

WORLD METEOROLOGICAL ORGANIZATION

COMMISSION FOR BASIC SYSTEMS

**IMPLEMENTATION CO-ORDINATION TEAM
ON INFORMATION EXCHANGE MANAGEMENT
FIRST SESSION**

GENEVA, 2-5 MAY 2000



FINAL REPORT

AGENDA

1. ORGANIZATION OF THE MEETING

- 1.1 Opening of the meeting
- 1.2 Adoption of the agenda
- 1.3 Working arrangements

2. REVIEW OF THE RECOMMENDATIONS OF OTHER EXPERT TEAMS

3. REVIEW OF GTS OPERATION AND INFORMATION EXCHANGE

- 3.1 Routing of data on the main telecommunication network
- 3.2 Review and status of implementation of RTH responsibilities

4. FORMAT OF METEOROLOGICAL MESSAGES

5. EXCHANGE OF FILES BY FTP

6. CATALOGUE OF METEOROLOGICAL BULLETINS

7. GTS MANAGEMENT INFORMATION

8. FUTURE WORK PROGRAMME

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1. ORGANIZATION OF THE MEETING (Agenda item 1)

1.1 Opening of the meeting

The meeting of the Implementation Co-ordination Team on Information Exchange Management was opened at 10.00 a.m. on Thursday 2 May 2000 in the Headquarters of the WMO Secretariat in Geneva. Ms M. Popova (Bulgaria) chaired the meeting. Mr D. Schiessl, Director for the World Weather Watch, Basic Systems Department of WMO opened the meeting on behalf of the Secretary-General and welcomed the experts to Geneva and the new WMO building. Mr Schiessl outlined the task entrusted by CBS and the objectives of the meeting. The primary purpose was to review and make further recommendations for the improvement of the GTS operation and information management.

1.1 Adoption of the agenda

The meeting adopted the agenda as reproduced at the beginning of this report.

1.2 Working arrangements

The meeting agreed upon working hours and arrangements.

2. REVIEW OF THE RECOMMENDATIONS OF OTHER EXPERT TEAMS

2.0 In the new CBS working structure, Implementation Co-ordination Teams (ICTs) are mainly based on regional representation to focus on the co-ordination of operational implementation aspects. Under this agenda item, the session considered the technical proposals developed by the relevant ISS/Expert Teams, and expressed comments related to the implementation and operational aspects of the recommendations in the respective WMO regions.

Expert Team on Data-Communication Systems and Techniques

2.1 The session reviewed the report of the first session of the Expert Team on Data-Communication Systems and Techniques (Geneva, September 1999). It noted with appreciation the further development of procedures and implementation guidance, in particular the refinement of TCP sockets procedures to mitigate possible loss of data, guidance for the migration and transition from X.25 to TCP/IP, as well as procedures for IP addressing and routing.

2.2 The session noted that an ever-increasing number of GTS centres (NMCs and RTHs) implemented TCP/IP for internal and national purposes. It also noted that the migration towards TCP/IP on GTS regional circuits and MTN circuits was progressing quickly. In Region VI, the implementation of the RMDCN was an opportunity for a migration to TCP/IP for a number of NMSs. The use of TCP/IP has also facilitated the replacement and upgrade of GTS systems as well as the introduction of computer based systems for GTS operation NMCs of some developing countries

2.3 The session noted that the implementation of TCP/IP sockets had facilitated the migration of GTS applications to TCP/IP, although it does not provide for end-to-end protocol mechanisms. It expressed some concern that TCP/IP sockets should be a transitory implementation, which nevertheless might last some time, towards the implementation of standard end-to-end procedures. It also noted that the use of FTP on the GTS has achieved widespread acceptance amongst National Meteorological Services. The mechanism for the transmission of 'normal' GTS messages (with Abbreviated Heading Line-AHL) batched in

files exchanged via FTP, as described in Attachment II-15, was widely adopted for operational use by many centres, including on the MTN. On the other hand, there was no indication of the use of other FTP mechanism (filenaming, metadata) for the transmission of files over the GTS. This matter was discussed in more details under agenda item 5.

2.4 As all WWW centres would in the near future or had already implemented access to the Internet, the session emphasized the critical importance of adequate security measures to ensure efficient and safe operations for the GTS. It noted with appreciation that the ET-DCST further developed guidance in this respect, with a view to ensuring a reasonable and affordable level of security and protection of GTS systems and centres. It concurred with the ET-DCST that a level of 100% security is not achievable, and that an acceptable compromise between the equipment and human resources involved and the accepted level of risk should be found at each centre. Nevertheless, it urged all GTS centres to pay due attention to this crucial matter, and invited the ET-DCST to pursue the development of relevant guidance.

2.5 The session noted with appreciation the planned on-line DCST information resources for making available to all Members practical information and guidance on the actual implementation of data communication systems and techniques.

Expert Team on the Improved Main Telecommunication Network

2.6 The session noted the draft project for the Improved Main Telecommunication Network, developed by the first session of the Expert Team on the Improved Main Telecommunication Network (Geneva, October 1999). The project had been reviewed by the Implementation Co-ordination Meeting on the Main Telecommunication Network (Geneva, October 1999), which agreed that the project was the best solution taking into account MTN requirements, technical efficiency, cost effectiveness, implementation feasibility and early benefits for the whole GTS.

2.7 All Members operating an RTH on the MTN were consulted about the draft project to seek their comments, possible preliminary agreement on the general concept and indication of their willingness and ability to proceed with implementation. The session noted with satisfaction that all the replies received so far (ten out of 18) supported the IMTN project. Noting that CBS-XII (2000) should be in a position to take well-coordinated decisions on the further development of the IMTN project, the session urged all NMSs operating an MTN centre to reply to the consultation from the Secretary-General of WMO. The session also noted from preliminary cost estimates obtained from potential telecommunication service providers that the IMTN would permit significant savings on recurrent costs in comparison with the current leased circuits, while enabling capacity upgrades.

2.8 In this regard, the session noted that design principle 2 of the GTS should be updated to reflect the increasing importance of data communication network services for the implementation of the GTS for the MTN and RMTNs. It recommended principles 2 and 4 (Part I, para. 1.3) to read as follows:

Principle 2

The system shall comprise an integrated network of point-to-point circuits, point-to-multipoint circuits, broadcast and multipoint-to-point circuits which are reliable and have suitable technical and operational characteristics. These circuits may be [composed of established via](#) a combination of terrestrial and satellite telecommunication links, [and data-communication network services](#).

Principle 4

In the planning of the circuits and transmission schedules, daily volume of traffic to be

passed over any one channel circuit shall not exceed 80 per cent of its theoretical capacity. The channels-circuits shall be designated to ensure the highest practicable reliability and availability.

