



INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE THIRD NORTH ATLANTIC REGIONAL AIR NAVIGATION MEETING

Montreal, October 1954

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This Report contains the recommendations of a Regional Air Navigation Meeting. For details of the action taken on the Report by the Council of ICAO, refer to the Supplement.

INTERNATIONAL CIVIL AVIATION ORGANIZATIONThird North Atlantic Regional Air Navigation MeetingMontreal, October 1954SUPPLEMENT No. 1Part I - GENERAL COMMITTEE

The Council, at the Nineteenth Meeting of its Twenty-third Session on 10 December 1954, noted that the purpose of Recommendation No. 1 had been served by its action on the reports of subordinate committees, and agreed that no specific action on this recommendation was necessary.

Part II - SUBCOMMITTEE 1 OF THE GENERAL COMMITTEE

The Council, at the Nineteenth Meeting of its Twenty-third Session on 10 December 1954, took action as indicated herein on the Report of Subcommittee 1 of the General Committee of the Third North Atlantic Regional Air Navigation Meeting. In examining the Report, the Council took note of the statements and reservations of delegations appearing at Appendix A.

The Council approved, without comment, Recommendations Nos. 1 - 6 inclusive, 8 - 10 inclusive, 18 and 19.

The Council took action on remaining recommendations as set forth hereunder.

Recommendation No. 7 (page Sub-62)

The Council approved this recommendation and urges States to produce aerodrome obstruction plans and profile charts so as to provide operators with the information required and to enable States to determine the need for amendments to the specification contained in Chapter 11 of Annex 4. The Council noted that this subject had been placed on the current work programme of the Air Navigation Commission.

Recommendations Nos. 11 and 12 (pages Sub-68 and Sub-69)

The Council approved these recommendations and urges States to effect the required improvements. The Council noted that the Air Navigation Commission would take the substance of these recommendations into account in its review of the status of implementation of regional plans.

Recommendation No. 13 (page Sub-70)

The Council approved this recommendation, and decided that 1 April 1955 should be considered as supplanting the phrase "four months after approval by Council of this part of the plan".
/Ref. MET b), page Sub-72/

Recommendation No. 14 (page Sub-72)

The Council approved the intent of this recommendation, noting that the RAC/SAR implementation date should be read as "four months after their publication in Doc 7030", as proposed in RAC/SAR Recommendation No. 14.

The Council specified the following implementation dates:

COM Supplementary Procedures	-	1 April 1955
RAC/SAR	"	" - 1 May 1955
Altimeter setting procedures	-	1 March 1955
MET Supplementary Procedures	-	as stated in the recommendation, except for paras. 4.4.2.1(1) and 4.4.2.3.1(1), which should be implemented on 1 April 1955.

Recommendation No. 15 (page Sub-74)

The Council approved this recommendation, noting that detailed recommendations for implementation were contained in the COM Committee Report (Recommendation No. 40).

Recommendation No. 16 (page Sub-75)

The Council approved this recommendation, noting that the requirement was for continuous operation of a NDB at Knob Lake, and that the COM Committee had included the facility in the regional plan.

Recommendation No. 17 (page Sub-76)

The Council approved this recommendation, noting that the COM Committee had included the facility in the regional plan.

Requirements for NOTAM Distribution (page Sub-63)

The Council noted that this table presented the requirements for the exchange of Class I NOTAMS in the North Atlantic Region, and decided that it should form part of the regional plan.

Part III - AERODROMES, AIR ROUTES AND GROUND AIDS COMMITTEE

The Council, at the Nineteenth Meeting of its Twenty-third Session on 10 December 1954, approved without comment all recommendations in the Report of the Aerodromes, Air Routes and Ground Aids Committee of the Third North Atlantic Regional Air Navigation Meeting. In examining the Report, the Council took note of the statements of delegations appearing at Appendix A.

Part IV - COMMUNICATIONS COMMITTEE

The Council, at the Nineteenth Meeting of its Twenty-third Session on 10 December 1954, took action as indicated herein on the Report of the Communications Committee of the Third North Atlantic Regional Air Navigation Meeting. In examining the Report, Council took note of the statements of delegations appearing at Appendix A.

The Council approved, without comment, Recommendations Nos. 1 - 9 inclusive, 11 - 15 inclusive, 18 - 25 inclusive, 27, 29 - 42 inclusive, 45 - 54 inclusive, 57, 59, 60, 62 and 64.

The Council took action on the remaining recommendations of the COM Committee as set forth hereunder.

Recommendation No. 10 (page COM-21)

The Council approved this recommendation and urges the States concerned to make appropriate arrangements to continue to make available the existing circuits Goose - Narssarssuaq and Narssarssuaq - Reykjavik for AFTN traffic until such time as the new AFTN circuits are implemented and, additionally, to improve insofar as practicable the method of handling of AFTN traffic over these existing circuits with the objective of meeting the transit time requirements established for the Region.

Recommendation No. 16 (page COM-33)

The Council approved this recommendation and decided that these circuits should form part of the regional plan.

Recommendation No. 17 (page COM-34)

The Council deferred action on this recommendation pending further study by the Air Navigation Commission.

Recommendation No. 26 (page COM-39)

The Council approved this recommendation and noted that an earlier date may be selected if coordinated in accordance with Recommendation No. 25 of the Fifth Session of the Communications Division (Doc 7480-COM/548) and Council action thereon.

Recommendation No. 28 (page COM-40)

The Council approved this recommendation with the understanding that it referred to the manner of operation of facilities and the deployment of staff at an aeronautical station.

Recommendation No. 43 (page COM-60)

The Council approved the intent of this recommendation and noted that the Air Navigation Commission would give consideration to the constitution and terms of reference of the panel at an early date.

Recommendations Nos. 44, 55 and 56 (pages COM-62 and COM-86)

The Council approved these recommendations and directed the Secretary General to ensure that the Ocean Station Vessel Manual is amended accordingly. The Council noted that the intent of Recommendation 56 was to establish a procedure for handling the messages of OSV "A" when that vessel was unable to communicate with Washington either directly or by relay through OSV "D".

Recommendation No. 58 (page COM-87)

The Council approved this recommendation and noted that the substance of the recommendation is also included in Recommendations Nos. 20 and 22 of the MET Committee.

Recommendation No. 61 (page COM-89)

The Council approved the intent of this recommendation, noting that in its action on Recommendation No. 14 of Subcommittee 1 it had specified 1 April 1955 as the implementation date of the COM Supplementary Procedures.

Recommendation No. 63 (page COM-91)

The Council noted that the Air Navigation Commission would take this recommendation into account.

Part V - METEOROLOGY COMMITTEE

The Council, at the Nineteenth Meeting of its Twenty-third Session on 10 December 1954, took action as indicated herein on the Report of the Meteorology Committee of the Third North Atlantic Regional Air Navigation Meeting.

The Council approved, without comment, Recommendations Nos. 1, 2, 4 - 8 inclusive, 10 - 15 inclusive, 18, 19, 23, 24, 30, 31, 34 and 35.

The Council took action on the remaining recommendations as set forth hereunder.

Recommendation No. 3 (page MET-15)

The Council approved this recommendation with the understanding that it referred to the reporting of weather radar information for use by meteorological offices, and not to ground-to-air reporting.

Recommendations Nos. 9 and 16 (pages MET-17 and MET-28)

The Council noted that no separate action was required on these recommendations, which had been superseded by the relevant part of Recommendation No. 13 of Subcommittee 1 of the General Committee, and that Council action on Recommendation No. 13 had established 1 April 1955 as the date in part (b) of Recommendation No. 16.

Recommendation No. 17 (page MET-28)

The Council approved this recommendation with the understanding that reports on traffic-handling checks carried out would be forwarded also to ICAO.

Recommendation No. 20 (page MET-31)

The Council approved this recommendation noting that it appears also as Recommendation No. 58 a) of the Communications Committee.

Recommendation No. 21 (page MET-32)

The Council deferred action on this recommendation noting that the Air Navigation Commission had instructed the Secretary General to request the French, Portuguese and United States authorities to notify ICAO of the completion of action, along the lines indicated in the Report of the Communications Committee, directed towards the elimination of existing weaknesses on the New York - Santa Maria - Paris meteorological circuit (Doc 7550, NAT III, Part IV, Section 1, Chairman's Report on Agenda Item 4, and Section 2, Recommendation No. 57).

Recommendation No. 22 (page MET-32)

The Council approved this recommendation noting that it appears also as Recommendation No. 58 b) of the Communications Committee.

Recommendation No. 25 (page MET-34)

The Council approved the objective of this recommendation, with the understanding that the circulation of the information referred to in paragraph (a) should be done by the most appropriate means.

Recommendation No. 26 (page MET-34)

The Council approved this recommendation, but recognized that general application of the "dead traffic" procedures in the NAT Region would be impracticable before the necessary communications procedures, currently under consideration as an amendment of Annex 10, became applicable. Council noted, however, that it might nevertheless be practicable to apply them earlier to individual circuits, where the need was urgent, by agreement between the States concerned.

Recommendation No. 27 (page MET-35)

The Council approved this recommendation, with the qualifications and modifications indicated below, on the understanding that the Regional Supplementary Procedures would be subject to collateral amendment, if required, after adoption of the amendments to Annex 3 and approval of the PANS-MET prepared in accordance with Recommendations Nos. 1 and 3 respectively of the Fourth Session of the MET Division:

a) The Council noted that the part of the recommendation referring to date of implementation was superseded by the relevant part of Recommendation No. 14 of Subcommittee 1 of the General Committee, as amended by action of the Council. This requires the application of paragraphs 4.4.2.1(1) and 4.4.2.3.1(1) of the recommended Regional Supplementary Procedures-MET, in place of the existing paragraphs 4.4.2.1(1), 4.4.2.3 and 4.4.2.3.1(1) on 1 April 1955, i.e., in advance of application of the remaining paragraphs.

b) The Council made the following editorial amendments to the recommended Regional Supplementary Procedures:

Paragraph 3.3.2.1.2 : Amend "regional criteria" to read "world-wide criteria (PANS-MET, Appendix 1)".

Paragraph 5.1.1 (6) : Amend to read "Reports of special aircraft observations made in accordance with the criteria contained in paragraph 2.2.9 of the PANS-MET".

Recommendation No. 28 (page MET-42)

The Council approved this recommendation with the understanding that it referred to the Supplementary Procedures - MET - for all Regions.

Recommendation No. 29 (page MET-43)

The Council noted that the Air Navigation Commission would take this recommendation into account when reviewing States' comments on the draft PANS-MET prepared in accordance with Recommendation No. 3 of the Fourth Session of the MET Division.

