The commission agreed early in the session that there would be no major changes to the whole family of code forms and codes. This decision was the yardstick by which action on other code items of the agenda were measured. Many excellent suggestions for changing the code forms to a major extent were therefore not given detailed consideration. Serious thought was given as to how these suggestions should be handled. Agreement was reached (see Resolution 6 (CSM-II)) on the formation of a working group with unrestricted membership but with a seven-men sub-group composed of a chairman and one representative from each Region. The terms of reference of this group were also developed. In Recommendation 87 (CSM-II) the need for financial assistance for the meetings of the group is expressed.

8.2

Code forms for reporting ground radar weather observations (Agenda item 8.2)

The commission studied various code forms at present in use or proposed for reporting ground radar weather observations. In view of the results of the inquiry made by the president of CSM in connexion with Recommendation 30 (CAeM-I/ICAO MET-IV) and in view of the fact that radar weather techniques are new and in rapid development, it concluded that it was still too early to develop an international code. It felt that the need expressed in Recommendation 3 of the Third NAT/RAN Meeting could best be met by a regional agreement of the countries operating ocean weather stations. The new code

form submitted by the USA for ground radar weather information was not considered appropriate for ocean weather stations (see Recommendation 79(CSM-II)).

8.3

Code form for the reporting of sea ice by aircraft (Agenda item 8.3)

The commission was informed by the president of CMM that his Working Group on sea ice intended to develop a code form and codes for the reporting of sea ice from aircraft and that it was unlikely that the code form at present in use in the United States and recommended for international use by CAeM would be adopted. The president of CMM also informed the commission that he planned to submit this code form to the President of WMO for adoption under General Regulation 36. However, realizing that while members of the CMM working group were world experts on sea ice, the commission considered that these experts were not necessarily experts on the intricacies of codes. It felt that CSM had an essential role to perform in finalizing the codes before the CMM report went to the President of WMO or the Executive Committee. The president of CSM was, therefore, invited to take appropriate action so as to ensure that CSM opinion on the new codes would be requested (see Resolution 2 (CSM-II).

8.4

Abbreviated code form for inter-Regional exchanges of surface reports (Agenda item 8.4)

Discussion on this item brought to light that even for inter-Regional exchange there was an overlapping of basic synoptic, aviation and other requirements. It was felt that some services might suffer in case an abbreviated code form for surface reports would be used and the commission decided that, at this time, no such code form would be developed. The meeting realized that there exists indeed some unhappiness with the present synoptic code form as a means for inter-Regional exchange; it places perhaps too much weight on aeronautical and temperate zone requirements. On the other hand, it was realized that the introduction of an abbreviated code form would also imply editing duties at telecommunication centres.

It also appeared from the discussions that in some cases only the mandatory groups of the synoptic reports are exchanged and in other cases the complete reports. Rec. 40 (CSM-II) recommends that the decision as to whether the reports be reduced to mandatory groups by editing or be left unchanged will be taken Regionally or inter-Regionally.

8.5

Code form for ground/ground exchanges of high-level forecasts (HIFOR) (Agenda item 8.5)

The commission in considering this item came to the conclusion that it was not difficult to add to the actual forecast code forms some groups in which

provision was made for the reporting of tropopause and jet stream core. For the exchange between forecast offices, the present Code 40 provides sufficient definitions to permit the recipients to interpolate adequately. It was felt, however, that the levels of tropopause and jet core should be indicated with the ICAO flight level number.

High-level forecasts for direct use by airline personnel should, however, contain altitude indications which make large interpolations unnecessary. The use of the ICAO flight level number in the actual code forms and in additional groups for tropopause and jet core data solves the extrapolation problem to a large extent. New code words for indicating those code reports, in which the ICAO flight level number is used throughout, were established (see Recommendation 4(CSM-II)).

8.6

Simplified code form for ships in areas where observations are sparse (Agenda item 8.6)

The commission took note of the special problems of many Members to encourage ships in remote areas to send reports, particularly when they were not calling regularly at a port served by a port meteorological officer. The meeting was informed that the introduction of SHIGY had met with considerable success. It was aware of the remark made by the chairman of the CMM working group on this problem that the use of the w for present weather made it difficult to include SHIGY reports in series of punched cards with other reports in forms FM 21.A, 22.A, 23.A and it therefore was in favour of a code form containing ww. Continuity of the collaboration of these ships following IGY was most important and an extension of the life of SHIGY for one year following the end of IGY was therefore recommended. The commission developed in Rec. 1 (CSM-II) a new code form SHRED. With the use of SHRED, the present code form FM 23.A is unnecessary and it can be deleted without penalty.

8.7

Code form for supplementary reports from ocean weather stations (Agenda item 8.7)

It was agreed that the code form FM 26.A was not completely adequate for transmission of special reports from ships and a new form FM 26.B was developed, with instructions for its use (see Recommendation 2 (CSM-II)).

Extensive discussions took place with regard to the telecommunication aspects of the onward relay of unscheduled reports. Reference is made to the remarks on this subject under agenda item 7.7.

8.8

Special phenomena (Agenda item 8.8)

Resolution 26 (EC-VIII) demanded that CSM-II study the desirability of using a universal $S_pS_ps_ps_p$ code. The commission was greatly appreciative of the

excellent work of Mr. Meyer's ad hoc group and the elegance of the solution proposed for combining the special phenomena codes of the various Regions. However, as there appeared to be no need to exchange the special phenomena group inter-regionally, the commission did not feel that there was an urgent need for a universal code. Mr. Meyer's report had sufficient merit to justify reference to the regional associations for their information. Recommendation 14 (CSM-II) draws the attention of the Regions to the work of the ad hoc group.

8.9

Risk group to indicate a more dangerous phenomenon in TAF-TAFOR messages (Agenda item 8.9)

The commission noted that the president of CAeM had advised that his commission was opposed to the re-introduction of the risk group or a code word indicating a risk factor. It decided not to take any action for the re-introduction of such a group.

8.10

Reporting of cloud base (Agenda item 8.10)

The commission found that there was need for clarification of the use of FM 17. This led to a minor modification in the specification for h = x and to the introduction of a note to Code 43 clarifying "height above ground". Rec. 12 (CSM-II) covers all these points adequately. It also gives complete coding instructions for clouds observed at mountain stations.

8.11

Code 92.A - w_1w_1 - Forecast weather at surface (Agenda item 8.11)

The commission, when considering this item, felt that it was not very well possible to follow the suggestion of CAeM (Recommendation 24 (CAeM-I/ICAO MET-IV)) and to delete the expression "within sight" from the code figures w_1w_1 = 15 and 16. The exchange of correspondence between the presidents of CSM and CAeM had clarified the use of w_1w_1 = 15 and 16 sufficiently; the term "within sight" refers to an observer who would make an observation at the time of validity of a forecast. As the existing specifications referred to "station", w_1w_1 = 15 and 16 were not applicable to ROFOR, FIFOR code forms, unless in certain situations, e.g., when the weather at certain turning points was specified. No note to indicate this was deemed necessary.

Clarification was given to the meaning of LOC in Code 50; the symbol SCT was added to the list of this code table. CAeM may wish to further interpret the operational significance of LOC, SCT, etc.; e.g., SCT might mean aircraft can avoid phenomenon by, at the most, slight diversions. The commission adopted Recommendation 28 (CSM-II).

8.12

Code 30 - F - Force of surface wind (Agenda item 8.12)

The commission considered it desirable to give guidance and directives to Mr. Dufour who will represent CSM interests in the Executive Committee Working Group on the Beaufort Scale (see Resolution 5 (CSM-II)).

8.13

Reporting of f_a (Agenda item 8.13)

The commission discovered that little use appears to be made of the surface wind speed groups in code forms FM 32.A and FM 33.A. Nevertheless, there was a desire by a majority of the commission to bring the specification for f_a into line with the usual rounding off practices in other codes, and therefore Recommendation 20 (CSM-II) was adopted.

8.14

Code C_e - Cloud character (Agenda item 8.14)

The original problem under this agenda item was withdrawn as its study seemed superfluous. The commission found, however, that the French text of Code 14 was not completely in conformity with the Cloud Atlas. Recommendation 25 (CSM-II) rectifies this.

8.15

Code 84 - VV - Horizontal visibility at surface (Agenda item 8.15)

Notwithstanding the many valuable suggestions received by the session for the revision of Code 84 - VV, it was decided to make no change at this time, in view of the fact that any significant change would affect the entire structure of the present code system. The continuing value of the suggestions will be brought to the attention of the Permanent Working Group on codes proposed under items 8.1 and 21 of the agenda.

8.16

Code for reporting characteristics of pressure tendency (Agenda item 8.16)

This item stemmed from equatorial countries. The commission discussed various aspects of the problems facing tropical meteorology in deriving maximum value from the group $T_dT_dj_aj_pj_p$. There appeared to be some research that might lead to the desirability of reporting app in the tropics also. Consequently it did not seem appropriate to propose any change in the present practice at this time.

8.17

Specifications for various code figures in the group $T_cT_cw_xI_xB_x$ in FM 42.A (Agenda item 8.17)

The commission noted that the president of CAeM was not in favour of the suggestions made to change the specifications of various code figures in $T_cT_cw_xI_xB_x$. Taking also into account the views of IATA that the POMAR code form will be no longer required in future, the session agreed that no action was necessary.

8.18

Reporting of temperatures in RECCO and TEMP code forms (Agenda item 8.18)

The commission found that there was no further need for reporting temperature in degrees F in the RECCO code form. Furthermore, there was evidence of substantial confusion resulting from the practice of using 99 for missing data and there existed no reason why the xx practice should not be used. Recommendation 23 (CSM-II) was therefore adopted.

8.19

Specifications for fog in ww-table, combined with items 8.20, 8.25, 8.30, 8.31, 8.42 and 8.46 (Agenda item 8.19)

These items were combined because they referred to the differences between the Cloud Atlas and the codes in Volume B, to points of difficulty in the ww-code, some of which arose from the Cloud Atlas and some from imperfections in the existing code table. The Cloud Atlas was accepted as the definitive text with the exception of the definitions of dust-haze, mist and fog, which need further study. The C_L, C_M and C_H-codes will be brought in conformity with the Cloud Atlas.

Many minor improvements are made to the ww-code, with consequential changes in the related codes for W, w, w_1w_1, etc. It was recognized that the ww-table is not in every respect ideal; many good suggestions for improvements will have to be studied by the Working Group on codes, which should also study documents CSM-II/31 and 146.

During the discussions on the subject, attention was drawn to Chapter 12 of the Technical Regulations, in which hydrometeor names are used which are not in conformity with the Cloud Atlas terminology. The results of the commission's studies are incorporated in Recommendation 9 (CSM-II).

8.20

Discrepancies between the French and English texts for ww = 07 and 08 (Agenda item 8.20)

Reference is made to the discussions under item 8.19.

8.21

Humidity indicator in RECCO (Agenda item 8.21)

The commission found it desirable to correct the minor inelegance in the use of symbols in the RECCO code form. The commission also noted that action under agenda item 8.18 had freed code figures 5, 6, 7, 8 and 9 in Code 47 so that they were now available to take care of possible future requirements which might arise from improvements in humidity measurements at high levels. Recommendation 24 (CSM-II) was adopted.

8.22

Symbolic words and letter groups (Agenda item 8.22)

The commission considered the proposals to change the symbolic words and letter groups not consisting of five letters. It was found that considerable inconvenience would be caused by changing such words as CLIMAT to conform to a rigit five-letter word. The change of such words as MONT to MONTS produced undesirable endings from a Morse code standpoint and such abbreviations as TAF could not appropriately be expanded. The commission was aware of the desire of ICAO to change the symbolic word AERO into METAR, but it felt that suggestions to this effect had to come from CAeM. Concluding, the commission considered that it would be undesirable to make any changes in the existing symbolic words. Guiding principles for the development of new symbolic words and letter groups were, however, set up in Rec. 30 (CSM-II) so as to ensure the maximum of uniformity in the future.

8.23

Numbering system of code specifications (Agenda item 8.23)

The commission considered a suggestion for the revision of the numbering system of code tables in Volume B and felt that the need for revision did not justify immediate action. However, in case a new edition of Volume B is planned, the Executive Committee might wish to authorize the Secretary-General to carry out this revision, which was considered mainly an editing matter, in consultation with the president of the Commission for Synoptic Meteorology.

8.24

Use of symbolic letter Y in SFAZU (Agenda item 8.24)

The commission noted that it was desirable to create a possibility for reporting the distribution of atmospherics over a period of less than 24 hours. It expanded the meaning of Y. (day of the week) to meet requirements for reporting atmospherics over periods which include parts of two calendar days (see Recommendation 29 (CSM-II)).

8.25

Discrepancies between Volume B and Volume II of Cloud Atlas (Agenda item 8.25)

Reference is made to the discussions under item 8.19.

8.26

CLIMAT SHIP (Agenda item 8.26)

The commission agreed that sea surface temperatures should be included in the CLIMAT SHIP. The development of suitable ship-borne raingauges was in an advanced state and for this reason it would be unwise to delete the code figures for monthly rainfall data as suggested by CCl. The commission revised the CLIMAT SHIP code form (see Recommendation 7 (CSM-II)).

8.27

Specification of PPP (Agenda item 8.27)

The commission suggests in Rec. 13 (CSM-II) some slight changes in the specification of PPP. It furthermore considered the proposals submitted by one Member to revise the pressure reporting procedures for stations which do not reduce the pressure to mean sea level. The session was, however, of the opinion that the proposals would add appreciably to the traffic load in many countries and that there did not appear to be any general difficulty with the present practice in the use of PPP in FM 11.A.

8.28

Symbols $\overline{PP}$ and $\overline{hh}$ in CLIMAT reports (Agenda item 8.28)

The combining of the symbols $\overline{PP}$ and $\overline{hh}$ in the symbolic code form for CLIMAT reports, as suggested by one of the Members, would not present the multi-purpose use of $\overline{PP}$ as clearly as is done by the present note. The commission therefore did not recommend any change.

8.29

Temperature and dewpoint in TAFOR code form (Agenda item 8.29)

The commission considered the problem of supplying information on temperature and dewpoint for take-off and landing of turbine-powered aircraft. It noted the changing nature of the requirements as presented in the CSM documentation and it agreed that, while it would not be difficult to develop additive code groups, it was undesirable to do so until the precise requirements were known. In the meantime the case of Q-code would suffice. It was recommended that ICAO be invited to state its precise requirements (see Recommendation 27 (CSM-II)).

8.30

Nomenclature for ice pellets and their coding under ww (Agenda item 8.30)

Reference is made to the discussions under item 8.19.

8.31

Specifications for ww-code figures 17, 18 and 19, 20-27, 54, 55 and 57 (Agenda item 8.31)

Reference is made to the discussions under item 8.19.

Considerable attention was given to the definition of a squall. Recommendation 78 (CSM-II) requests the Secretariat to collect information from the Members on definition and reporting practices.

8.32

Code for weather bulletins issued for shipping (Agenda item 8.32)

The commission developed a code form to be used for weather bulletins for shipping (Recommendation 3 (CSM-II)). In spite of the fact that the groups in this new code form do not look like any group in the ship reporting code form, it was believed that the code form will prove to be an excellent one, which will be easily understood with the help of a small decode-card.

The president of CMM will have to draw up a list of area designators; one could possibly use Marsden Squares. Names of areas could be used as an interim basis.

8.33

Definition of tropopause (Agenda item 8.33)

The commission considered the definition and code table developed by CAe at its second session. It had a very worthwhile discussion on the synoptic needs for reporting tropopause data, which indicated that some revision to either the definition or the proposed code table for character might be necessary later. The session concluded that the table was adequate for immediate use in synoptic meteorology and it adopted Recommendation 22 (CSM-II).

8.34

Notes to code table for P_W (Agenda item 8.34)

The commission removed the existing ambiguity in the code table for P_W and corrected the notes (see Recommendation 16 (CSM-II)).

8.35

Changes in 300 mb reporting level for metres and decametres (Agenda item 8.35)

The commission was in general agreement with the U.S. proposals to report the geopotential of the 500 mb level in decametres. In fact several delegates were willing to report in decametres at all levels. However, in view of the possible development of the 1000 mb chart, the need for greater accuracy in some countries having stations well above sea level and for tropical analysis in the lower levels, it was agreed to make the change only for 500 mb and above. The commission adopted Recommendation 21 (CSM-II).

8.36

Index numbers for stations making observations in physical meteorology (Agenda item 8.36)

The commission was afraid that the system of assigning index numbers to stations making observations in physical meteorology, proposed by the Secretary-General, would lead to several numbers for one station and therefore to an undesirable situation. It also expected that some of these observations (e.g., ozone observations) might be required for synoptic exchange in a relatively short time. It seemed therefore justified to assign an International Index Number to those stations, the observations of which are transmitted for international use on telecommunications system. With regard to the other stations, the session suggested that, in so far as these data were exchanged internationally by mail, station name abbreviations or numbers $QL_aL_aL_aL_oL_oL_o$ could be used. Any interim scheme that did not conflict with the International Index Numbers would be acceptable to the Commission for Synoptic Meteorology (see Recommendation 74 (CSM-II)).

8.37

Coding of upper-air wind data in CLIMAT reports (Agenda item 8.37)

The commission was informed that research in the Federal Republic of Germany has indicated that the routine receipt of upper-air vector mean winds in CLIMAT report would enable a quick indication of persistent errors in radiosonde data from a station. The session became, however, aware of the fact that a skewed distribution of such data from many stations might introduce real problems. It agreed to request that the matter be referred to CCl and CAe for comments, before any provision were made in the CLIMAT code forms for reporting the data. Resolution 3 (CSM-II) was adopted.

8.38

Codes for wind speed maximum and for tropopause data (Agenda item 8.38)

It proved relatively simple to reach agreement on the code forms for reporting maximum wind. With respect to tropopause data, there were widely divergent

views, reflecting, on the one hand, the relative newness of the tropopause analysis and, on the other, a desire to have a rigid economy of groups. Tropopause analyses are being carried out both with respect to pressure and geopotential.

The final solution for reporting maximum wind and tropopause data, as embodied in Recommendation 5 (CSM-II), requires the full use of a double-flagged symbolic group. It is believed that time and experience will reduce the number of variants; the present solution will also discourage the development of further Regional codes for the purpose.

8.39

Change in standard ship position groups (Agenda item 8.39)

The commission considered the proposal to use the code figure Y in the SHIP code form as a check figure. It came to the conclusion that there was a continuing need for the indication of the day of the week in SHIP reports and that the precise requirements for check figures need further study. No action was therefore taken.

8.40

Units used in hh of the group $8h_th_chh$ (IAC) combined with items 8.43 and 8.47 (Agenda item 8.40)

The commission came to the conclusion that the need of a revision of the IAC was apparent. Several new basic features were introduced in Recommendation 6 (CSM-II). The forecaster will now be able to indicate past or future motions for specified times in an analysis or in a fixed time prognosis message. He will also have the opportunity to send space time or "change" charts (analyses and prognosis), particularly with the wind field delineated as a series of grid points. Provision for jet stream and tropopause analysis and prognosis is also made.

The code form is now so flexible that a section in the Guide will be essential to explain its many uses. The table of contents in the proposed Guide makes provision for this.

8.41

Upper-level reports from land stations and ships (Agenda item 8.41)

The commission discussed the possibility of expanding the PILOT code form. It came to the conclusion that it was desirable to acquire the opinion of the regional associations on the needs for information beyond that which at present could be reported. Resolution 1 (CSM-II) requests the president of CSM to take some action. The need for information on wind vector differences was also considered under this agenda item. The difficulties for obtaining wind data of the 1000 mb level were noted. It was felt that advice from CAe should be obtained on this problem. Resolution 4 (CSM-II) was adopted accordingly.

8.42

Reporting of duststorm/sandstorm in Code 92 (Agenda item 8.42)

Reference is made to the discussions under item 8.19.

8.43

Provision for details of jet stream in analysis code (Agenda item 8.43)

Reference is made to the discussions under item 8.40.

8.44

Special provision in the cloud reporting procedure for reporting cumulonimbus clouds (Agenda item 8.44)

The commission found that there was a real need to improve the instructions for reporting small amounts of cumulonimbus clouds in the $8N_sCh_sh_s$ group of the AERO code form. Rec. 10 (CSM-II) recommends the change of one of the notes under FM 15.A, by which changes to the existing shortcomings are remedied.

8.45

Reporting clouds of different types having bases at the same level by the group $8N_sCh_sh_s$ (Agenda item 8.45)

The commission agreed that the present instructions under FM 15.A need clarification to cover the case of several types of clouds with bases at the same level in one reportable cloud layer. Recommendation 11 (CSM-II) recommends the addition of a note to FM 15.A, in which the correct reporting procedure is laid down.

8.46

Coding of thunderstorms in ww-Code 92 (Agenda item 8.46)

Reference is made to the discussions under item 8.19.

8.47

FM 45 - Code for analyses in complete form (IAC) (Agenda item 8.47)

Reference is made to the discussions under item 8.40.

8.48

Specifications for use of the variation group in TAFOR and TAF code forms (Agenda item 8.48)

The commission considered various problems connected with the specifications of the variation group in TAFOR and TAF. The delegate from Portugal, on whose

suggestions this item was placed on the agenda, advised that some of his original problems appeared now to be more appropriate for initial discussion in CAeM, but that a few points requiring clarification remained. These were discussed and appropriate action taken in Recommendation 26 (CSM-II).

9.

FORMAL ADOPTION OF DIFFERENT PARTS OF WMO PUBLICATION No. 9
(Agenda item 9)

9.1

Volume B - Chapter I (Agenda item 9.1)

The commission considered the question of the formal adoption of the Chapter I of the Volume B as well as of the Cloud Atlas. It was felt that these publications should not be treated as Technical Regulations but should be treated as separate publications and given the status of "Appendices" to the Technical Regulations. In the opinion of the commission, the words "shall" and "should" occurring in these publications need have only their dictionary meanings, and need not have the obligatory character they imply when occurring in the Technical Regulations.

The commission found it difficult to determine the exact status of the "shalls" and "shoulds" in the present annexes to the Technical Regulations and suggested this to be clarified. Until this has been done, the commission felt it best to refer to Volume B and the Cloud Atlas as appendices and not as annexes, as it was vital that the "shalls" and "shoulds" in these documents retain their dictionary meanings (see Recommendation 71 (CSM-II)).

9.2

Volume C - Chapter I (Agenda item 9.2)

The commission studied the present contents of Chapter I of Volume C. It concluded that the contents of the present chapter should more appropriately constitute a guide on telecommunications procedures. A format for this guide had already been prepared by the Secretariat.

The commission was aware of the fact that the decisions of its second session on telecommunications matters would have to be included in that guide and the Secretary-General was requested to take the necessary steps for its final completion (Recommendation 52 (CSM-II)) on the basis of the draft prepared by the Secretariat.

The commission thought that it would serve no useful purpose if the procedure recommended for the Synoptic Guide, as a result of the study of agenda item 17, was followed for the Telecommunications Guide also.

10.

NETWORKS OF STATIONS AND TIMES OF OBSERVATION FOR SYNOPTIC PURPOSES (Agenda item 10)

10.1

Quantitative criteria for determining the desirable distribution of observations in space and time (Agenda item 10.1)

The commission considered the excellent work already accomplished by the CSM Working Group on networks after only one meeting (reference is made to the discussion of agenda item 6.2) and it noted that the Executive Committee had reserved funds for one or more meetings. It decided to re-establish the working group (Resolution 7 (CSM-II)) with rather general terms of reference, but restricted, however, to the immediate task of establishing quantitative criteria for upper-air networks. The membership was kept limited in order to keep the costs of meetings low. Portugal offered to assign an expert to the group at no cost for the Organization if sessions were held. Since the working group would likely require special data, and perhaps even a temporary additional network of stations in order to complete its task, any such special requirements are to be indicated to the president of CSM, who, in turn, would explore various means of meeting the requirements. The initial report of the working group is to be made at the end of 1959 and the final report to the third session of CSM. Financial support for the holding of two sessions before the end of 1959 is requested in Recommendation 86 (CSM-II).

Since Members will be required to furnish special data in order to meet the requirements of the working group, it was decided that the studies contained on the report of the working group to the second session of CSM be published and distributed as a Technical Note. This decision is contained in Recommendation 72 (CSM-II).

The commission also considered the question of establishing a definition of basic synoptic network, noting Recommendation 1 (II-RA I) and Resolution 41 (EC-IX). It decided to propose a definition based on the Regional synoptic requirements, but without spatial criteria, until such time as the Working Group on networks has completed its work. The conclusions of the session on this subject are contained in Recommendation 80 (CSM-II).

10.2

Automatic weather stations (Agenda item 10.2)

The meeting examined Resolution 40 (CD Washington, 1947), which had been cancelled by Resolution 26 (EC-VIII), to determine whether information on automatic weather stations was needed. It was unanimously agreed that research in the field of automatic weather stations should be most strongly encouraged. The requirements for such stations range from the simplified instrument capable of reporting only one or two selected meteorological elements to the complex station capable of reporting all the elements normally obtained from

a manned synoptic station. Members should be particularly encouraged to install automatic stations to fill in the gaps in the network of manned synoptic stations and to complete the observation programme of manned stations working on a part-time basis.

The need for a suitable WMO publication giving complete information on existing automatic weather stations was expressed.

The conclusions of the meeting are contained in Recommendation 83 (CSM-II).

10.3

Aircraft reports (Agenda item 10.3)

The session examined Resolution 48 (IMC Paris, 1946), which had been cancelled by Resolution 26 (EC-VIII), to determine whether it needed repetition. It was agreed that the matter is adequately covered by the Technical Regulations. The IATA representative informed the meeting that at its Tenth Technical Conference, devoted mainly to turbine-powered aircraft operations, IATA had formulated the policy that it is prepared to give routine aircraft reports for the purposes of synoptic meteorology, if the items to be reported are limited, e.g., to temperature and winds. Full reports would only be made on a non-routine basis.

The session also noted with great appreciation the IFALPA policy in this matter. The commission was also aware of the fact that the Executive Committee had already instructed the Secretary-General to urge upon ICAO, IATA and IFALPA the importance of providing aircraft reports as prescribed by international and Regional agreements. It was the unanimous opinion that aircraft reports, especially from aircraft flying at high altitudes are a most useful and necessary supplement to the synoptic upper-air network in the same way as weather reports from ships supplement the surface network.

No recommendation on the subject was considered necessary.

10.3.1

Aircraft weather reconnaissance flights (Agenda item 10.3.1)

The session examined Resolution 47 (IMC Paris, 1946), which was cancelled by Resolution 26 (EC-VIII), in order to determine whether the substance required repetition. It was unanimously agreed that it would be proper to include a new paragraph in the Technical Regulations recommending that Members make arrangements to carry out aircraft weather reconnaissance flights, particularly with a view to filling the wide gap in the upper-air synoptic networks of ocean and desert areas and to report tropical revolving storms. Recommendation 68 (CSM-II) was adopted.

10.4

Ocean weather stations (Agenda item 10.4)

The session examined Resolution 60 (IMC Paris, 1946), which had been cancelled by Resolution 26 (EC-VIII), to determine whether it needed repetition.

It realized that nowhere in the Technical Regulations are Members encouraged to establish ocean weather stations. It was felt that this omission should be remedied by the inclusion of a new recommended practice (see Recommendation 67 (CSM-II)).

In connexion with this item, the commission discussed the necessity for obtaining additional material from the oceans, for instance, by establishing stations on islands. It was felt that there was a need for creating machinery to convene groups of countries who could take joint action. Recommendation 82 (CSM-II) was accordingly adopted.

10.4.1

Aerological observations made by ocean weather observation stations in the North Atlantic (Agenda item 10.4.1)

The session examined Resolution 81 (CD Washington, 1947), which had been cancelled by Resolution 26 (EC-VIII), to determine whether it needed repetition.

Considering the high cost of establishing and operating ocean weather stations, the session was of the opinion that they should be utilized to the maximum extent. The type of upper-air observations to be made by such stations was considered in the light of past experience which indicates that it may be sufficient to make two combined radiosonde/radiowind observations and two rawin observations per day. It was considered desirable to make a provision in the Technical Regulations indicating the recommended upper-air observing programme on ocean weather stations. The commission adopted Recommendation 69 (CSM-II).

When discussing this subject, the commission also considered the maximum levels to be attained by upper-air observations in general. It felt that the observations should reach the 100 mb level at the minimum; there was a feeling that observations to still higher levels should be carried out on a routine basis. The session recommended that CIMO should be informed of the need for instrumentation to levels of at least 10 mb, also in view of the fact that the Commission for Aerology had recommended publication of data up to that level. Recommendation 84 (CSM-II) was therefore adopted.

10.5

Upper-air observations near polar fronts (Agenda item 10.5)

The commission discussed whether there was a need for repetition of Resolution 46 (IMC Paris, 1946), which had been cancelled by Resolution 26 (EC-VIII).

The commission felt that it was difficult to define the average position of the polar front as mentioned in Resolution 46 (IMC Paris, 1946). However, it was felt that ultimately the question of the density of networks would find its solution as a result of the studies by the CSM Working Group on networks. It was agreed that Resolution 46 (IMC Paris, 1946) did not require repetition. No recommendation on the subject was therefore adopted.

10.6

Collection of additional information from ocean areas (Agenda item 10.6)

The session examined Resolution 36 (CD Washington, 1947), which had been cancelled by Resolution 26 (EC-VIII) and concluded that most points in the old resolution were already adequately covered in the Technical Regulations or had been included in Resolution 33 (EC-IX). The commission felt, however, that the attention of Members should be drawn to the possibility of making upper-air observations from mobile ship stations (see Recommendation 81 (CSM-II)).

10.7

Network in the tropics (Agenda item 10.7)

The commission discussed various possibilities for increasing the density of the network of upper-air stations (radiosonde and radiowind) in the tropics. As a result of the discussions, the Working Group on networks, recommended for re-establishment under agenda item 10.1, was directed to study networks in general, therefore including those in tropical areas.

Consideration was given to the possibility of conducting a field experiment with a dense network of stations in a limited land area of the tropics. It was felt premature, however, to recommend any such experiment, pending the advice of the Working Group on networks.

No further action was considered necessary.

10.8

Times of upper-air synoptic observations (Agenda item 10.8)

In considering this item, it was noted that the revised times of upper-air observations had been approved, as a matter of urgency, between two sessions of CSM in order to avoid the highly undesirable situation which would have arisen if the times of upper-air observations were changed in the course of, or after, the completion of the International Geophysical Year.

The commission considered two proposals to change the existing "primary" standard hours of upper-air observations (0000 and 1200 GMT) respectively to 0600-1800 and 0300-1500 GMT. These proposals were rejected by a strong majority. The question of simultaneity between surface and upper-air observations was discussed at great length and it was agreed that, while it did not appear possible to define exactly what is meant by this term, an upper-air observation should be "off the ground" at the standard time of observation and preferably be at some level between the surface and the 500 mb level.

The meeting accordingly concluded that for purely meteorological considerations the time of starting all upper-air observations should fall within the time range (H-30) to H. However, for considerations other than meteorological,

it was agreed that a small specified deviation from the ideal time-range should be permitted. The conclusions of the meeting are contained in Recommendation 70 (CSM-II).

10.9

Time of deposit of analysis and forecast reports (Agenda item 10.9)

The commission considered this item on the basis of Resolution 25 (EC-IV), which fixes the times at which the surface and upper-air master analyses should be issued by centres responsible and on the basis of a proposal by Regional Association V to reduce the delays in the issue of these analyses.

The commission was of the opinion that it was very important to maintain the highest possible standard of these analyses and that, therefore, the persons establishing them should not be put under undue pressure. It therefore concluded that Resolution 25 (EC-IV) should remain unchanged.

10.10

Criteria for designating a station as a mountain station (Agenda item 10.10)

No criteria for designating a station or a mountain station exist. It was necessary to know when the MONT-group should be used and when the letter M should be placed in the remarks column of Volume A of publication No. 9. Recommendation 63 (CSM-II) gives the necessary instructions.

11.

WEATHER ANALYSIS SYMBOLS (Agenda item 11)

11.1

Colours used in plotting reports (Agenda item 11.1)

The commission noted that the Executive Committee had decided that the substance of Resolutions 70, 71 (CD Warsaw, 1935) and Resolution 97 (CD Washington, 1947) would be included in the "Guide to Synoptic Meteorological Practice" after re-consideration by the Commission for Synoptic Meteorology.

It was agreed that the substance of the two Warsaw resolutions, modified and completed in the light of Resolution 97 (CD Washington, 1947), was indeed suitable for inclusion in the Guide. No recommendation was adopted on the subject.

11.2

Standardization of sea state charts for facsimile transmission (Agenda item 11.2)

The commission discussed the problem of the standardization of sea state charts for facsimile transmission. It was observed that two Members of the

Regional Association IV are the only ones preparing such charts at the present time. The commission decided that sea state charts may conveniently be included in the final version of the Synoptic Guide as one of the special charts. Details of these charts may be recommended by the Working Group on the Guide to Synoptic Meteorological Practice. Relevant documents of the session should be made available to the group. No recommendation was adopted on the subject.

11.3

Study of analysis symbols by the Secretariat, in addition with item 14.2 (Agenda item 11.3)

Excellent discussions took place on the subject of frontal terminology and frontal symbols. For the first time in the history of CSM (CSWI) adequate representation was available from the tropics, which made a study of tropical terminology and symbols possible. The commission was aware that the symbols recommended in Rec. 60 (CSM-II), which was adopted on the subject, are not the final answer, but they are a good foundation on which to build.

The discussions did show that in the extratropical regions (particularly in Region VI) a wide variety of symbols had grown up and that very little uniformity existed. To what extent this was the result of the removal of the symbols from Fascicule I of IMO was not determined.

The problem of analysis symbols will need close attention at regional associations meetings and at the third session of the Commission for Synoptic Meteorology.

The commission felt that it was not necessary to develop definitions of the terms employed in weather analysis. Scientific literature on the subject should be definitive. Annex 1 of Recommendation 60 (CSM-II) gives generalized description of a few terms not yet generally known, and for which new symbols were adopted.

11.4

Standardization of maps for facsimile dissemination of master analysis (Agenda item 11.4)

The commission discussed the need for uniformity of projection, scale and isopleth interval on master analysis charts which are transmitted by facsimile. It noted that with the increasing use of facsimile, recipients may wish to combine their analyses for adjacent areas. It was, however, realized that, since working charts of a different scale were used and facsimile techniques still showed shortcomings, it seemed premature at this time to make straightforward proposals.

The commission recommended that the Secretary-General should be asked to conduct a survey with Members in order to provide the third session of the commission with full information on the various national practices in the field (see Recommendation 58 (CSM-II)).

12.

COLOURS OF MAPS (Agenda item 12)

By its Resolution 26 (EC-VIII) the Executive Committee had decided that substance of Resolution 30 (CD Washington, 1947) was to be included in the "Guide to Synoptic Meteorological Practice" after re-examination by the Commission for Synoptic Meteorology.

The commission examined Resolution 30 (CD Washington, 1947) and found that, apart from some slight modifications, its text was still suitable for inclusion in the Guide. One modification resulted from the fact that there is no direct relation between the heights of a station and the datum level to which that station reduces its pressure reading. The other modification resulted from considerations of legibility of the station index number and of economy in chart printing. The conclusions of the session are contained in Recommendation 57 (CSM-II).

It was agreed, however, that the provisions expressed in this recommendation would not apply for charts printed for use as facsimile.

13.

INTERNATIONAL REQUIREMENTS AND ARRANGEMENTS FOR THE EXCHANGE AND DISSEMINATION OF DATA, ANALYSES, FORECASTS AND WARNINGS (Agenda item 13)

13.1

Questions arising out of the report of the CSM Working Group on telecommunications, regarding international exchange of meteorological data (Agenda item 13.1)

Under agenda item 13 and sub-item 13.1, the commission examined a number of the recommendations of its Working Group on telecommunications relating to the improvement of efficiency in the exchange of data. It adopted Recommendations 37, 41 and 51 (CSM-II) dealing with summaries of upper-air reports, the more detailed publication of broadcasting times for separate groups of reports and the possible combination of facsimile and radio-teleprinter transmissions.

The commission also examined under this agenda item the possible use of facsimile for the transmission of weather radar information.

It considered that, in view of the limited range of present weather surveillance radar equipments and the perishable nature of the detailed information, which they provide, it was doubtful if a requirement had been established to transmit weather radar information over any great distances (e.g. between Regions). It noted that, at present, equipment is employed in temperate latitudes mostly on a purely national basis in connexion with the provision of short period forecasts for very limited areas (e.g. automatic telephone weather services in major cities), but that owing to greater vertical cloud

development the range in tropical latitudes is greater and may be of the order of 180 miles, so that the equipment there might find a wider use. Furthermore, the information obtained from weather surveillance radar is particularly valuable where reporting stations are widely scattered.

In these circumstances, the commission considered it unnecessary to frame a recommendation, but it felt that the following summary of all the possible methods of transmission of radar weather data might be useful for reference :

(i) Coded reports, i.e. five-figure groups

This method has been tried by several Members who have developed national codes. The development of an international code is dealt with in Recommendation 30 (CSM-II).

(ii) Abbreviated plain language supplemented where necessary by coded groups

A combination of symbols and plain-language abbreviations is used at the present time in the United States where it is found to be reasonably satisfactory.