Expert Team on Quantity Monitoring)

2.9 Mr B. Sumner, chairman of the Expert Team on Quantity Monitoring, presented the report of the first session of the expert team, which was held in Geneva in September 1999. The report includes a proposal for an integrated WWW quantity real-time and non real-time monitoring (Annex to paragraph 4.1 of the report). The ICT-IEM expressed the opinion that the real-time problems experienced by GTS centres in the exchange of bulletins on the GTS were in most cases well known (e.g. failures of circuit), and that the proposed procedure would not facilitate overcoming problems in this respect. It was even felt that real-time monitoring procedures would impose an additional burden that operating staff could not face in case of operational difficulties. The procedures proposed for the real-time monitoring by the expert team would require additional resources for their implementation and operation, and could not be implemented as proposed.

3. REVIEW OF GTS OPERATION AND INFORMATION EXCHANGE (Agenda item 3)

Results of the 1999 Annual Global Monitoring

3.1 The Secretariat presented a comparison of the SYNOP reports received by the MTN centres during the 1999 Annual Global Monitoring (AGM). A summary of the comparison is given in Annex to this paragraph. The differences in the availability of SYNOP reports are due:

- The plan for routing data on the MTN (see Figure I of Attachment I-3) includes shortcomings;
- To the fact that bulletins were not relayed on the whole GTS. This may occur when the switching directories of GTS centres are not updated. This also may be due to incorrect implementation of the GTS procedures, as when reports from RBSN stations for global exchange are compiled into bulletins with ii>19 but are not compiled into bulletins for global exchange.
- To the fact that the bulletins are routed on different GTS circuits, which have not the same level of reliability.
- To different methods of implementing the monitoring procedures at centres. Some centres monitored a sub-set of the RBSN stations. The algorithms used to count the reports are different.

3.2 The meeting found very useful the presentation of the comparison prepared by the Secretariat by using coloured charts showing for each station the percentage of SYNOP reports received by each MTN centre in comparison with the total number of reports received by the MTN centres. The meeting requested the Secretariat to continue preparing those charts and to make them available in the WMO server for the next AGM exercises. It requested the Secretariat to also prepare for test purposes such charts for TEMP reports for the 1999 AGM exercise and to make them available in the WMO server.

3.3 The analysis of the Secretariat allowed to identify areas, from which several MTN centres did not receive the SYNOP reports received by the other centres, such as:

- Europe for Melbourne, Beijing, New Delhi, Cairo, Nairobi, Toulouse, Washington, Tokyo, Brasilia; this could be due to the fact reports from RBSN stations located in Europe are compiled into bulletins with ii>19 but are not compiled into bulletins for global exchange,

and consequently the bulletins were not switched to the centres or ignored in the monitoring results.

- An area including Iran, Pakistan, India and Myanmar for all centres except for New Delhi; this could be due to anomalies in the insertion of data from the zone of responsibility of RTH New Delhi into the GTS and their further relay on the MTN;
- The Southern part of Africa for Offenbach, Bracknell, New Delhi, Cairo, Nairobi, Toulouse, Moscow and Brasilia; this could be due the fact that the relevant data were received by WMC Washington on the circuit Pretoria - Washington, but were not relayed neither on the circuits Pretoria - Lusaka - Nairobi –Offenbach nor on the circuit Washington – Bracknell.

Routeing of the observational data on the MTN

3.4 The meeting noted with concern that the monitoring results still revealed major deficiencies in the exchange of observational data on the MTN. The observational data (excluding radar and satellite data) represent a small amount of the set of data exchanged on the MTN. The observational data could therefore be relayed to each MTN centre on different routes on the MTN. The meeting **recommended** that all the observational data for global exchange (see new paragraph 2 of Attachment I-3 in Annex to paragraph 3.10) received by a MTN centre from an adjacent MTN centre be relayed to all other adjacent RTHs located on the MTN. The implementation of the procedures to detect and eliminate duplicated bulletins at MTN centres would avoid loops in the transmission of the bulletins on the MTN. The meeting re-emphasised the importance of the implementation of this procedure.

3.5 The meeting requested the Secretariat to send letters to the Members operating an RTH on the MTN inviting them:

- To consider the recommendation given in the above paragraph 3.4;
- To start testing its implementation not later than the end of July 2000 on the MTN circuits as well on the other circuits linking two MTN centres;
- To send the results of the AGM to the Secretariat before the end of October 2000 so that the Secretariat can submit an analysis of the AGM results showing the impact of the implementation of the test of the recommendation before CBS-XII in November.

3.6 The implementation of the recommendation given in the above paragraph 3.4 would allow to stop RTHs maintaining the routeing of the transmission programmes on the MTN circuits as given in figure 1 – Plan for the routeing of observational data on the MTN - of Attachment I-3 of the Manual on the GTS since any of those transmission programmes might be exchanged on any MTN circuit, and therefore figure 1 should be deleted from Attachment I-3.

3.7 The meeting was of the opinion that the capacity of the MTN centres and circuits make it possible to exchange all observational data available in the WMO Member countries on the MTN that the GDPS require. It recommended to amend accordingly paragraph 2 of Attachment I-3 of the manual on the GTS. It also recommended to amend the definition and the use of the digits ii in the abbreviated headings to allow the global distribution of the series 01-39. It confirmed that the reports prepared at the main synoptic hours at the stations included in the RBSNs shall be compiled within bulletins with ii in the series 01 to 19. It recommended to amend accordingly paragraph 2.3.2.2 of Attachment II-5 of the Part II of Volume I of the manual on the GTS. In this regard, the session reviewed the related procedures for the exchange in bulletins of “essential data”, as defined in Resolution 40 (Cg-XII). The meeting felt that it would be useful to identify the “essential data” and invited CBS to recommend that “essential data” be compiled into bulletins with ii in the series 01 to 19; other types of data, including "additional data", should be compiled in the ii series above 19.

3.8 In many instances, same reports are compiled within bulletins with different abbreviated headings in the series 01-39. With a view to avoiding several retransmissions of the same reports on the same MTN circuits, the meeting recommended that GTS centres, which recompile reports into bulletins for specific purposes, shall use ii above 39.

Routeing of addressed messages

3.9 The meeting noted with appreciation the work done by RTHs Moscow, Offenbach and Tokyo in developing a plan for routeing messages on the MTN, in particular addressed messages. It requested the Secretariat to co-ordinate with the focal points of RTHs Moscow, Offenbach and Tokyo a proposal for a plan for routeing addressed messages on the MTN and to submit it to the focal points of the RTHs located on the MTN. The meeting requested the Secretariat to post the final version of the plan on the WMO server.

Amendments to the Manual on the GTS

3.10 As a result of the discussion under the agenda item 3, the meeting recommended to amend the Manual on the GTS as given in Annex to this paragraph. The meeting recommended to invite the Regional Associations to review the relevant parts of the Volume II of the Manual on the GTS to ensure their consistency with the new principles for the establishment of the exchange programme for observational data on the MTN (see new paragraph 2 of Attachment I-3).