Recommendation No. 32 (page MET-43)

The Council approved this recommendation noting that, in the draft PANS-MET prepared in accordance with Recommendation No. 3 of the Fourth Session of the MET Division and forwarded to States for comment, the criteria appear in Table I.

Recommendation No. 33 (page MET-43)

The Council noted that no separate action was required on this recommendation, which had been superseded by the relevant part of Recommendation No. 14 of Subcommittee 1 of the General Committee.

Part VI - RULES OF THE AIR AND AIR TRAFFIC SERVICES
AND SEARCH AND RESCUE COMMITTEE

The Council, at the Nineteenth Meeting of its Twenty-third Session on 10 December 1954, took action as indicated herein on the Report of the Rules of the Air and Air Traffic Services and Search and Rescue Committee of the Third North Atlantic Regional Air Navigation Meeting.

The Council approved, without comment, Recommendations Nos. 1 to 10 inclusive, 12, 14, 16, 17, 20 and 22 - 25 inclusive.

The Council took action on the remaining recommendations as set forth hereunder.

Recommendation No. 11 (page RAC/SAR-12)

The Council approved this recommendation with the qualification that the publication of such information would be in accordance with decisions to be taken concerning publication of information on Regional Plan implementation.

Recommendation No. 13 (page RAC/SAR-13)

The Council approved this recommendation, subject to the following amendment to the note recommended for inclusion in the Regional Supplementary Procedures (Doc 7030) following paragraph 2.1 b):

"Note.- When necessary to expedite the flow of air traffic, area controllers may, subject to appropriate prior coordination, assign flight levels irrespective of the direction of flight."

Recommendations Nos. 15, 18 and 19 (page RAC/SAR-15)

The Council noted these recommendations and observed that the Air Navigation Commission would take them into consideration in establishing the agenda for an appropriate meeting.

Recommendation No. 21 (page RAC/SAR-16)

The Council noted that the Air Navigation Commission had the subject matter of this recommendation under consideration.

- END -

INTERNATIONAL CIVIL AVIATION ORGANIZATION

Third North Atlantic Regional Air Navigation Meeting

Montreal, October 1954

SUPPLEMENT No. 2

Part IV - COMMUNICATIONS COMMITTEE

Recommendation No. 17 (page COM-34)

The Council, at the 6th Meeting of its Twenty-sixth Session on 8 November 1955 reviewed this recommendation and agreed that no action is required on the recommendation because of the fact that Dunstable (United Kingdom) is collecting and retransmitting the Greenland synoptic data and in conditions of poor propagation the Greenland data may be obtained by Dunstable from Gufunes (Iceland) on request, over the London-Reykjavik RTT circuit.

- END -

RAC

INTERNATIONAL CIVIL AVIATION ORGANIZATION

Third North Atlantic Regional Air Navigation Meeting

Montreal, October 1954

SUPPLEMENT NO. 3

The Council at the ninth meeting of its Twenty-ninth Session on 27 November 1956 took further action on Recommendation No. 11 of Subcommittee 1 of the General Committee, as follows:

Recommendation 11 The Council:
Page Sub-68

- (a) Confirmed its approval of Sub-1 Recommendation 11 noting that such action implies inclusion in the NAT Regional Plan of aeronautical mobile service stations utilizing the ground wave propagation technique at or associated with Gander, Prins Christians Sund, Rekjavik (Grindavik) and Shannon.
- (b) Instructed the Secretary General to invite on behalf of the Council, those States conducting trials of the ground wave technique to continue them with a view to providing information that will permit of an overall evaluation of the technique and also those States operating ground wave stations in regular service to continue observations of performance with a view to the accumulation of further data on operational experience.

Corrigendum #1
of 7/2/55 entered
3-9-56 by

CORRIGENDA

THIRD NORTH ATLANTIC REGIONAL AIR NAVIGATION MEETING

Corrigenda

The following revisions to place names were submitted by the responsible delegations too late for inclusion in the Report:

Amend "Greenland" to read "Denmark (Greenland)"
" "Narsarssuak" to read "Narssarssuaq"
" "Sondrestrom/Sondrestromfjord" to read "Søndre Strømfjord"
" "Prins Christiansund" to read "Prins Christians Sund"
" "Frødericksdahl" to read "Frederiksdal"
"Nanortalik"
"Simiutak"
"Angmagssalik"

Norway

Amend "Tromsø" to read "Tromsø"
" "Oslo/Gardermoen" to read "Oslo/Gardermoen"
" "Jeløy" to read "Jeløy"
" "Kjevik" to read "Kjevik"

Portugal

Amend "Lisboa" to read "Lisboa"

Sweden

Amend "Norrköping/Kungsängen" to read "Norrköping/Kungsängen"
" "Stockholm/Halmsjön" to read "Stockholm/Halmsjön"
" "Göteborg" to read "Göteborg"
" "Norrköping" to read "Norrköping"
" "Malmö" to read "Malmö"
" "Höör" to read "Höör"
" "Herråkra" to read "Herråkra"
" "Åker" to read "Åker"

PART I
GENERAL COMMITTEE

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SECTION 1 - CHAIRMAN'S REPORT1.1 - Historical Statement1.1.1 Place and duration of the Meeting

The Third North Atlantic Regional Air Navigation Meeting was convened in the International Aviation Building, Montreal, Canada, on Tuesday, 5 October 1954, and completed its work on Friday, 29 October 1954. The General Committee met on two occasions, both being open to the public.

The proceedings of the Meeting were conducted in English and French, and the working papers and documents of the Meeting were produced in these languages. Production Services were under the charge of Mr. J.P. de Loeschnigg and Language Services under Mr. F. Dufau-Labeyrie and Mr. C. Jané. Conference Services were supervised by Dr. P. Dai and Mr. Lawrence Fielding.

1.1.2 Representation

The Meeting was attended by the representatives of nineteen Contracting States and six international organizations. A list of these States and international organizations follows:

Contracting States

Belgium	Iceland	Norway
Canada	*India	Portugal
Denmark	Ireland	Spain
*Dominican Republic	Israel	Sweden
*Egypt	Italy	United Kingdom
France	*Lebanon	United States
	Netherlands	

International Organizations

Fédération Aéronautique Internationale (FAI)
International Airline Navigators Council (IANC)
International Air Transport Association (IATA)
International Federation of Airline Pilots' Associations (IFALPA)
International Radio Air Safety Association (IRASA)
World Meteorological Organization (WMO)

1.1.3 Participants

A list of the representatives accredited as participants in the Meeting is at Appendix A to this Report.

* Not a member State of the North Atlantic Region.

1.2 - Report on the Agenda

1.2.1 Agenda Item 1 - Opening of the Meeting by the Secretary General and announcement of the States and International Organizations attending

The Meeting was opened by its Secretary General, Mr. T.S. Banes, as temporary Chairman of the General Committee.

1.2.2 Address of welcome by the President of the Council

Dr. Edward Warner welcomed the delegates on behalf of the Council, and mentioned the Council's especial interest in this regional meeting as being the first to be held at ICAO Headquarters. He spoke of the enormous development in both air traffic and air navigation facilities in the Region since the first North Atlantic Meeting in 1946, and of the complex problems facing the present meeting. He concluded by observing that the necessary services could be provided only by cooperation among the States on both sides of the Atlantic, and that the planning to be done by the present meeting would be an essential guide to the efforts of these States.

1.2.3 Address by the Chairman of the Air Navigation Commission

Mr. Walter Binaghi conveyed to the delegates the greetings of the Air Navigation Commission. He pointed out that the agenda of the Meeting had, in compliance with Assembly Resolution A 7-11, been directed toward specific and important problems, and emphasized the value of States and interested international organizations making known their proposals relative to these problems at the earliest possible date. He explained the way in which the Commission expected the Meeting to deal with certain items of its agenda, and concluded by stating that the Commission had suspended its session to permit its members to follow closely the work of the Meeting.

1.2.4 Introduction of Officers of the Secretariat

The Secretary General introduced the principal ICAO officers assisting in arrangements for the Meeting and senior officers of the ICAO secretariat.

1.2.5 Agenda Item 2: Organization of the Meeting

1.2.5.1 Agenda Item 2.1: Explanation of Directives to Regional Meetings with special reference to recent amendments

1.2.5.2 Agenda Item 2.2: Explanation of the rules of procedure

The recent directives from the Air Navigation Commission to the Meeting, together with the Rules of Procedure and Directives (Doc 7214-C/831), had been documented and distributed to all participants.

1.2.6 Agenda Item 2.3: Determination of quorum for the General Meeting

Fifteen Member States of the Region being present at the Opening Meeting, the quorum was declared to be eight.

1.2.7 Agenda Item 2.4: Election of Officers of the Meeting

1.2.7.1 Agenda Item 2.4.1: Election of the Chairman of the General Committee

Mr. C.J. Teyssier, Chief of the French Delegation was unanimously elected Chairman of the General Committee.

1.2.7.2 Agenda Item 2.4.2: Election of First Vice-Chairman of the General Committee

Mr. C.H. Smith, Chief of the United States Delegation, was unanimously elected First Vice-Chairman of the General Committee.

1.2.7.3 Agenda Item 2.4.3: Election of Second Vice-Chairman of the General Committee

Mr. A. Kofoed-Hansen, Chief of the Delegation of Iceland, was unanimously elected Second Vice-Chairman of the General Committee.

1.2.8 Agenda Item 2.5: Establishment of Credentials Subcommittee

The Chairman appointed representatives from the Delegations of Belgium, France, and the Netherlands as the Credentials Subcommittee. This Subcommittee examined the credentials that had been deposited with the Secretary General and reported that they were in order, which report was approved by the General Committee.

1.2.9 Agenda Item 2.6: Establishment of Co-ordinating Subcommittee (Subcommittee 1)

1.2.9.1 Agenda Item 2.7: Establishment of any subcommittees considered necessary, and their terms of reference and agenda

1.2.9.2 Agenda Item 3: Establishment of technical committees and approval of agenda

1.2.9.3 Agenda Item 3.1: Aerodromes, Air Routes and Ground Aids (AGA)

1.2.9.4 Agenda Item 3.2: Communications (COM)

- 1.2.9.5 Agenda Item 3.3: Meteorology (MET)
- 1.2.9.6 Agenda Item 3.4: Rules of the Air and Air Traffic Services and Search and Rescue (RAC/SAR)

The Chairman declared the following committees established:

Subcommittee 1 of the General Committee
Aerodromes, Air Routes and Ground Aids (AGA)
Communications (COM)
Meteorology (MET)
Rules of the Air and Air Traffic Services
and Search and Rescue (RAC/SAR)

The agenda of the committees were approved, with the addition of two sub-items to Agenda Item 1 of Subcommittee 1 of the General Committee.