(iii) Transmission of a true detailed picture of the radar display by phototelegraphy

This is undoubtedly the best method of transmitting a true picture of the radar display at any fixed instant but is not entirely satisfactory. For example, the person interpreting the received picture may not be in a position to differentiate between permanent echo clutter due to physical obstructions and echoes produced by weather phenomena. A picture circuit is necessary and is relatively expensive.

(iv) Transmission by facsimile of an appreciation of the salient features of the radar display

This method is currently used by France for the transmissions from Trappes to Paris. The United Kingdom is also considering the use of facsimile for the transmission of weather radar information within a limited area. The cost of circuits will be much the same as for phototelegraphy, but no special photographic processing equipment is necessary.

(v) Remote presentation of the actual radar display using television techniques

Extremely expensive and probably only practicable for special purposes over short distances. Such a method is employed on a small scale in the United States.

(vi) Remote presentation of the actual radar display or an appreciation of its salient points using some form of "slowed down" television techniques

An interesting possibility which merits further study. The necessary equipments are at present only in the development stage.

13.1.1

Standardization of facsimile apparatus (Agenda item 13.1.1)

The commission reviewed the progress which has been made so far in formulating specifications for facsimile apparatus used for meteorological purposes and for associated transmission systems. It examined the detailed characteristics proposed by RA VI and the comments thereon by the CCIT. It considered that the work done so far provided a satisfactory basis for suggesting certain characteristics which could be considered as guidance material for the setting up of international facsimile networks, pending the outcome of studies which are being carried out in conjunction with WMO by CCIT and CCIR (see Recommendation 50 (CSM-II)).

13.1.2

Relations with other international organizations in the field of meteorological telecommunications (Agenda item 13.1.2)

The commission discussed at great length the relationship of WMO with other international organizations in the field of meteorological telecommunications, particularly ICAO and ITU. It took note of the fact that relations with ICAO were governed by the Working Arrangements between the two Organizations. It was, however, of the opinion that collaboration with ICAO in the field of the meteorological telecommunications was not sufficient. The commission noted with concern that WMO does not send its telecommunications experts to participate in the COM Division Meetings of ICAO even when matters concerning meteorological telecommunications are dealt with by them. It felt that co-operation with ICAO should be considerably extended in the field of meteorological telecommunications.

As regards the ITU, the commission noted that collaboration was necessary as follows :

(i) CCIT for matters concerning telegraphs and telephones, tariff, technical matters such as facsimile and radio-teleprinter apparatus, etc.;

(ii) CCIR for matters relating to technical aspects of radio transmissions such as the characteristics of radio circuits, atmospheric noise, etc.;

(iii) IFRB for matters concerning radio frequency usages for meteorological broadcasts, interference experienced by meteorological broadcasts, etc.

The commission felt that in the past, collaboration with the ITU had been very limited and that, as a consequence, the interests of meteorological telecommunications have suffered serious handicaps, such as the threat of the withdrawal of the preferential tariff, etc. It also noted that the IFRB has recently requested WMO to play an important part in connexion with meteorological broadcasts by :

(i) co-ordinating frequency requirements for meteorological telecommunications, meteorological aids, etc., and

(ii) investigating all cases of harmful interference experienced by meteorological transmissions.

The commission recognized that the question of protecting meteorological broadcasts from harmful radio interference has now become very urgent and of special importance because of the extreme congestion in the radio spectrum. It, therefore, felt that WMO should take all steps necessary to protect meteorological radio transmissions. Consequently it adopted Recommendation 54 (CSM-II).

In view of the above considerations, the commission felt very strongly that telecommunications experts from WMO should participate effectively in the various meetings of the different bodies of ICAO and ITU where matters of interest to meteorological telecommunications are discussed. It therefore adopted Recommendation 55 (CSM-II).

The commission was impressed with the need for continuous day-to-day collaboration between WMO and ITU.

13.1.3

Relations between the CSM Working Group on telecommunications and the Regional Working Groups on telecommunications (Agenda item 13.1.3)

The commission examined the responsibilities of Working Groups on telecommunications of regional associations as derived from those given to the regional associations in the field of meteorological telecommunications in Resolution 27 (EC-IV) and those of the Working Group on telecommunications of CSM. The commission felt that in the period between the first and second sessions of CSM, some regional associations had not been sufficiently represented in the work of the CSM Working Group on telecommunications. It felt that there should be more effective representation of the Regions at the sessions of the CSM Working Group on telecommunications, and that in any case, at least one representative designated by each regional association should attend all the sessions of the Working Group on telecommunications of CSM in order that the work of the latter may be fully effective. The commission recognized, however, that the absence of regional representatives in the past was very largely due essentially to the heavy costs involved. In view of the importance of the attendance of a representative from each of the Regions at the sessions of the Working Group on telecommunications of CSM the commission felt that the Executive Committee or Congress should consider favourably the possibility of paying their travelling expenses. Consequently it adopted Recommendation 56 (CSM-II).

13.1.4

Recommended specifications for radio-teleprinter equipment (Agenda item 13.1.4)

The commission considered that, in view of the increasing use being made of radio-teleprinter circuits and radio-teleprinter broadcasts for meteorological

purposes, it was desirable to propose certain specifications for the radio-teleprinter equipment which should be considered as guidance material. It adopted Recommendation 46 (CSM-II).

13.1.5

Telecommunication staff in WMO Secretariat (Agenda item 13.1.5)

This item was discussed in relation with agenda item 5; in this respect reference is made to Recommendation 88 (CSM-II). The commission was of the opinion that the Secretariat is the proper centre for co-ordination and stimulation of the activities in the field of telecommunications. Attention is also drawn to Recommendation 55 (CSM-II) where the desirability of a telecommunications expert of the Secretariat attending the sessions of the CSM Working Group on telecommunications has been expressed. Although the commission felt that the telecommunications section of the Secretariat would need strengthening, no specific recommendation on the subject was adopted.

13.2

Dissemination of meteorological data (Agenda item 13.2)

13.2.1

Grouping of territorial broadcasts (Agenda item 13.2.1)

The commission discussed the necessity for economizing in the use of radio frequencies and the desirability of arranging the transmissions of territorial broadcasts in such a way that copying by one operator of data of more than one country would be possible. Recommendation 34 (CSM-II) recommends the combining of territorial broadcasts with limited amounts of data into one single broadcast or the arranging of such broadcasts on a time and frequency sharing basis.

13.2.2

Facsimile to supplement or replace the exchange of weather data (Agenda item 13.2.2)

The commission examined the possibility of recommending the use of facsimile, specially for the transmission of analyses and prognostic charts from the centres responsible for master analyses, and for the transmission of plotted and coded data and diagrams. Regional associations were requested to develop programmes of facsimile transmissions for special and territorial broadcasts. Members were of the opinion that due note should be taken of Technical Regulation 6.1.1.10 (see Recommendation 36 (CSM-II)).

13.2.3

Radio-teleprinter exchanges (Agenda item 13.2.3)

The Working Group on meteorological telecommunications had already studied this item and the commission discussed its recommendations on the subject at length.

It was agreed that a change-over from Morse to radio-teleprinter broadcasts represented a major step forward in the exchange of meteorological information.

The commission recognized that, whilst simultaneous introduction on a world-wide basis by all continental and sub-continental centres was a desirable ideal, the greater need for higher speeds and the readier availability of funds and equipment in certain Regions inevitably would lead to earlier introduction of radio-teleprinter broadcasts in these Regions than in the other Regions. It was also aware of the fact that although the principles, agreed to earlier, confined the responsibility of sub-continental centres to their own Region, there is in practice a requirement for sub-continental transmissions to be available in the neighbouring portions of adjacent Regions to provide data in greater detail and at an earlier time than can be provided by a continental broadcast.

The commission realized that staggered implementation may cause difficulties as centres introducing radio-teleprinter transmissions would have to continue Morse broadcasts under the provisions of Technical Regulation 6.1.1.10; the strong hope was expressed that Technical Regulation 6.1.1.10 would be interpreted as generously as possible. Some members felt that no reference should be made to the data by which the change-over should be completed, but the majority of the commission was of the opinion that definite plans had to be established. Recommendation 35 (CSM-II) recommends that the change-over be completed by the end of 1962.

13.2.4

Flash bulletins (Agenda item 13.2.4)

It was obvious from the material submitted to the commission that the introduction of flash bulletins for upper-air information might lead to major code changes. The study of the introduction of flash bulletins was therefore referred to the newly established Working Group on codes. In this connexion, the commission noted that the term "flash bulletin" was likely to be misunderstood by telecommunications authorities and it felt that another suitable name for such messages (e.g., NUFOR messages) should be introduced.

During the discussions of that problem it was realized that a saving in lapsed time would be achieved by speeding up computation at the radiosonde stations. Recommendation 85 (CSM-II) reflects this idea.

13.2.5

Development of techniques and improvement of equipment (Agenda item 13.2.5)

Under this agenda item, the commission considered the best means for meteorological services to keep abreast of developments of telecommunications techniques and improvements in equipment likely to be of interest to them. It recognized that, for meteorological telecommunications to be planned and engineered as efficiently as possible, members of the Working Groups on telecommunications of CSM and the regional associations must be aware of the use of

all new types of telecommunications equipment and techniques so far as they may be applicable to meteorological telecommunications. It was, however, not considered necessary to lay down specific instructions; part of the problem was dealt with in Recommendation 55 (CSM-II).

The meeting requested that the following be inserted in the final report: "It seems desirable that Members ensure adequate liaison between their meteorological telecommunications services and also, where practicable, with any forms producing telecommunications equipment, so as to enable satisfactory co-ordination to be obtained between meteorological requirements and telecommunication developments".

13.3

Organization of world issues (Agenda item 13.3)

The commission examined the world-wide plan for the exchange of meteorological data approved in Resolution 27 (EC-IV) and the resolutions adopted by the various regional associations for implementing that plan. It noted that a number of the resolutions of the regional associations are either in the process of being implemented or under study. The commission therefore felt that it did not have sufficient information to take up a final position regarding the plan envisaged in Resolution 27 (EC-IV). After considerable discussion, it was of the opinion that the determination of existing deficiencies and the investigation of means necessary to remove them fall within the terms of reference of the Working Group on telecommunications. It felt that on the basis of the results of this study, a revised plan might have to be developed taking into account Resolution 27 (EC-IV), the various resolutions of regional associations concerned and the appropriate recommendations of the second session of CSM, as well as the possible financial implications involved.

Pending the results of the study envisaged above, the commission felt that the concept of continental and sub-continental broadcasts should not be changed at the present time, and that regional associations are sufficiently aware of the importance of this problem and will continue their active examination of measures designed to improve the existing exchanges.

13.3.1

Establishment of special centres for dissemination of northern hemisphere data (Agenda item 13.3.1)

The commission considered the importance of hemispheric charts and the need of various meteorological services in this connexion for upper-air and surface data of the two standard hours 00 and 12 GMT and of some services for surface data of 06 and 18 GMT. It examined the existing arrangements for collection and retransmission of the various data and noted that they were limited to a few centres only. Hence the commission adopted Recommendation 38 (CSM-II) wherein, for the northern hemisphere, five centres with different zones of responsibility for sending the data were envisaged, namely, Moscow,

New Delhi, Tokyo, New York and Frankfort. The task of these centres would be:

(a) Concentration of data of their zones of responsibility;

(b) Reception of the information concentrated in the other centres;

(c) Transmission of all northern hemisphere data for the benefit of users in their respective zones of responsibility.

The commission did not specify a date for the introduction of the plan, as it was learnt that difficulties existed for New Delhi and Tokyo for the immediate implementation.

In Recommendation 39 (CSM-II) the commission recommends that India and Japan initiate action for a speedy establishment of their centres and that the Executive Committee takes all necessary steps for providing assistance in this establishment if such assistance becomes necessary. The commission considered it desirable that an analogous plan for the southern hemisphere would be studied by the CSM Working Group on telecommunications.

Two statements were made in connexion with the adoption of Recommendation 38 (CSM-II) :

The USSR delegation could not agree with any decision concerning the transmission of data for the territory of the People's Republic of China;

The Norwegian delegation, speaking also on behalf of Denmark and Sweden, deplored that for the transmission of data between New York and Frankfort no mention was made of an additional relay employing ocean cable or a communication system with comparable efficiency. Reference was made to the high degree of meteorological activity between Regions IV and VI, to the insufficiency of the RTT circuit New York - Azores - Paris and to the forward scatter system under development under the aegis of ICAO. The Norwegian delegation found it difficult to understand how governments can act so boldly in respect of communications for long distance aviation and at the same time be so reluctant to recognize similar requirements with WMO. It considered the situation serious. The CSM is responsible for questions relating to world-wide meteorological telecommunications. In Regions VI and IV two large services had long ago resorted to bilateral arrangements to meet their requirements. Other services may find it necessary to do the same. Such sporadic development was clearly undesirable and it might, thus said the Norwegian delegate, eventually jeopardize efficient planning of meteorological communications on a world-wide basis.

13.4

Information other than that normally included in synoptic messages (Agenda item 13.4)

The commission examined Resolution 56 (CD Warsaw, 1935) (Information other than that normally included in synoptic messages) as required by Resolution 26 (EC-VIII). It considered that the substance of this resolution was worth retaining. Therefore it adopted Recommendation 45 (CSM-II).

13.5

Table of information issued in each collective message (Agenda item 13.5)

The session considered whether there was a need for maintaining the substance of Resolution 60 (CD Warsaw, 1935), which had been cancelled by Resolution 26 (EC-VIII). It was decided that there existed no need for checking the contents of collective messages. The resolution was therefore considered obsolete and no further action was necessary.

13.6

Standard levels above 200 mb, combined with items 13.9 and 16.1 (Agenda item 13.6)

In considering these items, the session was aware of the definition of standard isobaric surface proposed in Recommendation 18 (CAe-II) and of the isobaric surfaces recommended for publication purposes by Resolution 26 (EC-IX). It was felt that the proposed definition of "standard isobaric surface" was ambiguous. A revised wording was proposed, which makes it clear that data of standard isobaric surfaces are required for analyzing purposes in view of routine forecasting duties. The commission recommended the addition of the 100 mb surface to the list of standard isobaric surfaces, and suggested, in connexion herewith, corrections in Volume B of publication No. 9. It also re-considered Technical Regulation 7.4.1.3, with the object of providing for the requirements of civil aviation, while leaving a certain flexibility in the charts which services may wish to establish.

In order to achieve some degree of uniformity between services preparing upper-air charts for purely national purposes, the session established a list of pressure surfaces from which these services are invited to make their selection. In doing so, account was taken of the levels for which IGY observations are published. A proposal to adopt the 250 mb surface as a standard isobaric level was rejected. The commission was furthermore of the opinion that there was still a need for maps of 400 mb; it therefore indicated that it was not in agreement with the suggestion made in Recommendation 18 (CAe-II) to delete this surface from the list of standard isobaric surfaces. The conclusions of the commission are contained in Recommendation 17 (CSM-II) and in the final paragraph of Recommendation 65 (CSM-II).

13.7

Significant levels (Agenda item 13.7)

The basis for the discussion of that item was formed by Resolution 24 (EC-IX) which stemmed from Recommendations 11 and 12 (CAe-II) in which a definition of significant level for publication purposes was given.

The commission concluded that there exists a requirement for international rules specifying significant levels or points for inclusion in TEMP reports.

The increase in the number of groups to be transmitted in Section 2 of the TEMP code form would in general be insignificant. The meeting recommended (see Recommendation 19 (CSM-II)) the insertion of a note in Volume B, which lays down the criteria for determining significant levels; the criteria are analogous to those established by Resolution 24 (EC-IX). The commission was not very satisfied with these criteria; they will lead to certain duplication between Sections 1 and 2 of the TEMP code and the reporting of levels in these two sections which are very close together. It also noted that no indication had been given of the type of diagram to which they had to be applied. Without expressing this in a recommendation or resolution, the commission expressed the hope that the Commission for Aerology would re-study the matter in the light of the above remarks.

13.8

Improvement in the international exchange of radiosonde reports (Agenda item 13.8)

The commission reviewed the MESRAN and ABTOP (RA VI) summaries of upper-air reports. Recommendation 8 (CSM-II) recommends the use of MESRAN where communications are good and of the ABTOP where communications are restricted. Regional Association VI will have to abolish the ABTOP as a special code form for this Region.

13.9

Adoption of the 250 mb surface as a standard pressure surface (Agenda item 13.9)

Reference is made to the discussions under item 13.6.

14.

METHODS AND TECHNIQUES OF ANALYSIS AND FORECASTING (Agenda item 14)

14.1

Verification of forecasts (Agenda item 14.1)

The meeting examined Resolution 58 (CD Utrecht, 1923), which had been cancelled by Resolution 26 (EC-VIII), in order to determine whether it should be retained. It was agreed that verification of forecasts is most useful and that Members should be encouraged to make such verification on a regular basis. On the other hand, it was felt that progress in this field should not be impeded by inconsidered standardization. Recommendation 76 (CSM-II) expresses the wish that the Secretary-General be asked to obtain information on the methods actually in use for publication as a WMO Technical Note.

14.2

Standardization of frontal terminology, definitions and nomenclature (Agenda item 14.2)

Reference is made to the discussions under item 11.3.

14.3

Differences between wind data for routes, obtained from upper-air charts by different meteorological services (Agenda item 14.3)

The commission was informed of the various approaches that had been made to bring about a solution to the problem raised in Recommendation 46 (CAeM-I/MET-IV) and of the offer of the director of the French Meteorological Service presented to the ninth session of the Executive Committee. In essence this offer would permit an internationally composed group of four research workers to get together for a number of months in premises of the French Meteorological Service in Paris to attempt to solve the problem. The meeting took note of a study by Mr. B. Primault of the Swiss Meteorological Service "Des cartes en altitude et de leur influence sur le calcul des temps de vol - La Météorologie, octobre 1951", which concluded that it was improbable that the study required in Recommendation 46 (CAeM-I/MET-IV) would give significant results.

The commission also noted the contributions made in the field of objective analysis and objective forecasting, which would gradually diminish the difficulties which led to the adoption of Recommendation 46 (CAeM-I/MET-IV). It was realized that the developments taking place in civil aviation create new problems. Reference was made to Resolution 40 (EC-IX) which had led to the establishment of a Panel of Experts on the development in meteorology in view of commercial jet aircraft operations.

The commission therefore unanimously agreed to suggest that the president of CSM take appropriate steps to find out whether the director of the French Meteorological Service might permit the facilities of his offer to be used for the study of problems peculiar to analysis and forecasting for high-level flights. Since the president of CSM was already in correspondence with the appropriate authorities on this subject, no official decision of the commission was passed.

14.4

Streamline and isotherm analysis techniques applicable to tropical regions (Agenda item 14.4)

This question arose from Recommendation 26 of the second SEA/SOP ICAO Regional Air Navigation Meeting, which raised the following three points :

(i) The need for streamline / isotach analyses in tropical regions in South-East Asia and in the South Pacific;

(ii) The need for a code for isotach and streamline analyses;

(iii) The need for a study of streamline and isotherm analysis techniques, both actual and prognostic.

The meeting agreed that the president of CSM had already provided ICAO with a reply on all of the questions except on that dealing with the isotherm analysis and prognostic techniques. He had indicated that (i) was a regional problem; that code form FM 45 meets the need expressed in (ii); finally, that the report by Palmer, Wise, Stempson and Duncan, entitled "The Practical Aspects of Tropical Meteorology" (Geophysics Research Directorate, Air Force Surveys on Geophysics, No. 76, Air Force Cambridge Research Centre, Bedford, Mass.) dealt with the streamline and isotach analysis.

The commission decided to set up a working group to study the further development of isotherm analysis and of isotherm, streamline and isotach prognostic analyses (see Resolution 11 (CSM-II)).

15.

TELECOMMUNICATIONS NETWORKS, SCHEDULES AND OPERATIONAL PROCEDURES (Agenda item 15)

15.1

Questions arising from the session of the Working Group on telecommunications (Agenda item 15.1)

Amongst the questions not included under this agenda item was that of the issuance of amendments to Volume C of publication No. 9. Recommendation 64 (CSM-II) recommends monthly issue of amendments. This recommendation also refers to Volume A and Volume D of publication No. 9, and recommends that amendments to Volume A be issued every three months and to Volume D every month. Discussion on Volumes A and D was opened as a result of the review of resolutions and recommendations of the commission (agenda item 16.2).

Another question not specifically itemized was that of the economy of communications. It was realized that very often data were transmitted that were not really required for certain areas. Recommendation 53 (CSM-II) requests regional associations to study this matter further, with particular reference to relays of data which originate outside the Region and may not be required for onward relay in their entirety.

15.1.1

Radio-teleprinter exchange procedures (Agenda item 15.1.1)

The commission understood that some relay centres re-edit bulletins before transmitting them. It noted that a teleprinter exchange centre was responsible for consolidating in bulletin form the many individual reports it received from various sources for exchange purposes, and that, in addition, it might be responsible for relaying directly to an exchange circuit the complete

bulletins it received from a feeder or other circuit. Sometimes these bulletins were received at an exchange centre with portions of their contents garbled. It was learnt that while these bulletins were normally re-transmitted in "as received condition", some centres re-edited the bulletins and suppressed any garbled portions and changed abbreviated headings. It understood that this practice not only created difficulties in Region IV but that a substantial amount of useful data was sometimes not received. It felt that such a situation should be rectified and not allowed to develop in other Regions. The commission therefore adopted Recommendation 48 (CSM-II).

15.1.2

Possible use of groups with more than five figures in meteorological messages (Agenda item 15.1.2)

The commission discussed this item at some length. It took note of the fact that if groups of six or more figures could be used in meteorological messages, a number of difficulties which arise in connexion with codes could possibly be solved. It realized, however, that in many parts of the world most meteorological messages are carried on channels where groups are counted and charged for in accordance with the International Telegraph Regulations. Since under these circumstances each group consisting of more than five figures would count as two or more words, the commission viewed with concern the financial implications involved. In addition to the financial aspect, the commission felt that a change from the well-established practice of using five-figure groups might adversely affect the efficient handling and checking of messages. In view of these circumstances, the commission considered that, at the present time, the use of groups of more than five figures should be discouraged. No action on this subject was taken.

15.1.3

Use of the sign x, / or + to denote missing figures in meteorological messages (Agenda item 15.1.3)

The commission reviewed the development of the problems related to the use of the signs x, / or + to denote missing figures in meteorological messages from the beginning. It noted that both the ITU and the ICAO have not reacted favourably to the use of the + sign for the above purpose. It realized that the general adoption of the + sign would, under the present circumstances, give rise to great difficulties. It therefore considered that the question should be studied further in collaboration with ITU and ICAO and adopted Recommendation 49 (CSM-II).

15.1.4

Use of AFTN to provide meteorological circuits (Agenda item 15.1.4)

The commission examined Recommendation 4 (II-RA I) and the comments of the Working Group on telecommunications thereon. It heard the following statement from the ICAO observer :

"The following is an extract from ICAO's comments to WMO on Recommendation 4 (II-RA I). This important recommendation requires some interpretation. It is assumed that the "agreement" sought of ICAO is the establishment by the ICAO Council of the practice outlined in clause (1) as a planning principle in the further development of regional plans for AFTN circuits. Such a decision of Council would, of course, be notified to Contracting States, as suggested in clause (2) of the recommendation.

The ICAO Secretariat has noted the CSM Working Group on telecommunications report, paragraph 6.13 at the top of page 31, first two sentences. However, the situation varies very much from place to place and the matter will require further study before an official ICAO position can be agreed upon".

The commission was of the opinion that the assumption made by ICAO was correct and it considered that when RA I put forward its recommendation, it was unaware of Annex 10, Attachment D to Point I, and under the impression that an approach to ICAO was necessary. On the other hand, when this subject was considered by the working group, it was aware of the annex and thought that this covered the problem. In view of the ICAO statement and after examination of paragraphs (a), (b) and (c) of the Preamble of WMO's Working Arrangements with ICAO, the commission was of the opinion that no recommendation on the subject was required.

15.1.5

Efficient use of radio-communication channels (Document CSM-II/77) (Agenda item 15.1.5)

The commission examined Recommendation 5 (II-RA I) and the comments of the Working Group on telecommunications thereon. It was generally agreed that part (1) of the recommendation was covered by action already taken by the second session of the commission. Part (2) of this recommendation received detailed examination as it was pointed out that the principle of preferred use of relatively atmospheric interference-free methods for meteorological messages was involved. The commission whilst accepting the principle was of the opinion that this was already adequately expressed and that no recommendation was necessary.

15.1.6

Standardization of telecommunications procedures (Agenda item 15.1.6)

The commission considered that with the rapid expansion of radio-teleprinter broadcasts throughout all the Regions, standardized operating procedures for radio-teleprinter broadcasts were very necessary and should be produced early. It noted that certain regional associations have already commenced taking action in this respect and also that ICAO had established certain procedures. Consequently it developed standard procedures to be used on a world-wide basis in meteorological broadcasts by radio-teleprinter and adopted Recommendation 47 (CSM-II).

15.1.7

Times for transmission of synoptic observations and analyses (Agenda item 15.1.7)

In studying this item, the commission viewed it as being chiefly one of transit times for the transmission of synoptic data between originating stations and their particular communication centre. Due note was taken of Resolution 13 (II-RA I) and Resolution 16 (57-RA V), especially in respect of the transit times specified. It was agreed that there was a general need for specifying maximum acceptable transit times. The question was considered on the basis of the three main categories of communications channels used, viz. exclusive meteorological, public correspondence and AFTN channels. The commission considered that meteorological messages handled over public correspondence and AFTN channels already have relatively high degrees of priority and it would not be reasonable to expect any greater priority over these channels. Over exclusive meteorological channels, the question was rather of a domestic nature and should not be too difficult to solve. It was, however, considered that a basic maximum transit time should be laid down irrespective of the type of channel used. Therefore, the commission adopted Recommendation 42 (CSM-II).

15.1.8

Standardization of addresses for ships' weather reports (Agenda item 15.1.8)

The commission examined paragraph (1) of "Recommends" of Recommendation 22 (CMM-II) and recognized that there was a general desire to adopt one standard word for world-wide use, as the first word in the addresses for ships' weather messages. Two words were suggested, namely "OBS" and "MET"; the majority favoured the word "OBS". The commission was of the opinion that the subsequent words indicating the name of the addressee be decided as a national matter. The commission adopted Recommendation 43 (CSM-II).

15.1.9

Representation of WMO at the next Administrative Radio Conference of ITU (Agenda item 15.1.9)

The commission noted Recommendation 24 (CMM-II). It expressed the need for WMO being adequately represented at the ensuing Administrative Radio Conference of ITU. It agreed that the directives drawn up by CMM should be included in the brief to WMO representative.

15.2

Modification of frequencies and of broadcast times (Agenda item 15.2)

The commission examined Resolution 30 (IMC Salzburg, 1937) and it felt that the substance of the second part of that resolution should be included in the Technical Regulations. Accordingly it adopted Recommendation 44 (CSM-II).

15.3

"Dead traffic" (Agenda item 15.3)

The commission reviewed the results of the inquiries conducted by the president regarding the need for co-ordinating dead traffic procedures for meteorological messages with those in use over the AFTN. It felt that no world-wide action was necessary and that in cases where certain arrangements would be desirable they could be made on a regional basis or by bilateral agreements between Members concerned.

15.4

Abbreviated headings (Agenda item 15.4)

15.4.1

Abbreviated headings for amended aerodrome forecasts (Agenda item 15.4.1)

The commission found that there is sufficient need for a clear-cut, readily identified message heading procedure for amended TAFORs, even though this heading might not be carried on circuits which do not normally accept WMO abbreviated message headings. Provision for this is made in Recommendation 33 (CSM-II). The same procedures may be applied to the ARFOR and other forecast code forms, when necessary.

15.4.2

Additional abbreviated headings to meet requirements of Regional Association IV (Agenda item 15.4.2)

The commission reviewed the requirements for additional abbreviated headings of Regional Association IV. A number of new data indicators and geographical indicators was added to the list of Volume C, publication No. 9 (see Recommendation 32 (CSM-II)).

16.

REVIEW OF EARLIER DECISIONS CONCERNING THE FIELD OF SYNOPTIC METEOROLOGY (Agenda item 16)

16.1

Technical Regulations (Agenda item 16.1)

At the end of the session, the commission thoroughly studied the Technical Regulations in order to decide whether any changes were required in addition to those already recommended in connexion with the study of other agenda items. Recommendation 65 (CSM-II) suggests amendments in the Technical Regulations which resulted from this study.

16.2

Review of recommendations and resolutions concerning the field of synoptic meteorology (Agenda item 16.2)

The commission considered the resolutions and recommendations of CSM and it concluded that, with some exceptions, most had already served their purpose or were contained in their current intent in the discussions of the present session (see Resolution 13 (CSM-II)).

The commission also reviewed the resolutions of the Executive Committee based on CSM recommendations. Its findings are laid down in Recommendation 89 (CSM-II).

17.

GUIDE TO SYNOPTIC METEOROLOGICAL PRACTICE (Agenda item 17)

Considerable difficulties were encountered in reaching a common understanding on the implications and on the approach of the problem of how to develop a Guide to synoptic meteorological practice. It was found that there existed differences between the French and English texts covering the establishment of guides at Congress and Executive Committee; the French text implies a stronger moral force for compliance with material in the Guide than does the English text.

The French text interpretation was finally adopted by the commission and determined the course of action.

The commission realized that there exists at present a certain vacuum, as many of IMO and WMO resolutions on subjects to be included in the Guide had been abolished by the Executive Committee.

The final action recommended in Recommendation 61 (CSM-II) provides for the immediate publication of a current version of the Guide and lays plans for the comprehensive guide to emerge after the second session of the Commission for Synoptic Meteorology. The current version will contain only material already endorsed by Members and can therefore be produced by the Secretariat, taking into account a format which was established by the session and annexed to Recommendation 61 (CSM-II).

The comprehensive guide will be prepared by an ad hoc working group to be established by the president of CSM.

Resolution 12 (CSM-II) calls for the establishment of this working group and it lays down its terms of reference.

In discussing this item, the commission felt that it was necessary to develop a new plotting model for upper-air observations to be placed in the Guide (see Recommendation 59 (CSM-II)).

18.

WORLD CLIMATIC ATLASES (Agenda item 18)

Because of the preliminary character of the proposals on climatic atlases, only very general comments on this item could be made.

There exists a CSM interest in the system of isopleths and their values to be used in various charts, but comments could not be made until a decision on the projection and scale of charts was available.

Recommendation 73 (CSM-II) suggests the addition of one item, namely the extreme position of thickness lines by months to the provisional generalized list of parameters and expresses a certain priority in case all maps of the Atlas are not produced simultaneously.

19.

INTERNATIONAL EXCHANGE OF PAST WEATHER DATA (Agenda item 19)

The discussion on this item was not completely satisfactory to all members of the commission, because it was not clear whether the arrangements for the preservation of synoptic data, as such, and of maps lay within the field of CSM or in that of CCl.

Recommendation 75 (CSM-II) invites the Executive Committee to give directives on the matter, so that if it belongs to CSM, it can be discussed in the third session of the commission. Interim action for the benefit of research workers in the field of synoptic meteorology is also suggested in this recommendation.

20.

SCIENTIFIC LECTURES AND DISCUSSIONS IN THE FIELD OF THE COMMISSION (Agenda item 20)

The commission devoted one afternoon to scientific discussions.

The following papers were read :

1. "Some synoptic aspects of the use of radar", by Mr. P.H. Kutschenreuter
2. "A study of numerical weather prediction in India", by Mr. P.K. Das
3. "Some problems of automatic data processing", by Mr. L.W. Snellman
4. "A brief report on experiments in objective analysis of the 200 mb surface", by Mr. P. Thrane
5. "The U.S. transosonde programme", by Capt. P.R. Drouilhet
6. Presentation of the film "The tornado in Dallas (Texas)", by Mr. P.H. Kutschenreuter.

21.

ESTABLISHMENT OF WORKING GROUPS (Agenda item 21)

The commission re-established its Working Group on telecommunications (Resolution 8 (CSM-II)).

In the discussions on various other items, the establishment of the following working groups has already been mentioned : Working Group on pressure reduction methods, Working Group on the definition of terms to be used to describe the intensity of meteorological phenomena, Working Group on code problems, Working Group on networks, Working Group on the Guide to Synoptic Meteorological Practice and Working Group on isotherm analysis and isotherm streamline and isotach prognostic techniques in the tropics.

22.

ELECTION OF OFFICERS (Agenda item 22)

Reference is made to paragraph 1 of this report.

23.

DATE AND PLACE OF THIRD SESSION (Agenda item 23)

No suggestions for date and place of the third session of the commission were received.

RESOLUTIONS ADOPTED BY THE SESSION

Res. 1 (CSM-II) - EXPANSIONS OF SECTION 4 OF PILOT CODE FORM

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING that the desire for further expansion of Section 4 of the PILOT code form (FM 32.A) by adding groups for reporting wind data for other levels needs discussion at a regional level;

INVITES the president of the Commission for Synoptic Meteorology to ask the regional associations for which levels wind data are required, in addition to those that can be reported in the present PILOT code form, and to request for any further comments they wish to make on the best method for the expansion of the PILOT code form.

Res. 2 (CSM-II) - CODE FOR REPORTING SEA ICE

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Recommendation 6 (CAeM-I), Recommendation 61 (56-CSM), Resolution 6 (CMM-II);

(2) That the Commission for Maritime Meteorology has established a Working Group on codes for reporting sea ice, the report of which was not received in time to be studied by the second session of the Commission for Synoptic Meteorology;

(3) That the president of the Commission for Maritime Meteorology intends to use Regulation 36 of the General Regulations of the World Meteorological Organization to ensure rapid handling of the recommendations which will result from the report;

INVITES the president of the Commission for Synoptic Meteorology to take such steps as he may deem appropriate in order to ensure that the codes for reporting sea ice proposed by the Commission for Maritime Meteorology be in conformity with the coding principles and practices established by the Commission for Synoptic Meteorology, and that they be endorsed by the latter commission before they are presented to the President of the Organization or to the Executive Committee.

Res. 3 (CSM-II) - UPPER-AIR WIND DATA IN CLIMAT REPORTS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) That some recent research work had indicated the possibility of using monthly upper-air charts containing the corresponding monthly vector mean winds as a check on persistent errors in radiosonde data;

(2) That such checks may have real synoptic importance;

REQUESTS the president of the Commission for Synoptic Meteorology to ask the presidents of the Commission for Aerology and the Commission for Climatology to comment on the use of monthly upper-air charts containing the corresponding monthly vector mean winds with particular reference to their value in detecting persistent errors in radiosonde observations.

Res. 4 (CSM-II) - WIND VECTOR DIFFERENCES

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING that while there is a real need for provision to be made for the reporting of wind vector differences, advice on the best method of obtaining a wind value for the 1000 mb level is a prerequisite to the development of the appropriate sections of the PILOT and the TEMP code forms;

INVITES the president of the Commission for Synoptic Meteorology to consult the president of the Commission for Aerology on the best method of determining the wind to be used for the 1000 mb level when calculating wind vector differences.

Res. 5 (CSM-II) - GUIDANCE AND DIRECTIVES FOR THE REPRESENTATIVE OF THE COMMISSION FOR SYNOPTIC METEOROLOGY ON THE EXECUTIVE COMMITTEE'S WORKING GROUP ON THE BEAUFORT SCALE

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING Recommendation 1 (CMM-II), Resolution 34 (EC-IX) and the action of the president of the Commission for Synoptic Meteorology in appointing a representative of his commission to the Working Group on the Beaufort scale of the Executive Committee established by Resolution 34 (EC-IX);

DECIDES to give the following guidance and directives to its representative on this working group :

(1) There will be a continuing need for Code 30 for land stations;

(2) Code 30 preferably should contain one table of wind speed equivalents which applies for both land and sea;

(3) Maritime requirements, being the most important, should determine the wind speed equivalents for Code 30;

(4) The specifications of Code 30 for use by land stations will not likely need to be changed; they are considered sufficiently elastic to take into account any slight changes in wind speed equivalents which may result from the studies of the working group of the Executive Committee;

(5) A change in the specifications for use by land stations, if it appears unavoidable, be made only on the basis of observational data;

(6) Only one list of specifications for use by land stations is required, it being understood that national instructions will be developed to give effect to those specifications.