4. FORMAT OF METEOROLOGICAL MESSAGES (Agenda Item 4)

Operational procedures

4.1 The three-digit sequence number in the starting line of the meteorological messages is insufficient in case of high speeds transmission. The meeting was of the opinion that a five-digit group should be used under bilateral agreement when appropriate and recommended to amend the Manual in this respect (see part B of Annex to paragraph 3.10).

4.2 At the request of ICAO, and in its role as WAFC London, The Met. Office produces Binary Coded Global Significant Weather Charts in BUFR format for distribution to the Aviation Community. The current allocation of Data Type Designators as given in Attachment II-5 to Volume I, Part II of the Manual on the GTS does not provide appropriate designators for this purpose. The BUFR format enables many types of data to be encoded in this format, but the current Abbreviated Heading structure for forecast information in BUFR format is restrictive.

4.3 The meeting recommended to amend Attachment II-5 to Volume I of the Manual on the GTS as given in Annex to this paragraph. These would then bring the format of the abbreviated headings to be in line with those used for GRIB and T.4 products, which they more closely resemble.

4.4 Paragraph 2.3.2.2 of the Part II of Volume I of the Manual on the GTS includes provisions for two forms of the indicator BBB: form (a) (RR_x) and form (b) (RTD). The form (b) should only be used by those centres not yet able to use form (a); at such centres, use of form (a) should be introduced as soon as possible. The meeting recalled that these provisions were introduced by CBS-Ext.(85) and recommended stopping the use of form (b) as from 1 November 2001 (see part B of Annex to paragraph 3.10).

4.5 The meeting requested the Secretariat to dispatch in a next amendment to the Manual on the GTS the new Table A of Attachment II-5 reflecting the increase of the maximum length of the alphanumeric messages (15000 octets instead of 3800 octets).

Data representation forms migration strategy

4.6 The session noted the recommendation for a possible migration strategy developed by the ISS/ICT on data representation and codes at its recent session (Geneva, 10-14 April 2000). The proposed strategy foresees the complete replacement of all traditional WMO code forms for observational data by November 2005 by CREX and BUFR, with the further elimination of CREX by November 2009. The strategy envisages that during the transition period from 2002 until the target date of November 2005, observational data would be exchanged in parallel in various forms, i.e. traditional WMO code forms, CREX and BUFR to meet the requirements and ability to cope with the new forms by WWW centres. The ICT on data representation and codes estimated that the additional volume of data would not have any significant impact on the GTS.

4.7 The ICT-IEM stressed that such a migration strategy should cope with a number of serious operational issues in order to provide a feasible and realistic project, including a thorough analysis of data exchange management. It emphasized in particular that the conversion from one data representation form to another form (e.g. from SYNOP or TEMP into CREX or BUFR or reverse) can only be handled by Data Processing functions, as GTS functions cannot and shall not deal with the data content of messages or files; the related impact on delay in the availability of observational data should be thoroughly considered. The ICT-IEM also stressed that the impact on the GTS of multiple data forms in parallel would be more significant and possibly serious on the number of messages to be handled (e.g. on routing directories) rather than the data volume itself. The largest part of routing directories in RTHs are already dedicated at present to observational data, although of a limited volume, and increasing these directories entries by a factor of two or three would have a serious impact on relevant software and hardware resource, including disk capacity, as well as on routing management.

5. EXCHANGE OF FILES BY FTP (Agenda item 5)

5.1 The session reviewed the matters related to the exchange of files by FTP on the GTS, including procedures as given in Attachment II-15 (use of TCP/IP on the GTS) of the Manual on the GTS and further development required for file transfer on the GTS (e.g. filenaming conventions, procedures for metadata exchange). It noted that the procedure for the transmission of 'normal' GTS messages (with Abbreviated Heading Line-AHL) batched in files exchanged via FTP has been successfully implemented by many GTS centres and facilitated the efficient introduction of FTP on the GTS for operational data exchange. It noted that the file naming convention being used (CCCCNNNNNNNN.ext with location identifier of the sending Centre and a sequential number), met its limited objective of enabling file transfer between centres, while relying on the existing procedures (AHL) for the identification of the file content.

5.2 On the other hand, the session noted that there was not any indication of the use of the other mechanism described in Att. II-15 for the transmission of "non-AHL data" in files over the GTS via the use of an associated metadata file. The session noted, however, that "non-AHL data" files were routinely transmitted on some parts of the GTS, but without associated metadata files. It also noted that the metadata description standards were not yet developed, but that a proposal was considered by the ICT on data representation and codes, based on ISO standards. The session re-affirmed the crucial importance of standard conventions for filenaming and metadata for WMO programmes in general, and for the WWW in particular.

5.3 In this context of file exchange on the GTS, the session considered the most appropriate mechanisms for exchanging data on the GTS. It confirmed that, in view of time delay constraints and general data requirements, the distribution mechanism (data push) for the observational data remains the most effective system for the foreseeable future. On the other hand, the session felt that the exchange mechanisms for processed products, taking into consideration the limited number of sources (WMCs and RSMCs) as well as different requirements from user centres, needed to be reviewed, and that downloading product files (data pull) would have a significant number of advantages, including the access to metadata. The session emphasized, however, that in order to ensure a guaranteed level of quality of data-communication services on the GTS, co-ordination and efficient management mechanisms should be in place to prevent a system overload, which may be inherent to data pull services (too many users accessing data at the same time). The session agreed that this matter should be carefully studied as a matter of urgency, in co-operation with the ET-DCST, and be included in its future work programme.

5.4 The session considered a proposal for the access to and format of metadata metafile which was already in operation at WMC/RTH Washington (<http://www.nws.noaa.gov/dataproduct.html>). It agreed that this format and procedure presented several strengths and opportunities, including a full compatibility with current Internet standards. The system offers several options to users, including the access to metadata for consultation, the easy identification of changes, the possibility of copying directory and sub-directory trees in their own system, and avoiding the systematic transfer of metadata that is not likely needed. The proposed metafile system is described in Annex to this paragraph, and the ICT-IEM agreed to pursue the analysis and development of this method. It also invited the ISS/ET-DCST to consider the development and inclusion of the recommended procedures for use on the GTS of the "http" protocol, in order to support the proposed metafile system.

6. CATALOGUE OF METEOROLOGICAL BULLETINS (Agenda Item 6)

6.1 Following the decisions and recommendations of the extraordinary session of the CBS (Karlsruhe, 1998), the WMO Secretariat developed an application to update the complete catalogue of meteorological bulletins (Volume C1), and to prepare the METNO messages including the advanced notifications of the changes to the Volume C1, on the basis of the information provided by the MTN centres. The application was developed using the software Microsoft Access97. A description of the application is given in Annex to this paragraph.