A Steering Committee was formed to permit coordination of administrative matters and to keep watch on the progress of the work. It consisted of the Chairmen of all committees, assisted by the committees' secretariat.

- 1.2.10 Agenda Item 4: Approval of the Final Reports of sub-committees and of technical committees.

The Final Report of Subcommittee 1 of the General Committee was approved unanimously. The Final Reports of the AGA, COM, MET and RAC/SAR Committees were approved unanimously, subject to the comments thereon of Subcommittee 1.

- 1.2.11 Agenda Item 5: Consideration of any other business that members may wish to present and that is within the competence of the Committee as defined in the rules of procedure

No matters were brought forward under this item.

- 1.2.12 Agenda Item 6: Approval of Final Report of General Committee

At its closing meeting the General Committee approved a draft of the final report. This draft lacked certain material that could be added only after the General Committee had completed its work. The Committee therefore delegated to its Chairman the authority to approve the complete report.

1.3 Closing address by the Chairman of the General Committee

In his closing remarks, the Chairman commented on the substantial accomplishments of the Meeting, resulting from the energetic and cooperative approach of all delegations, and on the tangible benefits to safety and efficiency of operations that would accrue from the improved services planned by the Meeting. He mentioned that holding the Meeting in Montreal had permitted close observation of its work by Members of the Air Navigation Commission, which would be useful in their planning for future meetings, and also gave many delegates their first opportunity for observing the Headquarters and its working methods.

He concluded by commending the work of the Meeting's secretariat, and thanking the Air Navigation Commission, and the delegates of States and of International Organizations for their contribution to the success of the Meeting.

SECTION 2 - RECOMMENDATIONS OF THE GENERAL COMMITTEE

2.1 Recommendation No. 1 - that the Council approve the Report of Subcommittee 1 of the General Committee (Doc 7534, NAT III-GC-Sub.1) and the Reports of:

The Aerodromes, Air Routes and Ground Aids Committee	Doc 7530 NAT III-AGA
The Communications Committee	Doc 7533 NAT III-COM
The Meteorological Committee	Doc 7532 NAT III-MET
The Rules of the Air and Air Traffic Control and Search and Rescue Committee	Doc 7531 NAT III-RAC/SAR

subject to the comments of Subcommittee 1 thereon.

APPENDIX ALIST OF REPRESENTATIVES AND COMMITTEES ATTENDED

(Note.- "x" indicates attendance at one or more meetings of the committee)

<u>Capacity</u>		<u>Gen.</u>	<u>SC-1</u>	<u>AGA</u>	<u>COM</u>	<u>MET</u>	<u>RAC/SAR</u>
<u>Belgium</u>							
Jansen, L.	Chief of Delegation	x	x	x	x		x
Martin, H.	Delegate	x	x			x	
<u>Canada</u>							
Pattison, H.A.L.	Chief of Delegation	x	x		x		x
Barrowman, I.G.	Delegate	x	x				x
Britney, O.L.	Delegate	x	x		x		
Casey, P.K.	Delegate	x	x	x	x		x
Graham, R.C.	Delegate	x	x			x	
Hutchon, H.M.	Delegate	x				x	
Millar, W.B.	Delegate	x		x			x
West, J.M.	Delegate	x		x			
Brown, A.P.	Adviser	x					x
Cowie, M.J.	Adviser	x	x	x			x
Cunningham, T.C.	Adviser	x	x				
Elsley, E.M.	Adviser	x	x			x	
English, E.T.	Adviser	x	x		x		
Gibson, J.M.	Adviser	x	x	x			x
Loke, A.W.	Adviser	x	x				
Lussier, P.	Adviser	x	x	x			x
McNaughton, M.K.	Adviser	x	x				
Myrick, V.	Adviser	x					
Smith, R.H.	Adviser	x		x			x
Powell, R.A.	Observer	x					
<u>Denmark</u>							
Dalbro, S.A.	Chief of Delegation	x	x				x
Amundsen, O.	Delegate	x	x			x	
Hansen, A.	Delegate	x	x				x
Mølgaard, H.T.	Delegate	x	x		x		
Mosdal, V.	Delegate	x			x		
Svenningsen, K.	Delegate	x	x		x		
Hastrup, C.E.J.	Adviser	x	x	x			x
Holten Moeller, H.	Adviser	x			x		
Andersen, H.E.	Observer	x					
<u>Dominican Republic</u>							
Pichardo, J.M.	Observer	x					

<u>Capacity</u>		<u>Gen.</u>	<u>SC-1</u>	<u>AGA</u>	<u>COM</u>	<u>MET</u>	<u>RAC/SAR</u>
<u>Egypt</u>							
Soliman, A-H.	Observer	x	x				x
<u>France</u>							
Teyssier, C.J. (5.-11.10)	Chief of Delegation	x	x				
Barberon, J.P.	Delegate	x	x			x	
Chef, M.P.	Delegate	x	x		x		
Danel, L.A.	Delegate	x	x		x		
Griveau, M.L.A.	Delegate	x	x	x			x
Haguenaui, D. (12-29.10) (MF)	Delegate	x	x	x			x
Hames, F.R.	Delegate	x					x
Leclercq, P.T.	Delegate	x	x			x	
Meunier, C.J.C.	Delegate	x	x		x		
<u>Iceland</u>							
Kofoed-Hansen, A.	Chief of Delegation	x	x	x			x
Diego, F.A.H.	Delegate	x	x				x
Gudmundsson, S.H.	Delegate	x	x	x			x
Jonsson, B.	Delegate	x	x	x			x
Palsson, E.	Delegate	x	x		x		
Sigtryggson, H.	Delegate	x	x			x	
<u>India</u>							
Chakraverti, D.	Observer	x					
<u>Ireland</u>							
Algar, W.G.	Chief of Delegation	x					
Bourke, P.M.A.	Delegate	x	x			x	
Enright, G.E.	Delegate	x	x		x		
Hogan, T.L.	Delegate	x	x	x			
O'Brien, N.A.	Delegate	x	x				x
O'Sullivan, R.W.	Delegate	x	x				x
Saul, J.P.	Delegate	x	x				x
<u>Israel</u>							
Zurr, E.	Chief of Delegation	x	x	x	x		x
Williams, J.E.D.	Delegate	x	x	x	x		x
<u>Italy</u>							
Bucchi, M.	Chief of Delegation	x	x	x			
Jereb, C.	Adviser	x	x				

	<u>Capacity</u>	<u>Gen.</u>	<u>SC-1</u>	<u>AGA</u>	<u>COM</u>	<u>MET</u>	<u>RAC/SAR</u>
<u>Lebanon</u>							
Dabbas, E.	Observer	x					
<u>Netherlands</u>							
Rombouts, P.J.C.	Chief of Delegation	x	x	x	x		x
Lenstra, G.A.	Delegate	x	x			x	
Moeshart, H.E.	Delegate	x	x		x		
Postma, K.R.	Delegate	x	x			x	
Edwards, J.	Adviser	x	x	x			x
Vieyra, S.	Adviser	x					
<u>Norway</u>							
Simonsen, T.W.	Chief of Delegation	x	x	x			x
Sandvei, O.J.	Delegate	x	x		x		
Bougge, R.	Adviser	x	x		x		
<u>Portugal</u>							
Veres, V.	Chief of Delegation	x	x		x		
Blanc de Portugal, J.B.	Delegate	x	x			x	
<u>Spain</u>							
Merino, M.M.	Chief of Delegation	x	x				
Tordesillas, F.	Delegate	x	x	x	x		x
<u>Sweden</u>							
Karlsson, J.G.	Chief of Delegation	x	x	x			x
Berggren, K.R.	Delegate	x	x			x	
Enderlein, L.H.	Adviser	x	x	x			x
Engstrom, C.A.H.	Adviser	x	x				
Piculell, S.A.	Adviser	x	x				
<u>United Kingdom</u>							
Lindemere, N.V.	Chief of Delegation	x	x				
Camacho, V.	Delegate	x	x	x			
Cumming, J.C.	Delegate	x	x			x	
Farmer, J.C.	Delegate	x	x		x		
Gilbert, A.B.	Delegate	x			x		
Gilbert, H.G.	Delegate	x					
Hampton, G.H.	Delegate	x			x		
Lawman, I.T.	Delegate	x	x				
Manning, R.P.	Delegate	x	x		x		

<u>Capacity</u>		<u>Gen.</u>	<u>SC-1</u>	<u>AGA</u>	<u>COM</u>	<u>MET</u>	<u>RAC/SAR</u>
<u>United Kingdom (Cont'd)</u>							
Pearson, R.A.	Delegate	x	x				x
Philipps, R.A.	Delegate	x	x				x
Riley, J.	Delegate	x	x			x	x
Robinson, J.J.	Delegate	x	x		x		
Ware, E.M.	Delegate	x	x				
<u>United States</u>							
Smith, C.H.	Chief of Delegation	x	x	x			x
Catudal, A.L.	Delegate	x	x	x			
Clinkscales, R.H.	Delegate	x	x	x			
DeJoy, A.J.	Delegate	x	x				x
Halnon, W.L.	Delegate	x	x			x	
Kinney, J.L.	Delegate	x	x	x			x
McFarland, H.H.	Delegate	x	x				x
Shores, E.V.	Delegate	x	x		x		
Abbott, J.R.	Adviser	x	x			x	
Burnard, E.T.	Adviser	x	x	x	x		x
Child, D.K.	Adviser	x	x		x		
Durkovic, J.	Adviser	x	x		x		
Fuqua, F.H.	Adviser	x	x		x		x
Morris, L.N.	Adviser	x	x				x
Nye, R.M.	Adviser	x	x	x			x
Palmer, J.A.	Adviser	x	x				x
Palmer, W.J.	Adviser	x	x		x		
Petry, C.A.	Adviser	x	x		x		
Wall, L.C.	Adviser	x	x		x		
Weihe, V.I.	Adviser	x	x				
<u>Fédération Aéronautique Internationale</u>							
Truran, J.N.	Observer	x					
<u>International Airlines Navigators Council</u>							
Almin, H.	Observer	x					
Henderson, W.K.	Observer	x					
<u>International Air Transport Association</u>							
Aagaard, A.	Observer	x	x				x
Baumard, M.	Observer	x			x		
Bellringer, C.C.E.	Observer	x	x		x		x
Blaker, H.T.	Observer	x	x		x		
Boissel, G.M.	Observer	x	x				
Brown, R.F.	Observer	x	x	x	x	x	
Browne, J.A.	Observer	x	x				