Res. 6 (CSM-II) - WORKING GROUP ON CODE PROBLEMS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Resolution 22 (Cg-II);

(2) Resolution 3 (CSM-I);

(3) Recommendation 21 (CSM-I); and

CONSIDERING,

(1) That a thorough study of proposals relating to meteorological reports that may lead to substantial change in meteorological codes, together with any proposals which may in future be submitted by Members or constituent bodies of the World Meteorological Organization, is necessary in order to assess their value in relation to the known inconveniences of substantial changes;

(2) The far-reaching effects of any substantial change in the present system of codes including cost of implementing any change and the problems of instructing observers; and

(3) That the existing code forms have only been in use since 1955;

CONCLUDES that no substantial change be made in the system of code forms and codes at this time; and

DECIDES,

(1) To set up a CSM Working Group on codes, comprising :

(a) A chairman to be appointed by the president of the Commission for Synoptic Meteorology;

(b) A representative from each regional association;

(c) Representatives of Members who would be kept informed of the work of the group but only attend when a general meeting was called to finalize the report of the work done by the seven men sub-group comprised of (a) and (b) above;

(2) That the terms of reference of the Working Group on codes shall be as follows :

To study and formulate recommendations on

(a) Code problems submitted to the second session of the Commission for Synoptic Meteorology upon which no decision was reached, including those proposals concerning the basic principles of the structure of codes (see annex);

(b) Code problems which may be referred to the group by the president of the Commission for Synoptic Meteorology, or through him by Members or by constituent bodies of the World Meteorological Organization;

(3) That the working group shall be guided by the following principles :

(a) No major changes shall be recommended unless they provide substantial advantages which should be clearly demonstrated;

(b) Due regard shall be had to (i) the needs of synoptic meteorology, (ii) requirements in aeronautical and other specialized fields of applied meteorology, (iii) experience in the use of electronic computers for forecasting purposes, (iv) repercussions of an economic and operational nature which will result from the proposed changes;

(4) That this working group report to the Commission for Synoptic Meteorology at its third session;

(5) That if financial assistance as contemplated under Recommendation 87 (CSM-II) is not forthcoming, the president of the Commission for Synoptic Meteorology is authorized to convene an ad hoc working group with as broad a representation as possible to do the work of the group; and

REQUESTS the president of the Commission for Synoptic Meteorology to take appropriate steps for the establishment of the group and to initiate its work.

A N N E X

CODE PROBLEMS SUBMITTED TO THE SECOND SESSION OF THE COMMISSION FOR SYNOPTIC METEOROLOGY UPON WHICH NO DECISION WAS REACHED

Attention of the working group is directed to the specific problems set forth in the following referenced documents :

1. Document CSM-II/31
2. Document CSM-II/75
3. Document CSM-II/85
4. Report of first session of Working Group on meteorological telecommunications, Recommendation 4, paragraphs 3 and 4, under RECOMMENDS
5. Volume B, Code 15
6. ww - Drizzle with fog and rain with fog (Doc. I-RA III/73), various items (Docs. II-RA III/64 and 80), squalls, thunderstorms and litho- and hydro-meteors (Doc. CSM-II/101, paragraphs 10 (b), (g) and paragraph 20), Fundamental weaknesses in ww (Doc. CSM-II/31, annex 1, and Doc. 146)
7. VV - Documents CSM-II/43, 95, 129, 142 and 158
8. Check Digit - Documents CSM-II/100 and 106.

Res. 7 (CSM-II) - WORKING GROUP ON NETWORKS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING Resolution 8 (CSM-I);

CONSIDERING,

(1) The need to continue the work already carried out by the group;

(2) That the working group's study of the problems assigned to it has shown the original terms of reference to be too wide for a working group to produce solutions within a reasonable time;

(3) That the group made the most suitable choice in selecting for first consideration the development of quantitative criteria for spatial separation of instrumental observations;

(4) That the immediate task is to develop further and to test methods for the establishment of quantitative criteria for upper-air networks;

(5) That tests of methods will require assistance from Members and possibly temporary establishment of additional upper-air stations over limited areas in some regions where networks are at present sparse, such as the tropics;

DECIDES,

(1) That the president of the Commission for Synoptic Meteorology takes appropriate action for the re-establishment of the Working Group on networks with the following terms of reference :

(a) To continue the development of principles on which to establish quantitative criteria for the distribution in time and space of upper-air observations as a function of specified limits of accuracy in the analysis of scalar fields in the upper air (including wind speed);

(b) To indicate to the president of the Commission for Synoptic Meteorology the kind of information required from Members to enable the group to develop the criteria; and where data do not at present exist, to advise on a programme of temporary additional stations to obtain the necessary data;

(c) To advise on what other scalar fields might be examined by similar methods and the kind of information that would be required;

(d) To make an interim report to the president at the end of 1959 and a final report to the third session of the Commission for Synoptic Meteorology;

(2) That the president invites the following experts to serve on the working group :

J. Bessemoulin	(France)
J.N. Macrea	(Australia)
A.H. Nagle	(President CAeM)
P.D. Thompson	(U.S.A.)
J.D. Torrance	(Federation of Rhodesia and Nyasaland)
W.J.A. Kuipers	(Netherlands)

(3) That the president of the Commission for Synoptic Meteorology invites the Secretary-General to designate a suitably qualified member of his staff to participate in the technical work of the Working Group on networks.

Res. 8 (CSM-II) - RE-ESTABLISHMENT OF A WORKING GROUP ON TELECOMMUNICATIONS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING that there are a large number of important matters in the field of meteorological telecommunications which require study;

DECIDES,

(1) That the Working Group on telecommunications be re-established;

(2) That the Working Group on telecommunications consist of the following members;

(a) A representative designated by each regional association;

(b) Representatives of Members of the World Meteorological Organization who may wish to be represented;

(3) That the terms of reference of the Working Group on telecommunications be as in the annex to this resolution.

ANNEX

TERMS OF REFERENCE FOR THE WORKING GROUP ON TELECOMMUNICATIONS (COMMISSION FOR SYNOPTIC METEOROLOGY)

(a) Make recommendations from an inter-regional or world-wide point of view on meteorological telecommunications, such as recommendations concerning the standardization of operating practices and facilities, organizational procedures, contents and schedules of meteorological broadcasts or transmissions;

(b) Keep in touch with the activities of the Working Groups on meteorological telecommunications of all regional associations;

(c) Keep abreast of the activities relating to meteorological telecommunications of the International Civil Aviation Organization, the International Telecommunication Union and other international organizations;

(d) Keep under constant review questions regarding telecommunications techniques and equipment and to consider the introduction of the latest development of those to lead to a more efficient system of meteorological telecommunications;

(e) Consider questions relating to the establishment and operation of centres for the exchange of data for the northern hemisphere;

(f) Prepare proposals for the establishment of similar centres for the exchange of data for the southern hemisphere; and connexions between the centres of the northern and southern hemispheres so as to ensure complete world-wide exchange of data;

(g) Decide on action enabling the working group to perform its duties efficiently, such action to include the establishment of working parties for special studies, and inviting experts to assist it in any specific problem;

(h) To perform any other task which may be given to it by the president of the Commission for Synoptic Meteorology;

(i) To comply, in the discharge of the duties specified above, with the directives given by the Commission for Synoptic Meteorology.

Res. 9 (CSM-II) - WORKING GROUP ON PRESSURE REDUCTION METHODS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) The decision of the ninth session of the Executive Committee to refer the problem of pressure reduction to the Commission for Synoptic Meteorology for urgent action;

(2) WMO Technical Note No. 7 and the report by Mr. L.P. Harrison, chairman of the Working Group on the problem of pressure reduction of the Commission for Instruments and Methods of Observation;

CONSIDERING,

(1) That the Commission for Synoptic Meteorology should select from amongst the available pressure reduction methods the one best suited to meet the requirements of synoptic meteorology;

(2) That the selection could best be accomplished by making actual trials of suitable pressure reduction methods;

ACCEPTS with great appreciation the offer of France, India, Switzerland and U.S.A. to try out suitable methods from amongst those proposed in the above publications;

DECIDES to set up a working group with the following terms of reference :

(1) To select the pressure reduction methods to be tried out;

(2) To examine the results of the trials with the objective of reporting, before the end of 1959, to the president of the Commission for Synoptic Meteorology the pressure reduction method best suited to meet the requirements of synoptic meteorology;

REQUESTS the president of the Commission for Synoptic Meteorology to obtain from the permanent representatives of France, India, Switzerland and U.S.A. the name of the expert designated by each of them to serve as a member of the working group.

Res. 10 (CSM-II) - WORKING GROUP ON THE DEFINITION OF TERMS USED TO DESCRIBE THE INTENSITY OF METEOROLOGICAL PHENOMENA

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING the request by the second session of Regional Association VI to the effect that the Commission for Synoptic Meteorology develop definitions for the terms used to describe the intensity of meteorological phenomena (Rec. 9 (II-RA VI));

CONSIDERING that it is important for the purpose of synoptic meteorology that these terms be examined and be defined quantitatively, but that, before this is done, the whole question requires careful study;

DECIDES to set up a working group with the following terms of reference :

(a) To examine the terms used for qualifying meteorological phenomena in Code 92 - ww - Present weather - of Volume B of WMO publication No. 9, in order to see whether these terms are adequate to provide the synoptician with all the information he requires;

(b) To develop, if necessary, additional terms and to attempt to define quantitatively all the terms thus arrived at taking into account only the requirements of synoptic meteorology independently of the needs of other users;

(c) As a first stage to limit its study to the various forms of precipitation and to report before July 1959 to the commission, via the president of the Commission for Synoptic Meteorology;

(d) As a second stage, and taking into account the comments of the commission on the first report, to pursue its study and to extend it to include the definition of the qualifying terms of the following meteorological phenomena taken from Code 92 :

(i) sandstorm or duststorm
(ii) drifting snow and blowing snow
(iii) thunderstorm

and to have a complete report available for the third session of the Commission for Synoptic Meteorology;

REQUESTS the working group;

(1) To take as a starting point for its study the relevant documents submitted to the second session of the Commission for Synoptic Meteorology;

(2) To be guided as far as practicable by the following considerations of the second session of the Commission for Synoptic Meteorology :

(a) That it is desirable to have for world-wide synoptic use a single scale for specifying intensities for each of the types of phenomenon under consideration;

(b) That it may be necessary to increase the number of qualifying terms from three to five or more for some types of precipitation, in order to provide satisfactory descriptions of the intensity;

(c) That an attempt be made to define the qualifying terms of the various phenomena without reference to other meteorological phenomena;

(d) That due attention be paid to the plotting aspects of the proposed qualifying terms;

REQUESTS the president of the Commission for Synoptic Meteorology to invite the permanent representatives of the following Members to designate one expert each as a member of the above working group :

Canada
France
India
Rhodesia and Nyasaland
U.S.A.

Res. 11 (CSM-II) - WORKING GROUP ON ISOTHERM ANALYSIS AND ISOTHERM, STREAMLINE AND ISOTACH PROGNOSTIC TECHNIQUES IN THE TROPICS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING the request contained in Recommendation 26 of the second SEA/SOP ICAO Regional Air Navigation meeting;

DECIDES,

(1) To establish a working group to study the further development of isotherm analysis and isotherm, stream-line and isotach prognostic techniques in the tropics;

(2) That the president of the Commission for Synoptic Meteorology invite the permanent representatives of the following Members to nominate one expert each on the working group :

U.S.A.
India
Australia
France;

REQUESTS the president of the Commission for Synoptic Meteorology to establish the working group and invite the president of the Commission for Aerology to assist when required.

Res. 12 (CSM-II) - WORKING GROUP ON GUIDE TO SYNOPTIC METEOROLOGICAL PRACTICE

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING that the Guide for Synoptic Meteorological Practice as proposed in Recommendation 61 (CSM-II) must be kept up to date with the progress in synoptic meteorology;

DECIDES,

(1) That an ad hoc working group be established by the president of the Commission for Synoptic Meteorology to prepare a more comprehensive Guide taking into consideration :

(a) The national manuals of synoptic meteorological practice and suggestions submitted pursuant to (2) below;

(b) The working drafts prepared by the ad hoc group of Committee "A" on agenda item 17 of the second session of the Commission for Synoptic Meteorology;

(c) The table of contents as attached to Recommendation 61 (CSM-II);

(2) That the president of the Commission for Synoptic Meteorology request the Secretary-General to invite all Members of the World Meteorological Organization to submit copies of their national manuals of synoptic meteorological practice or their suggestions for the guidance of the working group;

(3) That the working group produce the draft of the comprehensive

Guide within two years and that this draft be circulated to all Members for study with a view to finalizing action on it at the third session of the Commission for Synoptic Meteorology.

Res. 13 (CSM-II) - REVISION OF RESOLUTIONS AND RECOMMENDATIONS OF THE COMMISSION FOR SYNOPTIC METEOROLOGY ADOPTED PRIOR TO ITS SECOND SESSION

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING that Resolutions 1 - 6, 7 (partially) and 8 - 12 (CSM-I) of the first session of the commission have now become obsolete;

HAVING EXAMINED the action taken on the recommendations adopted at its first session and by correspondence;

DECIDES,

(1) To cancel Resolutions 1 - 6, Resolution 7, with the exception of CONCLUDES (1) and (2), which should be placed in the Synoptic Guide, and Resolutions 8 - 12 (CSM-I);

(2) To maintain in force Recommendations 23, 32 and 54 (CSM-I) and to incorporate these recommendations in the final report of the second session;*

(3) To note the ac ion taken by the competent bodies on Recommendations 1 - 22, 24 - 31, 33 - 53 and 55 (CSM-I) and on Recommendations 56 - 59 (55-CSM) and 60 - 61 (56-CSM) which therefore need no longer be kept in force.

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* See annex, page 187.

RECOMMENDATIONS ADOPTED BY THE SESSION

Rec. 1 (CSM-II) - SIMPLIFIED CODE FORMS FOR SHIPS IN AREAS WHERE OBSERVATIONS ARE SPARSE

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING the actions by the Commission for Maritime Meteorology (Recommendation 14 (CMM-II)), the president of the Commission for Synoptic Meteorology, the President of the World Meteorological Organization and the ninth session of the Executive Committee in establishing the special SHIGY code form;

CONSIDERING,

(1) That this code form has led to an increase in the number of ship reports from certain areas;

(2) That, if this code form could not be used after the International Geophysical Year, the number of ship reports from sparse areas would be adversely affected;

(3) That there is a continuing need in some areas for a reduced type of a ship report, based on observations made with unchecked instruments, which need cannot be met by code forms FM 21.A, FM 22.A or 23.A;

(4) That the SHIGY code form presents a real difficulty to the climatologist, when the elements reported in this form are to be entered in punched cards;

RECOMMENDS,

(1) That code form FM 24 be continued for a period of one year after the end of the International Geophysical Year to permit adequate time for the change-over of the ships now reporting in FM 24 to the new FM 23.B;

(2) That the code form FM 23.A be replaced by a new code form FM 23.B :

SHRED $YQL_aL_aL_a$ $L_oL_oL_oGG$ Nddff VVwwW

PPxTT (D_sv_sxxx) ICE followed by plain language

or by (c_2KD_ire)

(3) That the following notes be added to this code form :

(1) The code name SHRED is used as a prefix to the report, indicating that the report is a reduced type of ship report. The code name SHRED should always be added to the report;

(2) Code form FM 23.B is considered suitable for any ship, other than a selected ship, a ship at an ocean weather station or a supplementary ship, which is not supplied with tested instruments and may be requested to report in areas where shipping is relatively sparse, or on request and especially when storm conditions threaten or prevail. These ships can report in plain language, if the use of code is impracticable. They are encouraged to make their reports at the main standard times of observation, but reports at other hours, more convenient to themselves, are acceptable, the actual time of observation being reported in the report to the nearest hour GMT;

(3) See Note (3) under SHIP FM 21.A;

(4) The x in the group PPxTT signifies that the information in the tenths of mb is not available owing to lack of accuracy or closeness of scale of the ship's barometer;

(5) If the group PPxTT is not reported 30 is added to the time of observation in whole hours GMT (example : actual time of observation 0550 GMT; GG = 06 + 30 = 36);

(6) Present Note (4) of FM 23.A;

(7) Present Note (5) of FM 23.A;

(4) That port meteorological officers, whenever they have an opportunity to visit ships reporting in code form FM 23.B, check the ship's instruments, give supplementary information and encourage ships' officers to report in FM 22.A.

Rec. 2 (CSM-II) - CODE FORM FOR SPECIAL REPORTS FROM SHIPS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Recommendations 1 and 2 (Third NAT/RAN Meeting ICAO);

(2) The general need for special or more frequent surface reports from ocean weather stations;

RECOMMENDS,

(1) That the code form FM 26.A be deleted and replaced by FM 26.B:

SPESH $GGggw_2$

$YQL_aL_aL_a$ $L_oL_oL_o$ Nddff VVwwW

$8N_sCh_sh_s$ $(OTTT_dT_d)$

(2) That the following notes be added to the code form FM 26.B :

(i) SPESH is a symbolic prefix, indicating a special report from a ship;

(ii) The criteria for the taking of a special report follow hereunder. They should be applied Regionally with a view to transmitting messages of interest to synopticians in order to avoid the transmission of a large number of reports. The criteria are :

(a) When a marked and sustained change in mean wind speed has occurred (of the order of 20 knots or more sustained for 10 minutes prior to the commencement of the observation). Identified by code figure for $w_2 = 1$;

(b) When a marked and sustained change in mean wind direction has occurred (of the order of 30° or more sustained for 10 minutes prior to the commencement of the observation) the mean wind speed having been 15 knots or more before or after the change. Identified by code figure for $w_2 = 1$;

(c) When fog has begun or ended. Identified by code figure for $w_2 = 2$;

(d) When precipitation has begun or ended (excepting individual showers in case of showery precipitation). Identified by code figure for $w_2 = 4$;

(e) When pressure has risen or fallen by 2 mb or more in the preceding hour. The sign of the pressure change will be reported by appending the words PLUS and MINUS to the message to indicate rising and falling pressure. Identified by code figure for $w_2 = 5$;

(f) When one or more of the following phenomena has occurred :

Hail Heavy snow Freezing precipitation	Identified by code figure for $w_2 = 4$
Thunderstorm	Identified by code figure for $w_2 = 8$

Squall Water spout	Identified by code figure for w_2 = 9

(iii) When more than one criterion exists simultaneously w_2 will be the higher number;

(iv) When a combination of these criteria occurs in such a manner as to indicate the likelihood of a frontal passage this may be indicated by appending the word front or the words cold front, warm front, etc., as appropriate;

(v) The 90-99 decade in the codes for VV and $h_s h_s$ should not be used;

(vi) See Note (3) under AERO FM 15.A;

(vii) See present Note (6) under FM 26.A;

(viii) See Note (5)(ii) under AERO FM 15.A;

(3) That Code 93 (w_2) be expanded by the addition of the specification : 5 = Pressure;

(4) That the attention of Members be drawn to the importance of the special reports from ocean weather stations, the difficulty of handling these reports on scheduled meteorological telecommunication circuits, the high rate of loss in the past and, consequently, to the advisability of introducing special procedures to accomplish as closely as possible speedy but scheduled transmission.

Rec. 3 (CSM-II) - CODE FOR WEATHER BULLETINS ISSUED FOR SHIPPING

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Recommendation 22 (CMM-II) and Resolution 33 (EC-IX) inviting the Commission for Synoptic Meteorology to design a code for issuing weather forecasts for shipping;

(2) The results of the inquiry conducted by the president of the Commission for Synoptic Meteorology among the members of this commission with a view to consider the suggestions made by the Commission for Maritime Meteorology;

(3) The compromise proposed by the Secretariat of the World Meteorological Organization;

CONSIDERING,

(1) That the Commission for Maritime Meteorology wants a code which is short and simple to apply;

(2) That the results of an inquiry conducted by the Commission for Synoptic Meteorology has shown evidence for the desirability of providing for a code sufficiently complete to meet the various needs of the users;

RECOMMENDS,

(1) That when there are difficulties in complying with Technical Regulation 10.2.3.6 with respect to the broadcast in English, forecasts for shipping may be given in the following code (see annex);

(2) That the Commission for Maritime Meteorology be invited to compile a list of indicators in the form AAA for maritime areas to which the forecasts refer;

(3) That the groups $OAAAa_m$ may be replaced by the geographical names for the forecast areas.

A N N E X

CODE FOR FORECASTS FOR SHIPPING

CODE FORM

FM 61.B MAFOR $OAAAa_m$ $1GDF_mW_1$ $(2VST_xT_n)$ $(33D_kP_wH_w)$

N o t e s :

(1) The name of the code MAFOR is used as a prefix to the message indicating that it is a forecast for shipping; if several of these messages are grouped in a single broadcast, the prefix will appear only at the beginning of the collective message.

(2) The group $1GDF_mW_1$ is obligatory; it can be repeated as many times as necessary to describe the changes in the meteorological conditions forecasted in a given area.

(3) The groups $(2VST_xT_n)$ and $(33D_kP_wH_w)$ are optional.

SPECIFICATIONS OF SYMBOLIC LETTERS AND CODE FIGURES

AAA - Indicator for maritime area

a_m - Indicator for the portion of the maritime area

Code figure

0	Whole of the area AAA
1	NE quadrant of the area AAA
2	Eastern half of the area AAA
3	SE quadrant of the area AAA
4	Southern half of the area AAA
5	SW quadrant of the area AAA
6	Western half of the area AAA
7	NW quadrant of the area AAA
8	Northern half of the area AAA
9	Rest of the area AAA

G - Period covered by the forecast

Code figure

0	Synopsis of meteorological conditions in the forecast area at the time of broadcast of the weather bulletin
1	Forecast valid for 3 hours
2	Forecast valid for 6 hours
3	Forecast valid for 9 hours
4	Forecast valid for 12 hours
5	Forecast valid for 18 hours
6	Forecast valid for 24 hours
7	Forecast valid for 48 hours
8	Forecast valid for 72 hours
9	Occasionally

N o t e s :

(1) The first group $1GDF_mW_1$ refers to the forecast weather commencing at the time of broadcast.

(2) Subsequent groups $1GDF_mW_1$ (for G = 1 - 8) give the period that the described weather is forecast to persist commencing at the end of the period covered by the preceding group $1GDF_mW_1$ (for G = 1 - 8).

(3) When a group in which G = 9 is used, it should follow the groups of the entire forecast $1GDF_mW_1$ $(2VST_xT_n)$ $(33D_kP_wH_w)$ and describes a phenomenon which is forecast to occur occasionally during the period of validity of these preceding groups indicated by G.

D - Direction of surface wind (Code 20)

F_m - Force of the surface wind

Code figure	Beaufort force	Code figure	Beaufort force
0	0-3	5	8
1	4	6	9
2	5	7	10
3	6	8	11
4	7	9	12

W_1 - Forecast weather

Code figure

0 Moderate or good visibility (greater than 5 km/3 nm)
1 Risk of accumulation of ice on superstructures (air temperature between 0 and -5°C)
2 Strong risk of accumulation of ice on superstructures (air temperature below -5°C)
3 Mist (visibility 1 - 5 km (5/8 to 3 nm))
4 Fog (visibility less than 1 km (less than 5/8 nm))
5 Showers
6 Rain
7 Snow or rain and snow
8 Squally weather
9 Thunderstorms

V - Visibility at the surface

Code figure

0	Less than 50 metres	(less than 55 yards)
1	Between 50 and 200 metres	(approximate 55 to 220 yards)
2	Between 200 and 500 metres	(approximate 220 to 550 yards)
3	Between 500 and 1000 metres	(approximate 550 to 5/8 nm)
4	Between 1 and 2 km	(approximate 5/8 to 1 nm)
5	Between 2 and 4 km	(approximate 1 to 2 nm)
6	Between 4 and 10 km	(approximate 2 to 6 nm)
7	Between 10 and 20 km	(approximate 6 to 12 nm)
8	Between 20 and 50 km	(approximate 12 to 30 nm)
9	50 km or more	(30 nm or more)

S - State of the sea (Code 75)

T_x - Maximum temperature of the air

T_n - Minimum temperature of the air

Code figure	Temperature in °C
0	Less than -10
1	-10 to -5
2	-5 to -1
3	About 0 (to nearly ± 1)
4	1 to 5
5	5 to 10
6	10 to 20
7	20 to 30
8	Greater than 30
9	Temperature not forecasted

D_k - Direction of swell (Code 20)

P_w - Period of waves (Code 69)

H_w - Height of waves (Code 42)

NOTE : The specific value of any of the above elements 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 concerned.

Rec. 4 (CSM-II) - CODE FORMS FOR GROUND-TO-GROUND EXCHANGES OF HIGH-LEVEL FORECASTS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING Recommendation 29 (CAeM-I/MET-IV);

CONSIDERING that high level aircraft operation requires information other than that provided in the existing ARFOR, ROFOR and FIFOR code forms (FM 53.A, FM 54.A and FM 55.A);

RECOMMENDS,

(1) That for general exchange of high-level forecasts between forecast offices the ARFOR, ROFOR and FIFOR code forms (FM 53.B, FM 54.B and FM 55.B), given below, be used;

(2) That the existing ARFOR, ROFOR and FIFOR code forms (FM 53.A, FM 54.A and FM 55.A) be replaced by the following code forms (FM 53.B, FM 54.B and FM 55.B) :

FM 53.B ARFOR $G_1G_1G_2G_2G_3$

AAAAA (Nddff) (VVw_1w_1x) $8N_sCh_sh_s$

$7h_th_th_fh_f$ $6I_ch_ih_it_L$ $5Bh_Bh_Bt_L$

$4h_xh_xT_hT_h$ $3d_hd_hf_hf_h$ $2h'_Ph'_PT_PT_P$

11111 $QL_aL_aL_oL_o$ $h'_jh'_jf_jf_jf_j$ $9i_3nnn$

FM 54.B ROFOR $G_1G_1G_2G_2G_3$

iii ($QL_aL_aL_oL_o$) iii Oi_2zzz (Nddff)

(VVw_1w_1x) $8N_sCh_sh_s$ $7h_th_th_fh_f$

$6I_ch_ih_it_L$ $5Bh_Bh_Bt_L$ $4h_xh_xT_hT_h$

$3d_hd_hf_hf_h$ $2h'_Ph'_PT_PT_P$ 11111

$QL_aL_aL_oL_o$ $h'_jh'_jf_jf_jf_j$ $9i_3nnn$

FM 55.B FIFOR $G_dG_dG_aG_aG_3$

$i_di_di_d$ ($QL_aL_aL_oL_o$) $i_ai_ai_a$ Oi_2zzz (Nddff)

(VVw_1w_1x) $8N_sCh_sh_s$ $7h_th_th_fh_f$ $6I_ch_ih_it_L$

$5Bh_Bh_Bt_L$ $4h_xh_xT_hT_h$ $3d_hd_hf_hf_h$ $2h'_Ph'_PT_PT_P$

11111 $QL_aL_aL_oL_o$ $h'_jh'_jf_jf_jf_j$ $9i_3nnn$

(3) That the following notes will be added to code form FM 53.B ARFOR :

(1) Present Note (1) under FM 53.A;

(2) Present Note (2) under FM 53.A;

(3) The group combination "11111 $QL_aL_aL_oL_o$ $h'_jh'_jf_jf_jf_j$", which specifies the position of the jet core and the wind to be encountered in the jet core may be combined at the end of the report in the form 11111 $QL_aL_aL_oL_o$ $h'_jh'_jf_jf_jf_j$ $QL_aL_aL_oL_o$ $h'_jh'_jf_jf_jf_j$ $QL_aL_aL_oL_o$ $h'_jh'_jf_jf_jf_j$ etc., in case the jet extends through a large portion of the area or through several zones;

(4) Present Note (3) under FM 53.A;

(5) Present Note (4) under FM 53.A;

(6) Present Note (5) under FM 53.A;

(7) Present Note (6) under FM 53.A;

(4) That the notes for FM 54.B and FM 55.B be brought up to date in Volume B in the same way as indicated above for FM 53.B;

(5) That the following specifications for $f_jf_jf_j$, $h'_jh'_j$, $h'_ph'_p$ and T_pT_p be inserted at the appropriate places in Volume B :

$f_jf_jf_j$	indicates wind speed in knots at the level of the jet stream core
$h'_jh'_j$	level of the jet stream core in ICAO flight level number with the last figure omitted
$h'_ph'_p$	level of the tropopause in ICAO flight level number with the last figure omitted
T_pT_p	temperature in degrees C at the tropopause;

(6) That the following code forms FM 56, FM 57 and FM 58, which are variants of FM 53.B, FM 54.B and FM 55.B, be introduced, to be used only for forecasts which extend above 9 km (30,000 feet) :

FM 56 HIARF $G_1G_1G_2G_2G_3$

AAAAA (Nddff) (VVw_1w_1x)

$8N_sCh'_sh'_s$ $7h'_th'_th'_fh'_f$ $6I_ch'_ih'_it_L$

$5Bh'_Bh'_Bt_L$ $4h'_xh'_xT_hT_h$ $3d_hd_hf_hf_h$ $2h'_ph'_pT_pT_p$

11111 $QL_aL_aL_oL_o$ $h'_jh'_jf_jf_jf_j$ $9i_3nnn$

FM 57 HIROF $G_1G_1G_2G_2G_3$

iii $(QL_aL_aL_oL_o)$ iii Oi_2zzz (Nddff) (VVw_1w_1x)

$8N_sCh'_sh'_s$ $7h'_th'_th'_fh'_f$ $6I_ch'_ih'_it_L$

$5Bh'_Bh'_Bt_L$ $4h'_xh'_xT_hT_h$ $3d_hd_hf_hf_h$

$2h'_ph'_pT_pT_p$ 11111 $QL_aL_aL_oL_o$ $h'_jh'_jf_jf_jf_j$ $9i_3nnn$

FM 58 HIFIF $G_dG_dG_aG_aG_3$

$i_di_di_d$ $(QL_aL_aL_oL_o)$ $i_ai_ai_a$ Oi_2zzz (Nddff)

(VVw_1w_1x) $8N_sCh'_sh'_s$ $7h'_th'_th'_fh'_f$

$6I_ch'_ih'_it_L$ $5Bh'_Bh'_Bt_L$ $4h'_xh'_xT_hT_h$

$3d_hd_hf_hf_h$ $2h'_ph'_pT_pT_p$ 11111 $QL_aL_aL_oL_o$

$h'_jh'_jf_jf_jf_j$ $9i_3nnn$

(7) That, in general, code forms FM 56, FM 57 and FM 58 be used for communication of information to aerodromes at which there is no main meteorological office, but that they may, by agreement be used for the exchange of high-level forecasts between forecast offices;

(8) That the notes applying to FM 53.B, FM 54.B and FM 55.B also apply to FM 56, FM 57 and FM 58 respectively and should therefore be inserted in Volume B;

(9) That all height indications in code forms FM 56, FM 57 and FM 58 refer to levels indicated by the International Civil Aviation Organization flight level number with the last figure omitted, and that the height specifications used in these code forms be inserted at the appropriate places in Volume B; and

(10) That in view of the importance to the recipient of accurately receiving the words HIARF, HIROF and HIFIF, they may be repeated at the end of the message.

Rec. 5 (CSM-II) - CODES FOR WIND SPEED MAXIMUM AND FOR TROPOPAUSE DATA

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING the general desire for the reporting of maximum wind data optionally in the PILOT and TEMP code forms and the desire for reporting the tropopause data optionally in the TEMP code form;

RECOMMENDS,

(1) That maximum winds in the TEMP and PILOT code forms be reported by the addition of the following section to FM 32.A, FM 33.A, FM 35.A, FM 36.A :

111AA (Optional)	$n_j H_m H_m H_m H_m$	ddfff

where

111AA	(See code table)
n_j	To be determined Regionally or nationally
$H_m H_m H_m H_m$	Altitude of the maximum wind
fff	Wind speed in knots

This section be Section 5 of FM 32.A and FM 33.A and Section 10 of FM 35.A and FM 36.A;

(2) That the criteria for reporting maximum wind be decided Regionally;

(3) That tropopause data in the TEMP code form be reported by the addition of the following section to FM 35.A, FM 36.A :

SECTION 11

I. Complete tropopause code form

111AA (Optional)	$H_t H_t P_t P_t P_t$	$T_p T_p T_{dp} T_{dp} S_t$ (Zddff)

where

111AA	(See code table)
$H_t H_t$	Geopotential of tropopause in geopotential hectometres or hundreds of geopotential feet
$P_t P_t P_t$	Pressure in whole millibars at the tropopause
$T_p T_p$	Temperature at the tropopause in whole degrees Celsius

$T_{dp}T_{dp}$ Dew-point in whole degrees Celsius at the tropopause

S_t Character of tropopause as recommended in Recommendation 22 (CSM-II)

Z Character of the change of the wind at the tropopause (Code 107)

N o t e : When more than one tropopause is to be reported the symbolic figure group 111AA will be repeated before each succeeding $H_tH_tP_tP_tP_t$ group.

II. Abridged tropopause code form

111AA $S_t\frac{(P_tP_t)}{(H_tH_t)}T_pT_p$

where

111AA (See code table)

P_tP_t Pressure in tens of mb

H_tH_t Geopotential in geopotential hectometre or hundreds of geopotential feet

N o t e : When more than one tropopause is to be reported the group $S_t\frac{(P_tP_t)}{(H_tH_t)}T_pT_p$ is repeated.

(4) Combined maximum wind and abridged tropopause data may be sent in the following form :

Combined maximum wind and abridged tropopause

111AA $n_jH_mH_mH_mH_m$ ddfff $S_t\frac{(P_tP_t)}{(H_tH_t)}T_pT_p$

where

111AA (See code table)

N o t e : When more than one tropopause is to be reported the group $S_t\frac{(P_tP_t)}{(H_tH_t)}T_pT_p$ is repeated.

CODE 111AA

11100	Maximum wind with altitude in decametres
11111	Maximum wind with altitude in hundreds of feet
11122	Complete tropopause code form with geopotential in hectometres
11133	Complete tropopause code form with geopotential in hundreds of feet
11144	Abridged tropopause code form with pressure reported
11155	Abridged tropopause code form with geopotential reported
11166	Maximum wind with altitude in decametres and abridged tropopause code form with pressure reported
11177	Maximum wind with altitude in hundreds of feet and abridged tropopause code form with pressure reported
11188	Maximum wind with altitude in decametres and abridged tropopause code form with geopotential reported
11199	Maximum wind with altitude in hundreds of feet and abridged tropopause code form with geopotential reported

Rec. 6 (CSM-II) - AMENDMENTS TO THE INTERNATIONAL ANALYSIS CODE

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING the limitations of the symbolic letters P_t, P_o, h_t, h_c, F_i, F_c and the group ($md_sd_sf_sf_s$) of the International Analysis Code (FM 45); and

CONSIDERING,

(1) A request for the expansion of Section 99966 of FM 45;

(2) A request for inclusion in FM 45 of wind forecasts at selected pressure levels;

(3) The increasing interest in the tropopause;

(4) The increasing interest in the jet stream;

RECOMMENDS that the following amendments be made to the International Analysis Code (FM 45) :

(1) The removal of brackets from groups 99900, 99911, etc.;

(2) The expansion of Sections 99900 and 99911 to permit amplification of information on past and future characteristics and movements of pressure or topography systems and fronts - annex 1;

(3) The expansion of Section 99966 to include information on aircraft icing and turbulence - annex 2;

(4) The insertion of a new Section 99977 - upper wind section - annex 3;

(5) The insertion of a new Section 99988 - jet stream section - annex 4;

(6) The insertion of a new Section 99999 - tropopause section - annex 5;

(7) The amendment to Code 28 - annex 6;

(8) Amendments to Code 101 - annex 6;

(9) The addition of new symbolic letters $g_p g_p$ - annex 7;

(10) The addition of clarifying notes to Codes 31, 32, 59, 66 - annex 7;

(11) The expansion of the table in Note (4) to FM 45 - annex 7;

(12) The addition of notes to symbolic letters $d_s d_s$ and $f_s f_s$ - annex 7;

(13) The adoption of new tables - annex 8 :

i_j Units indicator for jet stream

J Aircraft icing and turbulence.

A N N E X 1

Section 99900

99900

(9NNSS) $8P_tP_cPP$ or $8h_th_ch_ah_a$ yyyyy (.....) $(md_sd_sf_sf_s)$

$(00C_100)$ ....

or

(9NNSS) $000g_pg_p$ $8P_tP_cPP$ or $8h_th_ch_ah_a$ yyyyy (.....) $(md_sd_sf_sf_s)$

$(00C_100)$ ....

and

(9NNSS) $000g_pg_p$ $7P_tP_cPP$ or $7h_th_ch_ah_a$ yyyyy (.....) $(md_sd_sf_sf_s)$

$(00C_100)$

....

Section 99911

99911

(9NNSS) $66F_tF_iF_c$ yyyyy yyyyy ..... $(md_sd_sf_sf_s)$ $(00C_100)$

....

or

(9NNSS) $000g_pg_p$ $66F_tF_iF_c$ yyyyy yyyyy ..... $(md_sd_sf_sf_s)$

$(00C_100)$ ....

and

(9NNSS) $000g_pg_p$ $67F_tF_iF_c$ yyyyy yyyyy ..... $(md_sd_sf_sf_s)$

$(00C_100)$ ....

where h_ah_a = Geopotential of constant pressure surface in geopotential decametres or tens of geopotential feet.

N o t e : In Sections 99900 and 99911 the basic code forms give the details of pressure systems and fronts for the time of the chart in analysis messages, and for the time of the forecast chart in prognosis messages.

One or more alternative groups, introduced by a time group $000g_pg_p$, can be used when greater detail is required about past and future movements and characteristics of any pressure system or front. In Section 99900,

when $8P_tP_cPP$ is used after the time group $000g_pg_p$, the position group yyyyy refers to time G_cG_c, P_c refers to the character of the pressure system during the period g_pg_p hours prior to G_cG_c, the movement indicator figure m refers to the same period and $d_sd_sf_sf_s$ gives the mean direction and speed of the system in that period. In Section 99900, when $7P_tP_cPP$ is used after the time group $000g_pg_p$, the position group yyyyy refers to time G_cG_c, P_c refers to the forecast character of the pressure system during the period of g_pg_p hours following G_cG_c, the movement indicator figure m refers to the same period and $d_sd_sf_sf_s$ gives the forecast mean direction and speed of the system in that period. Frontal systems can be treated similarly in analysis messages. The same principle is adopted in prognosis messages. In these, the position groups yyyyy refer to the time $G_cG_c + G_pG_p$. However, forecast details of character and movement of pressure centres and fronts during periods prior to and following $G_cG_c + G_pG_p$ can be given, g_pg_p indicating the period relative to the time $G_cG_c + G_pG_p$.