6.2 The seven following MTN centres transferred their parts of the catalogue into the WMO FTP server: Melbourne, Moscow, Nairobi, Offenbach, Sofia, Tokyo and Toulouse. The Secretariat carried out tests to use these parts for updating the complete catalogue of meteorological bulletins (Volume C1) and to prepare the METNO messages. Some problems of formats of presentations of the parts were experienced and solutions were being discussed between the Secretariat and the relevant RTH focal points. The relevant remarks related to the formats of the catalogue of meteorological bulletins are given in Annex to this paragraph. The meeting recommended to implement the remarks. The meeting recommended to amend paragraph 5.2.3 of the Part II of the manual to include the two abbreviated headings for the METNO messages (see part B of Annex to paragraph 3.10):

NOXX01 LSSW for a METNO message related to Volume A
NOXX02 LSSW for a METNO message related to Volume C1.

6.3 Those MTN centres, which are not yet in a position to transfer **both** their parts of the catalogue and the advanced notifications into the WMO FTP in accordance with the agreed electronic formats, should compile the changes to the catalogues from their zone of

responsibility and send the advanced notifications to the Secretariat in accordance with the format of the advanced notifications approved by CBS. The advanced notifications should preferably be sent in the form of a file, e.g. attached to an Internet message. The WMO Secretariat will provisionally maintain the relevant parts of the catalogue as long as the MTN centres will not maintain their own parts.

6.4 With a view to maintaining the parts of the catalogue not yet maintained by the MTN centres, the Secretariat developed an application which could be used by the MTN centres to maintain their own parts. This application may be provided to the MTN centres to facilitate their implementation of the comprehensive catalogue. The installation of the application would require a licence to use the software Microsoft Access97 and the availability of a PC. The meeting requested the Secretariat to invite the MTN centres to consider using this WMO application to facilitate their implementation of the comprehensive catalogue.

6.5 The meeting noted the updating of the catalogue by RTH Offenbach in its zone of responsibility led to the addition of 126 bulletins and the deletion of 217 bulletins, corresponding to 17 per cent and 30 per cent of the 721 bulletins included in the previous version of the catalogue. The meeting was of the opinion that the implementation of the comprehensive catalogue should lead to a major improvement of the content of the catalogue, by ensuring that it includes the bulletins actually exchanged on the GTS. It recommended to invite all MTN centres to implement their own part of the catalogue with a view to achieving a complete catalogue.

6.6 The meeting requested the Secretariat to recall the procedures for the maintenance of the comprehensive catalogue in the operational newsletter of the WWW.

6.7 The meeting requested the Secretariat to consider providing the comprehensive catalogue on CD-ROM, including Acrobat PDF format.

7. GTS MANAGEMENT INFORMATION (Agenda item 7)

Routeing catalogues of RTHs

7.1 In accordance with paragraph 2.10.3.3 of the Part II of the Volume I of the Manual on the GTS, each RTH should prepare a routeing catalogue and make it accessible by the other GTS centres, in particular by its associated NMCs, and the routeing catalogue should be updated monthly if possible, but not less than every three months. Not all RTHs implemented their catalogue. Not all RTHs having implemented their catalogue update it every three months. The meeting agreed that the routeing catalogues were very useful information for the management of the GTS. The meeting strongly recommended all RTHs to fully implement the recommendations included in paragraph 2.10.3.3.

7.2 In accordance with paragraph 2.10.3.4 of the Part II of the Volume I of the Manual on the GTS, a GTS centre should include in its routeing catalogue the abbreviated headings of all the bulletins transmitted on satellite distribution systems. This information is very useful for the countries planning to implement or operating a satellite receiving system. The meeting noted that some RTHs provided this information in their catalogue and recommended that all RTHs operating a satellite distribution system follow the same procedure. The meeting recalled that CBS-Ext.(98) recommended that the RTHs operating a satellite distribution system send to the Secretariat a summary of the transmission programme to be inserted in the Volume C2. The Secretariat has not yet received such summaries.

7.3 In accordance with paragraphs 2.10.3.4 and 2.19.3.5 of the Part II of the Volume I of the Manual on the GTS, any bulletin scheduled to be received by the centre, even if not actually forwarded on the GTS, should be included in the routeing catalogue, and the

bulletins received and/or transmitted on a circuits established under a bilateral agreement for meteorological data exchange should also be included in the catalogue. In accordance with paragraph 1.4 of Attachment II-7, in the combination of characters CCCC, wild cards should only be used when the GTS centres cannot provide complete information, but the use of wild cards is not recommended, since this limits the information. The meeting noted that not all RTHs follow those procedures. The meeting stressed that, for the GTS managers, it was important to access to the complete list of bulletins available at the RTHs. It therefore recommended to invite the RTHs to fully implement those procedures.

7.4 The formats of presentation of the routeing catalogues of some RTH are not in conformity with the format recommended in Attachment II-7. In particular, fields are not separated by commas, which does not facilitate the importation of the catalogues into data base applications for their further processing. The meeting recommended that all the RTHs apply the recommended standardised format.

7.5 The Secretariat presented the results of a comparison between the bulletins included in the catalogue of meteorological bulletins, the bulletins included in the routeing catalogues of fifteen MTN centres, and the bulletins received during a SMM exercise. The comparison showed that there were significant discrepancies, which were due to the following main reasons:

- The RTHs did not include all the bulletins in their routeing catalogues (see above paragraph 7.3);
- The catalogue of meteorological bulletins was not updated (see above 6.5).

The meeting found very useful the comparison and requested the Secretariat to prepare such a comparison twice a year and to post the results in the WMO server.

7.6 The meeting noted that some GTS centres are not aware or well informed of the procedures related to the routeing catalogues given in the Manual on the GTS. It requested the Secretariat to include the procedures in a next issue the operational newsletter of the WWW.

Volume A – Observing stations

7.7 The meeting agreed that the Volume A was not sufficiently updated to be used in monitoring operation. Information on the real operation of the observing stations was needed. In this regard, the session noted with interest that the RA IV/WG-PIW recommended that, in view of the importance of validated information on observing stations for operational purposes, a master reference operational catalogue of observing stations be developed and made available to all NMHSs. The information contained in the catalogue would take into account the information provided for Vol. A, but will also take due account of the information provided by quality control lead centres as well as quantitative monitoring with respect to the actual implementation of observing programmes. The recommendation was forwarded to the forthcoming session of the CBS/OPAG on Integrated Observing System (September 2000).

Development of a pilot project for an interactive access to the GTS management information in the WMO server through Internet

7.8 The following GTS management information is available in relational data bases in the WMO server through Internet:

- Catalogue of meteorological bulletins. The catalogue provides information on the bulletins prepared by the centres. The catalogue provides the links between the observing stations and the bulletins, which contains the reports made at the stations.