<u>Capacity</u>		<u>Gen.</u>	<u>SC-1</u>	<u>AGA</u>	<u>COM</u>	<u>MET</u>	<u>RAC/SAR</u>
<u>International Air Transport Association (Cont'd)</u>							
Brunt, W.	Observer	x	x		x		
Buxton, E.B.	Observer	x					
Hardouin, J.	Observer	x	x			x	x
Henley, E.P.	Observer	x	x				x
Hermanson, F.A.	Observer	x	x		x		
Heybroek, E.P.	Observer	x	x			x	
Kennyhertz, J.J.	Observer	x	x		x		
Lorraine, A.C.	Observer	x	x	x			x
MacDougall, J.	Observer	x	x	x			x
Meline, J.	Observer	x	x	x			x
Miller, W.B.	Observer	x	x				
Olhede, S.G.	Observer	x				x	
Pattison, R.E.	Observer	x	x				x
Peck, T.A.	Observer	x	x		x		
Pike, E.W.	Observer	x					
Powell, A.O.	Observer	x	x	x	x	x	x
Reber, A.	Observer	x	x				x
Rustom, D.C.	Observer	x	x			x	
Thompson, R.	Observer	x	x				
Van der Aa, A.G.	Observer	x	x			x	
<u>International Federation of Airline Pilots' Associations</u>							
Bonnet, J.	Observer	x		x		x	x
Buck, R.N.	Observer	x		x		x	
Masland, W.	Observer	x	x		x		
Willet, J.E.	Observer	x		x			x
Spencer, C.C.	Observer	x					
<u>International Radio Air Safety Association</u>							
Martin, E.E.	Observer	x	x		x		
Pouw, J.A.	Observer	x	x		x		
Wootton, E.A.	Observer	x					x
<u>World Meteorological Organization</u>							
Nagle, A.H.	Observer	x	x			x	
Rivet, J.R.	Observer	x				x	

PART II
SUBCOMMITTEE 1
OF THE GENERAL COMMITTEE

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THIRD NORTH ATLANTIC REGIONAL AIR NAVIGATION MEETINGMONTREAL, QUEBECOCTOBER 1954SUBCOMMITTEE 1 OF THE GENERAL COMMITTEE

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SECTION 1 - CHAIRMAN'S REPORT1.1 Historical Statement.1.1.1 Place and duration of meeting of Subcommittee 1

Subcommittee 1 of the General Committee held eight meetings at the International Aviation Building in Montreal, Quebec, between 5 October 1954 and 28 October 1954, under the Chairmanship of Mr. Norman V. Lindemera, Delegate of the United Kingdom. Mr. D. Hagenau, Delegate of France acted as Vice-Chairman.

1.1.2 Representation.

A list of States and international organizations represented on the Subcommittee appears at Appendix A of the Report of the General Committee.

1.1.3 The Subcommittee was assisted in its work by Messrs. Paul M. Norman, J.A. Newton, F.M. Booth, P.J. Greven, G.J.W. Oddie, and H.R. Adam as Technical Secretaries. Misses Maude M. Murphy and Dorothy Nichiporowich acted as Recording Secretaries.

1.1.4 Working Arrangements.

The work of Subcommittee 1 was, so far as possible, carried forward by means of working groups to the stage where their reports required a minimum of discussion in the plenary sessions. Eight working groups were formed to deal with specific matters, as follows:

Working Group A. Preparation of statement of Operational Requirements for the NAT Region, based on the Report on Aircraft Operations, Air Navigation Facilities and Services. (Agenda Item 1)

An evaluation of the operational requirement for an air-ground COM station at Prins Christianssund. (Agenda Item 1(f) in part.)

The accuracy of present aeronautical charts of the Region. (Agenda Item 1(e))

Chairman: Mr. J.L. Kinney
Delegate of the United States

Working Group B. Preparation of lists to technical committees showing changes in types or locations of short distance navigational aids and aids to final approach and landing both visual and non-visual (OPS/AGA/COM/RAC-SAR). (Agenda Item 1 (a))

Chairman: Mr. I.T. Lawman
Delegate of the United Kingdom

Working Group C. The Working Group, taking into account the continued operational requirements for retention of the presently installed LORAN chains and CONSOL stations, will determine where long distance navigational aid coverage should be provided, improved or supplemented, and make appropriate recommendations to that end; and prepare requirements for aids to facilitate operations entering and departing oceanic control areas (OPS/AGA/COM/RAC-SAR). (Agenda Item 1(b) and (c))

An evaluation of the operational requirements for a NDB at Prins Christianssund and rating of the facility if required. (Agenda Item 1(f) in part.)

Chairman: Mr. J.C. Farmer
Delegate of the United Kingdom

Working Group D. Determination of the areas to be provided with air traffic services (OPS/RAC-SAR/COM). (Agenda Item 1 (d))

How to effect coordination between a flight information region (FIR) or control area and an adjacent FIR or control area and to effect uniformity in air traffic separation. (OPS/RAC-SAR/COM). (Agenda Item 3)

Chairman: Mr. H.H. McFarlane
Delegate of the United States

Working Group E. Preparation of statement of operational requirements for the exchange of aeronautical meteorological information (OPS/MET/COM). (Agenda Item 2)

Evaluation of the requirements for meteorological observations, and their dissemination, from Frins Christianssund. (Agenda Item 1(f) in part).

Chairman: Mr. E.T. Burnard
Delegate of the United States

Working Group F. To report on specific amendments to the existing arrangements within the Region for dissemination of aeronautical information, and upon the compatibility of currently applicable altimeter setting procedures in the Region with those of adjoining Regions and to propose any necessary modifications.

Chairman: Mr. I.T. Lawman
Delegate of the United Kingdom

Working Group G. To report on critical operational requirements and co-ordination of dates of implementation.

Chairman: Mr. D. Hagenau
Delegate of France

Working Group H. To resolve incompatibility between requirements for transit times over the AFTN and maximum delivery times of operational meteorological messages.

Chairman: Mr. D.K. Child
Delegate of the United States

1.2 Report on the Agenda1.2.1 Agenda Item 1. Preparation of statement of operational requirements for the Region, including determination of:

- a) any changes in the types or locations of short distance navigational aids and aids to final approach and landing;
- b) the requirements for long range navigational cover;
- c) the requirements for aids to facilitate movement of air traffic departing the oceanic control areas;
- d) the area to be provided with air traffic services;
- e) the accuracy of present aeronautical charts of the Region;
- f) requirements for Air Navigation Services at Prins Christiansund.

1.2.1.1 Subcommittee 1 divided its work upon this agenda item into four parts, in order to cover this item as well as items 2 and 3 in time for the results of its consideration of them to be of value to the technical committees. Five working groups (A, B, C, D, and E) were constituted to deal with the three items, as indicated by the terms of reference set forth in 1.1.4 of the present report, the specific sub-item (e) being in its three aspects, divided among the three working groups having terms of reference most nearly related to them. Topical discussions, as envisaged by the Air Navigation Commission, took place, therefore, within the working groups. By this means, it was possible to prepare and clear these three items before the technical committees met on the Monday following the opening of the Meeting. In following this procedure, the Subcommittee found that there was some overlap in the discussions carried on in the various working groups, and incompatibility between the reports rendered by them. After receiving the several reports and giving tentative approval to them, they were then reconciled and consolidated to form the statement of operational requirements contained in Section 2, Chapter 1 of the present report.

1.2.1.2 The Delegate of Canada dissented from the general agreement upon the manner of stating the requirement for maximum transit times for Class A messages over the AFTN on the grounds that thirty minutes, as specified in the last line of paragraph 2.1.6.1 was an unreasonable operational requirement.

1.2.1.3 Short range navigational aids and aids to final approach and landing

1.2.1.3.1 Difficulty was experienced by the Subcommittee in complying with its mandate to prepare lists of "changes in types or locations of aids". No current plan of the North Atlantic region exists and NAT III-WP/25 proved to be an inadequate substitute because, in the view of the Subcommittee, the

list of facilities therein is in part incomplete, in part incorrect, and in part comprised of facilities not within the North Atlantic region. It was concluded, therefore, that it would be necessary not only to determine changes in the aids, but also to list in so far as possible existing facilities which should form part of the plan.

1.2.1.3.2 The Subcommittee was next faced with the task of deciding which facilities should be considered as within the North Atlantic region. In default of specific directions on this point, the Subcommittee decided that it would consider facilities for all trans-Atlantic flights as far as the first point of landing and its alternate aerodromes within the continents on either side of the Atlantic.

1.2.1.3.3 As the work progressed, it became more and more obvious that the first task of a regional meeting should be to draw up or revise a list of the regular and alternate aerodromes in the region. Accordingly, in order to achieve relative comprehensiveness in its list of visual and non-visual aids to approach and landing the Subcommittee produced a list of regular and alternate aerodromes which could not, however, be considered to be in any sense complete. It has been completed by the AGA Committee.

1.2.1.3.4 Doubt had been expressed in the Subcommittee as to the advisability of producing a list of aerodromes requiring the installation of visual aids, as directed in consequence of the Air Navigation Commission's decision on 24 March 1953 (XII-29) to ensure that discussion would take these, as well as non-visual aids, into account. This doubt was resolved on the understanding that the list prepared would be restricted to aerodromes at which requirements for approach or lead-in lighting emerged from discussions respecting requirements for ILS, and that it would be for the AGA Committee to add to the list, or refer back to Subcommittee 1 any difficulties that might arise in implementing the stated requirements.

1.2.1.3.5 The Subcommittee considered it necessary that the meeting prepare a complete statement of the NAT plan for short range radio aids and aids to final approach and landing along the lines followed by the AFI II meeting. This is reflected in the requirements stated at 2.1.6.7 to 2.1.6.9 inclusive of Section 2, Chapter 1. New requirements for non-directional beacons considered in this listing are those with a range of less than 200 nautical miles, which is considered to be the limit of short range aids.

1.2.1.3.6 The Subcommittee noted a recommendation of the EUM III Meeting for implementation of an NDB at Tuskar Rock (Ireland) to provide a position reporting point and considered that this facility will not be required when VOR is implemented at Dublin.

cf
1192
M. B. Smith

1.2.1.4 Requirements for long range navigational cover^{*}

1.2.1.4.1 The Subcommittee examined various aspects of air navigation services that might lead to a need for the extension or supplementation of existing long range aid coverage and, while recognizing the value of such in facilitating the problem of navigation of an aircraft as a single entity, particularly in regions of high latitude, concluded that the principal justification for extending coverage arose from the need to reduce separation requirements imposed by Air Traffic Services.