A N N E X 2

Section 99966

Add the following groups :

($9CH_bH_bH_b$ $8JH_tH_tH_t$ yyyyy ....)

or ($7CH_bH_bH_b$ $6JH_tH_tH_t$ yyyyy ....)

where $H_bH_bH_b$ Altitude of base of cloud in hundreds of metres or hundreds of feet

$H_tH_tH_t$ Altitude of top of cloud in hundreds of metres or hundreds of feet

J Aircraft icing and turbulence

N o t e : The groups indicated by 9 and 8 refer to reported conditions, and by 7 and 6 to forecast conditions.

A N N E X 3

Upper wind section

99977	($000g_pg_p$)	yyyyy	8ddff	7ddff	5ddff	4ddff
			3ddff	2ddff	1ddff	($00C_100$)
.....						
.....						

N o t e : Wind analysis or prognosis for 850, 700, 500, 400, 300, 200 and 100 mb, or for a selection of these levels, are given for a series of positions indicated by yyyyy.

A N N E X 4

Jet stream section

99988

$9i_jH_jH_jH_j$	yyyyy	$d_jd_jf_jf_jf_j$	$9i_jH_jH_jH_j$	yyyyy	$d_jd_jf_jf_jf_j$
.....	.....	.....	.....	.....	.....
					($00C_100$)

and/or

$9i_jP_sP_sP_s$	yyyyy	$d_jd_jf_jf_jf_j$	yyyyy	$d_jd_jf_jf_jf_j$	
	.....	.....	.....	.....	($00C_100$)

where i_j Units indicator for jet stream

d_jd_j Wind direction in tens of degrees

$f_jf_jf_j$ Wind speed in units given by i_j

$H_jH_jH_j$ Geopotential of jet core in units indicated by i_j

$P_sP_sP_s$ Pressure in millibars of standard constant pressure surface on which the line of maximum wind speed is given

N o t e s : (1) Actual or forecast winds can be given for a number of positions along the jet stream core or along the line of maximum wind speed on the standard constant pressure charts immediately above or below the jet core.

(2) This section will be restricted normally to winds exceeding 60 knots or 100 km/hour.

ANNEX 5

Tropopause section

99999

$4e_1uuu$ yyyyy yyyyy ..... $(00C_100)$

....

ANNEX 6

Amendments to code tables

1) Code 28

Add a note to specification for $e_1 = 0$:

Note. In tropopause analysis uuu is in geopotential hectometres or hundreds of geopotential feet.

2) Code 101

Insert :

	$x_2x_2x_2$	$x_3x_3x_3$
000	Jet stream analysis	-
999	Tropopause analysis	-
xxx	Upper wind analysis	-

ANNEX 7

New symbolic letters

g_pg_p Number of hours to be added to or subtracted from G_cG_c (chart time) or $G_cG_c + G_pG_p$ to give supplementary information in Sections 99900 and 99911 or number of hours to be added to G_cG_c for indicating the time to which the forecast wind in Section 99977 refers.

Notes to code tables

Codes 31, 32, 59, 66 - add :

N o t e : The specifications apply to the time of the analysis or prognosis when used in the basic code form, and to the periods indicated by g_pg_p when used in the alternative code forms of FM 45.

Amendment to FM 45

Note (4) - add :

99977	Upper wind section
99988	Jet stream section
99999	Tropopause section

Specifications of symbolic letters

d_sd_s - add :

(2) d_sd_s denotes the direction towards which the system is moving at the time of the analysis or prognosis when used in the basic code form, and the mean direction over the periods indicated by g_pg_p when used in the alternative code forms of FM 45.

f_sf_s - add :

(1) f_sf_s denotes the speed of the system at the time of the analysis or prognosis when used in the basic code form, and the mean speed over the periods indicated by g_pg_p when used in the alternative code forms of FM 45.

A N N E X 8

New tables

i_j - Units indicator for jet stream

0	Wind in m/sec : geopotential of jet core in geopotential hectometres
1	Wind in km/hour : geopotential of jet core in geopotential hectometres
2	Wind in knots : geopotential of jet core in geopotential hectometres
3	Wind in knots : geopotential of jet core in hundreds of geopotential feet
4	Wind in m/sec : pressure in whole millibars
5	Wind in km/hour : pressure in whole millibars
6	Wind in knots : pressure in whole millibars

J - Aircraft icing and turbulence

0	No specification	
1	No icing and no turbulence	
2	Slight turbulence	no icing
3	Moderate turbulence	no icing
4	Heavy turbulence	no icing
5	Slight icing	no turbulence or slight turbulence
6	Moderate icing	no turbulence or slight turbulence
7	Heavy icing	no turbulence or slight turbulence
8	Slight icing	moderate or heavy turbulence
9	Moderate or heavy icing	moderate or heavy turbulence

Rec. 7 (CSM-II) - CLIMAT SHIP REPORTS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) The statement recorded in the general summary of the work of the second session of the Commission for Climatology that there exists a general desire for the reporting of mean monthly sea surface temperatures; and

(2) That there is also a desire to continue the provision for reporting monthly rainfall;

RECOMMENDS,

(1) That FM 72 be amended to read :

FM 72.B CLIMAT SHIP $xQL_aL_aL_a \quad L_oL_oL_oxx$

$\overline{PPTTT} \quad \overline{UUT_sT_sT_s} \quad (99R_1R_1R_d)$

(NORMAL $\overline{PPTTT} \quad \overline{UUT_sT_sT_s} \quad (99R_1R_1x)$)

(2) That the specification of $\overline{T_sT_sT_s}$, indicating mean sea surface temperature for the month in tenths of degree, be inserted at the appropriate place in Volume B of WMO publication No. 9, and that to this specification the notes under $\overline{TTT}$ should be added.

Rec. 8 (CSM-II) - MESRAN AND ABTOP SUMMARIES

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING that at the present time there appears to be a real need to permit the use of both MESRAN and ABTOP (RA VI) messages for the international exchange of summaries of upper-air data;

RECOMMENDS,

(1) That for the exchange of summaries of upper-air reports the following two summaries be used, preference being given to MESRAN where communications are good as it will make the information available earlier and in a more complete form, while ABTOP has advantages where communications are restricted as it reduces the length of the message;

(2) That Note (21) of FM 35.A and Note (8) of FM 36.A be replaced by the following :

Summaries of upper-air synoptic reports for world-wide use may be exchanged in either the complete summary form (code name MESRAN) or the abridged summary form (code name ABTOP).

MESRAN includes :

(1) Section 1 of the TEMP form, from which the surface data groups ($99P_oP_oP_o$ $T_oT_oT_{do}T_{do}T_{xo}$) are omitted;

(2) Section 10 (optional) of the TEMP form with the indicator group appearing once only at the beginning of the message if the MESRAN contains Section 10 data only;

(3) Section 11 (optional) of the TEMP form with the indicator group appearing once only at the beginning of the message if the MESRAN contains Section 11 data only;

(4) Section 7 (optional) with indicator 33333;

(5) Section 8 (optional) with indicator 44444.

N o t e s :

(1) The code name MESRAN will always be the first word of the message.

(2) Sections may be sent separately or combined.

(3) If TEMP SHIP collectives only are sent the message will be headed MESRAN SHIP.

ABTOP includes :

(1) As on page II-6-7 of Volume B;

(2) Section 10 (optional) of the TEMP form with the indicator group appearing once only at the beginning of the message if the ABTOP contains Section 10 data only;

(3) Section 11 (optional) of the TEMP form with the indicator group appearing once only at the beginning of the message if the ABTOP contains Section 11 data only.

N o t e s :

(1) } As on page II-6-7 of Volume B.
(2) }

(3) If SHIPs collectives only are sent the message will be headed ABTOP SHIP.

Rec. 9 (CSM-II) - AMENDMENTS TO VOLUME B OF WMO PUBLICATION No. 9.TP.4

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING that some discrepancies exist between the texts of the 1956 edition of the International Cloud Atlas and Volume B of WMO publication No. 9; and

CONSIDERING,

(1) That Code 92 is not satisfactory in all respects;

(2) That other codes in Volume B could be affected by changes in Code 92;

RECOMMENDS,

(1) That the Cloud Atlas be the substantive document and Volume B brought into conformity except with respect to the definitions of dust haze, mist and fog. In these cases the present usage in Volume B be continued in force pending correction of the Cloud Atlas;

(2) That in Note (1) under ww, page I-A-3-28 of Volume B, the word "hydrometeors" be replaced by the word "meteors";

(3) That Codes 90, 90 A, 92, 92 A, 93, 94, 95 and 96 A be amended as indicated in the annex;

(4) That ww plotting symbols be changed as follows :

ww	07	$
ww	17	⌈ζ
ww	79	△

(5) That the president of the Commission for Synoptic Meteorology be requested to resolve the problem of the definitions of dust haze, mist and fog in order to decide whether some modification of the Cloud Atlas is necessary with regard to these definitions.

A N N E X

Code 90 - W - Past weather

W	= 3	Sandstorm, duststorm or blowing snow
W	= 4	Fog or ice fog or thick haze

Code 90 A - W - Past weather (weather in previous hour or weather since previous report

w - Present weather

Code figure 3	Sandstorm, duststorm or blowing snow

Code 92 - ww - Present weather

ww	= 00-19	No precipitation, fog, ice fog, duststorm, sandstorm, drifting or blowing snow at the station* at the time of observation or, except for 09 and 17, during the preceding hour
ww	= 07	Dust or sand raised by wind at or near the station at the time of observation, but no well developed dust whirl(s) or sand whirl(s), and no duststorm or sandstorm seen
ww	= 08	Well developed dust whirl(s) or sand whirl(s) seen at or near the station during the preceding hour or at the time of observation, but no duststorm or sandstorm
ww	= 09	Duststorm or sandstorm within sight at the time of observation, or at the station during the preceding hour
ww	= 11	Patches of } shallow fog or ice fog at the station, whether on land or sea, not deeper than about 2 metres on land or 10 metres at sea
ww	= 12	More or less continuous }
ww	= 17	Thunderstorm, but no precipitation at the time of observation
ww	= 18	Squalls } at or within sight of the station during the preceding hour or at the time of observation
ww	= 19	Funnel cloud(s)** }

ww = 20-29 Precipitation, fog, ice fog or thunderstorm at the station during the preceding hour but not at the time of observation

ww = 20 Drizzle (not freezing) or snow grains } not falling as shower(s)

ww = 23 Rain and snow or ice pellets, type (a) } not falling as shower(s)

ww = 28 Fog or ice fog

ww = 30-39 Duststorm, sandstorm, drifting or blowing snow

ww = 32 Slight or moderate duststorm or sandstorm has begun or has increased during the preceding hour

ww = 35 Severe duststorm or sandstorm has begun or has increased during the preceding hour

ww = 38 Slight or moderate blowing snow } generally high (above eye level)

ww = 39 Heavy blowing snow } generally high (above eye level)

ww = 40-49 Fog or ice fog at the time of observation

ww = 40 Fog or ice fog at a distance at the time of observation, but not at the station during the preceding hour, the fog or ice fog extending to a level above that of the observer

ww = 41
ww = 42
ww = 43
ww = 44
ww = 45
ww = 46
ww = 47
} Replace "Fog" by "Fog or ice fog"

Footnote, page I-A-4-54 : * Hail, ice pellets type (b), snow pellets. French : grêle, grésil ou neige roulée.

ww = 54 Drizzle, not freezing, intermittent heavy (dense) at time of observation

ww = 55 Drizzle, not freezing, continuous heavy (dense) at time of observation

ww = 57 Drizzle, freezing, moderate or heavy (dense)

ww = 76 Ice prisms (with or without fog)

ww = 77 Snow grains (with or without fog)

ww = 79 Ice pellets type (a) (English text)
Granules de glace (French text)

ww = 87 Shower(s) of snow pellets or ice pellets type (b), with or without rain or rain and snow mixed - slight

ww = 88 Shower(s) of snow pellets or ice pellets type (b), with or without rain or rain and snow mixed - moderate or heavy

Footnote, page I-A-4-56 : ** Hail, ice pellets type (b), snow pellets. French : grêle, grésil ou neige roulée.

The present Notes (1), (3), (6), (8), (9) and (11) be replaced by :

N o t e s :

(1) In general, the highest applicable figure is to be selected, but code figure 17 should have preference over figures 20-49.

(3) When the phenomenon is not predominantly water droplets the appropriate code figure should be selected without regard to VV.

(6) The visibility restriction on ww = 10 is 1,000 m or more. The specification refers only to water droplets and ice crystals.

(8) In the case of ww = 28, visibility should have been less than 1,000 m. The specification only refers to visibility restrictions which occurred as a result of water droplets or ice crystals.

(9) For synoptic coding purposes a thunderstorm is 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. A thunderstorm is reported in present weather if thunder is heard within the normal observational period preceding the time of the report. A thunderstorm is regarded as having ceased at the time of the last audible thunder and the cessation is confirmed if thunder is not heard for 10 - 15 minutes after this time.

(11) A visibility restriction less than 1,000 m is to be applied to ww = 41-49. In the case of ww = 40, the apparent visibility in the fog or ice fog patch or bank is less than 1,000 m. 40-47 are used when the obstruction to vision consists predominantly of water droplets or ice crystals, and 48, 49 when the obstruction consists predominantly of water droplets.

Code 92 A - w_1w_1 - Forecast weather at surface

w_1w_1	=	06	Wide-spread dust in suspension*
w_1w_1	=	08	Well developed dust whirls or sand whirls
w_1w_1	=	11	Shallow fog or ice fog (in patches)
w_1w_1	=	12	Shallow fog or ice fog (continuous)
w_1w_1	=	17	Thunderstorm, but no precipitation
w_1w_1	=	38	Slight or moderate blowing snow } high (above eye level)
w_1w_1	=	39	Heavy blowing snow } high (above eye level)

w_1w_1 = 40
w_1w_1 = 41
w_1w_1 = 42
w_1w_1 = 43
w_1w_1 = 44
w_1w_1 = 45
w_1w_1 = 46
w_1w_1 = 47

} Replace "Fog" by "Fog or ice fog"

Foot of page I-A-4-58, insert footnote : * Dust haze.

w_1w_1 = 54 Drizzle, heavy (dense), intermittent

w_1w_1 = 55 Drizzle, heavy (dense), continuous

w_1w_1 = 57 Drizzle, moderate or heavy (dense), freezing

w_1w_1 = 76 Ice prisms

w_1w_1 = 77 Snow grains

w_1w_1 = 79 Ice pellets type (a)

w_1w_1 = 87 Shower(s) of snow pellets or ice pellets type (b), with or without rain or rain and snow mixed - slight

w_1w_1 = 88 Shower(s) of snow pellets or ice pellets type (b), with or without rain or rain and snow mixed - moderate or heavy

Code 93 - w_2 - Indication of the element forming the principal object of a report of deterioration or improvement of the weather or of a special report from a ship

w_2 = 7 Duststorm, sandstorm or blowing snow

Code 94 - W_c - Weather off course

W_c = 4 Fog or ice fog

Code 95 - W_s - Significant weather changes

W_s = 6 Fog or ice fog bank begins or ends

Code 96 A - w_p - Type of precipitation falling in the flight zone

w_p = 7 Snow pellets, hail

w_p = 9 Hail (snow pellets, snow) and thunder

Rec. 10 (CSM-II) - REPORTING OF ISOLATED CUMULONIMBUS CLOUDS IN THE $8N_sCh_sh_s$ GROUP

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING,

(1) That according to the present procedure of cloud reporting in the AERO code form (FM 15.A) cumulonimbus clouds, the amount of which is less than 3 octas, cannot be reported, even if there is only a trace of a lower layer of other clouds;

(2) That on many occasions cumulonimbus clouds are not reported in AERO reports;

RECOMMENDS that Note (3) under FM 15.A be changed to read as follows :

(3) Instructions for the group $8N_sCh_sh_s$:

(i) The group may be repeated to report a number of layers or masses of cloud. The normal number of groups does not exceed three; it may however be four in cases when cumulonimbus clouds are observed;

(ii) The selection of layers (masses) to be reported is made in accordance with the following requirements :

(a) The lowest individual layer (mass) of any amount (N_s equals 1 or more);

(b) The next higher individual layer (mass), the amount of which is greater than $N_s = 2$ (N_s equals 3 or more);

(c) The next higher individual layer (mass), the amount of which is greater than $N_s = 4$ (N_s equals 5 or more);

(d) Cb clouds, whenever observed and not reported under (a), (b) and (c) above by means of a group referring exclusively to Cb.

R e m a r k s

(a) The order of reporting of the groups is always from low to high levels;

(b) In determining the cloud amounts to be reported for individual layers or masses in the 8-group, the observer estimates, by taking into consideration the evolution of the sky, the cloud amounts of each layer **or** mass at the different levels, as if no other clouds were existing. Caution should be taken, however, to avoid unconsidered guessing. (This requires elaboration in national instructions.)

Rec. 11 (CSM-II) - REPORTING OF CLOUDS IN THE $8N_sCh_sh_s$ GROUP

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING that clarification is needed to the notes in the AERO code form FM 15.A in order to indicate the reporting procedure when two or more types of clouds exist with their bases at the same level;

RECOMMENDS that the following note be added to FM 15.A :

N o t e (3)

(iv) If two or more types of clouds occur with their bases at the same level and this level is one to be reported in accordance with (i) above then C will refer to the cloud type that represents the highest amount and N_s will refer to the total amount of clouds of all types whose bases are the same as that of the type reported by C.

Rec. 12 (CSM-II) - CLOUD REPORTS FROM MOUNTAIN STATIONS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) That in the code group $N_hC_LhC_MC_H$ there is difficulty in coding h when the base of the cloud is below the horizon and on some other occasions;

(2) That some difficulty had been experienced in reporting clouds from mountain stations;

RECOMMENDS,

(1) That Code 43 be amended as follows :

x = 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;

(2) That the following note be added to Code 43 :

The term "height above ground" is considered as being the height above the official aerodrome elevation or above station level at a non-aerodrome station;

(3) That the following notes replace the notes appearing under FM 17 :

(1) The MONT group is used to report, in combination with the group $N_hC_LhC_MC_H$ of the SYNOP code form, clouds observed at a mountain station. The group is not used for clouds the bases of which are above the mountain station.

(2) When the clouds have their bases above the station level they are reported in the same manner as at stations in flat country by the group $N_hC_LhC_MC_H$.

(3) When the low clouds have their tops at a level lower than the station level and there are no C_L and no C_M clouds above the station, the cloud group is coded $0090C_H$; the low clouds are reported by the MONT group.

(4) When the low clouds have their tops below the level of the station and there are C_M clouds with base above the level of the station, the group $N_hC_LhC_MC_H$ is reported as $N_hOhC_MC_H$ where N_h and h refer to the C_M cloud; the low cloud is reported by the MONT group.

(5) When there is one low cloud layer with tops below the level of station and another low cloud layer with base above the level of station, the higher layer is reported in $N_hC_LhC_MC_H$ and the lower layer is reported by the MONT group.

(6) When there are clouds of the type C_L which have their base below and their tops at a level above the station level, the station itself not being in the clouds, these clouds are reported in both groups $N_hC_LhC_MC_H$ and MONT $N'C'H'H'C_t$. N_h is then coded with the same figure as N', C_L and C' will refer to the same cloud genus (type), and h is coded as x. If in this case also other clouds of the type C_L are present, these clouds are to be reported in a second MONT group if their tops are below the level of the station or reported separately in plain language in case their base is above the station level.

(7) When the same conditions as (6) prevail with the difference that the station is in clouds, both groups $N_hC_LhC_MC_H$ and MONT $N'C'H'H'C_t$ are reported when the weather conditions are such that the station is in and out of cloud sufficiently frequently, that the various cloud features can be recognized. When this situation does not prevail, the group $N_hC_LhC_MC_H$ is reported as

9xOxx and the MONT group is omitted. (In this case the present weather would be coded in the forty decade or higher.)

(4) That the notes under the specification of C' and Note (4) of the specification for h be amended in accordance with (3) above.

Rec. 13 (CSM-II) - SPECIFICATION FOR PPP

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING that clarity would be improved by a minor change in the specification for PPP;

RECOMMENDS,

(1) That the specification for PPP be amended to read :

PPP Pressure in tenths of millibars or geopotential in geopotential metres or tens of geopotential feet;

and

(2) That the Note (2)(b) to the specification for PPP be amended to read :

(b) A station which cannot report mean sea level pressure with reasonable accuracy reports, by Regional agreement either the geopotential of an agreed standard "constant pressure level" or the pressure reduced to an agreed datum level for that station. The level chosen for each station is indicated in Volume A of publication No. 9.

Rec. 14 (CSM-II) - SPECIAL PHENOMENA

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Resolution 26 (EC-VIII);

(2) That there existed no specific information on the experiences of the Regions gained through use of their individual $S_pS_ps_ps_p$ codes, which indicated a need for inter-regional exchange;

RECOMMENDS,

(1) That the regional associations be requested to continue their study of the code $S_pS_{ps_ps_p}$, and report their experience and observations for further consideration at the third session of the Commission for Synoptic Meteorology;

(2) That for that purpose the Secretary-General provide the Members with a copy of the report of the CSM ad hoc Working Group on special phenomena, for information.

Rec. 15 (CSM-II) - VISIBILITY IN METEOROLOGICAL REPORTS AND FORECASTS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Resolution 17 (EC-V);

(2) Note (1) under VV on page I-A-3-26, Volume B of WMO publication No. 9;

(3) That, while a majority of Members report minimum visibility, a substantial minority reports "Visibility index";

CONSIDERING,

(1) That it seems highly improbable that in the near future international agreement may be reached on either of the above methods in view of their respective defects;

(2) That although the International Air Transport Association asks that average visibility be included in reports and forecasts, Recommendation 5 of the second Air Navigation Conference of ICAO expresses no preference for either minimum visibility of visibility index provided "reports and forecasts of aerodrome visibility transmitted to aircraft be supplemented by information concerning marked differences in horizontal visibility in particular directions";

(3) That every effort should be made to arrive at a single internationally accepted method of indicating visibility in reports and forecasts;

(4) That information is needed on the accuracy of estimates of visibility on various directions made from a single observing point;

(5) That Note (4) under the TAFOR code form in Volume B is adequate, provided provision is made to permit the indication in clear language of directional differences in the forecast visibility whenever such differences can be forecast;

RECOMMENDS,

(1) That, until international agreement can be reached on a single method, reporting of minimum visibility be maintained as the only recognized procedure;

(2) That, in order to permit the reporting, in a standard form, of directional differences in visibility reported by aeronautical meteorological stations using FM 15.A and FM 16.A code forms or the FM 11.A code form instead of the FM 15.A code form, the following note be added to the notes under these code forms in WMO publication No. 9, Volume B :

> When the horizontal visibility is different in different directions and it is desired to report this, it will be done by adding appropriate Q-Code or plain language at the end of message;

(3) That, in order to permit the indication of directional differences in the forecast visibility whenever such differences are expected, the following note be added to the notes appearing under the TAFOR, TAF, ARFOR code forms in Volume B of WMO publication No. 9 :

> When directional differences in visibility can be foreseen and it is desired to indicate the specific direction(s) and expected visibility in the forecasts, this will be done by adding appropriate Q-Code or plain language at the end of the message;

(4) That the Secretary-General be requested to invite, in consultation with the presidents of the Commission for Synoptic Meteorology and the Commission for Instruments and Methods of Observation, certain Members to carry out tests before the end of 1959 in order to determine:

(i) The accuracy of estimates of visibility;

(ii) The frequencies of occurrence of significant directional variations of measured visibility;

(5) That the president of the Commission for Instruments and Methods of Observation be requested to advise the Members who agree to carry out the above tests, on the methods of observation and instruments to be used for these tests;

(6) That the president of the Commission for Synoptic Meteorology be authorized to invite all Members via the Secretary-General, to conduct such trials that he considers best suited in the light of the results of the tests indicated in paragraph (5) above, with a view to

presenting the third session of the Commission for Synoptic Meteorology with a comprehensive report and if possible a solution which would lead to the desired internationally adopted method of reporting visibility.

Rec. 16 (CSM-II) - NOTES TO CODE TABLE FOR P_w

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING the present ambiguity in Code 69;

RECOMMENDS that the code table for P_w - Code 69 - be revised to read as follows :

2	5 seconds or less	8	16 - 17 seconds
3	6 - 7 seconds	9	18 - 19 seconds
4	8 - 9 seconds	0	20 - 21 seconds
5	10 - 11 seconds	1	Over 21 seconds
6	12 - 13 seconds	x	Calm, or period not determined
7	14 - 15 seconds		

N o t e s :

(1) The period of waves is the time between the passage of two successive wave crests past a fixed point (it is equal to the wave length divided by the wave speed).

(2) The average value of the wave period is reported, as obtained from the larger well-formed waves of the wave system being observed.

Rec. 17 (CSM-II) - STANDARD ISOBARIC SURFACES

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Resolution 19 (EC-V), Resolution 26 (EC-IX) and Recommendation 18 (CAe-II);

(2) The isobaric levels selected for the publication of upper-air data during the International Geophysical Year;

CONSIDERING,

(1) That the definition of "standard isobaric surface" as proposed in Recommendation 18 (CAe-II) needs clarification;

(2) That, as indicated by the Commission for Aerology it is desirable to expand the list of standard isobaric surfaces;

(3) That contrary to the views expressed in Recommendation 18 (CAe-II) the 400 mb level still has some operational value;

(4) That the recommended practice contained in paragraph 7.4.1.3 of the Technical Regulations needs to be brought up to date in the light of current requirements of civil aviation;

(5) That it is desirable to achieve uniformity in the selection of surfaces for which Members prepare upper-air charts;

RECOMMENDS,

(1) That the following definition of "standard isobaric surface" be adopted for inclusion in the WMO Technical Regulations :

Standard isobaric surface - An isobaric surface used on a routine and world-wide basis for representing and analyzing the conditions in the atmosphere;

(2) That the standard isobaric surface of 100 mb be added to those already listed in paragraph 7.4.1.2 of the Technical Regulations;

(3) That the 400 mb surface be retained as a standard isobaric surface;

(4) That Note (4) under code form FM 35.A in Volume B of WMO publication No. 9 be expanded to include the 100 mb surface;

(5) That to Section 4 of code form FM 32.A in Volume B of WMO publication No. 9, a group 1ddff be added and that Note (8) under code form FM 32.A be expanded to include the 100 mb surface;

(6) That the 300 mb surface be added to the surfaces already contained in paragraph 7.4.1.3 of the Technical Regulations;

(7) That Members deciding to prepare upper-air charts for surfaces above 300 mb choose levels from among the following : 200, 150, 100, 70, 50, 30, 20 and 10 mb.

Rec. 18 (CSM-II) - EXTRAPOLATION OF SOUNDINGS FOR GEOPOTENTIAL CALCULATIONS FOR USE IN TEMP REPORTS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Resolution 27 (EC-IX) dealing with the extrapolation of soundings for geopotential calculations for publication purposes;

(2) Paragraph 7.4.1.2 of the Technical Regulations specifying the standard isobaric surfaces;

CONSIDERING,

(1) That it is desirable to adopt, also for the purpose of transmitting data in the TEMP code forms FM 35.A and FM 36.A, a uniform procedure for obtaining by extrapolation the geopotential of either a standard isobaric surface or of one of the isobaric surfaces 150, 70, 50, 30, 20 and 10 mb;

(2) That this extrapolation procedure should be similar to the one already found satisfactory and approved for publication purposes;

RECOMMENDS that whenever, for the purpose of exchange by means of the TEMP code forms (FM 35.A and FM 36.A), it is desired to extrapolate a sounding for the computation of the geopotential at a standard isobaric surface or at one of the isobaric surfaces 150, 70, 50, 30, 20 and 10 mb, the following rules apply :

(a) Extrapolation is permissible if, and only if, the pressure difference between the minimum pressure of the sounding and the isobaric surface for which the extrapolated value is being computed does not exceed 1/4 of the pressure to which extrapolation is desired, provided the extrapolation does not extend through a pressure interval exceeding 25 mb;

(b) For the purpose of geopotential calculation, and for this purpose only, the sounding will be extrapolated, using two points only of the sounding curve on a log p, T-diagram, namely that at the minimum pressure reached by the sounding and that at the pressure given by the sum of this minimum pressure and the pressure difference, mentioned in (a) above.

Rec. 19 (CSM-II) - SIGNIFICANT LEVELS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Resolution 24 (EC-IX);

(2) That criteria had been developed for determining the significant levels for coding in FM 35.A and FM 36.A;

RECOMMENDS that the criteria for determining significant levels be included in Note (7) of FM 35.A by adding the following to the present text :

These levels will be selected so that the temperature obtained by linear interpolation between adjacent significant levels shall not depart from the observed temperature by more than 1°C below the 300 mb level or the first conventional tropopause whichever is reached first and by more than 2°C above this level.

Rec. 20 (CSM-II) - REPORTING OF f_a

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING that there was some confusion in the present specifications of f_a;

RECOMMENDS that the specifications of f_a be amended to read :

f_a - **Surface wind speed** to the nearest tens of knots or fives of metres per second, e.g.

0	0 - 4 knots	0 - 2 m/sec
1	5 - 14 knots	2 ½ - 7 m/sec
2	15 - 24 knots	7 ½ - 12 m/sec
3	25 - 34 knots	12 ½ - 17 m/sec
4	35 - 44 knots	17 ½ - 22 m/sec
5	45 - 54 knots	22 ½ - 27 m/sec
6	55 - 64 knots	27 ½ - 32 m/sec
7	65 - 74 knots	32 ½ - 37 m/sec
8	75 - 84 knots	37 ½ - 42 m/sec
9	85 knots and above	42 ½ m/sec and above

Rec. 21 (CSM-II) - REPORTING OF GEOPOTENTIAL FOR 500 AND 400 MB SURFACES IN FM 35.A AND FM 36.A

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING,

(1) That some difficulty is being experienced in determining the unreported digits in the geopotential ($h_nh_nh_n$) for plotting purposes at the 500 and 400 mb levels; and

(2) That with due regard to the accuracy of the original data, the reporting of the geopotentials of these levels to the nearest decametre instead of to the nearest metre when using metric units is acceptable;

RECOMMENDS that in FM 35.A and FM 36.A the geopotentials of the 500 mb surface and higher levels in Sections 1 and 8 of the code form be reported in geopotential decametres, when metric units are used and that Note (2) under the specifications of $h_1h_1h_1$, $h_2h_2h_2$, etc. be changed accordingly.

Rec. 22 (CSM-II) - CODE TABLE FOR S_t - CHARACTER OF TROPOPAUSE

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Recommendation 7 (CAe-II) and Resolution 21 (EC-IX) establishing the definition of the conventional tropopause; and

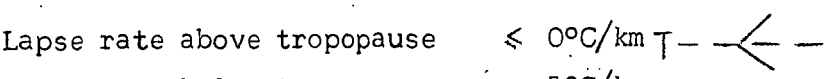
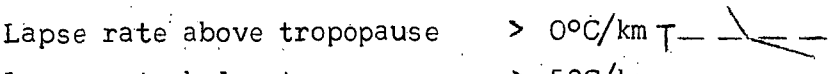
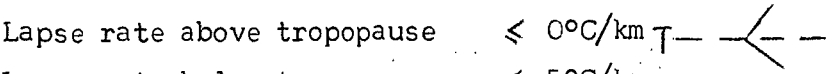
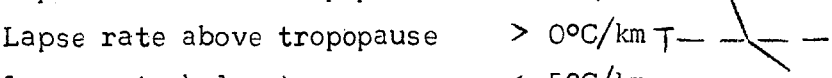
(2) Recommendation 8 (CAe-II) recommending a set of specifications for the character of the tropopause; and

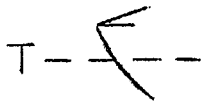
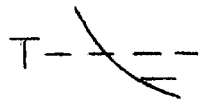
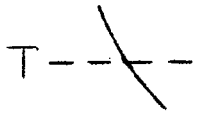
CONSIDERING that the definition of the conventional tropopause permits the objective reporting of tropopause data by radiosonde stations, notwithstanding the possibility that further research may lead to the need for some modifications to meet synoptic requirements;

RECOMMENDS that the code table for S_t recommended by Recommendation 8 (CAe-II) be adopted for describing the character of the tropopause and be inserted in Volume B as in the annex to this recommendation.

A N N E X

S_t - Character of tropopause

1	Conventional tropopause coincides with a significant change in lapse rate	Lapse rate above tropopause	$\leq$ 0°C/km	
		Lapse rate below tropopause	$\geq$ 5°C/km	
2		Lapse rate above tropopause	> 0°C/km	
		Lapse rate below tropopause	$\geq$ 5°C/km	
3		Lapse rate above tropopause	$\leq$ 0°C/km	
		Lapse rate below tropopause	< 5°C/km	
4		Lapse rate above tropopause	> 0°C/km	
		Lapse rate below tropopause	< 5°C/km	

5	Conventional tropopause does not coincide with any significant change in lapse rate	But a significant change in lapse rate > 3°C/km occurs at a level above the conventional tropopause	
6		But a significant change in lapse rate > 3°C/km occurs at a level below the conventional tropopause	
7		And no significant change of lapse rate > 3°C/km occurs at any other level	

8 Level of tropopause uncertain because top of ascent is less than 2 km above the level which appears to be the tropopause

9 Tropopause is not allocated to any of preceding categories

N o t e s :

(a) All lapse rates should be determined over 1 km intervals.

(b) If the conventional tropopause does not coincide with any significant change in lapse rate and a significant change of lapse rate occurs at levels both above and below the conventional tropopause, then the larger of these changes should be used to determine whether allocation to type 5 or type 6 is appropriate.

(c) When type 6 "conventional" tropopause is observed in arctic and antarctic regions in winter, the level of marked change in lapse rate below the "conventional" tropopause should be referred to as an arctic or antarctic tropopause and should be recorded as such in addition to the "conventional" tropopause, provided that over no interval of 1 km between the "conventional" and arctic or antarctic tropopause does the lapse rate exceed 3°C/km. In this case the character of the arctic or antarctic tropopause should be given by the code figure 9.

Rec. 23 (CSM-II) - REPORTING OF TEMPERATURE IN RECCO AND TEMP CODE FORMS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING,

(1) That there is no necessity to provide for reporting temperature in degrees F in the RECCO code form; and

(2) That the present use of 99 for missing temperatures and dew-point temperatures occasionally leads to confusion in reports given in the RECCO and TEMP code forms;

RECOMMENDS,

(1) That temperatures in the RECCO code form be reported only in degrees Celsius;

(2) That missing temperature and dew-point temperature be coded as xx and that the notes to code forms FM 35.A, FM 36.A and FM 41.A be amended accordingly;

(3) That Code 47 be amended by deleting the specifications for 5, 6, 7, 8 and 9.

Rec. 24 (CSM-II) - HUMIDITY INDICATOR IN RECCO CODE FORM

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) That there is a duplication of the use of the symbolic letter i in different code forms;

(2) That the symbolic letters i and T_dT_d as used in the RECCO code form do not give a correct impression of the elements to be reported;

RECOMMENDS,

(1) That in the RECCO code form (FM 41.A), the symbolic letter i be replaced by the humidity indicator i_u with the specifications as given in Code 47;

(2) That the two code figures for reporting humidity be designated by the symbol T_uT_u;

(3) That these new symbols be introduced in Volume B of WMO publication No. 9, and Note (4) for T_dT_d be deleted.

Rec. 25 (CSM-II) - IMPROVEMENT IN FRENCH TEXT OF CODE 14

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING that the specifications for code figures 6 and 9 of Code 14 in the French text of Volume B are not in complete conformity with the International Cloud Atlas; and

CONSIDERING that it is necessary that there be uniformity;

RECOMMENDS that the French text of specifications for code figures 6 and 9 of Code 14 be amended to read :

6 En couche (ou en masse) continue ...
9 En couche (ou en masse) continue ...

Rec. 26 (CSM-II) - SPECIFICATIONS FOR USE OF VARIATION GROUP IN TAFOR AND TAF CODE FORMS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING that some of the notes under code form FM 51.A and a few specifications in Code 50 referring to variation groups in TAFOR and TAF code forms are ambiguous;

RECOMMENDS,

(1) That the Note (7)(iii) under FM 51.A be changed to read :

The group $96GGG_p$ indicates a change beginning at GG and continuing throughout the period indicated by G_p;

(2) That the specification of $97GGG_p$ in Code 50 (page I-A-4-31 of Volume B, publication No. 9) be changed to read :

$97GGG_p$ Temporary variation at GG (when G_p = 0) or temporary variations taking place within the period indicated by G_p (when G_p = 1 - 9);

(3) That the specification of $98GGG_p$ in Code 50 be changed to read :

$98GGG_p$ Intermittent variations taking place within the period indicated by G_p;

(4) That under the plain language alternative terminology for Code 50 the specification of the group $9i_3nnn$ for $9999C_2$ be changed to read :

$9999C_2$ The form PROB (per cent) should be used for this group; e.g. "PROB 20".