- Routing catalogues of RTHs. The routing catalogue of an RTH provides information on the bulletins available or expected to be received at the RTH. It provides information on the transmission of these bulletins to the adjacent centres or through the broadcasts operated by the RTH.
- Monitoring results (AGM, SMM). The monitoring results show the availability of the observational data at the monitoring centres and make it possible to compare the availability between centres. It provides information on the actual compilation of the reports into the bulletins,

7.9 For the time being, the user has to load the files and to develop his own application programmes to process this information. The development by the Secretariat of an application for an interactive access to the GTS management information in the WMO server through Internet would have the following advantage:

- It would ensure a better use of the GTS management information by WWW centres, notably by establishing links between the data bases;
- It would avoid that the WWW centres download long files with a view to processing them locally;
- It would avoid duplications of efforts for the development of application programmes by the WWW centres to access to the information.

7.10 As regards the monitoring results, CBS-Ext. (98) supported the principle that a monitoring plan should include a mechanism plan for remedial action to address identified deficiencies. The meeting of the Expert Team on Quantity Monitoring of the WWW (September 1999) felt that the monitoring information was so voluminous that a large amount of work was required to extract the details needed to investigate a particular problem. The information could be made more useful through further consolidation and tailoring of the results to highlight problems for the particular Members concerned.

7.11 The meeting agreed that an interactive access to the GTS management information would greatly facilitate the work of the GTS managers. It recommended that a pilot project be developed and that the potential use of such an interactive access be evaluated by the GTS centres. The pilot project should allow requests for information through menus as follows:

- For a station preparing SYNOP reports, the user should access the co-ordinates of the station, the country operating the station, the RTH responsible for its insertion into the RMTN, the number of reports received during the last monitoring exercises, the abbreviated headings of the bulletins into which the reports are expected to be compiled (Volume C1) and the abbreviated headings of the bulletins which contained the reports and were received during the last monitoring exercises.
- For a country, the user should access the results of the last SMM exercise, the list of bulletins prepared by the country, the bulletins received during the last monitoring and the possible deficiencies revealed by the last SMM exercise;
- For a bulletin, the user should access the content of the bulletins as given in Volume C1 and as received during the last SMM exercise (e.g. lists of index number of stations compiled into the bulletin), the bulletins received during the last monitoring exercises (text of any bulletin, number of bulletins etc.), the routing of the bulletin on the GTS as extracted from the routing directories of the RTHs.

The meeting requested the Secretariat to seek the resources required to develop the proposal.

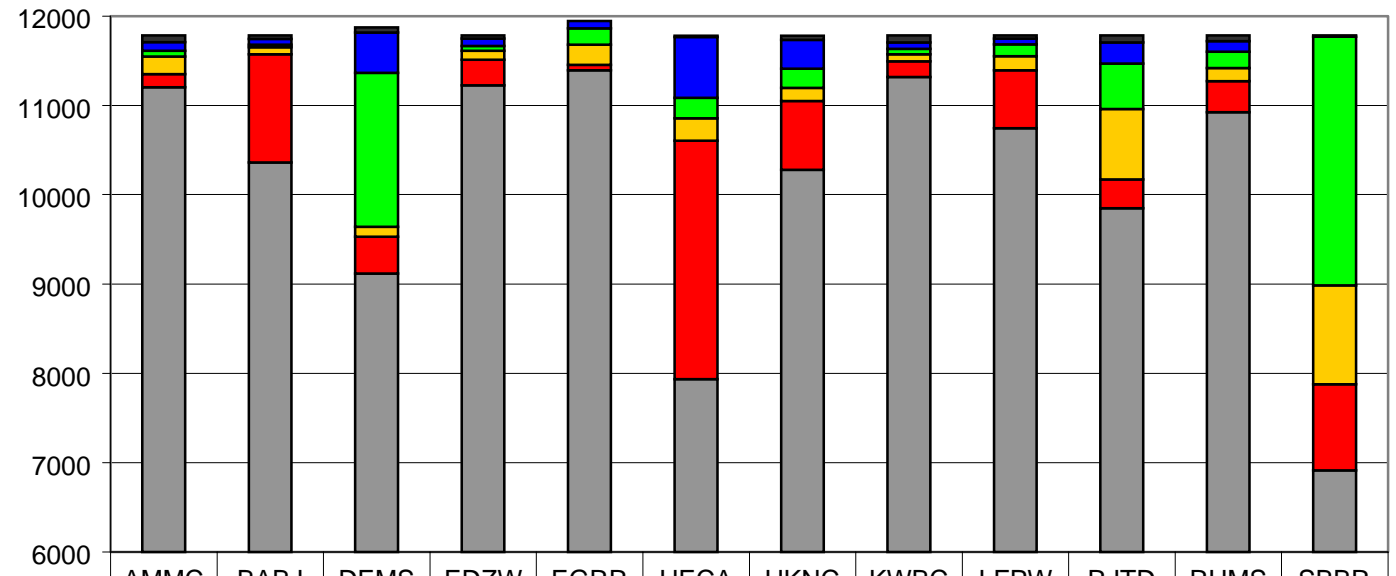
8. FUTURE WORK PROGRAMME (Agenda Item 8)

The meeting agreed to include the following items in its future work programme:

- To review the matters related to the recommendations concerning the routing of data on the MTN (see above paragraphs 3.4 and 3.7),
- To follow the implementation of a plan for routing addressed messages on the MTN (see above paragraph 3.9),
- To review the GTS matters related to the migration strategy for data representation forms (see above paragraphs 4.6 and 4.7) in co-operation with the Implementation Co-ordination Team on Data Representation and Codes (ICT-DRC),
- To follow the development of metadata description standards in co-operation with the ICT-DRC (see above paragraph 5.2),
- To study co-ordination and efficient management mechanisms for pulling data on the GTS, in co-ordination with the ICT-DCST (see above paragraph 5.3),
- To pursue the analysis and development of the access to metadata in accordance with the proposal given in Annex to paragraph 5.4,
- To follow the implementation of the comprehensive catalogue of meteorological bulletins (see above paragraphs 6.3 and 6.4),
- To review the implementation of routing catalogues at RTHs (see above paragraph 7.1), in particular the completeness of the catalogues (see above paragraph 7.3) and the conformity of the presentation of the catalogues to the standards (see above paragraph 7.4),
- To follow the development of a pilot project for an interactive access to the GTS management information in the WMO server through Internet.