1.2.1.4.2 The requirements have steadily increased from a time separation of fifteen minutes to thirty minutes because the position fixes received by ATC were not sufficiently accurate to apply lesser separation standards. Under existing traffic conditions this has lead, on numerous occasions, either to the clearance of aircraft to fly at altitudes other than those requested or to the acceptance of delays in departure. A survey shows that clearance for flights at altitudes other than those desired is at the present time occurring in respect to several aircraft (three to six) daily, when conditions require application of separation standards and that acceptance of delays up to half an hour while awaiting permission to fly at altitudes requested is occurring with similar frequency. The overall penalty in loss of time and efficiency is evident.

1.2.1.4.3 A detailed examination of traffic has indicated that total crossings in 1954 including all aircraft subject to ATC will likely exceed 60,000 and that this may be expected to increase to 90,000 in 1959. With this increase in traffic, a substantial increase in the present incidence of delays and of clearances to fly at altitudes other than those requested may be expected, unless steps are taken at an early date to provide better position fixing facilities.

1.2.1.4.4 The Subcommittee therefore considered what criteria might be established as a working basis for defining the coverage of a long range navigational aid system; that is the area within which the aid system would provide a fix with an accuracy that would permit a satisfactory degree of improvement in the conditions of operation imposed by ATS requirements at the present time. It was concluded that a fix accuracy of 20 NM obtainable 95 per cent of the time should be accepted as the criteria for determining the coverage of the system for the purpose in view. It should be emphasized, however, that coverage specified on the basis of this criteria should not be regarded as delimiting the area within which the system is of value both for ATS and other navigational purposes. Also, it is to be recognized that the accuracy stated may not be sufficient in special areas or locations such as approaches to or at certain points of entry to control areas.

^{*} See statement of the United States of America at Appendix A.

1.2.1.4.5 The Subcommittee used the above mentioned criteria in determining the extent of the coverage provided by existing aids and in establishing its recommendations on additional long range aids to provide the supplementary coverage considered necessary to meet the operational requirements stated in Section 2, Chapter 1 of the present report. (See also Recommendation No. 15 and comment thereon in Section 8 of the present report.)

1.2.1.4.6 Navigational facilities on board ocean station vessels in relation to long range navigational coverage. The Subcommittee considered the extent to which the radio navigational facilities on board ocean station vessels might contribute to or modify the long range navigational coverage to be provided by shore based installations.

1.2.1.4.7 It was agreed that long range coverage required for ATS purposes could not be predicated on the navigation aids on OSV as the functions of these vessels and the limitations on the availability of their navigational services would not assure the continuity of coverage required with respect to both time and accuracy. The Committee, however, recognized that the navigational services on board the OSV provided a valuable supplementary service and that if an aircraft should need to home on an OSV the guidance provided by its navigational services would be essential.

1.2.1.5 Requirements for aids to facilitate movements of air traffic entering and departing the oceanic control areas. The requirements indicated under this agenda item were examined from the aspect of the long range navigational coverage requirements developed by the Subcommittee and it was agreed that no general criteria could be stated. It was recognized that particular cases would need to be examined in the light of the problem involved and that, in general, their solution would be in the field of short range aids. Satisfaction, however, of the general long range coverage requirements would assist in their solution as the fixing accuracy likely to be obtainable in the areas where aircraft are entering and departing from oceanic control areas will, in general, be of a high order.

1.2.1.6 Area to be provided with air traffic services. With respect to Agenda Item 1 (d), having discussed the probability of increased air traffic in the area north of the existing North Atlantic FIR's and west of the NAT Region, as well as the needs of current or planned operations, the Subcommittee directed the RAC-SAR Committee to study the possibility of establishing new, or extending existing NAT, FIR's.

1.2.1.7 Accuracy of present aeronautical charts of the Region. Recent experiences in operating in the Polar areas of the Region have indicated certain deficiencies in the available aeronautical charts, particularly in the accuracy of elevations of the ice cap area of Greenland. There

are a number of States producing charts covering this area and the indication of elevations varies considerably from chart to chart, a difference of 3,000 feet having been noted in the case of one spot elevation. Although action has been taken to remedy this particular situation, there are others of similar magnitude and it is obvious that operators are being penalized in establishing safety altitudes or that the safety of operations is being compromised. The Subcommittee considered that there is a need for maximum co-ordination among the various States producing charts, in the interest of a free flow of basic compilation material, due to:

a) Lack of adequate survey data essential to the compilation of accurate charts;

b) Lack of information as to the degree of reliability of each chart.

Consequently a Recommendation (No. 6) was made for action to alleviate this condition.

1.2.1.8 Air Navigation Services at Prins Christianssund.

1.2.1.8.1 The Subcommittee agreed that although there was a general operational requirement for aircraft to be able to communicate at all times with at least one air/ground communication station when in the en route and terminal area phase of operations and with air traffic services when in the terminal area, this requirement was not being met in all conditions. This is particularly the case in the more northern routes within a large area located north-east of Newfoundland and Labrador, Greenland and south-west of Iceland. However, the Subcommittee did not find it possible, owing to the various technical problems involved, to state the specific location of an air/ground communication station but left it to the COM Committee to determine the best possible solution. (Section 2, Chapter 1, paragraph 2.1.6.3 refers.)

1.2.1.8.2 The Subcommittee discussed the need for meteorological observations from Prins Christianssund and their dissemination and came to the following conclusions:

a) The loss of the surface synoptic observations of Prins Christianssund would have serious repercussions on the possibilities for preparing synoptic analyses in an area of the North Atlantic which is most significant from the point of view of weather developments. Furthermore, any curtailment in the NAOS network affecting stations A and B would emphasize the importance of the station at Prins Christianssund.

b) It is particularly important that these observations be disseminated regularly and with the minimum delay practicable.

c) QNH values from Prins Christiansund, or a location within 60 or 70 nautical miles, would contribute materially to the efficiency of air navigation in that part of the Region.

There was no disagreement on these conclusions except for one State.

1.2.1.8.3 Continuation of operation of the NDB at Prins Christiansund was agreed and a Recommendation (No. 17) was made to that effect.

1.2.2. Agenda Item 2. Analysis of the problems associated with the exchange of aeronautical meteorological information, and preparation of a statement of operational requirements for such an exchange to meet the joint needs of the operators, the meteorological services and the air traffic services.

1.2.2.1 The Subcommittee prepared a revised statement of operational requirements for the exchange of aeronautical meteorological information in the NAT Region. This appears at Chapter 2 of Section 2 of this report. There was no disagreement on this statement of operational requirements.

1.2.2.2 Differences from similar statements prepared at previous Regional Meetings are not fundamental, reflecting in the main the special requirements of the NAT Region and recent developments in world-wide procedures for the provision of meteorological service for air navigation as well as the efforts of the Subcommittee to state the requirements as accurately as possible. Special mention should be made of para.2.2.4, (Requirements for Operational Planning) which gave rise to lengthy discussion before being reduced to a brief statement of the pure operational requirement followed by notes concerning implementation.

1.2.2.3 The Subcommittee also considered views expressed by the Representative of IATA, concerning the operational requirements for in-flight meteorological service. As a result, in amplification of that part of the statement of operational requirements, three notes were added to 3(f) that relate to the provision of new or amended flight forecasts during flight. Agreement was not reached on further proposals by the IATA Representative concerning meteorological service for in-flight operational planning and the proposals were dropped.

1.2.2.4 The Subcommittee considered the task of completing and revising the tables of ground exchanges of meteorological information which were included in the documentation for this meeting. Bearing in mind the experience at previous Regional Air Navigation Meetings, the Subcommittee

came to the conclusion that this material could not be expected to be ready for transmission to the COM Committee until too late to be of use. The Subcommittee therefore prepared a tabulation of the changes required in this traffic from that existing at present, it proved to be possible to prepare such a table, which was believed accurate enough for the COM Committee's purposes and this appears at Chapter 3. In view of the short time available for discussion it cannot, however, be taken as giving with complete accuracy all details of additional exchanges required for inclusion in the MET part of the Regional Plan. The Delegates of Canada, France and Portugal wished to be recorded as disclaiming any implied firm acceptance of the requirement of the exchanges listed in so far as their meteorological services were concerned.

1.2.2.5 There was a difference of opinion regarding the need for the preparation of full tabulations showing either the existing traffic or the total expected traffic, the majority holding the view that nothing further than the expected changes in traffic was required. Bearing in mind the experience gained at this and previous Regional Air Navigation Meetings, the Subcommittee adopted a Recommendation (No. 18) respecting this matter.

1.2.2.6 The Subcommittee believed that it would be useful if the COM Committee, on the basis of its experience in using the material provided at this meeting, could give its views on the best way of arriving at an assessment of the expected volume of ground exchanges of meteorological information for use by the COM Committee at future RAN Meetings.

1.2.3 Agenda Item 3. Analysis of the problems of:

- a) coordination between a flight information region or control area and the adjacent flight information regions or control areas.
- b) separation procedures and flight level clearances.

The Subcommittee concluded that there was an urgent requirement for improved and more reliable communications in the North Atlantic Region and an equally urgent need for amending the navigation aids plan so as to permit closer co-ordination between air traffic services centres, more accurate position determination and more uniform application of separation criteria within NAT control areas. Four general aspects of the problem were considered:

- a) air-ground communications;
- b) aeronautical fixed service communications;
- c) uniform application of separation criteria; and
- d) navigation aids.

The requirements emerging from this consideration are included in Section 2, Chapter 1 of the present report.

1.2.4 Agenda Item 4. Consideration of specific amendments to the existing arrangements within the Region for the dissemination of aeronautical information, including:

4.1 Notification to the COM Committee of communications requirements for NOTAM distribution.

1.2.4.1 The Subcommittee examined existing arrangements in the NAT Region for dissemination of aeronautical information and concluded that in a number of respects current practice falls short of what is required to provide an adequate service to operators. In general, however, the Subcommittee considered that most requirements would be met if States complied with the Standards and Recommended Practices contained in Annex 15. The Subcommittee's action on this agenda item appears at Section 3 of the present report.

1.2.4.2 The COM Committee was notified that the AFTN should cater for dissemination through its facilities of the NOTAMS Class 1 exchanges listed at page Sub-63.

1.2.5 Agenda Item 5. To weigh the compatibility of currently applicable altimeter setting procedures in the Region with those of adjoining Regions and to recommend any necessary modifications.*

1.2.5.1 The Subcommittee considered a proposal by the United States for amendment of the current Altimeter Setting Procedures found in Part 1 of Doc 7030 and two recommendations by IATA, one calling for the complete and uniform application of these procedures throughout the NAT Region and a second proposing the adoption of uniform transition procedures to be applied to aircraft entering or departing from the NAT Region.