Rec. 27 (CSM-II) - INFORMATION FOR TAKE-OFF AND LANDING OF TURBINE-POWERED AIRCRAFT

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING Recommendation 24 (PAC-I-ICAO) and Resolution 40 (EC-IX);

CONSIDERING that it would be undesirable at this time to develop code groups for meeting anticipated meteorological requirements for landing of turbine propelled aircraft, as the information about these requirements is changing rapidly;

RECOMMENDS,

(1) That until the precise needs of turbine-powered aircraft for temperature, humidity and pressure forecasts for take-off and landing have been stated, Q-Code additions to the TAFOR code form may be used to provide for such of these data as may be requested;

(2) That the International Civil Aviation Organization be invited to state its precise requirements as soon as possible.

Rec. 28 (CSM-II) - MEANING OF "LOCAL" AND "SCATTERED" IN CODE 50

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING that the use of code w_1w_1 in conjunction with the group $9i_3nnn$ in ARFOR, ROFOR, FIFOR code forms gave rise to some difficulties in differentiating between the terms LOCAL and SCATTERED;

RECOMMENDS,

(1) That the meaning of the term LOC in Code 50 be clarified by adding the following :

> LOC when used will always be accompanied by plain language sufficient to identify the locality in which the phenomenon is expected;

(2) That the term SCT (Scattered) be added to the list in Code 50 with the meaning that the phenomenon is expected to be scattered in space or time or both.

Rec. 29 (CSM-II) - REPORTS IN SFAZU CODE FORM

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING,

(1) That it is desirable that the SFAZU code form (FM 83.A) can also be used for periods of time less than 24 hours; and

(2) That there is ambiguity in the present specification for Y in the SFAZU code form;

RECOMMENDS,

(1) That the SFAZU code form (FM 83.A) be used for reports of the distribution of atmospherics by bearings for any period of time up to and including 24 hours; and

(2) That the specification of Y in Volume B, WMO publication No. 9, be expanded by the addition of a note to read :

(3) When in a report in SFAZU code form (FM 83.A) information is given for a period which includes parts of two calendar days, Y refers to the second calendar day.

Rec. 30 (CSM-II) - SYMBOLIC WORDS AND LETTER GROUPS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) A substantial desire for uniformity in the development of symbolic words and letter groups;

(2) The wide-spread use of a number of such words and groups of varying length;

CONSIDERS that it would be undesirable to make any changes in the existing symbolic words and letter groups; and

RECOMMENDS that when new symbolic words and letter groups are developed wherever possible they (a) be pronounceable, (b) give self evident indication of the nature of the report and (c) consist of five letters.

Rec. 31 (CSM-II) - DATE OF INTRODUCTION OF CODE FORMS AND CODES ADOPTED OR AMENDED AT THE SECOND SESSION

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING that time will be required to prepare and distribute instructions and to complete other arrangements;

RECOMMENDS that the additions, corrections and deletions to Volume B, WMO publication No. 9, recommended by the second session of the Commission for Synoptic Meteorology be brought into force on 1 January 1960.

Rec. 32 (CSM-II) - ADDITIONAL ABBREVIATED HEADINGS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING that it is desirable to expand the system of abbreviated headings, as established by Recommendation 33 (CSM-I);

RECOMMENDS that the following data designators and geographical designators be added to the table, published in Volume C of WMO publication No. 9 :

Table A

Surface data (observations) S	
River and special service reports	SR
Seismograph earthquake reports	SE
Microseismograph reports	SG
Supplementary airway weather reports	SW
Radar reports	SD
Forecasts F	
Winter sports forecasts with data	FW
Extended forecasts	FE
Temperature extreme forecasts	FM
Public forecasts	FP
Radio warning service (radio propagation forecasts)	FG
Aviation forecasts	FA
Operational forecasts	FO
Marine forecasts	FZ

Upper-air data U	
Combined PIBAL and RAWIN reports	UC
Vector wind differences	UV
Maximum wind	UM
Tropopause	UO
Analyses A	
Three hourly analyses	AT
Weather summaries	AP
Zonal analyses (hemispheric)	AZ
Zonal wind analyses (hemispheric)	AL
Wind analyses	AW
Thickness analyses	AH
Vertical motion analyses	AV
Convective analyses	AC
Climatic data C	
Surface climatic data	CS
Upper air climatic data	CU

Table B

Geographical designators	
Northern hemisphere	XN
Western hemisphere (between 0 and 180° west)	XW
Eastern hemisphere (between 0 and 180° east)	XE
Southern hemisphere	XS
Arctic region (to replace Arctic Ocean)	AC

Rec. 33 (CSM-II) - ABBREVIATED HEADINGS FOR AMENDED FORECASTS FOR AVIATION

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING the importance of messages containing amended TAFORs and the need to have them readily recognized;

RECOMMENDS,

(1) That the following note be added to FM 51.A :

(13) When an amended TAFOR has to be sent the message will be identified by the word AMEND and be coded according to the following procedure on circuits on which the WMO abbreviated message headings are used :

MTTAA (N) CCCC $Y_aY_aG_aG_ag_ag_a$

AMEND YYGGgg TAFOR $G_1G_1G_2G_2G_3$ etc.

where the first line is the abbreviated heading in which

$Y_aY_aG_aG_ag_ag_a$	is the time of issue of the amendment;
YYGGgg	the original time of issue of the TAFOR being amended;
G_1G_1	is the beginning of the period for which the amendment applies;
G_2G_2	is the same time as in the original TAFOR;

(2) That a note of the same tenor as the above be added to the ROFOR, FIFOR, ARFOR, HIROF, HIFIF and HIARF code forms.

Rec. 34 (CSM-II) - GROUPING OF TERRITORIAL BROADCASTS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING paragraph 6.2.1 of the Technical Regulations;

CONSIDERING,

(a) That it is desirable to effect all possible economy with regard to territorial broadcasts by the saving of frequencies and the reduction of overlapping;

(b) That the issue by one broadcast centre of data from two or more countries greatly facilitates the collection of weather data at other centres;

RECOMMENDS,

(1) That Members having a limited amount of data to diffuse be invited to combine their territorial broadcasts into a single broadcast;

(2) That in cases where such a combined broadcast cannot be arranged, Members should broadcast data on the same frequency (or frequencies), on a co-ordinated time schedule.

Rec. 35 (CSM-II) - METEOROLOGICAL BROADCASTS BY RADIO-TELEPRINTER

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING that the transmission and reception of figures by radio-teleprinter results in greater speed and economy of man-power as compared with handspeed Morse;

NOTING Technical Regulation 6.1.1.10;

RECOMMENDS,

(1) That as soon as possible but not later than the end of 1962, transmission of continental and sub-continental broadcasts be made by radio-teleprinter;

(2) That each regional association be requested :

(a) To deal with the problems involved in the cessation of Morse broadcasts when radio-teleprinter transmissions are introduced at each of its continental and sub-continental broadcast centres; and

(b) To consider whether radio-teleprinter transmissions could be introduced instead of Morse for any other types of broadcasts in its Region.

Rec. 36 (CSM-II) - METEOROLOGICAL BROADCASTS BY FACSIMILE

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING Technical Regulation 6.1.1.10;

CONSIDERING,

(a) That facsimile is an expeditious method of transmitting diagrams, which reduces considerably the processing of data (and therefore saves time and man-power) as compared with transmitting cipher characteristics of diagrams by teleprinter;

(b) That it is desirable to gain further experience of facsimile transmission of meteorological data (in the form of coded data, plotted data and diagrams);

RECOMMENDS,

(1) That transmission of analyses and prognostic charts from those centres responsible for master analyses be made by facsimile;

(2) That facsimile transmission of coded data, plotted data and diagrams be made in periods not used for facsimile transmission of master analyses and prognostic charts;

(3) That regional associations be requested to develop programmes of facsimile transmission for special and territorial broadcasts, taking into consideration the transmissions mentioned under (1) and (2) above.

Rec. 37 (CSM-II) - POSSIBLE COMBINATION OF FACSIMILE AND RADIO-TELEPRINTER BROADCASTS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING,

(a) The present congested state of the radio spectrum, particularly in the HF band, and the consequent need to make the best possible use of frequencies utilized for meteorological transmissions;

(b) That, because direct frequency modulation of the radio carrier is the preferred type of modulation for both meteorological facsimile and radio-teleprinter transmissions, it is technically possible to utilize under certain circumstances the same transmission system for both radio-teleprinter and facsimile transmissions;

RECOMMENDS that, where the quantity of information does not justify the separate operation of full time radio-teleprinter and facsimile transmissions, the two systems be operated wherever possible, on a time and frequency sharing basis.

Rec. 38 (CSM-II) - ORGANIZATION FOR THE EXCHANGES OF HEMISPHERIC DATA

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(a) That the present system for the world-wide collection and dissemination of meteorological data is not a rapid and dependable means of providing data for northern hemisphere charts;

(b) That to obtain the necessary information, at present the data must be collected from a great number of continental, sub-continental and territorial centres;

CONSIDERING,

(1) That charts for the northern hemisphere are extremely important for the following reasons :

(a) For scientific research;

(b) To meet the requirements of long distance aviation;

(c) To make long range weather forecasts;

(d) To make weather forecasts with the help of electronic computers;

(2) That the meteorological services of many countries need for their operations and scientific work, surface and upper-air data originating from the whole of the northern hemisphere, for the two standard hours of 0000 GMT and 1200 GMT, with aerological data to at least the 100 mb level and that some services foresee a future requirement for the exchange of surface reports for 06 and 18 hours;

(3) That a regular and complete collection of these data is more likely to be achieved by simultaneous collection and transmission from several specified inter-regional centres;

(4) That at present there is limited rediffusion of northern hemisphere data in certain Regions;

RECOMMENDS,

(1) That the plan for the northern hemisphere shown in the annex to this recommendation be implemented as resources become available with a view to the complete scheme being in operation at the earliest possible date;

(2) That the Working Group on telecommunications of the Commission for Synoptic Meteorology consider the establishment of a similar scheme for the concentration and rediffusion of selected data for the whole of the southern hemisphere so that at some future date there will be a possibility of exchanging information on a global basis by arranging suitable linkages.

A N N E X

COLLECTION, EXCHANGE AND DISSEMINATION OF NORTHERN HEMISPHERE DATA

1. Five centres are required to be responsible for the handling of data needed for the construction of northern hemisphere synoptic charts.

2. Each centre must be capable of :

(a) Collecting the required information from within an area assigned to it and which will be designated as its "zone of responsibility";

(b) Transmitting the collected information to adjacent centres which will relay the bulletins to other northern hemisphere centres; and

(c) Re-broadcasting the northern hemisphere data it receives from other centres, together with those from its own zone, for use by recipients within its own zone of responsibility.

3. The following centres are designated for purposes of exchange of northern hemisphere data and will be known as Northern Hemisphere Exchange Centres (NHEC's) :

1. Moscow
2. New Delhi
3. Tokyo
4. New York
5. Frankfurt/Main.

4. The zones of responsibility for each centre are indicated by the boundary lines on the diagram reproduced as appendix I to this annex, whilst the individual stations from which surface and upper-air reports are required are listed in appendices II and III respectively, it being understood that small changes to the list will be inevitable as necessitated by changing circumstances.

5. The centres (NHEC's) mentioned in paragraph 3 above are required to be interconnected, by one duplex point-to-point teleprinter circuit. Generally speaking the diagram reproduced in appendix IV to this annex illustrates the interconnexion; changes may, however, be made as decided by centres, or by the Regions concerned when relays are involved, provided the efficiency of the exchange is not impaired. In the event that it is found necessary to supplement the circuit, by an additional circuit, or circuits, between certain centres, action should be initiated by the Regions in which the centres are situated. In the diagram existing circuits are indicated by full lines and projected circuits by dotted lines. Relay centres are also shown.

The directions of flow of traffic so far agreed are indicated by arrows. Figures give the number of the centre whose reports will be carried together with the approximate number (in brackets) of five-figure groups involved. The diagram is symmetrical in general in that each centre is shown as sending in each direction its own contribution to the network plus the contribution it has received from an adjoining centre. However, in the case of New York, the existence of five relays between Tokyo and Frankfurt/Main suggests that it might be preferable for data from Tokyo to be routed via New Delhi and Moscow to Frankfurt/

Main and for data from Frankfurt/Main to be routed via Moscow and New Delhi to Tokyo. Since there is insufficient information at this time to definitely determine this, the question will be reconsidered when the centres at Tokyo and New Delhi are established. In the interim, the United States will consider the possibility of relay of data from the Tokyo centre to Frankfurt/Main via New York and from Frankfurt/Main to Tokyo via New York.

6. Arrangements for the expeditious collection of the necessary data are required to be made by the Region in which a particular centre is located, and by inter-Regional agreement in cases where collection from stations outside the Region is involved.

7. The Region in which a NHEC is located will be responsible for arranging for details regarding the broadcast of northern hemisphere data for the benefit of recipients within the appropriate zone of responsibility, bilateral or multilateral action being taken in cases where other Regions are concerned.

8. Reports to be exchanged under this scheme are to be SYNOP, SHIP reports and upper air summaries not exceeding 25 groups per report, for 00, and 12 hours GMT. Wherever possible, however, SYNOP reports for 06 and 18 hours GMT may be added.

9. Since the efficiency of the exchange of the northern hemisphere data is dependent upon the reliability of individual links between centres, it is of paramount importance that appropriate Regions shall make every endeavour to secure that the best possible means of communication are provided between centres. Continuous study of this matter should be undertaken by the Regions in conjunction with the CSM Working Group on telecommunications.

A P P E N D I X I

(See pages 111-112)

A P P E N D I X II

Provisional list of surface stations for the construction of northern hemisphere synoptic charts

01: 001, 005, 020, 028, 055, 062, 098, 105, 212, 262, 361, 415, 482

02: 052, 057, 062, 069, 077, 084, 090, 095, 103, 836, 864, 911, 935

03: 005, 026, 091, 262, 302, 396, 772, 804, 917, 953, 976

04: 005, 018, 077, 082, 202, 210, 212, 220, 231, 250, 260, 270, 310, 320, 330, 340, 350, 360, 380

06: 011, 081, 180, 230, 447, 590, 670

07: 021, 110, 150, 222, 257, 510, 577, 650, 690, 747, 761

08: 001, 023, 055, 160, 202, 221, 285, 302, 314, 390, 488, 495, 503, 506, 509, 515, 521, 536, 538, 583, 589, 594

10: 184, 147, 338, 384, 438, 866

11: 035, 518

12: 330, 375, 425, 565, 840, 882, 940

13: 128, 274, 334, 615

15: 120, 420, 552, 614

16: 059, 090, 158, 239, 260, 320, 400, 420, 560, 597, 620, 687, 716, 743, 754

17: 022, 026, 038, 060, 129, 090, 170, 200, 219, 244, 300, 350, 606

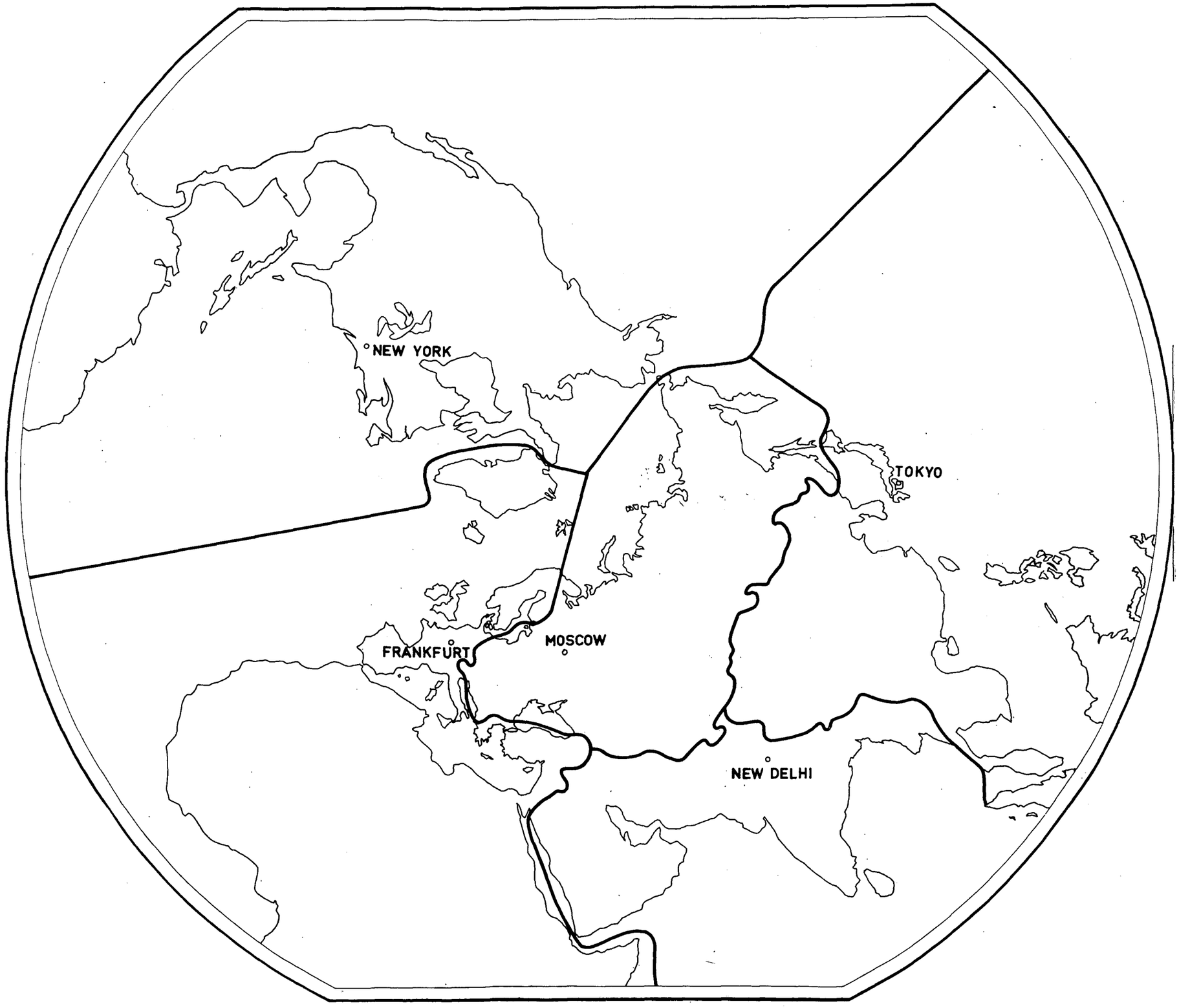
20: 047, 069, 087, 274, 292, 353, 667, 674, 744, 891

21: 358, 432, 504, 647, 802, 824, 946, 965, 982

22: 113, 165, 235, 522, 550, 583, 768, 802, 820

23: 022, 074, 146, 205, 219, 256, 330, 383, 418, 472, 552, 585, 631, 711, 804, 849, 884, 891, 921, 933, 955

24: 105, 125, 143, 266, 329, 343, 382, 507, 561, 629, 641, 671, 688, 738, 817, 908, 944, 959, 966



ANNEX TO RECOMMENDATION 38/
ANNEXE A LA RECOMMENDATION 38

APPENDIX I / APPENDICE I

Block numbers of countries falling in the areas indicated in Appendix I/
Indicateurs régionaux des pays qui se trouvent dans les zones indiquées dans l'Appendice I

Centres	Block numbers of countries/ Indicateurs régionaux des pays
FRANKFURT	01, 02, 03, 04, 06, 07, 08, 10 (Partly/en partie), 16, 17, 40 (Partly/en partie), 60, 61, 62, 63, 64, 65.
MOSCOW	10 (Partly/en partie), 11, 12, 13, 15, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38.
NEW YORK	70, 72, 74, 76, 78, 80, 81, 82, 91 (Partly/en partie).
NEW DELHI	40 (Partly/en partie), 41, 42, 43, 48 (Partly/en partie).
TOKYO	45, 46, 47, 48 (Partly/en partie), 91 (Partly/en partie), 96, 97, 98.

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25: 123, 173, 248, 399, 400, 551, 563, 594, 621, 677, 703, 821, 913, 954, 956

26: 038, 063, 258, 298, 422, 629, 702, 781, 850

27: 037, 196, 553, 595, 612, 703, 947

28: 225, 275, 440, 493, 661, 679, 698, 722, 900, 952

29: 231, 263, 282, 574, 612, 634, 698, 838, 865

30: 054, 230, 309, 372, 393, 433, 521, 554, 636, 673, 692, 710, 758, 802, 879, 935, 949, 965

31: 004, 088, 137, 168, 300, 329, 369, 416, 510, 532, 707, 735, 829, 873, 909, 960

32: 061, 098, 150, 165, 195, 217, 411, 509, 540, 564, 611, 618

33: 008, 041, 345, 393, 658, 791, 815, 837, 910, 946

34: 009, 172, 300, 391, 500, 560, 731, 747, 824, 866, 880

35: 078, 108, 121, 133, 229, 358, 394, 416, 663, 700, 746, 796, 925

36: 003, 177, 428, 498, 729, 870, 982

37: 018, 054, 235, 260, 549, 575, 789, 985

38: 001, 062, 178, 232, 262, 341, 388, 392, 457, 507, 613, 656, 687, 696, 750, 836, 880, 895, 927, 954, 974

40: 007, 025, 045, 100, 180, 199, 356, 357, 362, 372, 373, 395, 427, 449, 460, 477, 564, 575, 586, 588, 597, 608, 642, 648, 676, 718, 736, 754, 772, 800, 808, 819, 823, 842, 853, 886, 948, 980

41: 530, 598, 620, 640, 661, 675, 712, 715, 756, 765, 768, 780, 858, 917, 941

42: 103, 111, 165, 182, 189, 314, 339, 348, 361, 379, 398, 410, 475, 543, 559, 591, 623, 635, 647, 704, 754, 779, 809, 840, 867, 875, 886, 909, 971, 977

43: 003, 014, 041, 063, 128, 149, 185, 193, 201, 237, 279, 283, 296, 314, 329, 333, 344, 351, 369, 371, 395, 400, 418, 466, 497

45: 005

46: 692, 752

47: 008, 058, 110, 115, 159, 165, 184, 401, 412, 420, 582, 600, 604, 662, 678, 744, 750, 778, 816, 827, 898, 909, 918, 927, 936, 945, 963

48: 008, 035, 042, 057, 060, 062, 078, 080, 094, 096, 108, 110, 112, 327, 378, 381, 400, 407, 431, 455, 475, 480, 564, 568, 601, 615, 620, 647, 657, 665, 694, 820, 827, 848, 855, 860, 877, 900, 918, 930, 940, 948, 966, 972, 985

60: 015, 030, 069, 096, 115, 150, 155, 230, 250, 360, 390, 490, 525, 545, 570, 580, 590, 600, 606, 608, 625, 640, 655, 670, 675, 680, 715, 765, 780, 785

61: 017, 024, 049, 052, 075, 090, 096, 202, 219, 223, 226, 240, 250, 257, 265, 272, 290, 297, 401, 403, 415, 421, 442, 450, 461, 499, 600, 630, 641, 687, 695, 809, 816, 829, 832, 856, 866, 886, 891, 931, 934

62: 002, 016, 019, 053, 063, 131, 161, 271, 306, 333, 366, 393, 405, 414, 417, 420, 432, 462, 600, 640, 641, 660, 680, 721, 730, 760, 770, 771, 772, 840, 880, 941

63: 021, 043, 126, 170, 205, 225, 230, 240, 250, 260, 331, 450, 471, 533, 612, 630, 705

64: 005, 014, 015, 034, 040, 062, 074, 077, 458, 459, 460, 500, 510, 552, 556, 600, 610, 650, 654, 655, 656, 658, 659, 660, 661, 700, 701, 705, 706, 709, 750, 751, 753, 754, 756, 758, 870, 893, 900, 910, 931, 950

65: 001, 046, 073, 082, 101, 123, 134, 167, 201, 229, 243, 250, 271, 306, 333, 387, 408, 411, 422, 429, 432, 443, 449, 457, 503, 510, 539, 548, 555, 578, 592

70: 026, 086, 121, 133, 162, 200, 218, 219, 222, 231, 235, 261, 273, 291, 308, 316, 326, 350, 361, 381, 388, 409, 454, 485

72: 201, 202, 208, 211, 219, 232, 234, 240, 248, 250, 251, 253, 259, 265, 266, 270, 274, 278, 280, 290, 304, 308, 317, 326, 327, 334, 344, 353, 363, 365, 374, 386, 389, 394, 405, 411, 413, 428, 434, 440, 446, 451, 464, 469, 476, 486, 488, 494, 503, 506, 518, 520, 528, 532, 534, 537, 553, 562, 572, 576, 578, 583, 594, 597, 600, 601, 606, 625, 645, 654, 658, 662, 677, 681, 688, 698, 707, 712, 726, 734, 735, 745, 747, 749, 753, 764, 768, 773, 775, 785, 793, 800, 803, 809, 811, 814, 815, 816, 820, 821, 826, 828, 831, 836,

72: (Continued)
840, 848, 852, 860, 863, 867, 869, 870, 877, 879, 888, 891, 892, 895, 896, 898, 900, 902, 903, 904, 905, 906, 907, 908, 909, 912, 913, 914, 915, 916, 917, 918, 920, 923, 924, 925, 926, 932, 934, 937, 938, 940, 945, 946, 949, 936, 953, 964, 965, 968

74: 043, 051, 072, 073, 074, 082, 090, 098, 107

76: 050, 151, 160, 225, 342, 382, 390, 405, 412, 255, 458, 499, 551, 556, 571, 581, 644, 648, 656, 679, 692, 695, 741, 750, 775, 805, 833, 848, 903

78: 016, 063, 076, 095, 107, 119, 310, 321, 325, 353, 367, 384, 397, 439, 457, 486, 501, 526, 584, 663, 701, 714, 741, 762, 793, 806, 897, 926, 954, 956, 970, 988

80: 001, 014, 022, 062, 110, 143, 233, 252, 308, 336, 361, 401, 402, 405, 409, 410, 411, 413, 414

81: 002, 006, 202, 225, 405

82: 024, 029

91: 030, 066, 115, 131, 155, 165, 182, 190, 218, 232, 245, 250, 275, 285, 317, 334, 348, 356, 366, 376, 385, 408, 413, 464, 601, 610

96: 001, 035, 073, 145, 413, 441, 465, 491, 509

97: 008, 014, 404, 450

98: 135, 223, 232, 327, 428, 439, 536, 538, 550, 618, 645, 748, 754, 836

(1) Ocean stations ships A, B, C, D, E, I, J, K, M, N, P, V, T

(2) Arctic floating stations

(3) Ships

The following stations are additional to those listed above and represent a requirement of the United States of America. This selection will be given further study and if found necessary an amended list will be furnished to the Secretariat for distribution to Members.

01: 030, 111, 152, 203, 241, 306, 384, 452

02: 108, 283, 897, 958, 963

03: 015, 100, 171, 496, 653, 715, 774, 960

04: 063, 390

06: 610, 700, 762

07: 130, 169, 190, 335, 444, 601, 630, 660, 645

08: 141, 181, 261, 543, 562, 568, 575, 538

10: 035, 202, 320, 610, 658, 738

11: 010, 735, 847

12: 115, 295

13: 286, 351, 462, 483

15: 150, 310, 480, 642, 725

16: 190, 310, 350, 470, 530, 642, 684, 749

17: 024, 030, 090, 096, 112, 124, 196, 240, 280

20: 871, 982

22: 383, 887

23: 002, 867

24: 197, 705

25: 206, 379

26: 544

27: 271

28: 916

29: 209, 247, 939

30: 157, 719

31: 026

32: 227, 389

33: 213

34: 924

35: 635, 683

36: 096

37: 189, 597

38: 198, 989

40: 001, 045, 471, 621, 672, 688, 709, 745, 763, 781, 790, 811, 843

41: 515, 661, 746

42: 071, 123, 131, 260, 369, 435, 451, 498, 571, 667, 675

43: 049, 117, 157, 245, 321, 424, 473

46: 747

47: 055, 105, 113, 132, 156, 417, 430, 585, 637, 646, 807, 891, 931

48: 018, 104, 300, 331, 354, 450, 462, 500, 566, 655, 674, 838, 870, 907, 985, 995

60: 119, 125, 178, 190, 265, 275, 280, 340, 425, 550, 555, 560, 565, 635, 650, 660, 685, 735, 745, 750, 775, 798

61: 230, 701

62: 007, 011, 056, 318, 387, 751, 336

64: 860

65: 019, 145, 215, 257, 264, 344, 501

80: 028, 078, 223, 406, 408

91: 337, 483, 487, 490

96: 449, 471

97: 028

98: 133, 233, 336, 433, 444, 524, 548, 613, 630, 653, 741, 830

A P P E N D I X III

Provisional list of upper-air stations for the construction of northern hemisphere synoptic charts

01: 001, 005, 020, 028, 030, 152, 241, 384, 415

02: 062, 077, 084, 836, 963

03: 005, 026, 322, 774, 808, 917, 953

04: 018, 202, 220, 270, 310, 320, 340, 360

06: 011, 230, 610

07: 119, 145, 510, 645, 761

08: 001, 221, 302, 495, 509, 521, 536, 594

10: 035, 384, 739, 866

11: 035, 518

12: 374, 425

13: 276, 334

15: 120, 420, 614

16: 044, 090, 239, 320, 420, 560, 596, 622, 716

17: 030, 062, 130, 220, 240, 280, 606

20: 047, 069, 274, 292, 353, 674, 744, 891

21: 358, 432, 504, 647, 824, 965, 982

22: 113, 165, 522, 550, 820

23: 074, 146, 205, 330, 418, 472, 552, 804, 884, 921, 933, 955

24: 125, 266, 343, 507, 641, 688, 817, 944, 959

25: 123, 173, 399, 551, 563, 594, 677, 703, 954

26: 063, 258, 422, 702, 850

27: 037, 196, 553, 595, 612, 947

28: 275, 440, 698, 722, 900, 952

29: 231, 282, 574, 634, 698

30: 230, 554, 692, 710, 758, 935

31: 004, 088, 168, 329, 510, 735, 960

32: 061, 150, 195, 540, 618

33: 345, 393, 837, 946

34: 009, 139, 300, 560, 731, 866

35: 229, 394, 700, 746, 796

36: 177, 870

37: 018, 054, 260, 549, 789, 985

38: 062, 392, 457, 507, 687, 880, 954

40: 007, 100, 181, 427, 597, 648, 754

41: 530, 640, 660, 756, 780, 917, 941

42: 071, 182, 339, 410, 475, 809, 867, 909

43: 003, 063, 149, 279, 333, 371, 466

45: 004

46: 692, 752

47: 401, 412, 420, 582, 600, 646, 678, 744, 778, 808, 827, 909, 931, 110, 184, 963

48: 097, 327, 455, 568, 694, 820, 900

60: 015, 119, 250, 390, 570, 580, 625, 680, 715

61: 052, 290, 401, 642, 832, 931

62: 011, 053, 306, 366, 414, 432, 721

63: 705

64: 005, 650, 700, 870, 910

65: 046, 201, 578

70: 026, 086, 133, 200, 219, 231, 261, 273, 291, 308, 316, 326, 350, 398, 409, 454

72: 201, 202, 208, 211, 221, 226, 232, 235, 240, 248, 250, 251, 259, 261, 265, 270, 274, 278, 286, 290, 304, 308, 311, 317, 327, 340, 352, 353, 365, 386, 394, 405, 436, 445, 451, 454, 469, 476, 486, 493, 506, 518, 520, 528, 532, 553, 562, 576, 583, 597, 600, 606, 645, 655, 662, 681, 698, 712, 722, 734, 747, 764, 768, 775, 785, 798, 801, 811, 815, 816, 826, 836, 848, 867, 879, 896, 906, 907, 909, 913, 915, 917, 918, 924, 926, 934, 938, 945, 964, 968

74: 043, 051, 072, 074, 082, 090, 109, 498, 570, 785

76: 458, 644, 679, 692

78: 016, 063, 076, 118, 325, 355, 367, 383, 397, 467, 501, 526, 663, 806, 866, 897, 967, 988

80: 001, 027, 062, 224, 252, 401, 402, 411

81: 405

91: 066, 115, 131, 165, 218, 245, 250, 275, 285, 334, 348, 366, 376, 408, 413

96: 035

97: 014

98: 327, 645, 836

(1) Ocean stations ships A, B, C, D, E, I, J, K, M, N, P, V, T

(2) Arctic floating stations

(3) Ships

The following stations are additional to those listed above and represent a requirement of the United States of America. This selection will be given further study and if found necessary an amended list will be furnished to the Secretariat for distribution to the Members.

01: 052

02: 836

03: 171, 496, 743

06: 180, 260, 447

07: 110, 170, 180, 480

10: 202, 338, 393, 512, 610, 739

11: 934

12: 843

13: 130

16: 080, 100, 747

17: 219, 300

21: 865

23: 022

24: 759, 793, 908, 923

25: 379, 822, 913, 956

26: 298, 629, 781

27: 962

28: 825

29: 642

30: 054, 521, 636, 673, 719

31: 300, 369, 561, 707, 909

32: 099, 165, 217, 389

33: 562, 658, 815

34: 172, 880

35: 108, 121

36: 096

37: 189

38: 061, 231, 750, 836, 989

40: 745, 886

41: 940

45: 005

46: 697, 747

47: 058, 103, 113, 132, 807

48: 819

80: 028

91: 217, 490

98: 014

(1) Moving ships

(2) Dropsondes and reconnaissance reports

(3) Selected and edited aircraft reports over oceanic regions

UPPER AIR (SUPPLEMENTARY)

(These reports are desirable but since they would represent a sizeable increase in the traffic load, they are presented here only as a possible addition at some later date when transmissions can be accomplished in MESRAN form)

03: 957, 976

04: 250

07: 222, 435, 630

08: 027, 055, 280, 433, 488, 545

13: 483

16: 150, 190, 300, 400, 370, 651, 749, 754

17: 196, 244, 350

20: 274

21: 715

22: 235, 471, 602, 762, 820

23: 631, 724

24: 143, 383, 629, 763, 843

25: 400, 428

28: 225, 493, 661, 879

29: 612, 864

30: 309, 372, 433, 965

31: 026, 137, 174, 443

32: 010, 331, 408

33: 791

34: 445, 579, 601

35: 361, 406, 542, 663, 925

36: 003, 061, 403, 622, 778

37: 235

38: 001, 082, 413, 613

40: 449, 564, 575, 586, 608, 742, 672, 676, 689, 772, 819, 823, 948, 980

41: 515, 598, 620, 675, 715, 718, 768, 858

42: 165, 189, 348, 361, 379, 398, 543, 591, 635, 667, 675, 875, 886, 971

43: 014, 041, 063, 128, 181, 193, 201, 237, 283, 295, 344, 351, 369, 395, 413, 418, 497

47: 655, 898

48: 042, 062, 080, 094, 108, 110, 354, 378, 431, 480, 551, 602, 615, 657, 660, 855, 860, 870, 879, 907, 948, 991

60: 030, 096, 490, 525, 545, 745, 775

61: 017, 024, 075, 090, 202, 214, 219, 226, 257, 265, 272, 403, 415, 421, 442, 687, 695, 809, 829, 856, 891

62: 019, 063, 131, 161, 271, 405, 600, 641, 771, 840, 941

63: 021, 630

64: 014, 040, 072, 500, 522, 600, 601, 610, 654, 656, 750, 753, 756, 893, 950

65: 082, 123, 250, 271, 306, 333, 408, 422, 443, 503, 510, 555, 592

81: 002, 225

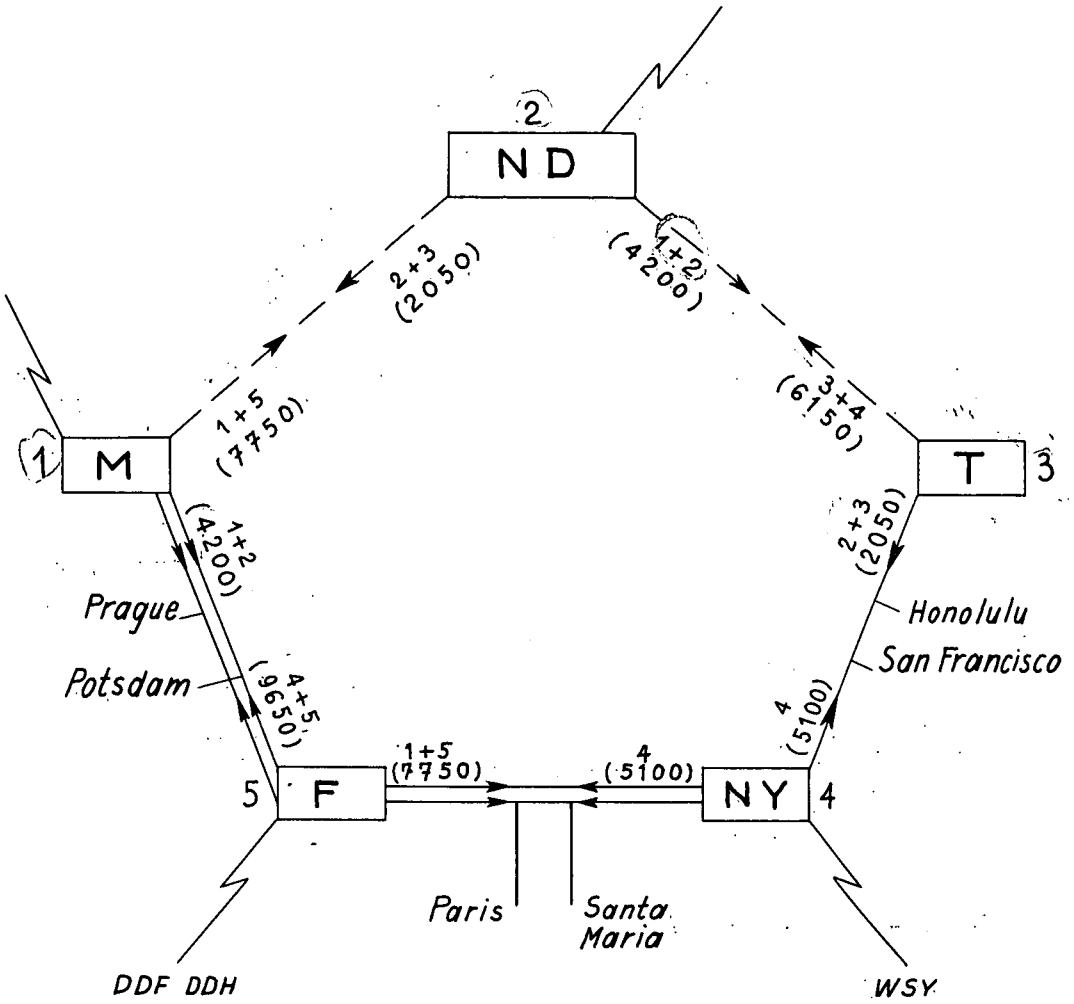
91: 337, 348

96: 001, 073, 109, 145, 413, 465, 491, 509, 583

97: 014, 404, 450

98: 135, 223, 328, 444, 553, 630, 754

A P P E N D I X IV


2
ND
2+3
(2050)
1+2
(4200)
1
M
1+5
(7750)
3+4
(6150)
T
3
1+2
(4200)
2+3
(2050)
Prague
Potsdam
Honolulu
San Francisco
4+5
(9650)
4
(5100)
1+5
(7750)
4
(5100)
5
F
NY
4
Paris
Santa
Maria
DDF DDH
WSY

Rec. 39 (CSM-II) - ASSISTANCE FOR THE ESTABLISHMENT OF NORTHERN HEMISPHERE EXCHANGE SYSTEM

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING,

(1) The great importance of speedy establishment of centres for the exchange of surface and upper-air information for the construction of meteorological charts covering the whole of the northern hemisphere;

(2) That the speedy establishment of such centres at New Delhi and Tokyo, in addition to the centres at New York, Frankfurt and Moscow are urgently necessary in order to facilitate the exchange of the meteorological data required for the construction of hemispheric charts;

(3) That technical assistance would allow for the earlier implementation of the plan as set out in Recommendation 38 (CSM-II) in cases where assistance is required;

RECOMMENDS,

(1) That urgent action be initiated by India and Japan for the establishment of these centres in their respective countries as speedily as possible;

(2) That the Executive Committee take all possible action concerning the provision of assistance for the purpose through the United Nations Technical Assistance Administration or otherwise if such assistance becomes necessary.