Annex to paragraph 3.1

AGM 1-15/10/1999 - Daily average availability of RBSN SYNOP reports at MTN centres



	AMMC	BABJ	DEMS	EDZW	EGRR	HECA	HKNC	KWBC	LFPW	RJTD	RUMS	SBBR
■ Missing reports from stations for which 95% to 99% of the available reports were received	76	40	58	36	0	15	48	78	35	76	66	0
■ Missing reports from stations for which 80% to 95% of the available reports were received	96	63	452	83	82	679	322	72	65	239	118	13
■ Missing reports from stations for which 50% to 80% of the available reports were received	63	30	1727	55	183	229	214	63	132	508	182	2788
■ Missing reports from stations for which less than 50% of the available reports were received	200	79	108	100	224	253	148	78	156	791	146	1105
■ Missing reports from silent stations	147	1213	412	287	62	2670	773	175	648	323	347	963
■ Reports received	11203	10359	9118	11225	11395	7936	10278	11320	10748	9847	10926	6915

Annex to paragraph 3.10

Amendments to the Manual on the GTS – Volume I

A. Part I - Attachment I-3

To replace paragraphs 2 and 3 by the new following paragraphs 2 and 3, and add the new following paragraph 4:

2. PRINCIPLES FOR THE ESTABLISHMENT OF THE EXCHANGE PROGRAMME FOR OBSERVATIONAL DATA ON THE MAIN TELECOMMUNICATION NETWORK

2.1 The types of meteorological messages containing observational data to be exchanged on the Main Telecommunication Network are given below.

2.2 *Type of information*

- (a) Surface observations on land and sea, including data from ships and buoys;
- (b) Upper-air observations including data from aircraft;
- (c) Climatological data;
- (d) Selected satellite data;
- (e) Seismic data (level 1), Tsunami and other types of data as agreed.

NOTE: Items (a) to (e) do not indicate priorities.

2.3 Stations/areas from which reports should be included in the bulletins that are to be exchanged

The list of stations from which reports should be included in the bulletins that are to be exchanged are established as follows:

- (a) All surface stations. The SYNOP reports from land stations exchanged on the MTN shall include at least Sections 0 and 1 of the SYNOP code form. As an interim measure, Section 3 of the SYNOP code form shall also be included in the global exchange on the MTN;
- (b) All stations (on land or at sea) making radiosonde/radiowind observations;
- (c) All aircraft;
- (d) All climatological stations;
- (e) All oceanographical stations;

3. RESPONSIBILITIES OF CENTRES LOCATED ON THE MAIN TELECOMMUNICATION NETWORK FOR THE EXCHANGE AND DISTRIBUTION OF OBSERVATIONAL DATA, EXCLUDING SATELLITE DATA

All the observational data for global exchange, excluding satellite data, received by a MTN centre from an adjacent MTN centre should be relayed to all other adjacent RTHs located on the MTN. Operational aeronautical data are exchanged under multilateral arrangements.

4. RESPONSIBILITIES OF CENTRES LOCATED ON THE MAIN TELECOMMUNICATION NETWORK FOR THE EXCHANGE AND DISTRIBUTION OF PROCESSED INFORMATION AND SATELLITE DATA

The exchange of processed information and satellite data on the MTN should be arranged between the MTN centres to meet the requirements of the WWW centres.

To delete Figure 1

B. Part II

To add the following note at the end of paragraph 2.3.1.2:

Note: A five digit-group could be used by bilateral agreement; it should be used on circuits with a speed of 64 Kbits or above to enable appropriate recovery procedures.

To read paragraph 5.2.3 as follows:

5.2.3 METNO and WIFMA messages shall be compiled in the standard format for routine meteorological messages using the abbreviated heading NOXX02 LSSW for changes related to the Volume C1 of the WMO Publication No. 9 - Catalogue of Meteorological Bulletins - and NOXX01 LSSW for the changes to the other Volumes of the WMO Publication No. 9.

To amend paragraph 2.3.2.2 and the beginning of paragraph 2.3.2.3 as follows:

2.3.2.2 The symbols shall have the following meanings:

T₁T₂A₁A₂ii Data designators.

NOTE: The WMO standard data designators are given in Attachment II-56.

T₁T₂ Data type and/or form designators.

A₁A₂ Geographical and/or data type and/or time designators.

ii It shall be a number with two digits. When It is used to differentiate two or more bulletins which contain data in the same code and which originate from the same geographical area and have the same originating centre, ~~it shall be a number with two digits.~~ The following sets of ii numbers shall be used for indicating the bulletins for global, interregional, regional and national distribution.

ii = 01 - ~~19~~ 39 inclusive for global distribution;

~~ii = 20 - 39 inclusive for regional and interregional distribution;~~

ii = 40 - 89 inclusive for regional, interregional, national and bilaterally agreed distribution;

ii = 90 - 99 reserved.

The reports prepared at the main synoptic hours at the stations included in the Regional Basic Synoptic Networks shall be compiled into bulletins with ii in the series 01 to 19.

All centres, which recompile reports into bulletins for specific purpose, shall use ii above 39.

In the case of bulletins containing observational data and climatic data (surface and upper-air) from land stations, ~~one separate~~ one each ii number shall be allocated to ~~one each~~ bulletin containing a fixed list of stations with the exception of bulletins with T₁ = I or K. ~~This list may be different at different hours, provided it is known, and that it is given in the Catalogue of Meteorological Bulletins shall be fix~~ for the same group T₁T₂A₁A₂ii Y Y G G q q.

In the case of bulletins containing ships weather reports and aircraft reports, the number ii should be used for facilitating the selective distribution of ships weather reports and aircraft reports (surface and upper-air). Whenever practicable, a fixed

number of ii should be allocated to the bulletins for those reports which are collected from a certain area within each Region (e.g. southern Indian Ocean in Region I, southern Atlantic in Region III, etc.), and separate bulletins should be prepared for northern and southern hemispheres, respectively.

~~Special provisions apply to the~~ **The use of ii in respect of bulletins containing satellite data, processed information, and pictorial information in digital form and certain bulletins coded in BUFR** ~~(see is defined in Tables A and D2 of Attachment II-5).~~

~~The use of ii is mandatory in both International Telegraph Alphabet No. 2 and International Alphabet No. 5 for all bulletins using the data designators.~~

~~All information concerning the number ii and~~ **The abbreviated headings and the contents of bulletins shall be published in the WMO Publication No. 9, Volume C1 - Catalogue of Meteorological Bulletins.**

~~NOTE: The Catalogue of Meteorological Bulletins is given in WMO Publication No. 9, Volume C.~~

CCCC International four-letter location indicator of the station originating or compiling the bulletin, as agreed ~~bilaterally or multilaterally~~ internationally, and published in WMO Publication No. 9, Volume C1, Chapter I, Catalogue of Meteorological Bulletins. Once a bulletin has been originated or compiled, the CCCC must not be changed even if (because of inadequate reception, or for any other reason) the bulletin in question has to be re-compiled at another centre.

YYGGgg International date-time group.

YY Day of the month.

GGgg For bulletins containing meteorological reports intended for standard times of observation, the time shall be the standard time of observation in UTC.

For aerodrome, route and area (aeronautical) forecasts: the full hour in UTC (the last two digits shall be 00) preceding the transmission time.

For other forecasts and analyses: standard time of observation in UTC on which forecast or analysis is based.

For other messages the time shall be the time of compilation in UTC.