1.2.5.2 The United States proposed and was seconded by Canada that the procedures in Doc 7030 be amended by inserting the following additional paragraph in 1.1.6.

"The transition while en route from an altimeter setting of 1013.2 mb. (29.92 in.) to a QNH setting and vice versa shall be made approximately 100 nautical miles seaward from Bermuda, Iceland and the Azores."

Using Iceland as reference a working group of the Subcommittee had discussed at considerable length the merits of this proposal and the current procedures in Doc 7030 and had concluded that no such amendment to Doc 7030 was required. Upon being put to a vote the proposal was lost by a vote of 2 in favour (Canada and the United States) and 10 opposed (Belgium, Denmark, France, Iceland, Ireland, Italy, Norway, Netherlands, Sweden and the United Kingdom) with Portugal abstaining.

* See Statement by the United States at Appendix A.

1.2.5.3 The Subcommittee then adopted by a vote of 8 to 2 with one abstention, the recommendation proposed by the working group that the current procedures in Doc 7030 be implemented throughout the NAT Region, i.e. that they replace the procedures currently in use at Iceland, Bermuda and the Azores. (See Recommendation No. 8.)

1.2.5.4 In view of this decision, the Subcommittee decided that the present paragraph 1.1.6.3 of Doc 7030 served no useful purpose and should be deleted.

1.2.5.5 The second IATA recommendation calling for the adoption of uniform transition procedures to be used by aircraft entering or departing from the NAT Region was then considered. The Subcommittee concluded that there was little hope of developing common procedures for both sides of the Atlantic at this meeting. However, having noted that paragraph 1.1.6 of Doc 7030 contained no transition procedures for the eastern boundary of the NAT Region, the Subcommittee agreed that a suitable paragraph should be introduced. (See Recommendation No. 9.) A proposal that the last sentence of this paragraph be deleted was defeated by a vote of 3 in favour and 6 opposed, with 3 abstentions. The recommendation was then adopted by a vote of 11 in favour, and 2 opposed.

1.2.5.6 In line with the normal procedure at regional meetings, it was agreed that the areas to which the NAT Altimeter Setting Procedures applied should be defined in terms of the FIR's recommended by the RAC Committee.

1.2.6 Agenda Item 6. Recapitulation of recommendations of Subcommittee 1 of the 2nd North Atlantic Regional Air Navigation Meeting with a view to eliminating those which are no longer applicable.

1.2.6.1 The Subcommittee reviewed the Recommendations of Subcommittee 1 of the Second North Atlantic Regional Air Navigation Meeting and concluded that action taken since that meeting had effectively disposed of them, and they were therefore to be considered no longer valid.

1.2.7 Agenda Item 7. Preparation of a list of those facilities and services included in the revised regional plan that are considered of critical importance to air operations in the Region, and that for this reason should be given priority in the implementation plans of the State concerned.

1.2.7.1 In considering the revised regional plan, Subcommittee 1 decided that there were at present no facilities and services to be considered as being of critical importance, and as such requiring absolute priority to be given by States in their implementation.

1.2.7.2 Subcommittee 1, nevertheless, considered it desirable to list certain facilities to which the attention of States should be drawn in as much as they constitute urgent operational requirements. The Subcommittee adopted Recommendations Nos. 11 and 12 accordingly.

1.2.7.3 The Subcommittee considers that the attention of the Air Navigation Commission should be drawn to the difficulties encountered in dealing with Agenda Item 7 without a precise definition of what must be termed critical requirements. In many cases the facilities which will ensure an increased satisfaction of operational requirements constitute a whole, from which it is not desirable to select, in a more or less artificial manner, a few isolated items and state that they alone represent critical requirements. However, Technical Committees may at all times, if they wish to emphasize the urgency of meeting certain requirements, recommend a higher priority in implementation for such facilities.

1.2.8 Agenda Item 8. Coordination of dates for implementation of procedures and recommendations for facilities.

1.2.8.1 The Subcommittee found no inconsistencies in the implementation dates recommended by the various Technical Committees. Its recommendations on implementation dates appear at Section 7 of the present report.

1.2.9 Agenda Item 9. Review of the Final Reports of the Technical Committees and the indication of any measures required to ensure the presentation of a coordinated regional plan.

1.2.9.1 In reviewing the reports of the Technical Committees Subcommittee 1 noted that all problems had been sufficiently thoroughly thrashed out in the respective committees as to require virtually no comment by Subcommittee 1. The Subcommittee's action is indicated at Section 5 of the present report.

1.3 Other Matters Considered

1.3.1 Preparatory work for RAN meetings. In the earlier stages of its work the Subcommittee encountered some difficulty that might be overcome in the future by somewhat more advanced planning. It wishes particularly to invite attention to:

i) the need for advance notice of operators' requirements;

ii) the need for fact-finding reports to be out well in advance of meetings;

iii) the need for the exact routes to be covered by the meeting to be specified.

1.3.2 The relationship of maximum delivery times of meteorological messages to the criteria for transit times of messages on the AFTN.

1.3.2.1 The Subcommittee, in drafting the operational requirements appearing in Section 2 of the present report, had considered that criteria for maximum delivery times of MET messages could best be specified in terms of fixed intervals of time, whereas maximum transit times on the AFTN could best be specified in terms of a percentage of flight time with an overriding fixed interval of time of 30 minutes if the percentage of flight time were greater than this. These criteria subsequently proved to be incompatible.

1.3.2.2 The Subcommittee found that since the AFTN was engineered to meet AFTN transit time criteria and the meteorological transit time requirements forwarded to the COM Committee in some cases are more stringent than the AFTN criteria, it is apparent that the total MET requirements cannot be met on the existing AFTN without disrupting the normal flow of other types of traffic. Further, the stated requirement for MET operational traffic cannot be fully satisfied on the exclusive MET channels without disrupting the Scheduled Synoptic data on these circuits.

1.3.2.3 The Subcommittee was of the opinion that the ideal solution to the problem would be the establishment of a communications network for the exclusive use of MET operational type traffic. However, it was recognized that it was unlikely that this solution could be implemented in the immediate future and therefore considered that States should keep under review the present procedure for handling meteorological traffic via AFTN circuits with a view to maintaining the best possible transit times.

1.3.2.4 In view of the foregoing, Subcommittee 1 agreed upon Recommendation No. 19.

SECTION 2 - OPERATIONAL REQUIREMENTS

The tables included in Section 2 of the present report established at the beginning of the meeting by Subcommittee 1 have been revised by the technical committees in their final reports, to which reference should be made.

CHAPTER 1 - STATEMENT OF OPERATIONAL REQUIREMENTS IN THE NAT REGION

2.1.1 - INTRODUCTION

2.1.1.1 All Committees should base their work on NAT III-WP/25 as amended.

2.1.1.2 In addition to the data in NAT III-WP/25, the following statement of operational requirements is furnished to the technical committees for their guidance.

2.1.2 - GENERAL

2.1.2.1 The committees should avoid recommendations in too general terms, and should present specific recommendations relating to specific aerodromes, facilities or services.

2.1.2.2 In making use of the factual data on routes and locations, committees should ensure that, where possible, any supplementary procedures developed by this meeting are consistent with those currently in effect in the adjoining regions. If any supplementary procedures apply to groups of aerodromes, ground aids, stations, routes or areas, committees should state clearly where they apply. Technical committees should ensure that the areas in which flight procedures apply are clearly defined and wherever possible be made to coincide with the FIR boundaries, especially in the areas of overlap with adjoining regions. In addition, those portions of the regional plan which affect, or are affected by, the regional plans of adjoining regions, should be made consistent in so far as practicable.

2.1.2.3 Planning for current and future operations should be on a 24 hour day basis for all operations as a general rule; however, pending the ultimate development to a 24 hour service in areas where traffic density is particularly low, planning should be as operationally required.

2.1.2.4 In their deliberations, committees should carefully consider the provisions of paragraph 4.4 of Part II of "Rules of Procedure and Directives for Regional Air Navigation Meetings" (Document 7214-C/831/1). Consideration should also be given to the practicability of establishing target dates for the withdrawal of facilities no longer required in the region. Withdrawal dates should be consistent with the needs of adjacent regions and with respect to necessary changes in airborne equipment.

2.1.2.5 The work of the technical committees should be mainly concerned with the planning for international air operations, but there is no objection to the possible consideration of domestic operational requirements where necessary.

2.1.2.6 When planning for future operations, particular attention should be given to the special requirements of advanced types of aircraft that are likely to come into general operational use. Features of such aircraft, which are likely to have an important bearing on facilities planning and on procedures, are: high speed, high altitude operations and high fuel consumption under special conditions. Any additional requirements of low altitude operations by slow flying aircraft, such as helicopters, should also be considered.

2.1.3 - AERODROMES AND GROUND AIDS

2.1.3.1 In the interests of economy, it is hoped that many aerodromes used regularly by international air services for traffic or refuelling purposes will also serve as alternates for each other, and that the requirements for special "alternate aerodromes" will not be great. Recommendations involving the development of aerodromes solely for alternate use should therefore be limited to those where an imperative need exists and, for these, special justification should be provided.

2.1.3.2 The AGA Committee should give consideration to the provision of visual aids, in conformity with Annex 14, at all regular and alternate aerodromes, taking into account the individual importance of each aerodrome. An operational requirement exists for approach or lead-in visual aids, as specified in each case, at the regular and alternate aerodromes given below. It is recognized that this list may not be a complete listing of the aerodromes in the NAT Region at which approach or lead-in visual aids are required and consideration should, therefore, be given to the listing of ~~any~~ requirements additional to those given below.