Rec. 40 (CSM-II) - INTER-REGIONAL EXCHANGE OF SURFACE SYNOPTIC REPORTS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) The importance of Regional and inter-Regional exchange of surface synoptic reports for the construction of extensive charts needed for forecasts beyond a period of 24 hours;

(2) The unavoidable delay, if editing is done before retransmission of collectives;

(3) The necessity of making maximum use of the existing communication channels;

RECOMMENDS that Regional and inter-Regional agreements decide whether surface synoptic reports exchanged Regionally or inter-Regionally be left unchanged or be reduced to the mandatory groups by editing.

Rec. 41 (CSM-II) - SUMMARIES OF UPPER-AIR REPORTS IN METEOROLOGICAL BROADCASTS BY RADIO

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING that bulletins containing summaries of upper-air reports make for the easier and more expeditious handling of upper-air data originating from large areas;

RECOMMENDS,

(1) That, where necessary, all Regions include in their continental broadcasts at fixed times summaries of upper-air reports;

(2) That if no continental broadcast operates in a Region, such summaries, where necessary, be included at fixed times in all the subcontinental broadcasts in the Region intended for inter-Regional exchange.

Rec. 42 (CSM-II) - TRANSIT TIMES FOR THE TRANSMISSION OF METEOROLOGICAL MESSAGES FOR SYNOPTIC PURPOSES TO BROADCASTING CENTRES OVER PRIMARY CIRCUITS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING Resolution 13 (II-RA I) and Resolution 16 (57-RA V);

CONSIDERING,

(a) That in some cases the transit times of meteorological messages from the stations of origin to the designated communication centre are intolerably long;

(b) That effective action is urgently required to reduce such long transit times;

(c) That, although no transit times are specified for meteorological messages over public correspondence and aeronautical channels, relatively high priorities are afforded to meteorological messages over both these channels and that it appears unreasonable to expect any higher priorities over these channels;

(d) That if maximum transit times are specified, it would be of assistance in planning telecommunication facilities;

RECOMMENDS,

(1) That meteorological messages for synoptic purposes should normally have a transit time of not more than 10 minutes from the time of filing at the observing station to the time of delivery at the designated meteorological communication centre;

(2) That in no case should such transit time exceed 30 minutes;

(3) That in cases where the transit times mentioned in (1) and (2) above cannot be achieved as a regular measure by existing means of telecommunications, especially public correspondence or aeronautical channels, Members concerned should investigate the possibility of utilizing other means of telecommunications by which the required transit times can be achieved.

Rec. 43 (CSM-II) - STANDARDIZATION OF ADDRESSES FOR SHIP WEATHER MESSAGES

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING Recommendation 23 (CMM-II);

CONSIDERING,

(1) That radio operators on ships experience difficulty in sending ship weather reports to the various collection centres when there are various words or phrases in the address;

(2) That the word or words after the first word in the address need not necessarily be restricted to the name of the meteorological collection centres;

RECOMMENDS,

(1) That the first word of the address for meteorological messages originating from ships be OBS;

(2) That the subsequent word(s) of the address be decided upon by Members as a national matter.

Rec. 44 (CSM-II) - NOTIFICATION OF IMPENDING CHANGES IN ROUTINE METEOROLOGICAL TRANSMISSIONS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING Resolution 26 (EC-VIII) and in particular its reference to Resolution 30 (IMC Salzburg, 1937);

RECOMMENDS that the following new paragraph be inserted in Technical Regulations, chapter 6, between paragraphs 6.1.1.9 and 6.1.1.10, the latter being renumbered 6.1.1.11 and the new paragraph being numbered 6.1.1.10 :

6.1.1.10

In addition to the information supplied to the Secretariat under 6.1.1.8, notification of impending changes in frequencies or in time schedules of any routine meteorological radio transmissions should be included in at least three of these transmissions shortly before the changes are implemented.

Rec. 45 (CSM-II) - EXCHANGE OF INFORMATION OTHER THAN THAT NORMALLY INCLUDED IN METEOROLOGICAL TELECOMMUNICATIONS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING,

(a) Resolution 56 (CD Warsaw, 1935); and

(b) Resolution 26 (EC-VIII);

RECOMMENDS that the use of the international telecommunication systems intended for the exchange of basic meteorological data, for the transmission of types of meteorological information and associated traffic other than that normally exchanged be allowed subject to the following conditions being fulfilled :

(a) The inclusion of the additional information does not involve the omission or delay of any reports which are normally transmitted and does not involve interference with the timetable of routine issues;

(b) The nature of the information is clearly identified in the heading; and

(c) Except in the case of emergency or bilateral agreements, prior approval is obtained from the regional association concerned or, in the case of continental broadcasts, the Commission for Synoptic Meteorology.

Rec. 46 (CSM-II) - SPECIFICATIONS FOR RADIO-TELEPRINTER EQUIPMENT

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(a) That the International Radio Consultative Committee (CCIR) has not yet recommended the standardization of the relative position of the marking frequency and the spacing frequency, but has indicated preferred values for the frequency shift (cf. CCIR, Plenary Assembly VIII, Recommendation No. 150 and question No. 20);

(b) That the International Civil Aviation Organization has recommended :

(i) that the difference between the frequencies associated with the marking and spacing elements should be 850 c/s and should be maintained within plus or minus 25 c/s of that value;

(ii) that the radio frequency associated with the marking element should be higher than that associated with the spacing element (cf. ICAO, Annex 10,point I, paragraphs 4.2.1.2.1 and 4.2.1.2.2);

(c) That the International Telegraph Consultative Committee (CCIT) has recommended that the standard modulation rate of start-stop apparatus used in international service should be 50 bauds (cf. CCIT, Plenary Assembly VIII, Recommendation C.4);

(d) That the International Civil Aviation Organization has recommended that, in so far as it is practicable, the modulation rate should be 50 bauds (cf. ICAO, Annex 10,point I, paragraph 4.2.2.2);

(e) That both the International Telegraph Consultative Committee (CCIT) and the International Civil Aviation Organization have recommended that the nominal duration of the transmitting cycle of start-stop apparatus used in international service should be at least 7.4 units (preferably 7.5), the stop element lasting for at least 1.4 units (preferably 1.5)(cf. CCIT, Plenary Assembly VIII, Recommendation C.4, and ICAO, Annex 10,point I, paragraph 4.2.2.3);

(f) That both the International Telecommunication Union and the International Civil Aviation Organization have recommended that in the

international service the International Telegraph Alphabet No. 2 should be used (cf. ITU, Telegraph Regulations, paragraph 231, and ICAO, Annex 10, point I, paragraph 4.2.2.1);

(g) That both the International Telegraph Consultative Committee and the International Civil Aviation Organization have recommended that the number of characters which the textual line of page printing apparatus may contain should be fixed at 69 (cf. CCIT, Plenary Assembly VIII, Recommendation C.6, and ICAO, Annex 10, point I, paragraph 4.2.2.5);

(h) That increasing use is being made of radio-teleprinter broadcast and point-to-point circuits for the international exchange of meteorological data;

CONSIDERING that in order to permit and facilitate the efficient and economical exchange of meteorological data by radio-teleprinter on a world-wide basis, it is desirable to standardize, in so far as may be possible, the characteristics of the equipment used;

RECOMMENDS,

(1) That the specifications given in the annex to this recommendation be taken as guidance for the equipment to be used for the international exchange of meteorological data by radio-teleprinter facilities utilizing frequency shift modulation;

(2) That where it is not possible to adhere to these specifications :

(i) Characteristics be agreed bilaterally or multi-laterally between the services concerned;

(ii) Detailed characteristics be published in appropriate publications or documents for the information of all concerned.

A N N E X

SPECIFICATIONS FOR RADIO-TELEPRINTER EQUIPMENT

1. Pending a definite recommendation by the International Radio Consultative Committee, the difference between the frequencies associated with the marking and spacing elements should be 800 c/s. The value of the frequency shift should be maintained within 3 per cent of its nominal value, i.e. 400 c/s $\pm$ 3 per cent.

Notes :

(a) This conforms to the International Radio Consultative Committee preferred value of 400 c/s for the frequency shift associated with systems operating between 3 mc/s and 30 mc/s and working on only two conditions (cf. CCIR, Plenary Assembly VIII, Recommendation No. 150);

(b) This is also in line with the suggestion that the difference between the black and white frequencies for facsimile systems employing a similar type of modulation should be 800 c/s.

2. Pending a definite recommendation by the International Radio Consultative Committee, the radio frequency associated with the marking element should be higher than that associated with the spacing element.

Notes :

(a) This specification conforms to the present standard adopted by the International Civil Aviation Organization;

(b) The definitions of "marking" and "spacing" are those contained in the International Telegraph Consultative Committee List of Essential Telecommunication Terms (Yellow Book) - i.e. the "marking" signal corresponds to the "stop" element.

3. The standard modulation rate should be 50 bauds.

4. The nominal duration of the transmitting cycle should be at least 7.4 units (preferably 7.5) the stop element lasting for at least 1.4 units (preferably 1.5).

5. The International Telegraph Alphabet No. 2 should be used.

6. The maximum number of characters which the textual line of page printing apparatus may contain should be fixed at 69.

Rec. 47 (CSM-II) - STANDARDIZATION OF TELECOMMUNICATION PROCEDURES USED FOR METEOROLOGICAL BROADCASTS BY RADIO-TELEPRINTER

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING that the use of meteorological radio-teleprinter broadcasts is rapidly developing;

CONSIDERING that standardization of procedures for radio-teleprinter broadcasts will lead to increased efficiency;

RECOMMENDS that the procedures set out in the annex be included in Chapter I, Volume C, WMO publication No. 9.TP.4.

A N N E X

TELECOMMUNICATION PROCEDURES USED FOR METEOROLOGICAL BROADCASTS BY RADIO-TELEPRINTER

Identification

A radio-teleprinter broadcast will be preceded by the transmission of call signals.

Form of call signals

The call signals will comprise : the general call to all stations (transmitted three times), the conventional signal DE, the identification of the broadcasting station consisting of the radio call sign followed by the frequency reference index or indices (transmitted three times) and the letters RY repeated without separation for one line.

Example :

CQ CQ CQ DE WSY21/22 WSY21/22 WSY21/22
RYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRY

Transmission of call signals

Call signals will be transmitted :

1. Before broadcasts due to begin at a fixed time for at least the two minutes which precede the official time of starting;
2. Each time that the station has no traffic during assigned broadcast periods;
3. During the five minutes preceding the first broadcast following a change of frequency on the frequency in which the broadcast will take place.

Rec. 48 (CSM-II) - PROCEDURES FOR RADIO-TELEPRINTER RELAY CENTRES

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(a) That certain relay-centres in radio-teleprinter exchanges edit the bulletins they receive from feeder circuits, cutting out garbled portions;

(b) That this practice results in the loss of much useful data;

RECOMMENDS,

(1) That in radio-teleprinter exchanges where a communication centre is responsible for the relay of the bulletins originated by another centre, the abbreviated heading must not be altered whether the bulletin is re-transmitted complete or incomplete;

(2) That where a bulletin is received with some groups of individual reports garbled, the relay centre retransmit the bulletin as received and if possible obtain a retransmission from the originating centre;

(3)(a) That national instructions cover the case of the measures to be taken when complete garbling occurs in order to ensure that all usable data are relayed with a minimum delay, with the elimination, where possible, of completely garbled portions;

(b) That whenever the elimination mentioned above is performed, the abbreviation INC be added at the end, to indicate that the bulletin is incomplete;

(c) That the relay centre take all necessary steps to receive from the originating centre those parts of the bulletin which were garbled, and transmit them as soon as possible.

Rec. 49 (CSM-II) - CHARACTER FOR INDICATING MISSING FIGURES IN METEOROLOGICAL REPORTS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Recommendation 28 (CSM-I);

(2) That the sixth session of the International Civil Aviation Organization, Communications Division, made no change to annex 10, part III, paragraph 3.8.2 which limits acceptance of characters for transmission over AFTN circuits to the 26 letters and 10 figures and in addition the signs / and . (decimal point or full stop);

(3) That the VIIIth Plenary Assembly of the International Telegraph Consultative Committee cancelled question No. 40 as the World Meteorological Organization withdrew it;

CONSIDERING that it is desirable to find a character for indicating missing figures in meteorological messages which is acceptable to the World Meteorological Organization, the International Telecommunication Union and the International Civil Aviation Organization;

RECOMMENDS,

(1) That the Secretary-General should, in consultation with the International Telecommunication Union and the International Civil Aviation Organization, arrange for a further study of all problems related to the choice of a digit for indicating missing figures in meteorological reports or messages with the aim of reaching general agreement on the use of a digit suitable for that purpose and acceptable to all three organizations;

(2) That, in view of the fact that on some exclusive meteorological circuits the plus sign is already used to denote missing figures, its use may be continued pending the outcome of the joint WMO-ITU-ICAO study.

N O T E :

The following points are to be kept in mind in the interest of the World Meteorological Organization :

(1) The selected digit should be distinctive and not easily confused with any other character;

(2) The digit should preferably be one which is equally acceptable on all types of transmission - e.g. morse and teleprinter systems;

(3) The digit should employ the minimum of key-board operations.

Rec. 50 (CSM-II) - GUIDANCE CONCERNING COMPATIBILITY OF FACSIMILE EQUIPMENT

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Recommendation 39 (CSM-I);

(2) Resolution 28 (EC-IV); and

(3) Resolution 21 (II-RA VI);

CONSIDERING,

(1) That facsimile apparatus specially designed for meteorological purposes is currently being produced by manufacturers in a number of countries;

(2) That land-line facsimile networks and radio facsimile broadcasts are currently being operated by a number of Members throughout the world;

(3) That an increased use of facsimile transmission for meteorological purposes is desirable;

(4) That, in order to achieve compatibility of facsimile apparatus used for meteorological purposes, it is desirable to offer some guidance material for the benefit of Members who wish to set up facsimile networks;

(5) That questions relating to specifications recommended for facsimile apparatus and transmission systems used for meteorological purposes are currently being studied in conjunction with the World Meteorological Organization by both the International Telegraph and Telephone Consultative Committee (CCITT) and the International Radio Consultative Committee (CCIR);

RECOMMENDS,

(1) That the characteristics and comments in the annex to this recommendation be considered as guidance for setting up of facsimile networks;

(2) That the World Meteorological Organization in conjunction with the appropriate bodies of the International Telecommunication Union should continue the study of characteristics with a view to formulating recommendations on them at the earliest possible date.

A N N E X

SPECIFICATIONS OF FACSIMILE APPARATUS FOR THE TRANSMISSION OF METEOROLOGICAL CHARTS

EXPLANATORY NOTE

This annex contains the proposals made by Regional Association VI in Resolution 21 (II-RA VI), and the comments and remarks which have been made by the CCIT and CSM. The present position reached with regard to the standardization of facsimile equipment and transmission systems used for meteorological purposes is thus summarized in this one document.

INTRODUCTION

The requirements laid down in this annex are for facsimile apparatus which will :

(a) Transmit meteorological charts up to an approximate maximum size of 45 x 55 cm (18 x 22 inches);

(b) Transmit a chart of this maximum size in less than forty minutes at the lowest transmission speed;

(c) Produce the received copy without any subsequent processing;

(d) Operate over radio circuits or standard telephone circuits;

(e) Be capable of operation by unskilled personnel and, as far as possible, be automatic in operation.

CCIT comments

Paragraph (a)

The CCIT took note of the fact that the dimensions 45 x 55 cm related to an approximate maximum size and that there is in use a large number of machines capable of handling documents of a maximum size of 45 x 30.5 cm only.

Paragraphs (b) and (c)

No comment.

Paragraph (d)

The standard telephone circuits referred to were regarded as those prescribed by the CCIF, but it was understood that transmissions would also be made over various types of radio circuits. In this connexion it is relevant to note that long distance radio telephone circuits operating at frequencies below 30 mc/s may not necessarily transmit audio frequencies above 2600 c/s (see CCIR, Rec. No. 40 of London).

Paragraph (e)

No comment.

Remarks by CSM

No comment.

SPECIFICATIONS

1. INDEX OF CO-OPERATION (Module de coopération)

Primary 576
Supplementary 288

Note : It is considered that an index of 288, as given by a drum diameter of 152 mm (6 inches) and a scanning density of 1.89 lines per mm (48 lines per inch), is satisfactory for the transmission of charts made up wholly of contour lines.

CCIT comments

Primary 576

The CCIT recommends that this index of co-operation be adopted as the normal value for the facsimile transmission of meteorological charts.

Supplementary 288

Where direct recording is employed it is not practicable, on account of the difficulty of changing the writing elements (viz. writing edge, stylus or scribing wheel), to provide an alternative index of 288 on a recorder designed to operate with an index of 576. It is however possible to double the line advance of the paper (or recording head) in order to co-operate with a transmitter having an index of 288. In this case each recorded line will be separated from its neighbours by a gap approximately equal to its own width.

In the case of a transmitter, the adjustment of both scanning pitch and scanning aperture necessary to provide the alternative index presents no serious difficulties and such a change permits the drum speed to be doubled with no significant increase in the nominal modulating frequency. If the aperture is not increased in size and the transmitter is merely adjusted to scan alternate lines, then the apparatus cannot be considered as having a true index of 288 since the nominal modulating frequencies correspond to the primary index of 576.

In the latter case, the transmission time as compared with an index of 576 for the same drum speed is halved but the nominal modulating frequency is the same for both.

The CCIT sees no objection to the use of the lower definition. Nevertheless, it considers it incorrect to associate an index of 288 with apparatus designed for an index of 576 but adjusted to scan alternate lines. The CCIT is not competent to state whether the lower definition is satisfactory for the purpose envisaged (i.e. the transmission of line charts); this is a matter for the meteorological services to decide.

Remarks by CSM

In view of the remark made by the CCIT it would be better to standardize the Index of Co-operation as follows :

Primary 576
Supplementary 576 with alternate line scanning.

The CCIT comment that an increase in the scanning aperture when alternate line scanning is used permits the drum speed to be doubled without significantly increasing the nominal modulating frequency is noted with interest.

2. DRUM SPEED (Vitesse de rotation du cylindre)

Primary 60, 120 rpm
Supplementary 90 rpm

CCIT comments

The CCIT recommends the adoption of 60 rpm as the normal standard. Whereas with an index of 576 in association with a drum speed of 60 rpm satisfactory reception can be expected on normal metallic circuits, the quality of the recording may be impaired at higher drum speeds depending upon the composition of the circuit and the presentation of the original document : the extent to which such degradation can be tolerated is a matter for the user to decide from the content of the document.

Remarks by CSM

(a) It is noted that the majority of equipments in current production do provide for operation at all three drum speeds, viz. 60, 90 and 120 rpm;

(b) So far as automatic speed control is concerned (see paragraph 10), it is noted that it is much more difficult to provide for the automatic selection of one of three different drum speeds than it is in the case where there are only two possibilities;

(c) It is noted that a simple relationship between drum speeds (i.e. 60/120) permits the speed change to be made electrically without recourse to the use of a mechanical gear box.

3. DRUM DIAMETER

It is desired that the drum diameter should be between 130 mm and 160 mm. The values currently employed are 132 mm and 152 mm.

CCIT comments

Provided that the standardized indices are adhered to, it is not essential to specify a standard drum diameter. The CCIT notes, however, that there is already a very large number of equipments in use having a drum diameter of 152 mm and only a few having other diameters, e.g. 132 mm. Where machines having different drum diameters co-operate, the received copy will be reproduced on a scale which is different from that of the original.

Remarks by CSM

It is understood that HELLFAX machines which formerly had 132 mm drums will be produced in future with 152 mm drums.

4. SCANNING DENSITY (Finesse d'exploration)

It is obtained from the relationship

$$\text{Scanning density} = \frac{\text{index of co-operation}}{\text{drum diameter}}$$

The scanning density should be :

- Approximately 4 lines per mm for the index of co-operation 576 and
- Approximately 2 lines per mm for the index of co-operation 288

CCIT comments

See comments on Index of Co-operation 1. above.

Remarks by CSM

It will be better to replace :

"approximately 2 lines per mm for the index of co-operation 288",

by the following :

"approximately 2 lines per mm where alternate lines scanning is employed".

5. DRUM LENGTH

As an ever-increasing use is being made of continuous roll recorders, it is considered unnecessary to specify a maximum length for the transmitter drum.

The minimum length of the drum must permit transmission of a chart of the size stated in the Introduction.

CCIT comments

See comment on Introduction, paragraph (a) above.

Remarks by CSM

No comment.

6. DIRECTION OF SCAN (Direction d'exploration)

Transmission/reception over a left-hand helix (hélice à gauche).

Note : It is recognized that this is not in accordance with the existing CCIT standard for phototelegraphy but the left hand helix is recommended, because :

(a) There are already a large number of equipments employing a left-hand helix in use for meteorological purposes;

(b) It seems unlikely that there will be much occasion for co-operation between equipment primarily intended for meteorological purposes and those intended for phototelegraphy.

CCIT comments

The CCIT has adopted a new definition for the direction of scanning which, in the case of equipment used in the meteorological service, would be as follows :

'At the transmitting apparatus, the plane (developed in the case of a drum transmitter) of the message surface is scanned along lines from left to right, commencing at the top, so that scanning commences at the top left-hand corner of the surface and finishes at the bottom right-hand corner : this is equivalent to scanning over a left-hand helix on a drum. The orientation of the message on the scanning plane will depend upon its dimensions and is of no consequence.

At the receiving apparatus, scanning takes place from left to right and top to bottom (in the above sense).'

Remarks by CSM

CCIT definition is acceptable.

7. GRIPPING LOSS (Secteur mort)

A maximum of 5 per cent of the total length of the scanning line (ligne d'exploration), e.g. total circumference of the transmitting drum - should be allowed for securing the original to the drum.

CCIT comments

No comment.

Remarks by CSM

No comment.

8. PHASING (Mise en phase)

8.1 Apparatus should be capable of operation using either phase white or phase black (mise en phase sur blanc ou sur noir).

Note : In view of the fact that in the case of automatic apparatus designed to operate on a single standard, the use of inverse phasing will probably necessitate manual adjustments at the recording terminal; it would be useful therefore, to formulate a single standard for apparatus operating entirely by remote control.

8.2 Length of phasing pulse (Durée de l'impulsion de la mise en phase)

The length (or duration) of the phasing pulse should be not less than 5 per cent of the total transmission time of one scanning line (e.g. 50 milli-seconds at 60 rpm) and should also not exceed this value if the transmission of phasing pulses is continued throughout transmission of picture intelligence.

8.3 Duration of transmission of phasing pulses

Phasing pulses should be transmitted for not less than 30 seconds before the transmission of picture intelligence, regardless of the drum speed employed. Phasing pulses may continue to be sent throughout the period of transmission of picture intelligence provided that the length of the pulse does not exceed 5 per cent of the total time taken to transmit one scanning line.

8.4 Sequential or continuous transmission

If a sequence of charts is sent from automatically coupled transmitters, or if a flat bed (continuous scanning) transmitter is employed, the length of picture transmitted without re-phasing should not exceed a figure more than approximately three times the total length of the scanning line.

CCIT comments

8.1 In view of the increasing use of automatic continuous roll recorders, it is considered that one standard should be adopted. The CCIT suggests that the initial phasing signals should be "white" pulses in

all cases, to ensure the reliable remote control of the receiver and to enable the adjustment of the black recording level before the commencement of transmission of the subject matter. In view of the fact that there is some existing receiving apparatus which requires phasing pulses throughout the transmission of the subject matter, these latter pulses should be "black". It is therefore desirable that receiving equipment should be capable of accepting both "phase-white" and "phase-black" to ensure correct operation during the whole of transmission, and to permit a receiver to be phased correctly to a transmission which has already commenced.

8.2 The CCIT is of the opinion that the length of the phasing pulse should be within the limits 4 per cent $\pm$ 1 per cent of the total time taken to transmit one scanning line.

8.3 No comment.

8.4 No comment.

Remarks by CSM

8.1 "Phase-white" should be adopted as the standard phasing signal to be transmitted prior to the transmission of picture intelligence. The CCIT reference to recorders which require phasing pulses throughout the transmission of picture intelligence is not fully understood. The black pulses sent during the transmission of picture intelligence are in most cases merely the transmissions of the image of the clip securing the subject matter to the transmitter drum, and do not always appear.

8.2 It would only appear to be necessary to specify a minimum length for the phasing pulse, and the minimum of 3 per cent permitted by the CCIT suggestion may be somewhat shorter than the optimum requirements (5 per cent gives a 25 m/sec pulse at 120 rpm whereas 3 per cent gives a pulse of only 15 m/sec). The original suggestion by RA VI that the pulse should be of a duration not less than 5 per cent of the total transmission time for scanning one line may therefore be a more desirable standard.

8.3 It is difficult to envisage the transmission of white phasing pulses throughout the transmission of picture intelligence because meteorological charts are predominantly white in character. Any pulses sent during the transmission of picture intelligence will therefore presumably be black ones and will usually result from a transmission of the clip image - see comment under 8.1. There are good reasons, particularly in the case of recorders employing electrolytic paper, for arranging the transmitter so that the image of the paper retaining clip is not sent during the transmission of picture intelligence.

8.4 No comment.

9. SYNCHRONIZATION

The scanning speeds of apparatus used should be maintained within $\pm$ 5 parts in 10^6 of their nominal values.

Note : This tolerance admits a maximum skew of approximately 1:55 in the case where the transmitter and recorder operate at the maximum permitted deviation in opposite directions.

CCIT comments

The view of the CCIT is that the amount of skew which can be tolerated is a matter for the user to decide. The imposition of a smaller speed tolerance than that quoted ($\pm$ 5 parts in 10^6) would be likely to increase the cost and complexity of the equipment. The CCIT has observed that the maximum skew can be 1:55 for the speed tolerance quoted.

Remarks by CSM

No comment.

10. SIGNALS FOR AUTOMATIC OPERATION

In the case of automatic equipment, standards have to be formulated for the following signals at least :

- for starting
- for phasing
- for stopping.

These signals must be acceptable for both land-line and radio transmissions; in the latter case, they should retain their identifying characteristics when subjected to AM/FM and FM/AM conversion.

CCIT comments

The CCIT took note of the contribution made by France and the United Kingdom (see appendix). It is also noted that a contribution on this subject has been submitted direct to the WMO by the Federal Republic of Germany. It was considered that insufficient is known on this question, which should receive further study in relation to both meteorological apparatus and the wider requirement which includes apparatus for business documents. In this connexion, before formulating standards, it is necessary to determine precisely what functions of the apparatus have to be controlled automatically.

Remarks by CSM

The question of automatic control signals needs further study. It is considered that if the recorder is to be fully automatic it must be capable of carrying out the following operations :

(1) Recognize a starting signal;

(2) Select the correct speed (i.e. 60,90 or 120 rpm);

(3) Where necessary set recording levels;

(4) Phase correctly;

(5) Revert to a stand-by condition at the end of the transmission.

These functions need not necessarily be carried out in the above sequence nor is a separate and different controlling signal necessarily required for each operation.

It is considered that WMO should give further attention to this matter, and should formulate suggested standards for automatic control signals.

11. MODULATION

11.1 Land-line

Primary : Amplitude modulation (AM) - Maximum amplitude of the carrier frequency should correspond to the transmission of picture black.

Supplementary : Sub-carrier frequency modulation (SCFM) - See under 11.2 for frequencies.

11.2 Radio facsimile transmission

Primary : Frequency shift keying (FSK) : $\pm$ 400 c/s.

Note : It is recognized that in the case of L.F. transmissions, a smaller shift or approximately $\pm$ 150 c/s may be used.

Supplementary : Sub-carrier frequency modulation (SCFM)
1500 c/s black
2300 c/s white

CCIT comments

The CCIR at its VIIIth Plenary Assembly issued a Recommendation No. 226 dealing with the modulation characteristics for sub-carrier frequency modulation. It has also set a new question, Number 130, for the study of direct frequency modulation.

Recommendation 226 - Facsimile transmission of meteorological charts over radio circuits (Warsaw, 1956)

The CCIR,

CONSIDERING,

(a) That increasing use is being made of facsimile telegraphy for the transmission of meteorological charts for reception on direct recording apparatus;

(b) That it is desirable to standardize certain characteristics of the radio circuits for this purpose;

UNANIMOUSLY RECOMMENDS that when frequency-modulation of the sub-carrier is employed for the facsimile transmission of meteorological charts over radio circuits, the following characteristics should be used :

- sub-carrier frequency 1900 c/s
- black frequency 1500 c/s
- white frequency 2300 c/s

Note : The normal index of co-operation is 576 associated with a speed of 60 rpm. The same index of co-operation is also used in association with speeds of 90 and 120 rpm. It is to be observed that whereas with the drum speed of 60 rpm satisfactory reception can usually be expected the quality of the recording may be impaired at higher drum speeds, depending upon the composition of the circuit and the presentation of the original document.

Question No. 130 (III) - Transmission of meteorological charts over radio circuits by direct frequency-modulation of the carrier (Warsaw, 1956)

The CCIR,

CONSIDERING,

(a) That meteorological charts are being transmitted extensively over radio circuits by direct frequency-modulation of the carrier;

(b) That for high-frequency (decametric) transmissions a deviation of 800 c/s is widely used, while for low frequency (kilometric) transmissions a deviation of 300 c/s is used;

UNANIMOUSLY DECIDES that the following question should be studied by the Joint Study Group of the CCIT and CCIR in so far as radio transmission problems are concerned :

(1) What frequency deviations should be used in different radio-frequency bands for the transmission of meteorological charts by direct frequency-modulation of the carrier;

(2) Should the higher or the lower limit of the carrier-frequency deviation correspond to documentary black ?

Remarks by CSM

Pending the outcome of the study being undertaken by the CCIR, it is desirable that there should be some interim standardization of meteorological radio facsimile transmissions employing direct frequency-modulation of the radio-carrier (FSK). It is therefore recommended that so far as may be possible the following characteristics should be adopted :

(1) HF : a shift of $\pm$ 400 c/s
(2) LF : a shift of $\pm$ 150 c/s
(3) a negative shift for picture black in each case.

12. PICTURE CARRIER FREQUENCY AND SIGNALS LEVELS

It is recognized that the optimum carrier frequency and signal levels will depend upon the quality of land-line circuits available and also upon particular requirements. It is therefore desirable that apparatus should be so constructed that it can easily be adapted to operate on picture carrier frequencies of the order of 1800 c/s. It is also desirable that recorders for land-line operation should accept signals in the range of + 5 dbm to - 20 dbm.

CCIT comments

The CCIT has no comment to make at this stage on the question of picture carrier frequency.

The CCIT considers that it is desirable and practicable for automatic recorders on metallic circuits to function correctly on receipt of signals corresponding to picture black within a range of 25 dbm, the limits to be capable of adjustment to meet particular requirements.

Remarks by CSM

No comment.

13. CONTRAST RATIO (Contraste)

At least 12 db.

CCIT comments

The CCIT notes that constrast ratios of 12 db and 25 db appear to be in current use ; at this stage no further comment can be offered.

Remarks by CSM

No comment.

14. HALF-TONES (Demi-tons)

It is desirable, but not essential, that a limited number of tones between white and black should be capable of transmission.

CCIT comments

No comment.

Remarks by CSM

No comment.

A P P E N D I X

(Extracts from CCIT documents SG IV/32 and SG IV/34)

UNITED KINGDOM (SG IV/32)

For land-line transmissions it is possible to operate satisfactorily with automatic recorders which start on the receipt of white phasing pulses and which close down when the picture carrier frequency is removed from the line. However, for radio transmissions it is considered that more positive signals are necessary if spurious operation is to be avoided. A preliminary study in the United Kingdom indicates that these stop/start signals :

(a) Must be acceptable for transmission over land-lines;

(b) Must be capable of transmission over radio links and in particular, must not lose their identifying characteristics when subject to AM/FM and FM/AM conversion;

(c) Cannot conveniently be confined to the dead sector period of drum rotation, and therefore should be distinguishable from the facsimile signal.

It is tentatively proposed that the stop/start signals should be formed by substituting for the facsimile information before modulation either one or two tones having frequencies of the order of several hundred c/s.

Note : If positive stop/start signals are employed for radio transmissions it will probably be convenient to employ the same procedure over land-lines.

FRANCE (SG IV/34)

It also appears that, apart from a few exceptions, meteorological services have adopted continuous automatic reception, as in France. This, incidentally, raises the special problem of remote control of definitions and speeds; as far as the French administration is aware, only the French meteorological services have proposed solutions to this problem, it being understood that only two combinations are suggested, i.e. index 288/speed 120 rpm and index 576/speed 60 rpm.

For automatic control of the facsimile receiver the following code is used:

Permanent black : condition of non transmission.

White pulses on a black background : signals for starting, for remote control of the choice of speed/index combination, for phasing, for showing the presence of the facsimile sender (these last signals lasting 5 per cent of the time taken by the transmitting drum to rotate).

The return to permanent black causes the receiver to stop automatically.

For transmission on radio channels, modulation converters ensure direct control of frequency modulation in transmitters which may be of the telegraph type : the automaticity of the receiver does not raise any problem in this respect.

FEDERAL REPUBLIC OF GERMANY

(Revised translation of contribution contained in annex to WMO circular letter - C.L.-MC/No. 203)

Automatic control signals must be devised so that they are equally suitable for land-line and radio operation, and for amplitude and frequency modulation. We suggest that the starting signal should be chosen so that the transmitter can be operated in any way desired during breaks in the service. In particular it must be possible to set up the transmitter on black or white signals for the purpose of tuning, etc. The transmission of a station identification signal must not operate the automatic control mechanism of the recorder.

It is therefore recommended that, prior to the transmission of the phasing signal, which may be transmitted as a black signal interrupted by white pulses (viz. "phase-white"), a selective control signal should be sent. For this selective control signal it is recommended to key the carrier with a low frequency signal of the order of 1/5 to 5 cycles/sec, and to recognize this signal at the receiving end. If this selective control signal is received correctly for several seconds, the recorder is set in operation.

The selective control signal is followed by the phasing signal. During the transmission of picture intelligence, black pulses are sent which can be used for phasing during the transmission. The recorder closes down when no further black pulses are received.

It should be possible for the recorder to be switched automatically to 60, 90 or 120 rpm by transmitting different selective control signals.

Remarks by CSM

The question of automatic control signals needs further study. It is considered that if the recorder is to be fully automatic it must be capable of carrying out the following operations :

(1) Recognize a starting signal;

(2) Select the correct speed (i.e. 60, 90 or 120 rpm);

(3) Where necessary set recording levels;

(4) Phase correctly;

(5) Revert to a stand-by condition at the end of the transmission.