BBB An abbreviated heading defined by T₁T₂A₁A₂ ii CCCC YYGGgg shall be used only once. Consequently, if this abbreviated heading has to be used again for an addition, a correction or an amendment, it shall be mandatory to add an appropriate BBB indicator, identified by a three-letter indicator which shall be added after the date-time group.

The indicator BBB shall have ~~one of the following forms (a) or (b) as defined below:~~

- (a) RR_x for delayed routine meteorological reports;**
- CC_x for corrections to previously relayed reports;**
- AA_x for amendments to processed information;**
- P_{xx} for segmenting a large set of information into several bulletins;**
- where _x is an alphabetic character of A through X;**

~~**(b) RTD for delayed routine meteorological reports;**~~

~~**COR for corrections to previously relayed reports;**~~

~~_____~~ **AMD for amendments to processed information.**

~~This form should only be used by those centres not yet able to use form (a); at such centres, use of form (a) should be introduced as soon as possible.~~

NOTE: See Attachment II-12 for detailed explanation on the use of BBB of (a) above.

2.3.3 Text of meteorological bulletins

2.3.3.1 The following procedures shall apply to the compilation of the text of a meteorological bulletin:

(a) The text of a bulletin shall be in one code form only.

(b) The text of a bulletin shall not contain both "essential" and "additional" data as defined in Resolution 40 (Cg-XII).

~~(b)~~(c) The text of a bulletin shall be in alphanumeric or binary representation. It shall start by the following sequence:

Annex to paragraph 4.3**Amendments to Attachment II-5 of Volume I of the Manual on the GTS**

A. To amend the row $T_1 = J$ of Table A as follows:

T_1	Data Type	T_2	A_1	A_2	ii	Priority	Max Length
J	Forecast Information, (Binary coded) - BUFR	B3	C6	C4	D2	3	15000

B. To amend Table C6 as follows

$T_1 = J$ (Forecast Products) and $T_2 = U$ (Upper Air)

Add the following entries

Designator	Data Type
B	BINARY Coded SIGWX, Embedded Cumulonimbus
C	BINARY Coded SIGWX, Clear air turbulence
F	BINARY Coded SIGWX, Fronts
N	BINARY Coded SIGWX, Other SIGWX parameters
O	BINARY Coded SIGWX, Turbulence
T	BINARY Coded SIGWX, Icing/Tropopause
V	BINARY Coded SIGWX, Tropical Storms, Sandstorms, Volcanoes
W	BINARY Coded SIGWX, High Level Winds

C. To read the title of Table C4 as follows:

Reference time designator A_2
(when $T_1 = D, G, H, J, O, P$ or T)

D. To read the title of Table D2 as follows:

Level designator ii
(when $T_1 = D, G, H, J, P, Q, X$ or Y)

Annex to paragraph 5.4

Proposal for METAFILE implementation on the MTN of the GTS

Supporting Requirement

1. The ICT-IEM requests that "http" protocol be included for use on the GTS. The ability to implement this proposal requires the ISS/ET-DCST to establish an additional higher level protocol for use on the GTS circuits operating with TCP/IP.
2. That the ET-DCST modify their attachment of the Manual 386 to reflect the use of HTML pages as the mechanism for METADATA to be used with FTP data, product, and information exchange on the GTS when using FTP for the transfer.
3. The GTS Centres operating circuits with TCP/IP to include the http server software for storage of HTML pages with access to the GTS as well as access to like pages on servers for Internet access in case needed by the user community.

Establishment Requirements

The Centres shall develop HTML pages which detail their data and product files which can be exchanged using FTP. These pages shall include any subdirectory paths and file names needed for accessing files on the host Centre's file servers. These HTML pages will be called the METAFILES for the specified data or product types and for documentation files.

METAFILE page content

1. The pages shall provide the location of the FTP server by either URL name or IP address on Web pages for reference in establishing the FTP session for operational data exchange. This will be necessary for either FTP "put" or "get" executions.
2. The pages shall refer to or describe the file and subdirectory standards used by the centre for use by other Centres such as for printing locally as reference material.
3. The page shall contain instructions to users on
 - a. How to establish FTP connectivity
 - b. Frequency of exchange permitted or desired
 - c. Data or product file availability
 - d. Establishment of either a "PUSH" or "PULL" process
 - e. Contact personnel e-mail addresses
 - f. Any available software needed to execute FTP processes at either Centre

METAFILE page names

The establishment of a uniform METAFILE Web page file name prefix to facilitate locating these pages on the http servers. Example such as **obsfiles.html** for pages containing the file information for observational data.

Access links to these METAFILE Web pages from links in the Centre's Homepage Web presentation to facilitate locating the HTML pages by using a standard link name constructed with a label "METAFILE for _____ data", where the blank will be the data or product type detailed in the linked to HTML page or pages

Annex to paragraph 6.1

Implementation of the comprehensive catalogue of meteorological bulletins at the Secretariat

1. SEMI-ANNUAL UPDATES

Each RTH transfers, at least twice per year, its part of Volume C1 into the WMO FTP server. Each RTH informs the Secretariat of the transfer by an Internet message. The update is compared with the existing valid Volume C1. When there are differences, those differences are listed and the administrator has to decide on the follow-up action.

A history file is created for the semi-annual updates. It includes information on the date of implementation of the update and the references of the transmitting centre. This file is named HISTYYYY.txt (YYYY being the year) and is available in the WMO FTP server.

2. ADVANCED NOTIFICATIONS

The advanced notifications are transferred into the WMO FTP server by each RTH in the form of a file. Each RTH informs the Secretariat of the transfer of those files by an Internet message. The system checks the sequence number of the advanced notifications. In the event of problem, the intervention of the administrator will be necessary. The administrator can introduce advanced notifications.

The advanced notifications are stored in the WMO data base up to their date of validity. Each day the system prepares the lists of advanced notifications of changes entering into force that day and updates accordingly the Volume C1 at 01 UTC. The administrator is informed of each update.

With a view to keeping a trace of each advanced notification, two history files are created. These files are stored on the FTP server. The first (HIANBEYY.txt, YY being the last two figures of the year) will include all the advanced notifications RTH before their date of validity, the second (HIANAFYY.txt) after their date of validity.

3. METNO MESSAGES

The program prepares the METNO messages. These messages contain the advanced notifications received by the Secretariat from the RTHs since the last METNO message. They will be created from the history file HIANBEYY.txt.

The METNO Messages will be sent at 8h00 U.T, every Tuesday. In order to differentiate METNO messages related to Volume C1 from those related to Volume A, the following abbreviated headings are used:

NOXX01 LSSW YYGGgg for a METNO message related to Volume A
NOXX02 LSSW YYGGgg for a METNO message related to Volume C1

The first line of the text of the METNO message will include a sequence number CXXYY (XX: number of the week, YY: Year).