REGULAR AERODROMES

<u>COUNTRY</u>	<u>LOCATION</u>	<u>REQUIREMENT</u>
Belgium	Bruxelles	Ae
Bermuda	Kindley Field	Ae (1)
Canada	Gander	A (on runways 04 and 22)
	Montreal	Ae
Denmark	København	Le
France	Paris/Orly	Ae (2) (on runways 03 and 26)
Germany	Frankfurt	Ae

<u>COUNTRY</u>	<u>LOCATION</u>	<u>REQUIREMENT</u>
Iceland	Keflavik	Ae (3)
Ireland	Shannon	Ap
Netherlands	Amsterdam	Ae
Norway	Bodo	Ae
	Oslo/Fornebu	A (2)
	Stavanger	Ae
Portugal	Lisboa	A (cf. EUM plan)
	Santa Maria	A (both ends of runway) (5)
Spain	Madrid	A (cf. EUM plan)
Sweden	Stockholm	Ae
Switzerland	Geneva	Ae
United Kingdom	London	Ae
	Prestwick	Ap
United States	Boston	Ae
	New York/International	Ae (2) (4)

ALTERNATE AERODROMES

<u>COUNTRY</u>	<u>LOCATION</u>	<u>REQUIREMENT</u>
Canada	Goose Bay	A
	Moncton	A
	Ottawa	Ae
	Sydney	A
Denmark	Aalborg	Ae (2)
France	Bordeaux	Ae (2)
	Marseille	A (5)
	Paris/Le Bourget	A (2)
Germany	Dusseldorf	Ae
	Hamburg	Ae
	Munich	Ae
	Hanover	Ae
	Bremen	Ae
	Nuremburg	A (at new airport)
Iceland	Reykjavik	A
Ireland	Dublin	Ap
Norway	Oslo/Gardermoen	Ae
Portugal	Lajes	Le
Spain	Barcelona	A
	Sevilla	A
Sweden	Göteborg	Ae
	Norrköping	Le
	Malmö	Ae

<u>COUNTRY</u>	<u>LOCATION</u>	<u>REQUIREMENT</u>
Switzerland	Zurich	Ae
United Kingdom	Bournemouth/Hurn	Le A (6)
	Blackbushe	Le
United States	New York/La Guardia	A (2)
	Washington	A (2)
	Newark	Ae
	Philadelphia/International	Le (2)
	Detroit	Le (2)
	Norfolk, Va.	Le (2)
	Columbus, Ohio	Le (2)
	Pittsburgh/Greater Pittsburgh	Le (2)
	Cleveland	Le (2)

LEGEND

- A - Standard approach lighting required.
- Ae - Standard approach lighting required and existing.
- L - Standard lead-in lighting required.
- Le - Standard lead-in lighting required and existing.
- Ap - Standard approach lighting required and projected.
- (1) - In view of the United States, this requirement has been met in so far as practicable.
- (2) - Requirement to bring aid into conformity with ICAO Standard.
- (3) - Approach lighting required on runway 21; State concerned to consider also installation of aid on runway 12.
- (4) - Second approach lighting required with installation of second ILS facility.
- (5) - Technical feasibility to be determined by AGA Committee.
- (6) - Consideration of requirement to be given by AGA Committee.

NOTE: The above recommendations do not go farther than the conditions of application in Annex 14, giving new installations priority over the improvement of existing ones.

2.1.3.3 Crash/Fire and Rescue - Pending the issue of approved Standards and Recommended Practices for the provision of Crash/Fire and Rescue Services, the scale to which these services should be provided in the region should continue to be the responsibility of the States concerned. Recommendations should therefore be confined to general items, but should emphasize the importance of Crash/Fire and Rescue and appropriate staff training.

2.1.4. - RULES OF THE AIR AND AIR TRAFFIC SERVICES

2.1.4.1 The RAC Committee, in their deliberations, should be guided by Annex 2, Annex 11, the PANS-RAC (Doc 4444-RAC/501/5) and the SUPPS-RAC (Part 2 of Doc 7030).

2.1.4.2 There is a requirement for flight information and alerting service throughout the Region. The area now provided with air traffic services in accordance with the current approved North Atlantic ATS Air Navigation Plan is shown on the chart on page 3-1-1 of Chart ATS 1, NAT III-WP/25. This area does not cover all flight paths flown or planned to be flown by the North Atlantic operators, particularly over Greenland and Northern Canada and consideration, therefore, should be given to expanding the existing Flight Information Regions to the North Pole.

2.1.4.3 Control areas should be established on those international air routes on which the traffic density and/or operational conditions warrant.

2.1.4.4 The RAC Committee should make specific recommendations on target dates for implementation of the ATS facilities recommended.

2.1.4.5 At certain high density terminal areas, there may be a requirement for ground interpreted aids to facilitate air traffic control (appropriate ground radar). The locations where these facilities are required should be determined by the RAC Committee and transmitted to the COM Committee as a matter of urgency.

2.1.4.5.1 Due to increased movements in high density terminal areas, there may be additional requirements for air/ground communications facilities. The RAC Committee should transmit such requirements to the COM Committee as soon as possible.

2.1.4.6 The RAC Committee should consider the necessity for surveillance radar for air traffic control purposes at Gander and Lisboa and other terminals or localities where problems resulting from air traffic density or convergence of air routes could thereby be alleviated. The ATS requirements for this facility should be transmitted to the COM Committee for further consideration.

2.1.4.7 The RAC/SAR Committee should review the application of separation minima now applied within NAT Control areas and recommend measures to ensure consistency in the application of separation criteria. It should be noted that the question of vertical separation is being studied by a panel of experts recently appointed by the Air Navigation Commission,

2.1.4.8 The RAC/SAR Committee should review the urgent requirement for more rapid inter-area communications for ATS and SAR purposes in the NAT Region and transmit, as soon as possible, specific requirements arising from this review to the COM Committee for consideration.

2.1.4.9 The RAG/SAR Committee should examine the list of VOR facilities given below in relation to the air traffic control pattern of the listed portions of the NAT Region and determine if these additional VOR facilities are required for air traffic control purposes. The results of these determinations should be transmitted to COM Committee for further action. If other additional requirements emerge, they should be referred to Subcommittee 1, for confirmation.

NEW REQUIREMENTS FOR VOR IN NAT REGION

PRIORITY 1

(All NAT locations providing position guidance to aircraft entering or leaving Oceanic Control Areas)

<u>COUNTRY</u>	<u>LOCATION</u>	<u>STATUS</u>	<u>NOTES</u>
Canada	Belle Isle	Required	(2)
	St. Johns	Required	(2)

PRIORITY 2

(NAT alternate aerodromes and en-route locations not listed under Priority 1)

<u>COUNTRY</u>	<u>LOCATION</u>	<u>STATUS</u>	<u>NOTES</u>
United Kingdom	North Berwick	Required	(5)
	Ottringham	Required	(5)
Norway	Jeloy	Required	(1) (3)
	Kievik	Required	(1)
Denmark	Hanstholm	Required	(1)
	Billum	Required	(1)
	Route New York-Gander	Required	(6) (7)
Canada)	via - New York		
U.S.A.)	Nantucket		
	Yarmouth		
	Sydney		
	Gander		
Canada)	Route New York-Goose Bay	Required	(6) (7)
U.S.A.)	via - New York		
	Millinocket		
	Mont Joli		
	Seven Islands		
	Goose Bay		

<u>COUNTRY</u>	<u>LOCATION</u>	<u>STATUS</u>	<u>NOTES</u>
Canada)	Route Montreal-Gander via -- Montreal Millinocket Moncton Sydney Gander	Required	(6) (7)

NOTES

- (1) This location included in EUM Plan.
- (2) Canada states it is not convinced of the justification for VOR at this location.
- (3) The VOR site may be shifted from Jeloy to suit new airways plan now under consideration.
- (4) The United Kingdom sees no need for this installation, and observes that the ICAO Standard does not require VOR for the purpose which underlies this recommendation.
- (5) The en-route coverage should be continuous for altitudes of 5,000 feet and above.
- (6) Canada states that it is not convinced of the justification for VOR coverage along the Canadian sections of these routes.

2.1.5. - SEARCH AND RESCUE

2.1.5.1 Provision should be made for water and land search and rescue service in the Region to ensure the security of international air traffic.

2.1.6. - TELECOMMUNICATIONS

2.1.6.1 Aeronautical Fixed Telecommunications. The COM Committee should review existing plans for the AFTN in light of Recommendation No. 119 of the COM Division, Fourth Session as follows:

"The Division recommends that in such cases when it is determined as the result of regional consideration that the maximum

transit time can be stated as a proportion of the direct flight time, the maximum transit time for Class A messages of the lowest priority should not exceed 20% of the direct flight time.

Note 1. - The direct flight time is computed on the basis of an aircraft speed of 300 (until 1954) or 400 (1954 onwards) knots and the distance from point of departure to point of destination of the flight.

Note 2. - Transit time is the elapsed time between the handing in of a message to the Aeronautical Fixed Telecommunication Network to the time of delivery to the Addressee."

Where this recommendation reads "20% of the direct flight time," COM Committee should read "20% of the direct flight time, or 30 minutes, whichever is the lesser".

2.1.6.1.1 The COM Committee should consider any urgent requirements forwarded by the RAC/SAR Committee for ATS or SAR inter-area communications and make provision in the NAT plan for sufficient aeronautical fixed communications to meet these requirements.

2.1.6.2 Aeronautical Mobile Telecommunications. There is a requirement for aircraft to be able to communicate at all times with at least one air/ground radio station when in the en-route and terminal area phase of operation and with air traffic services when in the terminal area. The COM Committee should therefore review the existing HF and VHF aeromobile facilities plans, determine their deficiencies, and develop the plans to meet these requirements. Provision should be made for the increasing use of radiotelephone communications in view of the rapid change over from W/T to R/T.

2.1.6.2.1 The COM Committee should consider every possible means of improving air/ground communications in the NAT Region with the immediate objective of providing for the most rapid exchange of communications between aircraft and area control centres and the ultimate objective of providing direct communication between aircraft and air traffic control.

2.1.6.3 In evaluating the operational requirement for an air/ground communication station at Prins Christianssund it was found that the requirement in 2.1.6.2 is not being met under all conditions, particularly on the more northern routes, within a large area of the Region generally located North-east of Newfoundland and Labrador, Greenland, and South-west of Iceland. The COM Committee should, therefore, direct its attention to this matter to determine the best possible solution to fill this gap.

2.1.6.4 Ocean Station Vessels. There is a requirement for an alternative relay route via Ocean Station Vessels for mobile service communications that cannot be transmitted over the normal channels owing to temporary communications difficulties in the North Atlantic mobile service. The COM Committee should take into account the recommendations of the Fourth NAOS Conference.

2.1.6.5 Radionavigation Aids. The COM Committee should prepare a statement of the plan for the NAT Region for long and short distance radio aids to navigation and aids to final approach and landing. The following material should also be considered and included in the statement of the plan. All existing radio aids appropriate to the NAT Region and including VDF, HF/DF, GCA, NDB, RANGES, should be included in the statement of the plan.

2.1.6.6 Long Distance Aids. The COM Committee should consider in more detail the requirement given below for the long distance radionavigation aids required in the NAT Region and recommend more precise details in respect to coverage and locations for addition to this requirement. (See also Section 8 of the present report, Recommendation No. 15.)