These functions need not necessarily be carried out in the above sequence nor is a separate and different controlling signal necessarily required for each operation.

It is considered that WMO should give further attention to this matter, and should formulate suggested standards for automatic control signals.

Rec. 51 (CSM-II) - BROADCASTING TIMES FOR DIFFERENT TYPES OF REPORTS IN METEOROLOGICAL BROADCASTS BY RADIO

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING that Volume C of WMO publication No. 9 - Transmissions, does not contain in all cases sufficiently precise details for the most efficient reception of transmissions by radio-telegraphy;

RECOMMENDS that as far as possible the details of broadcast schedules other than territorial broadcasts published in Volume C, Section A1 of WMO publication No. 9.TP.4, include the broadcasting times separately for each type of report (i.e. SYNOP, SHIP, TEMP, PILOT, etc.).

Rec. 52 (CSM-II) - PARTS A AND B, CHAPTER I, VOLUME C, WMO PUBLICATION No. 9.TP.4

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING the decision by the ninth session of the Executive Committee concerning the status of WMO Guides and in particular of Chapter I, Parts A and B of Volume C of WMO publication No. 9;

CONSIDERING,

(a) That the format of a draft guide on telecommunications suggested by the Working Group on telecommunications of the Commission for Synoptic Meteorology, prepared by the Secretariat was satisfactory;

(b) That the conclusions of the second session of the Commission for Synoptic Meteorology concerning telecommunication matters will have to be included in the final draft;

RECOMMENDS,

(1) That the Secretary-General be requested to complete the Guide on telecommunications as and when final decisions will have been taken on the conclusions of the second session of the Commission for Synoptic Meteorology;

(2) That this Guide be established in line with the instructions of the ninth session of the Executive Committee and on the basis of the draft already prepared by the Secretariat;

(3) That this Guide become Chapter I of Volume C of publication No. 9.

Rec. 53 (CSM-II) - ECONOMY OF COMMUNICATIONS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING the general need to speed up meteorological communications; and

CONSIDERING that one aspect of this problem is the suppression of redundant data from broadcasts;

RECOMMENDS that regional associations be instructed to make a study of the information that is being exchanged Regionally and inter-

Regionally with a view to suppressing the unnecessary transmission of data with particular reference to relays of data which originated outside the Region and may not be required for onward relay in their entirety.

Rec. 54 (CSM-II) - PROTECTION OF RADIO FREQUENCIES USED BY METEOROLOGICAL RADIO TRANSMISSIONS AND METEOROLOGICAL AIDS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) That the International Frequency Registration Board (IFRB) is currently engaged in clearing all out-of-band radio operations and fitting them into their appropriate bands in the Table of Radio Frequency Allocations, Atlantic City 1947;

(2) That as a consequence, several meteorological broadcasts now operating satisfactorily may suffer harmful interference in future;

(3) That the IFRB has requested the co-operation of the World Meteorological Organization in this matter;

(4) That in this connexion the IFRB has requested several technical details concerning meteorological radio transmissions;

(5) That the information is not available in any of the standard publications of the World Meteorological Organization;

(6) That the question of protecting meteorological transmissions from harmful radio interference has become very urgent because of the extreme congestion in the radio spectrum;

(7) That it is essential to take all steps necessary to ensure efficient protection of meteorological transmissions; and

(8) That information on reception areas and receiving points would also be of considerable use to Members;

RECOMMENDS,

(1) That the Secretary-General be instructed to make arrangements to collect all technical data (such as equipment characteristics, reception areas, characteristics of antennae systems used, etc.) concerning the transmissions included in Volume C of publication No. 9,

that are necessary for taking steps to secure the efficient and continued protection of radio frequencies used by meteorological radio transmissions and by meteorological aids; and

(2) That the information so obtained be made available to the Members.

Rec. 55 (CSM-II) - CO-ORDINATION OF TELECOMMUNICATION MATTERS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING,

(1) That it is important that continuity and proper co-ordination be assured on telecommunication matters between sessions of the Commission for Synoptic Meteorology;

(2) That the Secretariat is in the best position to accomplish much of this desired co-ordination and continuity;

RECOMMENDS,

(1) That effective representation be arranged for the World Meteorological Organization at meetings of other international organizations dealing with telecommunication matters of interest to the Commission for Synoptic Meteorology, particularly the International Telecommunication Union and its various organs and the International Civil Aviation Organization;

(2) That regional associations and their telecommunication working groups be kept adequately informed of the broad aspect of CSM telecommunication planning which may require attendance of an expert on CSM telecommunication problems at the meetings of these bodies;

(3) That a telecommunication expert of the Secretariat be authorized to attend the sessions of the CSM Working Group on telecommunications.

Rec. 56 (CSM-II) - REGIONAL REPRESENTATIONS AT MEETINGS OF THE WORKING GROUP ON TELECOMMUNICATIONS OF THE COMMISSION FOR SYNOPTIC METEOROLOGY

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Paragraph 121(4) of the general summary of the Second Congress;

(2) Resolution 6 (EC-II);

(3) Paragraph 43 of the abridged report of the eighth session of the Executive Committee;

(4) Resolution 8 (CSM-II);

CONSIDERING,

(1) That to fulfil efficiently the tasks assigned to the CSM Working Group on telecommunications established by Resolution 8 (CSM-II), it is indispensable that the regional associations should contribute effectively in its work;

(2) That during the first meeting of the CSM Working Group on telecommunications, several Regions were not represented;

(3) That such absence in the case of some of the chairmen of the Working Groups on telecommunications of regional associations was due to the costs involved in their travelling expenses;

RECOMMENDS that the question of paying the travelling expenses of the representatives nominated by the regional associations so that they will be able to attend meetings of the CSM Working Group on telecommunications be considered favourably.

Rec. 57 (CSM-II) - COLOURS IN WHICH METEOROLOGICAL CHARTS OTHER THAN THOSE FOR FACSIMILE USE ARE PRINTED

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING the decision of the Executive Committee (Resolution 26 (EC-VIII)) to include the substance of Resolution 30 (CD Washington, 1947) in the "Guide to Synoptic Meteorological Practice" after re-examination of its substance by the Commission for Synoptic Meteorology;

RECOMMENDS the adoption of the following for inclusion in the "Guide to Synoptic Meteorological Practice" :

The use of two-colour charts, wherever possible, is recommended. For the sake of uniformity the following is suggested :

(i) Two-colour charts

Brown or ochre for

(a) frame, title, scale, remarks about projection, etc.;

(b) grid;

(c) contour lines for surface and upper air charts;

(d) shadings of layer tints for surface charts and as necessary for upper air charts;

Blue for

(a) shading of water areas;

(b) shading of inland areas covered by eternal snow or ice;

(c) river courses;

Brown, ochre or blue for

(a) station circles;

(b) station index numbers;

(c) outlines of land areas;

(ii) One colour charts

It is preferable to use two-colour maps, but if only a single colour is used, brown or ochre would be most suitable.

N O T E : The colour of the shadings on two-colour charts should be as light as practicable. Contours may be shown as broken lines, but the contour tints should not be bounded by a line. The number of tints should be as small as possible. Different tints may be used, for example, for the heights 0-1000 m, 1000-3000 m and above 3000 m. Dotted contour lines may be used to indicate the 200 m level and dashed contour lines the 500, 2000 and 4000 m levels.

Rec. 58 (CSM-II) - STANDARDIZATION OF MAPS FOR FACSIMILE DISSEMINATION

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING,

(1) That with the increasing use of facsimile, recipients may wish to combine the analyses for adjacent areas;

(2) That a high degree of standardization, though desirable, would be premature in view of the present developmental stage of facsimile;

RECOMMENDS,

(1) That the Secretary-General be requested to conduct a survey among the Members responsible for issuing master analyses and who transmit them by facsimile;

(2) That this survey be conducted during the 12 months preceding the third session of the Commission for Synoptic Meteorology and in preparation for that session, and that the survey cover the following points :

(i) Scales and projections of charts used for the preparation and the transmission of the master analyses;

(ii) The isopleths intervals in the original analyses and in the transmitted analyses;

(iii) Any other question that may come to light as a result of the above and on which clarification would be required in order to permit a decision on standardization by the third session of the Commission for Synoptic Meteorology;

(3) That a similar survey be conducted among Members not responsible for the issue of master analyses, but who make facsimile transmissions of analyzed charts.

N O T E : The results of the surveys mentioned under (1) and (3) are to be presented in two separate reports.

Rec. 59 (CSM-II) - PLOTTING MODEL FOR UPPER-AIR SYNOPTIC OBSERVATIONS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Resolution 99 (CD Washington, 1947);

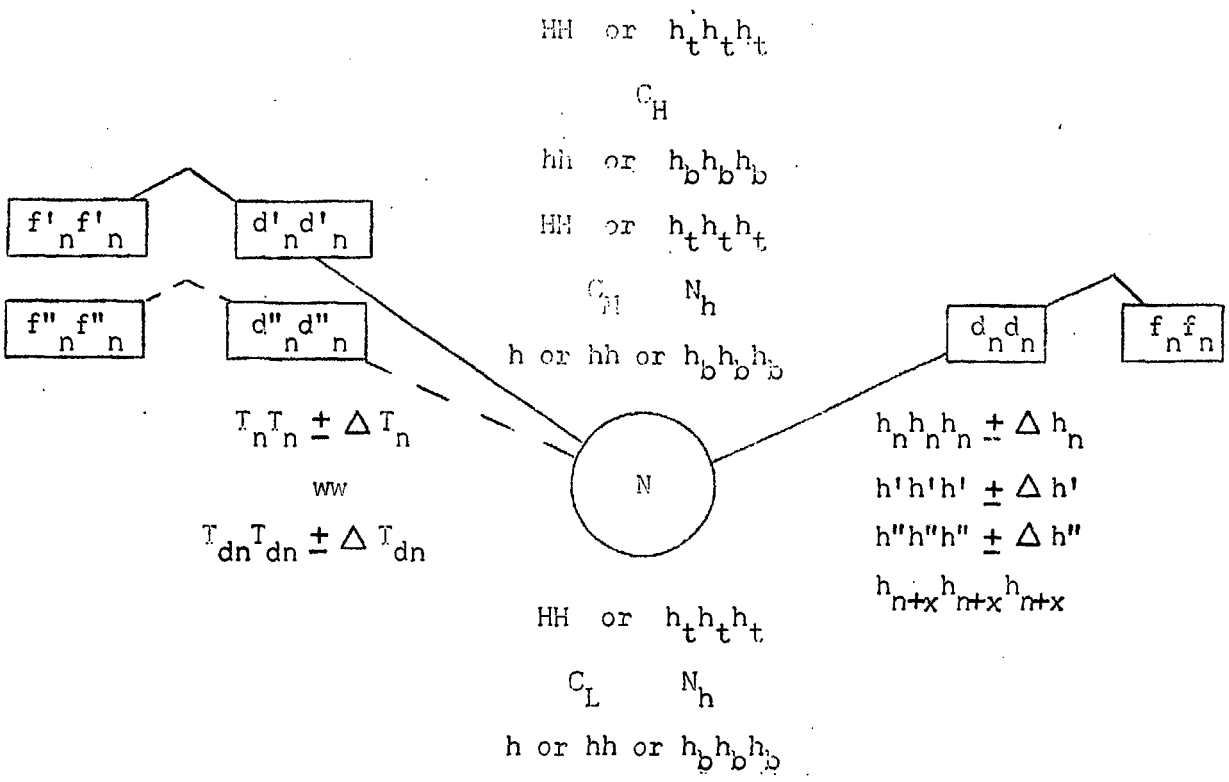
(2) Recommendation 41 (CSM-I);

(3) Recommendation 42 (CSM-I);

RECOMMENDS that a new plotting model for upper-air synoptic observations on constant pressure charts be as in the annex to this recommendation and be placed in the Guide to Synoptic Meteorological Practice.

A N N E X

PLOTTING OF UPPER-AIR SYNOPTIC OBSERVATIONS ON CONSTANT PRESSURE CHARTS



Plotting model

In polychromatic method, temperature (T_nT_n), dew point temperature ($T_{dn}T_{dn}$), relative geopotential (thickness)(h'h'h') and derived wind would be plotted in red.

N O T E : $h_{n+x}h_{n+x}h_{n+x}$ = geopotential of pressure surface other than for $h_nh_nh_n$.

Rec. 60 (CSM-II) - SYMBOLS FOR WEATHER ANALYSIS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING the desirability of having the widest possible uniformity of terms and symbols for weather analysis;

RECOMMENDS,

(1) That the published scientific papers on weather analysis should be relied upon to furnish the necessary information regarding the terms employed in weather analysis;

(2) That definitions of the terms employed in weather analysis should not be included in the Guide to Synoptic Meteorological Practice; but where necessary for clarity, brief generalized descriptions be given in the Guide without in any way ~~employing~~ implying any restriction on the generality of the weather analysis terms so described; published scientific literature on the subject being definitive in these cases also (these descriptions appear in Annex I to this recommendation);

(3) That the symbols given in Annex II be placed in the Guide to Synoptic Meteorological Practice.

A N N E X I

DESCRIPTIONS

Intertropical convergence zone

A narrow zone where the trades of the two hemispheres meet.

Intertropical discontinuity

A discontinuity separating very hot and dry continental air from the cooler moist air from equatorial regions.

Subtropical discontinuity

A discontinuity separating very hot and dry continental air from cooler air from higher latitudes.

Trowal

A trough of warm air aloft.

ANNEX II

GENERAL RULES

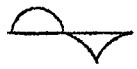
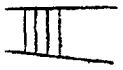
1. The basic symbol shown in the table is repeated as necessary to indicate the extent of the phenomenon.

2. The arrows on items 1 to 6 of the table are not part of the symbol but are entered to indicate the orientation of the symbol with respect to the direction of motion of the phenomenon.

3. The symbols in the table have their bases downwards - the base is normally placed on the line along which the symbols are repeated.

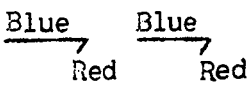
SYMBOLS

	Term	Monochromatic	Polychromatic
1.	Cold front at the ground		Solid blue line
2.	Cold front above the ground		Broken blue line
3.	Warm front at the ground		Solid red line
4.	Warm front above the ground		Broken red line
5.	Occluded front at the ground		Solid purple line
6.	Occluded front above the ground		Broken purple line

	Term	Monochromatic	Polychromatic
7.	Stationary front at the ground		Alternate red and blue solid line
8.	Stationary front above the ground		Alternate red and blue broken line
9.	Stationary occluded front		Purple
10.	Instability line		Black
11.	Shear line		Black
12.	Inter-tropical convergence zone		 Orange

N O T E : The separation of the two lines gives a qualitative representation of the width of the zone, the hatched lines may be added to indicate areas of activity.

13.	Inter-tropical discontinuity	Heavy broken line	Alternate red and green broken line
14.	Sub-tropical discontinuity	Thin broken line	Brown broken line
15.	Axis of trough	Solid line	Solid black line

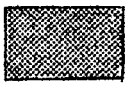
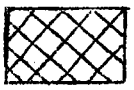
	Term	Monochromatic	Polychromatic
16.	Trowal		
17.	Isopleths		

Priority lists

(a)	Isobars	(a) ————	(a) Black
(b)	Isohypses of absolute topography (contours)	(b) — — —	(b) Red
(c)	Stream lines	(c)	(c) Green
(d)	Isotachs		
(e)	Isohypses of relative topography (thickness lines)		
(f)	Isotherms		
(g)	Moisture lines		
(h)	Isallobars		

N O T E S :

1. When two or more systems of isopleths are entered on the same chart, priority of symbol and colour is normally chosen in accordance with the priority in the list of terms above.
2. When this rule is not followed the isopleths must be clearly identified on the chart.

18.	Zones of continuous precipitation	 or 	Solid shading cross hatching	Same as monochromatic but in green

N O T E S :

1. The shading or hatching should not obliterate the plotted data.
2. Appropriate ww symbols may be superposed on the shaded area to indicate the nature of the weather in the area.
3. The extent of the area may be delineated with a thin boundary line.

	Term	Monochromatic	Polychromatic
19.	Zones of intermittent precipitation	 Single hatching	Same as monochromatic but in green

N O T E S : Same notes as in 18.

20. Areas of showers, snow showers, etc. may be shown by distributing large ww symbols for the appropriate element over the area. In the polychromatic system green is used. The extent of the area may be delineated with a thin boundary line.

21. Area of thunderstorms - as in 20, but red is used in the polychromatic system.

22. Areas of fog may be shown by distributing the fog symbol over the area in the monochromatic system. Yellow shading is used in the polychromatic system.

23. Areas of duststorm, sandstorm or dust haze may be shown by distributing the appropriate ww symbol over the area in the monochromatic system and by brown shading together with the appropriate ww symbol in the polychromatic system.

Rec. 61 (CSM-II) - GUIDE TO SYNOPTIC METEOROLOGICAL PRACTICE

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) That a Guide to Synoptic Meteorological Practice must be produced quickly to give status to the large number of old resolutions of

the International Meteorological Organization and the World Meteorological Organization now in a state of suspended animation;

(2) The draft Guide to Synoptic Meteorological Practice prepared by the Secretariat (Doc. CSM-II/25);

CONSIDERING that the material in the Guide to be effective must be endorsed by the largest possible number of Members;

RECOMMENDS that the Guide to Synoptic Meteorological Practice be published as quickly as possible in the following manner :

(a) The table of contents will be as in the annex to this recommendation;

(b) The text will contain only :

(i) The appropriate recommendations and resolutions of the second session of the Commission for Synoptic Meteorology, as approved by the Executive Committee;

(ii) Those appropriate recommendations and resolutions of the first session of the Commission for Synoptic Meteorology, except as modified by the second session of that commission;

(iii) Resolutions and recommendations of the International Meteorological Organization and the World Meteorological Organization and its constituent bodies as directed by the Executive Committee in Resolution 26 (EC-VIII) or as are otherwise appropriate except as modified by the first and second sessions of the Commission for Synoptic Meteorology;

(iv) Such Technical Regulations from Volume I as are appropriate.

A N N E X

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4. Chapter IV - Representation on prognostic charts
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5. Chapter V - Coded analyses
5.1 General
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6.3 etc. Other types of special charts

Rec. 62 (CSM-II) - STATION ELEVATION TO BE REPORTED IN VOLUME A OF WMO PUBLICATION No. 9.TP.4

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING the symbols and definitions for various elevations as defined in Recommendation 8 (CIMO-I) approved by Resolution 46 (EC-IV);

CONSIDERING that the elevation indications regarding stations

appearing in Volume A of WMO publication No. 9.TP.4 are not entirely adequate for the purposes of synoptic meteorology;

RECOMMENDS,

(1) That the following information on the height of stations be published in Volume A :

(a) For synoptic land stations not located at aerodromes : H (elevation of the ground) and H_p (station elevation), both in metres and feet;

(b) For synoptic land stations located at aerodromes : H_a (official aerodrome elevation) and H_p (station elevation), both in metres and feet;

(2) That, in addition, for those stations which report the pressure of a level other than mean sea level (MSL), or which report the geopotential of a reference isobaric surface, the geopotential (in gpm or gpf) of the level to which the pressure is reduced or the reference isobaric surface will be included in Volume A;

(3) That no information on H_z (elevation of the zero point of the barometer) be included in Volume A;

(4) That the concept geodynamic metre be no longer used in Volume A.

Rec. 63 (CSM-II) - USE OF TERM "MOUNTAIN STATION" IN FM 17 AND IN VOLUME A OF WMO PUBLICATION No. 9.TP.4

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING that difficulty is being experienced in determining whether for the purposes of Volume A of WMO publication No. 9 and the use of FM 17 a station should be considered as a mountain station;

RECOMMENDS,

(1)(a) That the words "mountain station" be replaced by the words "land station" in the title and notes to FM 17;

(b) The addition of the following note to FM 17 :

Any station reporting in code form FM 11.A may use, in addition, code form FM 17 for any cloud that is observed, and which cannot be reported fully by the group $N_hC_Lh C_M C_H$ alone, due attention being taken of FM 17 Notes (1) and (7) above;

(2)(a) That the term "mountain station" in Volume A be used only in its synoptic sense;

(b) That the following general criteria be used for deciding for the purpose of entering "M" on the "remarks" column of Volume A :

(i) The station be distinguishable from stations on plateaux, in valleys or on level terrain;

(ii) The station may be on the side or near the top of the mountain;

(iii) The station is normally 500 m or more above the floor of the neighbouring valley or above the surrounding terrain (whichever term is appropriate).

Rec. 64 (CSM-II) - AMENDMENTS ISSUED TO VOLUMES A, C AND D OF WMO PUBLICATION No. 9.TP.4

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Recommendation 51 (CSM-I) and Resolution 20 (EC-IV);

(2) That amendments to Volumes A, C and D of publication No. 9.TP.4 are being issued at very infrequent intervals so that the information issued is usually very much out of date;

CONSIDERING that it is vital that Members have current information, in particular, regarding meteorological transmissions;

RECOMMENDS,

(1) That satisfactory arrangements be made as soon as possible for compliance by the Secretariat with the spirit of Technical Regulation 6.1.1.9 so that :

(a) Amendments to Volume A be issued once every three months;

(b) Amendments to information about meteorological transmissions received at the Secretariat are made available to Members within two months, by means of the monthly issue of amendments to Volume C of WMO publication No. 9.TP.4, as provided for in Resolution 20 (EC-IV); and

(c) Amendments to Volume D be issued once a month;

(2) That the Secretary-General be authorized to issue special amendments to these volumes at any time he considers necessary.

Rec. 65 (CSM-II) - AMENDMENTS TO TECHNICAL REGULATIONS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

HAVING EXAMINED the World Meteorological Organization Technical Regulations and the necessity for amending them in the light of decisions taken at the second session of the Commission for Synoptic Meteorology;

RECOMMENDS that, in addition to the proposals contained in other recommendations of the second session of the Commission for Synoptic Meteorology as a result of the study of specific items, the following amendments be made to the WMO Technical Regulations :

(1) Chapter 1

- Amend the definition of meteorological transmission to read :

  Meteorological transmission - A transmission by radio, cable or by land-line of meteorological information, either point-to-point or by broadcast.

- Introduce a new definition as follows :

  Meteorological broadcast - A broadcast by radio, cable or land-line of meteorological information.

(2) Chapter 3

- Amend paragraph 3.2.1.2 to read :

  The intermediate standard times for surface synoptic observations shall be 0300, 0900, 1500 and 2100 GMT.

(3) Chapter 6

- Amend paragraph 6.1.1.7 to read :

  When a Member establishes within its territory a routine meteorological transmission intended for use by other Members, the Member shall send the following information, as appropriate, to the Secretariat :

  (a) unchanged
  (b) unchanged
  (c) unchanged
  (d) unchanged
  (e) unchanged
  (f) Index of co-operation and drum speed(s) of facsimile transmitter.

- Replace paragraph 6.4 and all its sub-paragraphs by the following :

6.4

TELEPRINTER TRANSMISSIONS

Time schedules and operational procedures relating to teleprinter transmissions should be established to the satisfaction of the Members concerned.

(4) Chapter 7

- Amend paragraph 7.2.1.4 to read :

The symbols used for the graphic representation of data on weather charts should be those given in the Guide to Synoptic Meteorological Practice;
The symbols used for analysis on weather charts for cold fronts, warm fronts and occluded fronts and stationary fronts should be those given in the Guide to Synoptic Meteorological Practice.

Amend paragraph 7.4.1.3 to read :

Members should prepare upper-air charts for at least three of the four following levels : 850, 700, 500 and 300 mb.

Rec. 66 (CSM-II) - ELEVATION OF A STATION

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING that Recommendation 8 (CIMO-I), as approved by Resolution 46 (EC-IV) includes numerous possibilities for indicating the altitude or elevation of a meteorological station;

CONSIDERING that paragraphs 2.3.2.2 and 2.6.1.1(c) of the Technical Regulations require amplification;

RECOMMENDS,

(1) That paragraph 2.3.2.2 of the Technical Regulations be changed to read :

The elevation data for a synoptic land station or an aeronautical meteorological station on land shall be specified in whole metres or feet.

NOTE : The metre is the recommended unit.

(2) That paragraph 2.6.1.1 of the Technical Regulations be reworded as follows :

Geopotential of the datum level to which pressure is reduced, or the reference isobaric surface, whose geopotential is reported.

Rec. 67 (CSM-II) - OCEAN WEATHER STATIONS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Resolution 26 (EC-VIII) and in particular its reference to Resolution 60 (IMC Paris, 1946);

(2) That the observational coverage over large ocean areas is still inadequate;

(3) That stations on islands, although of great value, cannot fill all the existing gaps in the network;

(4) That there is at present no provision in the Technical Regulations requesting Members to establish ocean weather stations;

RECOMMENDS that the following recommended practice be included in the Technical Regulations, as contained in WMO publication No. 49.BD.2, in the form of a new paragraph 2.2.1.9 :

2.2.1.9

Members should establish, either individually or jointly, ocean weather stations over ocean areas when there are large gaps in the world network of surface and upper-air synoptic stations.

Rec. 68 (CSM-II) - AIRCRAFT WEATHER RECONNAISSANCE FLIGHTS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Resolution 26 (EC-VIII) and in particular its reference to Resolution 47 (IMC Paris, 1946);

(2) That there is at present no provision in the Technical Regulations, requesting Members to carry out aircraft weather reconnaissance flights (RECCO-flights);

CONSIDERING that aircraft weather reconnaissance flights (RECCO-flights) constitute a valuable additional means to fill wide gaps in

the world network of upper-air synoptic stations and to report by direct observation, the development, progress and decay of tropical revolving storms;

RECOMMENDS that the following recommended practice be included in the Technical Regulations, as contained in WMO publication No. 49.BD.2, in the form of a new paragraph 2.2.1.10 :

2.2.1.10

Members should organize, either individually or jointly, routine and special aircraft weather reconnaissance flights.

Rec. 69 (CSM-II) - AEROLOGICAL OBSERVATIONS MADE BY OCEAN WEATHER STATIONS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) That Resolution 81 (CD Washington, 1947) has been cancelled by Resolution 26 (EC-VIII);

(2) Paragraph 4.3.1.2 of the Technical Regulations;

(3) That there is at present no provision in the Technical Regulations covering upper-air observations by ocean weather stations;

RECOMMENDS that the following recommended practice be included in the Technical Regulations as contained in WMO publication No. 49.BD.2, in the form of a new paragraph 4.3.1.1.1;

4.3.1.1.1

At ocean weather stations, upper-air synoptic observations should comprise rawinsonde observations at 0000 and 1200 GMT and radiowind observations at 0600 and 1800 GMT.

Rec. 70 (CSM-II) - TIMES OF UPPER-AIR OBSERVATIONS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) The revised provisions of the Technical Regulations regarding time of upper-air observation recommended by the Commission for Synoptic Meteorology in Recommendation 60 (56-CSM) and approved by the Executive Committee for introduction on 1st April 1957;

(2) That it is not known what is the preferred level to be reached by an upper-air observation at the standard time of observation;

(3) The comments by the second session of the Commission for Aerology in paragraph 44 of its abridged final report;

(4) That some Members encounter great practical difficulties in releasing balloons within the stipulated time limits;

(5) That some Members encounter difficulties in obtaining pilot balloon observations to high altitudes in twilight conditions;

CONSIDERING that the time range for the beginning of an upper-air synoptic observation should allow for the possibility of simultaneity between the surface observation and the upper-air observation at some level between the surface and the 500 mb level;

RECOMMENDS,

(1) That Technical Regulation 4.2.1.2 be amended to read :

4.2.1.2

The actual times of upper-air synoptic observations should fall within the time range (H-30) to H except that for pilot balloon observations, in order to obtain winds to greater heights, the actual time of an observation may be varied in accordance with cloud conditions or expected adverse light conditions.

(2) That Technical Regulation 4.2.1.3 be amended to read :

4.2.1.3

For an upper-air synoptic observation, other than a pilot balloon observation, which requires a substantial time to complete, the actual time of observation should in no case deviate by more than 15 minutes from the release time range (H-30) to H.

Rec. 71 (CSM-II) - STATUS OF CHAPTER I, PART A OF VOLUME B OF WMO PUBLICATION No. 9 AND OF THE INTERNATIONAL CLOUD ATLAS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING Resolution 3 (EC-VIII);

CONSIDERING the desirability of indicating clearly the special status needed for Volume B of WMO publication No. 9 and the International Cloud Atlas;

RECOMMENDS,

(1) That Chapter I, Part A of Volume B as brought up to date by Supplement No. 10 be finally adopted as an appendix to the Technical Regulations subject to the following conditions :

(i) It continues to be published, along with Chapters II and III, and separate from the Technical Regulations;

(ii) The words "shall" and "should" continue to have their dictionary meanings and do not have the regulatory character of the "shalls" and "shoulds" in the Technical Regulations (see Technical Regulations, Preface, first paragraph);

(iii) That this action in no way affects Technical Regulations that at present cross-refer to Volume B;

(iv) That all amendments contained in the recommendations of the second session of the Commission for Synoptic Meteorology be incorporated together with such consequential editorial changes as may be found necessary;

(2) That the Cloud Atlas be finally adopted in its present form as an appendix to the Technical Regulations subject to the following conditions :

(i) It continues to be published separately from the Technical Regulations;

(ii) The words "shall" and "should" continue to have their dictionary meanings and do not have the regulatory character of the "shalls" and "shoulds" in the Technical Regulations (see Technical Regulations, Preface, first paragraph);

(iii) That this action in no way affects Technical Regulations that at present cross-refer to the Cloud Atlas;

(iv) That the definitions and descriptions of dust haze, fog and mist be brought in conformity with the results of the actions to be taken on the basis of Recommendation 9 (CSM-II);

(3) That the status of the "shalls" and "shoulds" in the present annexes to the Technical Regulations be clarified.

Rec. 72 (CSM-II) - PUBLICATION OF THE REPORT OF THE WORKING GROUP ON NETWORKS ESTABLISHED BY THE FIRST SESSION OF THE COMMISSION FOR SYNOPTIC METEOROLOGY

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING the valuable studies contained in the report of the Working Group on networks established by the first session of the Commission for Synoptic Meteorology;

CONSIDERING that Members will have to be called upon to provide certain information to permit the newly set up working group to conclude its work, and should therefore receive a copy of the report;

RECOMMENDS that the report of the Working Group on networks to the second session of the Commission for Synoptic Meteorology be published as a WMO Technical Note.

Rec. 73 (CSM-II) - WORLD CLIMATIC ATLASES

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING the provisional generalized list of parameters for maps of the free atmosphere prepared by the Working Group of the Executive Committee on climatic atlases;

CONSIDERING that until the map scales, projections, etc. are finalized detailed comment is inappropriate;

RECOMMENDS,

(1) That the provisional generalized list of parameters for maps of the free atmosphere be regarded as satisfactory for synoptic purposes with the addition of one item to Group III to read :

(iv) Extreme positions of the thickness lines by months;

(2) That if all the maps are not produced simultaneously the priority be :

(i) Group I;

(ii) Item (iv) of Group III;

(iii) Group II;

(iv) Items (i), (ii) and (iii) of Group III.

Rec. 74 (CSM-II) - INDEX NUMBERS FOR STATIONS MAKING OBSERVATIONS IN PHYSICAL METEOROLOGY

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) The decision of the ninth session of the Executive Committee to instruct the Secretary-General to prepare a system of index numbers for stations making observations in physical meteorology; and

(2) The request of the Secretary-General for comments from the Commission for Synoptic Meteorology;

RECOMMENDS,

(1) That the method suggested by the Secretary-General of identifying stations, making observations in physical meteorology, does not appear appropriate, as it would lead to a multiplicity of numbers for any station taking observations in several branches of physical meteorology;

(2) That index numbers, based on the international system of index numbers as prescribed by Technical Regulation 2.4.1.1 be assigned to those stations from which observations in physical meteorology are transmitted for international use on telecommunication system;

(3) For those stations taking observations in physical meteorology not covered by paragraph (2) above, and which may exchange their data internationally by mail, an appropriate method of producing a system of identifiers appears to be that, in which station name abbreviations or numbers corresponding to $QL_aL_aL_aL_oL_oL_o$ are used. The final choice could be made on a Regional or a national basis; any system should however be so designed that no confusion is possible with the existing international index numbers.

Rec. 75 (CSM-II) - INTERNATIONAL EXCHANGE OF PAST WEATHER DATA

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING the present difficulties in collecting unpublished past weather data from different countries; and

CONSIDERING that an easy access to the data mentioned in Technical Regulations 3.5.1.1 and 4.5.1.1 is very important for research in synoptic meteorology;

RECOMMENDS,

(1) That each Member inform the Secretariat of the proper address to be used for correspondence with its national meteorological archives maintained pursuant to Technical Regulations 3.5.1.1 and 4.5.1.1;

(2) That the Secretariat publish a list of these addresses;

(3) That, within the context of Technical Regulations 8.3.1.3 and 8.3.1.4, each Member does its utmost to make copies of data easily available to users on request;

(4) That the scope of the terms of reference of the Commission for Climatology and the Commission for Synoptic Meteorology be clarified to show which body is responsible for considering the problems of the preservation of "synoptic data" and analysed maps and charts ("synoptic data" being reports assembled on a time area basis as for the plotting of a synoptic map).

Rec. 76 (CSM-II) - VERIFICATION OF FORECASTS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) The action by the Executive Committee on Resolution 58 (CD Utrecht, 1923) as contained in Resolution 26 (EC-VIII);

(2) That many services are carrying out regular checking of forecasts, and are continuing to develop and improve methods of verification;

CONSIDERING,

(1) That regular verification helps to maintain and improve the quality of forecasts;

(2) That a number of methods of forecast verification are likely to be required to meet the diverse needs of Members;

RECOMMENDS,

(1) That Members be encouraged to carry out regular verification of forecasts;

(2) That the Secretary-General be requested to obtain from Members the details of their verification methods, for publication as a WMO Technical Note.

Rec. 77 (CSM-II) - CRITERIA FOR REPORTING GUSTY WIND

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(a) The report to the eighth session of the Executive Committee by the president of the Commission for Aeronautical Meteorology (Doc. EC-VIII/36);

(b) Paragraphs 181 and 182 of the final report of the eighth session of the Executive Committee;

(c) That the various definitions contained in the report mentioned under (a) above have been provisionally adopted by the Secretary-General in consultation with the President of the World Meteorological Organization;

CONSIDERING,

(a) That a gusty wind can be sufficiently well determined from variations in the wind speed and that no reference need be made to the vector properties of the wind;

(b) That the present definition of one individual gust has certain shortcomings;

(c) That the reporting of gusty winds in synoptic reports is of limited use to synoptic meteorologists;

(d) That international criteria for reporting gusty winds may be desirable;

(e) That it is premature to develop world-wide coding and plotting practices for gusty winds;

RECOMMENDS,

(1) That Members be invited to try out criteria for reporting gusty wind and be requested to report their experiences for consideration at the third session of the Commission for Synoptic Meteorology;

(2) That the following criteria for reporting gusty winds in synoptic reports be used as guidance, when developing national criteria.

The wind is termed gusty when :

(a) There are three or more marked positive peaks, at least one of which reaches a speed of 20 knots (10 mps) or more, during the 10-minute period preceding the time of observation; and

(b) The wind speed reached in at least one third of the number of positive peaks exceeds the speed during this 10-minute period by :

  (i) 50 per cent or more from the mean wind speed when the mean does not exceed 40 knots (20 mps);

  (ii) 20 knots (10 mps) or more when the mean exceeds 40 knots (20 mps).

Rec. 78 (CSM-II) - CRITERIA FOR REPORTING SQUALLS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING the difficulty of giving precise instructions to observers on the reporting of squalls;

CONSIDERING that a satisfactory definition of a squall is unlikely to be reached without further study and a wide exchange of views;

RECOMMENDS,

(1) That the Secretariat be requested to invite Members to provide details of their definitions of "squalls" and their criteria for the reporting ww = 18, together with any views they may wish to put forward on the adoption on a world-wide basis of a definition and reporting procedure for squalls;

(2) That the Secretariat prepare an analysis of these replies for submission to the president of the Commission for Synoptic Meteorology for such action as he may deem appropriate in preparing for the third session of that commission.

Rec. 79 (CSM-II) - CODES FOR GROUND RADAR WEATHER OBSERVATIONS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING Recommendation 30 (CAeM-I/ICAO MET-IV), Resolution 18 (EC-V) and Recommendation 3 (Third NAT/RAN Meeting of ICAO);

CONSIDERING,

(1) That ground radar weather observations have both aeronautical and synoptic importance;

(2) That in addition to the limited exchange of detailed features for aeronautical purposes, there is in some regions a need for wide exchange of essential features for synoptic purposes;

(3) That, on the other hand, the scientific interpretation of ground radar weather echoes is new and still in rapid development; and

(4) That, in connexion therewith, the establishment of an international code for ground radar weather observations seems inappropriate at the moment;

RECOMMENDS,

(1) That codes for ground radar weather observations be developed on a regional basis and that in particular Members operating ocean weather stations on the North Atlantic Ocean should establish such a code for use on ocean weather stations; and

(2) That the Secretary-General be instructed to collect all regional codes for ground radar weather observations, together with such national codes which may exist and place them for consideration before the third session of the Commission for Synoptic Meteorology.