The METNO message has the following format:

NOXX02 LSSW YYGGgg

METNO CXXYY

Sequence No./Change Type/Change Date/Region/RTH/Country/Centre/...
etc.

Note: The sequence No. is the sequence number of the relevant advanced notification prepared by the RTH or the Secretariat.

Example of a METNO message prepared on Tuesday 28 September 1999 (C3999):

NOXX02 LSSW 280999

METNO C3999

0344 DD 17/08/1999 5 WELLINGTON NEW ZEALAND WELLINGTON...

0345 DD 17/08/1999 5 WELLINGTON NEW ZEALAND..WELLINGTON...

etc.

All the METNO messages will be kept on the WMO FTP server for one year (e.g.: /... /METNO/MC3999.txt).

If there is no advanced notification for a week, a METNO message with a text "NIL" is sent. With this procedure each GTS centre can check that it received the sequence (current week number and year) of METNO messages. The METNO messages will not contain the advanced notifications, which are only related to a change in the field "Code form".

5. ACCESS TO THE INFORMATION IN THE WMO FTP SERVER

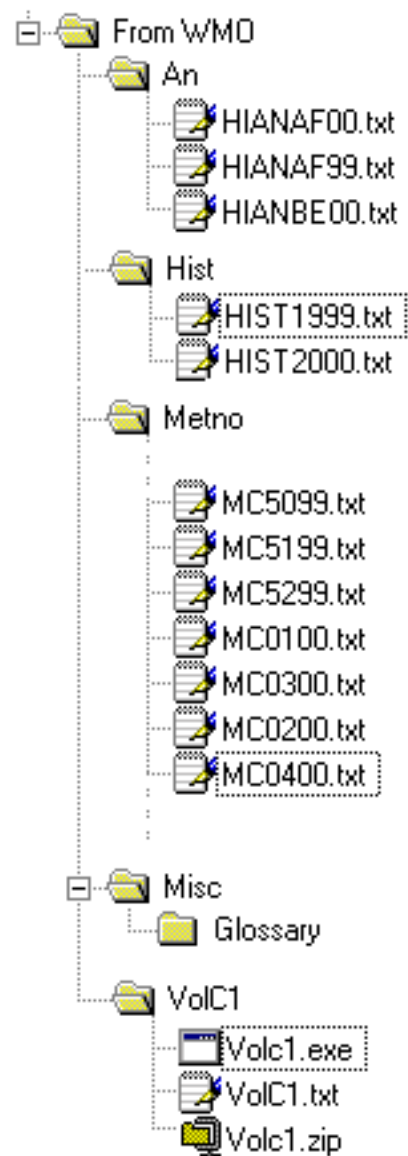
An example of the structure of the part of the WMO FTP server accessible by the WWW user centres is given in the following page. The valid catalogue of meteorological bulletins, as compiled by the Secretariat, will be available on the WMO FTP server in the file " VOLC1.txt ". A zipped version (VOLC1.zip) and a zipped executable version (VOLC1.exe) will also be available.

All the information contained in the database (Volume C1) is in English. However a glossary will be available for the translations in the other languages.

6. MISCELLANEOUS

- The files will be in the form of a text file (*.txt). The fields of each record will be separated by commas and surrounded by quotation marks (ex: "field1","field2",etc.).
- A backup of the database will be carried out daily (backup).
- A site " mirror " of the WMO FTP server for the catalogue will be maintained by RTH Offenbach.
- As a principle, the MTN centres are responsible for their part of the catalogue that they maintained. In this respect, the secretariat may inform the MTN centres of any "anomalies" found, but will not modify any information provided, and expect that the MTN centres will amend themselves the catalogue.

Example of the structure of the part of the WMO FTP server accessible by the WWW users centres:



Annex to paragraph 6.2

Remarks related to the formats of the catalogue of meteorological bulletins

1. fields *Content* and *Remarks*

- The field *Content* should only contain the station index numbers and the ICAO location indicators; for the GRID/GRIB data, it should contain the area of coverage and grid spacing,
- The field *Remarks* should contain any other information.

2. Use of double quotation marks

Each field starts and ends by double quotation marks, and the fields are delimited by a comma. If there is a word surrounded by double quotation marks inside a field, the second quotation marks is taken as the end of the field and the record will not be correctly imported in an Access table.

For example, there is a problem of importation of the following record (Manille is between double quotation marks):

```
"1","NAIROBI","REUNION","ST.DENIS","01/08/1999","E","ATIO01","FMEE","FM 85-IX","00,06,12,18","""MANILLE" REPORTS; INFORMATION ON LOCALISATION, INTENSITY AND STRUCTURE OF TROPICAL CYCLONES WITH A VIEW TO IMPROVE MODEL ANALYSES; NOTE: WHEN A TROPICAL CYCLONE IS PRESENT ON RSMC'S AREA OF RESPONSIBILITY",
```

With a view to ensuring a correct importation of the files, the centres should choose one of the following presentations:

- Never use double quotation marks inside fields; the above record should be presented as follows:

```
"1","NAIROBI","REUNION","ST.DENIS","01/08/1999","E","ATIO01","FMEE","FM 85-IX","00,06,12,18","MANILLE REPORTS; INFORMATION ON LOCALISATION, INTENSITY AND STRUCTURE OF TROPICAL CYCLONES WITH A VIEW TO IMPROVE MODEL ANALYSES; NOTE: WHEN A TROPICAL CYCLONE IS PRESENT ON RSMC'S AREA OF RESPONSIBILITY",
```

- Double the double quotation marks inside fields; the above record should be presented as follows:

```
"1","NAIROBI","REUNION","ST.DENIS","01/08/1999","E","ATIO01","FMEE","FM 85-IX","00,06,12,18","""MANILLE"" REPORTS; INFORMATION ON LOCALISATION, INTENSITY AND STRUCTURE OF TROPICAL CYCLONES WITH A VIEW TO IMPROVE MODEL ANALYSES; NOTE: WHEN A TROPICAL CYCLONE IS PRESENT ON RSMC'S AREA OF RESPONSIBILITY",
```

- Use another sign, simple quotes instead of the double quotation marks; the above record should be presented as follows:

```
"1","NAIROBI","REUNION","ST.DENIS","01/08/1999","E","ATIO01","FMEE","FM 85-IX","00,06,12,18","'MANILLE' REPORTS; INFORMATION ON LOCALISATION, INTENSITY AND STRUCTURE OF TROPICAL CYCLONES WITH A VIEW TO
```

IMPROVE MODEL ANALYSES; NOTE: WHEN A TROPICAL CYCLONE IS PRESENT ON RSMC'S AREA OF RESPONSIBILITY",

3. Composition of the files Observation and Product

The bulletins should be included in the files Observation and Product according to the value of the character T1 of the abbreviated heading TTAAii as follows :

- for the Products: T1=D, G, H, J, P, Q, X, Y.
- for the Observations: any other letter than above.