N O T E : The word regional in this recommendation refers to regions in the broadest sense of the word; it may, for instance, refer to a part of a WMO Region, to a part of two or more WMO Regions, to the whole of a WMO Region, etc.

Rec. 80 (CSM-II) - DEFINITION OF BASIS SYNOPTIC NETWORKS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Recommendation 1 (II-RA I);

(2) Resolution 41 (EC-IX);

(3) The preliminary report of the Working Group on networks of the Commission for Synoptic Meteorology;

RECOMMENDS that, until such time as the newly constituted CSM Working Group on networks has completed its work, the following definition for basic synoptic network be adopted :

The basic synoptic network within each Region of the World Meteorological Organization is the network of stations, including the observational programmes, which the regional association decided to recommend its Members to establish and maintain. This network is to be composed of the stations and observational programmes which are considered a minimum requirement throughout the Region to permit synoptic meteorology to fulfil its recognized responsibilities.

N o t e : Normally, these stations are regularly included in the normal meteorological transmissions established for the purpose of reception within the Region in question.

Rec. 81 (CSM-II) - UPPER-AIR OBSERVATIONS BY MOBILE SHIP STATIONS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING that Recommendation 15 (CMM-II) as approved by Resolution 33 (EC-IX) does not mention, as a possible means of obtaining additional information from ocean areas, upper-air observations carried out on mobile ship stations;

RECOMMENDS that Members be advised that upper-air observations from mobile ship stations constitute another means of obtaining additional information from ocean areas.

Rec. 82 (CSM-II) - ACTION FOR OBTAINING ADDITIONAL INFORMATION FROM OCEAN AREAS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) That in the Convention and the General Regulations of the World Meteorological Organization, no specific provision has been made for convening groups of countries other than regional associations, for discussing problems of mutual interest;

(2) That, therefore, there exist no adequate means within the World Meteorological Organization for co-ordinating the various possible means of obtaining meteorological information from the oceans other than the surface observations from mobile ship stations;

CONSIDERING that there is an urgent need for additional meteorological information from ocean areas, such as surface and upper-air observations from islands;

RECOMMENDS that the Executive Committee make a study, for submission to Third Congress, on the possibilities of including in the Convention or General Regulations, certain clauses, which permit, under the aegis of the World Meteorological Organization, initiation of combined efforts, possibly including joint support action by Members, for improving the availability of meteorological information from ocean areas.

Rec. 83 (CSM-II) - AUTOMATIC WEATHER STATIONS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) The action by the Executive Committee on Resolution 40 (CD Washington, 1947) as contained in Resolution 26 (EC-VIII);

(2) Recommendation 13 (CAeM-I/ICAO MET-IV) and Resolution 16 (EC-V);

(3) The setting up by the Commission for Instruments and Methods of Observation (Resolution 3 (CIMO-II)) of a working group to collate existing information on automatic weather stations and to state the various requirements for such stations;

(4) The diverse fields of application of automatic weather stations;

CONSIDERING,

(1) That automatic weather stations constitute an increasingly valuable means of obtaining meteorological information in all cases where such information cannot be obtained from a regularly manned and full-time operating synoptic station;

(2) That automatic weather stations (including those on buoys) have not yet attained the desired stage of development at which they can be accepted as fully satisfactory substitutes for synoptic surface stations requested in the Regionally recommended basic synoptic networks;

RECOMMENDS,

(1) That Members be strongly urged to accelerate their efforts to develop automatic weather stations for use on land and on sea, ranging from the simplified station capable of reporting only one or two meteorological elements to the complete station capable of reporting all the elements required from a manned synoptic station;

(2) That Members be encouraged to install automatic weather stations both over land areas and maritime areas where synoptic observations are sparse and also at synoptic stations which cannot be manned on a 24-hour basis in order to complete the observational programmes;

(3) That arrangements be made for the early publication and distribution to Members of the material assembled by the Working Group on

automatic stations of the Commission for Instruments and Methods of Observation and that this information be kept up-to-date by periodical supplements.

Rec. 84 (CSM-II) - REQUIREMENTS IN RESPECT OF UPPER-AIR INFORMATION

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Resolution 8 (CAe-II);

(2) The requirements of international civil aviation for high-level forecasts;

(3) Recent developments in synoptic meteorology, which necessitate the obtaining of information from increasingly higher levels;

RECOMMENDS,

(1) That Members make the necessary arrangements so that their upper-air observations regularly reach at least the 100 mb level;

(2) That, in addition, Members make every effort so that in upper-air observations the highest possible level above that of 100 mb be attained;

(3) That the Commission for Instruments and Methods of Observation be informed of the need for instrumentation, which would make it possible to obtain regularly upper-air information from levels considerably above that of 100 mb, at least to 10 mb.

Rec. 85 (CSM-II) - RAPID AVAILABILITY OF UPPER-AIR DATA

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING that a reduction in lapsed time between time of observation and time of receipt of the upper-air reports at forecast centres would result from a speeding up of the computation of the radiosonde data at the radiosonde station and that in many cases this will be much more significant than the saving in transmission time resulting from the shortening of the message by a few groups;

RECOMMENDS that the attention of Members be drawn to the possibility of a real reduction in lapsed time between observation and use of radiosonde data by speeding up the computation at the radiosonde station.

Rec. 86 (CSM-II) - SPECIAL ARRANGEMENTS FOR THE WORKING GROUP ON NETWORKS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) Resolution 7 (CSM-II) regarding re-establishing the Working Group on networks;

(2) The conclusion contained in the preliminary report of the group presented to the second session of the Commission for Synoptic Meteorology regarding the impracticability of making progress by correspondence;

(3) That, to continue the work already commenced, the group will require a considerable amount of derived data such as correlation functions;

RECOMMENDS,

(1) That provision be made for two meetings to be held by the group before the end of 1959;

(2) That the president of the Commission for Synoptic Meteorology be authorized to approach, via the Secretary-General, certain Members with a view to obtaining from them the information required by the working group.

Rec. 87 (CSM-II) - FINANCING OF MEETINGS OF WORKING GROUP ON CODE PROBLEMS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING the decisions of the eighth session of the Executive Committee regarding the financing of meetings of working groups of technical commissions;

CONSIDERING,

(1) That the vital work of the Working Group on codes will only be done on a world-wide basis if all the members of the group attend its meetings;

(2) That this will not be possible unless travel expenses are paid;

RECOMMENDS,

(1) That financial support be provided for the Working Group on codes established by Resolution 6 (CSM-II) and in particular that this be included in the list to which paragraph 121(4) of the general summary of Second Congress applies;

(2) That the travel expenses of the chairman and of the representatives of regional associations to attend meetings of this working group be paid.

Rec. 88 (CSM-II) - ASSISTANCE TO THE COMMISSION FOR SYNOPTIC METEOROLOGY

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) General Regulations 142 and 145(8);

(2) The many problems which the Commission for Synoptic Meteorology has to solve or develop between sessions and the heavy agenda with which each session of the commission is faced;

(3) The unduly heavy task which consequently befalls the president of the Commission for Synoptic Meteorology;

CONSIDERING,

(1) That the president of the Commission for Synoptic Meteorology and the chairmen and members of the working groups of that commission can only devote a part of their time to the work of the World Meteorological Organization;

(2) That the work of the commission and its working groups would be greatly facilitated and consequently speeded up if the Secretariat could conduct enquiries and prepare reports to a greater extent than has been possible in the past;

(3) That various publications in the field of activities of the Commission for Synoptic Meteorology could be prepared by the Secretariat;

RECOMMENDS that the Executive Committee study the difficulties encountered in the effective functioning of the Commission for Synoptic Meteorology with a view to alleviating them as soon as possible.

Rec. 89 (CSM-II) - REVISION OF RESOLUTIONS OF THE EXECUTIVE COMMITTEE BASED ON PREVIOUS RECOMMENDATIONS OF THE COMMISSION FOR SYNOPTIC METEOROLOGY

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING with satisfaction the action taken by the Executive Committee on the previous recommendations of the Commission for Synoptic Meteorology;

CONSIDERING that many of these recommendations have become redundant in the meantime;

RECOMMENDS that the following Executive Committee resolutions be no longer considered necessary :

(EC-IV) 20, 23, 28, 29, 32;

(EC-VIII) 5;

(EC-IX) 4.

A N N E X

Annex to Resolution 13 (CSM-II)

RECOMMENDATIONS ADOPTED BEFORE THE SECOND SESSION AND MAINTAINED IN FORCE

Rec. 23 (CSM-I) - HANDLING OF PLAIN LANGUAGE RADIOTELEPHONY IN-FLIGHT REPORTS FOR GROUND-TO-GROUND COMMUNICATIONS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

RECOGNIZING the importance of avoiding delays which result from encoding of plain language in-flight weather reports before including them in ground-to-ground exchanges;

RECOMMENDS that plain language radiotelephony in-flight reports should be transmitted ground-to-ground in the form in which they are logged at ground receiving stations.

* *

Cf : Report of Chairman, ICAO First AN Conference, Montreal 1953.

Rec. 32 (CSM-I) - UNIVERSAL TIME

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) The position of the International Civil Aviation Organization, as a consequence of a study which involved consultation with 21 international organizations, that there appeared to be insufficient justification at present for modifying the International Civil Aviation Organization practice of employing GMT;

(2) That the terms "Greenwich Mean Time", "Greenwich Civil Time" and "Universal Time" all now refer to mean solar time reckoned from midnight on the Greenwich meridian and that no practical inconvenience or confusion appears to arise from the concurrent use of these three synonyms for this standard of time;

RECOMMENDS that the World Meteorological Organization should not initiate any further action at present to secure the designation and international use of one agreed term to denote the time reckoned from midnight on the meridian of Greenwich.

* *

Cf : Rec. 20 (CAeM Paris 1950), Publ. OMI No. 80.

Rec. 54 (CSM-I) - KEY STATIONS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING the inadequacies of the present system of reporting cloud observations, particularly with respect to the development, direction and distance from the observer of the clouds reported;

RECOMMENDS that the procedures outlined in the annex to this recommendation be adopted in principle on a trial basis during 1954 by at least one Member, who would desire to participate in this work and whose territory embraces a large area, and that the results be evaluated by that Member to establish the desirability of adopting such a procedure on an international basis.

A N N E X

TRIAL GROUP FOR KEY STATIONS

Certain weather stations, having full-time observers and a free horizon - especially on mountains, sea-coasts or isolated islands, and at ocean weather stations or aerodromes - should be asked to give, in a trial group, special information on the location and development of the clouds visible from the station.

The clouds in the sky may :

(1) Be evenly or irregularly distributed over all the sky;

(2) Occur as a cloud sheet, a group of clouds, or as a single cloud, which mainly occupies a certain part (a segment) of the sky, but which cannot be regarded as a cloud system; or

(3) Be arranged into a so-called cloud system.

At the observational hours for which the station shall send such a trial group, the group should never be missing in the report. (If the sky is cloudless the station shall report I_N0000. If all cloud observation

is obstructed by fog, drifting snow, duststorm, or darkness, the whole trial group is reported as $I_N$xxxx).

In the case of (1) above, the trial group always has the form $I_N C_N 999$.

In the case of (2) above, the trial group has the form $I_N C_N H_N d_N f_N$. The letters in this group have the following meaning :

I_N - Indicator figure or sign for this type of group

C_N - Cloud reported by the trial group, according to the code for C

H_N - Angular distance from the upper edge of the cloud sheet, the group of clouds or the single cloud, down to the horizon. (See Table 1)

d_N - Direction to the highest point above the horizon of the cloud sheet, the group of clouds or the single cloud. (See page 191)

f_N - Development of the cloud sheet, the group of clouds, or the single cloud, during the last half hour, according to Table 2

In the case of (3) above, the trial group has the form $I_S C_S H_S d_S f_S$. The letters in this group have the following meaning :

I_S - Indicator figure or sign for this type of group

C_S - Cloud mainly forming the cloud system reported by the trial group, according to the code for C

H_S - Angular distance from the upper edge of the cloud system down to its base at the horizon. (See Table 1)

d_S - Direction to the highest point above the horizon of the cloud system. (See page 191)

f_S - Development of the cloud system during the last half hour. (See Table 2)

Cloud systems are mainly composed of those clouds which are reported by the code figures C_M = 1, 2, 4, 5 and 7 and also C_H = 4 - 8, but also of Cumulonimbus clouds, especially of the species capillatus, which may fuse or grow into a kind of a cloud system. In a cloud system the clouds are neither irregularly nor evenly distributed over the sky, when the cloud system is approaching. The clouds then grow up from a special segment of the horizon and are thicker or more concentrated in that direction. Moreover, an approaching cloud system is often increasing as a whole, both as to thickness and extension, although the individual clouds, or parts of clouds, may change rapidly and even dissolve. More detailed statements concerning different kinds of cloud systems are found in the International Cloud Atlas, edition 1939.

It is important that a cloud system should not be confused with a bank of low cloud, or of fog, at a distance. By comparison, the latter

is not visible at such a great distance as a cloud system. Therefore, it is generally either white or grey without any yellowish tint, and it is also denser than a bank of approaching medium or high clouds. A bank of low clouds or fog also has a rather clear-cut and generally typical wavy upper edge.

If there is more than one kind of cloud in the sky that fulfills the conditions mentioned in paragraph (2) above, then those clouds should be described each by one trial group. In this case, Cumulonimbus should be preferred for Cumulus, and Altocumulus or Stratocumulus for Stratus.

If two different cloud systems appear simultaneously in the sky in different directions, or in the same direction but at two different levels, each cloud system should be reported by one trial group. If a more or less continuous cover of low clouds (not forming a system) prevents the observer from determining whether there is a cloud system, this cloud cover should be reported as in the case (1).

Table 1

H_N H_S - The angular distance from the uppermost edge of the cloud sheet, etc., or the cloud system, down to the horizon, in the direction d_N or d_S

Angular distance	H_N H_S	Angular distance	H_N H_S
0° - 5°	0	90° - 135°	5
5° - 15°	1	135° - 150°	6
15° - 30°	2	150° - 165°	7
30° - 45°	3	165° - 175°	8
45° - 90°	4	175° - 180°	9

N o t e s :

1. When determining the position of this edge, that part of the celestial dome within which clouds C_N form an essentially continuous cover is taken into account. The rest of the sky where clouds C_N may occur scattered, or may be absent is left out of consideration. (See Fig. 3, page 47, in the Swedish Instruction on the SYNOP Code, S.M.H.I., Stockholm 1952).
   In the case of a group of clouds, only the typical and rather well-developed clouds C_N are counted; the detached or torn pieces of clouds that may occur are disregarded.

2. Stations that have a theodolite, or any other instrument, for determining angular heights, should use this for determining H_N and H_S. In the lack of any instrument, the observer may use the width of the hand (including the thumb), which at full arm's length corresponds to about 10°.

d_N d_S - The direction to the highest point of the cloud sheet, etc., or the cloud system above the horizon

N o t e s :

1. This direction is reported according to a scale from 1 to 8, where 1 = NE, 2 = E, etc.

2. When a cloud system has surpassed zenith and still, on the whole, reaches down to the horizon in that direction from which it invaded the sky, the figure d_S still refers to this direction. When an ordinary cloud cover, or a group of clouds, or an individual cloud, has surpassed zenith, d_N is the direction to the "centre of gravity" of this cloud.

3. If the sky is entirely covered by the cloud system in question, $H_S d_S$ is reported as 99.

Table 2

f_N f_S - The development of the cloud sheet, etc., or of the cloud system, during the last half hour

Cloud development		f_N f_S
There have been no clouds during the last half hour		0
The extension of the cloud system, etc., is decreasing		1
The extension of the cloud system, etc., is unchanged	but its thickness decreases	2
	and its thickness is unchanged	3
	but its thickness is increased	4
The extension of the cloud system, etc., is increasing	but its thickness decreasing	5
	but its thickness unchanged	6
	and its thickness increasing	7
The extension of the cloud system, etc., is rapidly increasing	but its thickness unchanged	8
	and its thickness increasing	9

Rec. 56 (55-CSM) - IMPROVEMENT OF NEW AERONAUTICAL METEOROLOGICAL CODES

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

NOTING,

(1) The opinion expressed by the simultaneous session of the Commission for Aeronautical Meteorology (1st session) and the Meteorology Division of ICAO (4th session), according to which the new aeronautical meteorological code form and codes, as developed by the CSM and approved by Resolution 21 (EC-IV) for implementation as from 1 January 1955, meet the basic requirements of International Air Navigation;

(2) Recommendation 24 (CAeM-I/MET-IV) and Resolution 16 (EC-V);

RECOMMENDS,

(1) That, for indicating changes along a route in the ROFOR and FIFOR code forms, the following additional specifications for the change group $9i_3nnn$ be adopted :

951 xx Gradual change along the route

952 L_aL_a Rapid change at latitude L_aL_a North along the route

953 L_aL_a Rapid change at latitude L_aL_a South along the route

954 L_oL_o Rapid change at longitude L_oL_o East along the route

955 L_oL_o Rapid change at longitude L_oL_o West along the route

with the following plain language alternative terminology :

951 xx GRADU (without time group)

952 L_aL_a RAPID L_aL_aN

953 L_aL_a RAPID L_aL_aS

954 L_oL_o RAPID L_oL_oE

955 L_oL_o RAPID L_oL_oW

In ROFOR, such a change group must be qualified by a change group relative to time;

In FIFOR, this group does not require to be qualified by a change group relative to time;

(2) That the following additional instructions be adopted for the use of any change group $9i_3nnn$ in coded aeronautical meteorological forecast messages :

Meteorological services have the choice between the coded form of the change group and its plain language equivalents for the purpose of ground/ground exchange and ground/air transmission of forecasts. For the purpose of ground-air transmissions of forecasts in TAF code, however, the plain language alternatives of the change group are preferable;

(3) That the following note be adopted for addition to the specification of the symbol :

I_c Type of ice accretion :

This symbol refers to icing deposited on the external parts of the aircraft;

(4) That the following examples of plain language additions to AERO reports when used for landing purposes be added to the examples already given :

Hill top in cloud, fog in valley;

(5) That the relevant part of the explanations regarding the manner of determining N_s in the 8-groups (cloud) be changed to read :

Caution should be taken, however, to avoid unconsidered guessing;

(6) That the following clarification be adopted regarding the height indications in the AERO, TAFOR and TAF code forms :

Heights should be above official aerodrome elevation for AERO reports from aerodromes, but above station level in all other AERO reports. In TAFOR and TAF, height should be above official aerodrome elevation;

(7) That code table 14 for C_e - Cloud character - POMAR code form, be amended to read :

Code figure

1	scattered	mainly stratiform
2	broken	
3	continuous	
4	scattered	mainly cumuliform
5	broken	
6	continuous	
7	scattered	towering Cu or Cb with extensive vertical development
8	broken	
9	continuous	

(8) That the specification of dd - True direction of wind, in tens of degrees, at the level given by HHH - POMAR code form, be extended to make provision of the following :

If the mean wind has been observed at a level different from HHH, it should be reported in the normal manner, with a remark indicating the actual altitude at which it was measured;

(9) That the following note be adopted for addition to the specification of w_x - Present weather - POMAR code form :

Solid precipitation, other than hail, not adhering to the aircraft should be reported by code figure 7 (snow). Precipitation freezing to the aircraft should be reported by code figure 5 (freezing rain). Amplification should be given in remarks when necessary;

(10) That the above changes become effective as from 1 January 1956.

Rec. 57 (55-CSM) - INCLUSION OF DATA FOR 150 AND 100 MB LEVELS IN CLIMAT TEMP AND CLIMAT TEMP SHIP REPORTS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

HAVING CONSIDERED Recommendation 32 (CCl-I);

RECOMMENDS,

(1) That the data for the 150 and 100 mb levels shall be included in CLIMAT TEMP reports;

(2) That this inclusion will come into effect as from 1 April 1956.

Rec. 58 (55-CSM) - INTRODUCTION OF A CLOUD GROUP IN TEMP AND TEMP SHIP CODE FORMS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

HAVING CONSIDERED the request contained in Resolution 10 (CAe-I);

RECOMMENDS,

(1) That the following section (Section 9) be added to the code forms FM 35.A and FM 36.A : 01010 $N_hC_LhC_MC_H$;

(2) That the inclusion of this section in TEMP and TEMP SHIP reports be optional; and

(3) That the regional associations be invited to establish rules regarding the use of this section and its date of introduction.

Rec. 59 (55-CSM) - SPECIFICATIONS OF $\overline{PP}$ AND PPP

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING that the meaning of $\overline{PP}$ in CLIMAT reports of high level stations needs clarification;

RECOMMENDS,

(1) That the following specifications be adopted for $\overline{PP}$ in code forms FM 71 and 72 :

$\overline{PP}$ Monthly mean pressure or monthly mean geopotential for surface stations.

1. $\overline{PP}$ indicates the pressure reduced to an agreed datum level specified for PPP, or the geopotential of an agreed standard constant pressure level specified for PPP;
2. For the zones between latitudes 20°N and 20°S, $\overline{PP}$ reports the pressure in tenths of millibars or the geopotential in geopotential metres or tens of geopotential feet; for other zones, $\overline{PP}$ reports pressure in whole millibars or geopotential in geopotential decametres or hundreds of geopotential feet;
3. In preparing monthly mean values of meteorological elements for broadcasting in CLIMAT reports, the following should be observed when all daily values are not available :
   (a) Where possible, missing daily values are interpolated from the synoptic and aerological charts;
   (b) Where all daily values are not available and cannot be deduced, the mean of available values is given as the monthly mean value, provided that not less than ten individual values are available and provided that there is no continuous period of five days without an assigned value;
4. When $\overline{PP}$ is given in the occasional broadcasts of normal data, following the code word NORMAL, it represents the normal value of the pressure or geopotential for the month, deduced from observations over a thirty-year normal period;

(2) That the following amendment be adopted for the specifications of PPP :

Change the present Note (2)(b), under the specifications for PPP in Volume B to read :

A station which cannot report mean sea level pressure with reasonable accuracy, reports by Regional agreement, in place of PPP (pressure reduced to mean sea level) either the geopotential (in geopotential metres or tens of geopotential feet) of an agreed standard "constant pressure level" or the pressure reduced to an agreed datum level for that station. The level chosen for each station is indicated in Volume A of publication No. 9;

(3) The above changes become effective as from 1 November 1956.

Rec. 60 (56-CSM) - HOURS OF UPPER-AIR OBSERVATIONS

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

CONSIDERING,

(1) That from a scientific and practical point of view there exists a need for the synchronization of synoptic surface and synoptic upper-air observations;

(2) That it is also desirable to obtain the highest possible uniformity in the launching times of balloons, etc., for making aerological observations;

RECOMMENDS the following changes in the Technical Regulations :

(1) Technical Regulation 4.2.1.1 to read : The standard times of upper-air synoptic observations (H) shall be 0000, 0600, 1200 and 1800 GMT;

(2) Technical Regulation 4.2.1.2 to read : The actual times of upper-air synoptic observations should be as close as practicable to (H-30), except that for pilot balloon observations, in order to obtain winds to greater heights, the actual time of an observation may be varied in accordance with the cloud conditions;

(3) Technical Regulation 4.2.1.3 to read : For an upper-air synoptic observation, other than a pilot balloon observation, which requires a substantial time to complete, the actual time of observation should in no case be outside the period from (H-60) to H;

(4) Technical Regulation 4.3.1.2 to read : When four upper-air synoptic observations cannot be made, upper-air observations should be made and reported at 0000 and 1200 GMT at least; and

RECOMMENDS also that :

(5) The above changes be effective from 1 April 1957.

Rec. 61 (56-CSM) - CODE FORM FOR REPORTING SEA ICE BY AIRCRAFT

THE COMMISSION FOR SYNOPTIC METEOROLOGY,

HAVING STUDIED Recommendation 6 (CAeM-I);

RECOMMENDS that the following note (to be numbered 14) be added to code form FM 41.A on pages I-A-1-33 to I-A-1-35 of Volume B of WMO publication No. 9.TP.4 :

(14) Sea ice data. The question of including in the RECCO code form an optional section for reporting sea ice will be studied by the second session of the Commission for Synoptic Meteorology. USA reports sea ice, as observed by aircraft, in a national code form (see page III-A-4-8); other Members may use the same code form, but when adopting it are requested to inform the Secretariat accordingly.

LIST OF DOCUMENTS DISTRIBUTED BEFORE AND DURING THE SECOND SESSION OF THE COMMISSION FOR SYNOPTIC METEOROLOGY

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1	Provisional agenda (Rev. 2)	3	-
2	Explanatory memorandum to the provisional agenda	3	-
3	Discrepancies between Volume B and Cloud Atlas	8.25	President of CSM
4	CLIMAT SHIP reports	8.26	President of CSM
5	Use of symbolic letter Y in SFAZU	8.24	Belgium
6	Numbering system of code specifications	8.23	United Kingdom
7	Humidity indicator in RECCO code form	8.21	President of CSM
8	Reporting of temperature in RECCO and TEMP	8.18	President of CSM
9	Discrepancies between French and English texts of ww = 07 and 08	8.20	France
10	Specification of fog in ww - table	8.19	Canada
11	Specification for various code figures in the group $T_cT_cw_xI_xB_x$ in FM 42.A	8.17	Ireland
12	Specifications for f_a	8.13	Egypt
13	Code form for ground/ground exchange of high level flight forecasts (HIFOR)	8.5	President of CSM
14	Specification of PPP (Add. 1)	8.27	British West Africa, Japan
15	Symbols $\overline{PP}$ and $\overline{hh}$ in CLIMAT reports	8.28	Australia
16	Reporting of cloud base	8.10	Poland, El Salvador

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17	Code form for reporting sea ice by aircraft	8.3	President of CSM
18	Code form for supplementary reports from ocean weather stations	8.7	President of CSM
19	Additional symbolic words and letter groups	8.22	President of CSM
20	Special phenomena	8.8	President of CSM
21	Organization of world issues	13.3	President of CSM
22	Abbreviated code forms for inter-regional exchange of surface reports	8.4	President of CSM
23	Information other than that normally included in synoptic messages	13.4	President of CSM
24	Information issued in collective messages	13.5	President of CSM
25	Guide to synoptic meteorological practice	17	Secretary-General
26	Automatic weather stations	10.2	Secretary-General
27	Colours used in plotting reports	11.1	Secretary-General
28	Verification of forecasts	14.1	Secretary-General
29	Upper-air observations near polar fronts	10.5	Secretary-General
30	Code for weather bulletins issued for shipping	8.32	Secretary-General
31	Systems of code forms and codes	8.1	Secretary-General, President of CSM
32	Ocean weather stations	10.4	Secretary-General
33	Visibility	7.1	Secretary-General

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34	Establishment of national data control authorities	19	Secretary-General
35	Study of analysis symbols by the Secretariat	11.3	Secretary-General
36	Collection of additional information from ocean areas	10.6	Secretary-General
37	Co-ordination of "Dead traffic" procedures for the AFTN with communication procedures for meteorological circuits (Add. 1)	15.3	Secretary-General
38	Standardization of frontal terminology, definitions and nomenclature	14.2	Secretary-General
39	Colours of maps	12	Secretary-General
40	Aircraft reports	10.3	Secretary-General
41	Aircraft weather reconnaissance flights (Add. 1)	10.3.1	Secretary-General
42	Networks in the tropics	10.7	Secretary-General
43	Code table 84 - VV - Horizontal visibility at surface	8.15	Secretary-General
44	Definition of gust	7.4	Secretary-General
45	Streamline and isotherm analysis techniques applicable to tropical regions	14.4	President of CSM
46	Standardization of sea state charts for facsimile transmission	11.2	Canada
47	Nomenclature for ice pellets and its coding under ww	8.30	Canada
48	Specifications for ww code figures 17, 18 and 19, 20-27, 54, 55 and 57	8.31	Canada

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49	Times of upper-air synoptic observations (Add. 1)	10.8	Canada, President of CSM, Secretary-General
50	The free atmosphere section of climatic atlases	18	Secretary-General
51	Preliminary report of the CSM Working Group on networks	6.2, 10.1	Chairman of the working group
52	Temperature and dew-point in TAFOR code form	8.29	President of CSM
53	Standard levels above 200 mb (Add. 1 and 2)	13.6	President of CSM
54	Code 30 - F - force of surface wind	8.12	President of CSM
55	Code C_e - Cloud character	8.14	President of CSM
56	Code for reporting barometric characteristics	8.16	President of CSM
57	Simplified code form for ships in sparse areas (Add. 1)	8.6	President of CSM
58	Code form for reporting ground radar weather observations (Add. 1)	8.2	President of CSM, Secretary-General
59	Elevation of a station to be indicated in WMO publication No. 9.TP.4, Vol. A	7.3	President of CSM
60	Formal adoption of different parts of WMO publication No. 9, Volume B	9.1	President of CSM
61	Definition of the terms used to describe the intensity of meteorological phenomena	7.2	President of CSM
62	Code table 92 A - w_1w_1 - Forecast weather at surface	8.11	President of CSM

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63	Risk group to indicate a more dangerous phenomenon in TAF - TAFOR	8.9	Belgian Congo
64	Significant levels	13.7	President of CSM
65	Networks in the tropics	10.7	President of CSM
66	Pressure reduction	7.5	President of CSM
67	Differences between wind data for routes obtained from upper-air charts by different meteorological services	14.3	President of CSM
68	Extrapolation of sounding for geopotential calculation	7.6	President of CSM
69	Definition of tropopause	8.33	President of CSM
70	Notes to code table for P_w	8.34	President of CSM
71	Questions arising from the first session of the Working Group on telecommunications	15.1,15.2, 15.4	Chairman of the working group
72	Notes to various agenda items in connexion with the report of the Working Group on meteorological telecommunications	8.2,9.2, 10.9,11.3, 13.1,13.2, 13.4,13.5, 15.1,15.2, 15.4,16,22	President of CSM
73	Standardization of maps for facsimile dissemination of master analysis	11.4	President of CSM
74	Time of deposit of analysis and forecast reports	10.9	President of CSM
75	Flash bulletins	13.2.4	President of CSM
76	Use of aeronautical fixed telecommunications network to provide exclusive meteorological circuits	15.1.4	President of CSM

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77	Efficient use of radio-communication channels	15.1.5	President of CSM
78	Modification of frequencies and broadcast times	15.2	President of CSM
79	Specification for various code figures in the group $T_cT_cw_xI_xB_x$ in FM 42.A	8.17	President of CAeM
80	Temperature and dew-point in TAFOR code form (Add. 1)	8.29	President of CAeM
81	Formal adoption of publication No. 9, Volume C, Chapter I	9.2	President of CSM
82	Amended aerodrome forecasts	15.4.1	President of CSM
83	Standardization of addresses for ships' weather reports	15.1.8	President of CSM
84	Representation of WMO at ITU Administrative Radio Conference	15.1.9	President of CSM
85	Improvement in the international exchange of radiosonde reports	13.8	United States
86	Additional abbreviated headings to meet RA IV requirements	15.4.2	President of CSM
87	Special phenomena	8.8	Chairman of the ad hoc working group
88	Reporting missing temperatures	8.18	United States
89	Change in 300 mb reporting level for metres and decametres	8.35	United States
90	Elevation of a station to be indicated in WMO publication No. 9.TP.4, Volume A	7.3	President of CSM
91	RAREP code for ocean station vessels	8.2	United States

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92	Aerological observations made by the ocean weather observation stations on the North Atlantic	10.4.1	Secretary-General
93	Review of earlier recommendations and resolutions concerning the field of synoptic meteorology	16.2	Secretary-General
94	Forecast verification in Canada	14.1	Canada
95	Code table 84 - VV - Horizontal visibility at surface	8.15	Australia
96	Definition of gust	7.4	India
97	Coding of upper-air wind data in CLIMAT reports	8.37	Federal Republic of Germany
98	Codes for wind speed maximum and for tropopause data	8.38	Federal Republic of Germany
99	Adoption of the 250 mb surface as a standard pressure surface (Add. 1)	13.9	United States, President of CSM
100	Change in standard ship position groups	8.39	United States
101	Revision of the wording of the synoptic code	8,9.1	President of CSM
102	Standardization of analysis symbols and of frontal terminology, definitions and nomenclature	11.3, 14.2	Union of South Africa
103	Unit used in hh of the group $8h_th_chh$, IAC	8.40	Japan
104	Procedures for the issue and exchange of information from ocean station vessels	7.7	Netherlands
105	Standardization of projections, scales and isohypses used for weather charts included in flight forecast folders	11.4	ICAO Secretariat

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106	Observations on the agenda of the CSM	8.3,8.32, 8.39	President of CMM
107	Report of the president of the Commission for Synoptic Meteorology	5	President of CSM
108	Standard levels	13.6	President of CAeM
109	Improvement in the international exchange of radiosonde reports	13.8	President of CAeM
110	Code table 92A-w_1w_1 - Forecast weather at surface	8.11	President of CAeM
111	Risk group to indicate a more dangerous phenomenon in TAF-TAFOR	8.9	President of CAeM
112	Comments on preliminary report of the CSM Working Group on networks	6.2,10.1	President of CAeM
113	Relations with other international organizations in the field of meteorological telecommunications	13.1.2	Secretary-General
114	Guide to Meteorological Telecommunications	9.2	Secretary-General
115	Simplified code form for ships in areas where observations are sparse	8.6	President of CSM
116	Comments by Rhodesia and Nyasaland on items on the agenda of CSM-II	7.2,8, 10.8,11.1, 13.6,13.8, 17	President of CSM
117	Meaning of the terms Local and Scattered used in aviation forecasts and provision for reporting scattered distribution in ROFOR, FIFOR and ARFOR codes	8.11	India

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118	Establishment of a network of weather radar stations and adoption of a suitable code for reporting the radar observations for synoptic purposes	8.2	India
119	Coding of thunderstorms in ww-Code 92	8.46	Canada
120	Index numbers for stations making observations in physical meteorology	8.36	Secretary-General
121	Visibility	7.1	India
122	Definition of the terms used to describe the intensity of meteorological phenomena	7.2	India
123	Extrapolation of soundings for geopotential calculation	7.6	India
124	Code form for reporting ground radar weather observations	8.2	India
125	Abbreviated code form for inter-Regional exchange of surface reports	8.4	India
126	Code form for ground/ground exchange of high-level flight forecasts (HIFOR)	8.5	India
127	Risk group to indicate a more dangerous phenomenon in TAF-TAFOR	8.9	India
128	Code table 30-F - Force of surface wind	8.12	India
129	Code table 84 - VV - Horizontal visibility at surface	8.15	India
130	Humidity indicator in RECCO code form	8.21	India

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131	Temperature and dew-point in TAFOR code form	8.29	India
132	Code for weather bulletins issued for shipping	8.32	India
133	Organisation of world issues	13.3	India
134	Information other than that normally included in synoptic messages	13.4	India
135	Verification of forecasts	14.1	India
136	Differences between wind data for routes obtained from upper-air charts by different meteorological services	14.3	India
137	Standardization of addresses for ships' weather reports	15.1.8	India
138	Co-ordination of "Dead traffic" procedures for the AFTN with communication procedures for met. circuits	15.3	India
139	Intensity of precipitation	7.2	United Kingdom
140	Automatic weather stations	10.2	President of CAeM
141	Definition of gust	7.4	President of CAeM
142	Code table 84 - VV - Horizontal visibility at surface	8.15	President of CAeM
143	Temperature and dew-point in TAFOR code form	8.29	President of CAeM
144	Code form for ground/ground exchange of high level forecasts (HIFOR)	8.5	President of CAeM
145	Information other than that normally included in synoptic messages	13.4	President of CAeM

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146	Suggestions concerning changes in the specifications for ww	8.31	USSR
147	Abbreviated code forms for inter-Regional exchange	8.4	USSR
148	1000 mb geopotential in synoptic reports	7.8	Canada
149	Standardization of frontal terminology, definitions and nomenclature	14.2	Egypt
150	Improvement in the international exchange of radiosonde reports	13.8	United Kingdom
151	Definition of terms used for describing the intensity of meteorological phenomena	7.2	France
152	Co-ordination of "Dead traffic" procedures for the AFTN with communication procedures for meteorological circuits	15.3	President of CAeM
153	Relations with other international organizations in the field of meteorological telecommunications	13.1.2	Secretary-General
154	Verification of forecasts	14.1	France
155	World-wide organization of meteorological broadcasts by radio	13.3	United States
156	Code form for ground/ground exchange of high-level forecasts (HIFOR)	8.5	United Kingdom
157	Specifications for ww code figures	8.31	Pakistan
158	Code table 84 - VV - Horizontal visibility at surface	8.15	Pakistan
159	Standardization of sea state charts for facsimile transmission	11.2	United States

Doc. No.	Title of document	Agenda item	Submitted by
160	Times of upper-air synoptic observations	10.8	United States
161	Upper level reports from land stations and ships	8.41	New Zealand
162	Elevation of a station to be indicated in WMO publication No. 9.TP.4, Volume A	7.3	British West Africa
163	Technical Regulations	16.1	British West Africa
164	Colours of maps	12,17	British West Africa
165	Collection of additional information from ocean areas	10.6	United States
166	Gusts	7.4	France
167	Upper level reports from land stations and ships	8.41	Sweden
168	*		
169	Meteorological automatic stations in France	10.2	France
170	Establishment of meteorological stations in small islands	16.1	Madagascar

* Document 168 does not exist.