2.1.6.6.1 Long range radionavigational fixing coverage, as defined below, should be provided to serve all aircraft. Present LORAN and CONSOL stations should be continued in operation.

2.1.6.6.2 Additional CONSOL stations are required to meet the foregoing requirement at appropriate locations in the following places.

1. Iceland
2. Southern Greenland
3. Azores
4. Eastern Newfoundland
5. Labrador (Goose Bay Area)
6. Nantucket Island, Mass.
7. Atlantic City, N.J.

The areas to be served by the above additional CONSOL stations are:

1. The area in latitudes north of latitude 50°N lying between the existing LORAN, CONSOL stations coverage.
2. The area in the central portion of the North Atlantic lying approximately between latitudes 30°N and 50°N .
3. The eastern approaches to the U.S. and Canadian seaboard.

Note. Long range navigational fixing cover 'is defined as the area in which a fix accuracy of 20 NM is obtainable for 95% of the time

2.1.6.6.3 The COM Committee should also examine in more detail the relative advantages of having a CONSOL station in Newfoundland with 360 degree coverage as an alternative to CONSOL stations of single orientation at Newfoundland and Labrador.

2.1.6.7 Short Distance Aids

2.1.6.7.1 NDB

The COM Committee should include the following requirements in the plan:

<u>COUNTRY</u>	<u>LOCATION</u>	<u>COVERAGE</u>	<u>STATUS</u>
Canada	Wesleyville	150 NM	Required and projected
Greenland	Amgmagassalik	150 NM	Required and projected.

The COM Committee should recommend an appropriate amendment to the EUM Plan for the deletion of a requirement for NDB at Tusker Rock, Ireland. This facility will not be required when VOR is installed in Dublin.

2.1.6.7.2 VOR

The COM Committee should include in the statement of the NAT Plan new requirements for VOR as follows:

NEW REQUIREMENTS FOR VOR IN NAT REGION

PRIORITY 1

(NAT terminal aerodromes)

<u>COUNTRY</u>	<u>LOCATION</u>	<u>STATUS</u>	<u>NOTES</u>
Ireland	Shannon	Required	(1)
Canada	Gander	Required and Projected	
	Goose Bay	Required	
France	Paris (2 VOR)	Required and existing	(1)
Iceland	Keflavik	Required, existing but not operating	
United Kingdom	Prestwick	Required and projected	(1)
United Kingdom	London	Required and projected	(1)
Portugal	Lisboa	Required	(1)

<u>COUNTRY</u>	<u>LOCATION</u>	<u>STATUS</u>	<u>NOTES</u>
Portugal	Santa Maria	Required	
Spain	Madrid	Required	(1)
Canada	Montreal	Required	
Switzerland	Geneva	Required	(1)
Bermuda	Hamilton	Required	
Denmark	København	Required	(1)

PRIORITY 2

(NAT alternate aerodromes)

<u>COUNTRY</u>	<u>LOCATION</u>	<u>STATUS</u>	<u>NOTES</u>
Ireland	Dublin	Required	(1) (4)
Spain	Barcelona	Required	(1)
France	Bordeaux	Required	(1)
Switzerland	Zurich	Required	(1)
Canada	Moncton	Required	(2)
	Sydney	Required	(2)

NOTES:

- (1) This location included in EUM Plan.
- (2) Canada states it is not convinced of the justification for VOR at this location.
- (3) The VOR site may be shifted from Jeloy to suit new airways plan now under consideration.
- (4) The implementation of VOR at this location will delete the EUM plan requirement for NDB at Tuskar Rock.
- (5) The United Kingdom sees no need for this installation, and observes that the ICAO Standard does not require VOR for the purpose which underlies this recommendation.
- (6) The en-route coverage should be continuous for altitudes of 5,000 feet and above.

2.1.6.8 Aids to Final Approach and Landing

The COM Committee should include the following facilities in the statement of the NAT Plan.

2.1.6.8.1 ILSNEW REQUIREMENTS - ILS

<u>COUNTRY</u>	<u>LOCATION</u>	<u>STATUS</u>	<u>NOTES</u>
Iceland	Keflavik	Required	(1)
Canada	Goose Bay	Required	
	Gander	Required	(2)
Portugal	Lisboa	Required	(3)
	Santa Maria	Required	(5)
Spain	Madrid	Required	(3)
	Barcelona	Required	
	Sevilla	Required	
United Kingdom	Prestwick	Required	(4)
United States	New York/Idlewild	Required	(6)

NOTES:

- (1) Continuous operation required urgently.
- (2) Additional requirement for runway 14.
- (3) ILS to be brought into conformity with Annex 10.
- (4) Reliable functioning of ILS on runway 13 required.
- (5) Reliable functioning of ILS required.
- (6) Additional ILS required on runway 22 or 25 left.

NEW REQUIREMENTS - LOCATORS

<u>COUNTRY</u>	<u>LOCATION</u>	<u>REQUIREMENT</u>
Belgium	Bruxelles	Locator beacon on extended centre line of runway 07 to permit back course let-down.
Canada	Goose Bay	location with ILS
	Gander	" " "
Iceland	Keflavik	" " "
Spain	Sevilla	" " "
*Portugal	Santa Maria	" " "
United States	New York/Idlewild	" " "
Greenland	Narsarsuak	Z marker required at site of NDB
Bahamas	Nassau	Locator beacon on extended centre line of runway to be considered when change in aerodrome takes place.

* Technical feasibility to be determined by the COM Committee.

EXISTING ILS FACILITIES TO BE INCLUDED IN THE NAT PLAN(a) REGULAR AERODROMES

<u>COUNTRY</u>	<u>LOCATION</u>	<u>REQUIREMENT</u>
Belgium	Bruxelles	Existing
Canada	Gander	Existing
	Montreal	Existing
Denmark	København	Existing
France	Paris/Orly	Existing
Iceland	Keflavik	Existing
Ireland	Shannon	Existing
Netherlands	Amsterdam	Existing
Norway	Bodø	Existing
	Oslo/Fornebu	Existing
	Stavanger	Existing
Portugal	Lisboa	Existing
	Santa Maria	Existing
Spain	Madrid	Existing
Sweden	Stockholm	Existing
Switzerland	Geneva	Existing
United Kingdom	London	Existing
	Prestwick	Existing
United States	Boston	Existing
	New York/International	Existing
Germany	Frankfurt	Existing

(b) ALTERNATE AERODROMES

<u>COUNTRY</u>	<u>LOCATION</u>	<u>REQUIREMENT</u>
Germany	Dusseldorf	Existing
Switzerland	Zurich	Existing
Canada	Moncton	Existing
	Ottawa	Existing
	Sydney	Existing
France	Bordeaux	Existing
	Marseille	Existing
	Paris/Le Bourget	Existing
Germany	Hamburg	Existing
	Munich	Existing
	Hanover	Existing
	Bremen	Existing
Ireland	Dublin	Existing
Norway	Oslo/Gardermoen	Existing

<u>COUNTRY</u>	<u>LOCATION</u>	<u>REQUIREMENT</u>
Portugal	Lajes	Existing
Sweden	Göteborg	Existing
	Norrköping	Existing
	Malmö	Existing
United Kingdom	Bournemouth/Hurn	Existing
	Blackbushe	Existing
United States	New York/La Guardia	Existing
	Washington	Existing
	Newark	Existing
	Philadelphia/International	Existing
	Detroit	Existing
	Norfolk, Va.	Existing
	Columbus, O.	Existing
	Pittsburgh/Greater Pittsburgh	Existing
	Cleveland	Existing

2.1.6.9 EXISTING SHORT RANGE AIDS TO BE INCLUDED IN NAT PLAN

The following air routes or route segments require adequate coverage as provided by existing short range aids and are directed to the COM Committee as a guide for the preparation of a list of facilities to be included in the NAT Regional Plan:

1.	Route	New York - Gander	via airways
2.	"	New York - Boston	" "
3.	"	Boston - Gander	" "
4.	"	Boston - Goose Bay	" Quebec and Seven Islands
5.	"	Boston - Goose Bay	" airways to Stephen- ville and then direct to Goose Bay
6.	"	Belle Isle - Stephenville	direct
7.	"	Goose Bay - Gander	direct
8.	"	Gander - St. John's	via airways
9.	"	Sydney - St. John's	" "
10.	"	Sydney - Stephenville	" "
11.	"	Montreal - Gander	" "
12.	"	Montreal - St. John's	" "
13.	"	Montreal - Goose Bay	" airways to Seven Islands then direct to Goose Bay
14.	"	Lisboa - Madrid	" airways

15.	Route	Fastnet Rock - London	via Strumble
16.	"	Fastnet Rock - Paris	" Ploneis
17.	"	London - Oslo	" airways
18.	"	London - Stockholm	" "
19.	"	London - København	" "
20.	"	London - Frankfurt	" "
21.	"	London - Amsterdam	" "
22.	"	London - Bruxelles	" "
23.	"	London - Paris	" "
24.	"	London - Prestwick	" "
25.	"	London - Shannon	" "
26.	"	London - Geneva	" "
27.	"	Shannon - Oslo	" "
28.	"	Shannon - Stockholm	" "
29.	"	Shannon - København	" "
30.	"	Shannon - Frankfurt	" "
31.	"	Shannon - Amsterdam	" "
32.	"	Shannon - Brussels	" "
33.	"	Shannon - Paris	" "
34.	"	Shannon - Prestwick	" "
35.	"	Shannon - Geneva	" "
36.	"	Shannon - Dublin	" "
37.	"	Prestwick - Amsterdam	" Ottringham
38.	"	Prestwick - Oslo	" North Berwick and Kievik
39.	"	Prestwick - København	" North Berwick
40.	"	Prestwick - Frankfurt	" Amsterdam
41.	"	Prestwick - Geneva	" airways
42.	"	Prestwick - Oslo - Stockholm	" "
43.	"	Prestwick - Stavanger	direct
44.	"	Keflavik - Prestwick - Oslo	direct
45.	"	Lisboa - Fastnet Rock	direct
46.	"	Santa Maria - Fastnet Rock	"
47.	"	Lisboa - Santa Maria	"
48.	"	Santa Maria - London	"
49.	"	Santa Maria - Boston	"
50.	"	Santa Maria - New York	"
51.	"	Santa Maria - Bermuda	"
52.	"	Bermuda - Boston	Via Nantucket
53.	"	Bermuda - New York	Direct
54.	"	Gander - Keflavik	"
55.	"	Gander - Prestwick	"
56.	"	Gander - Shannon	"
57.	"	Gander - Fastnet Rock	"
58.	"	Gander - Santa Maria	"
59.	"	Goose Bay - Keflavik	"

60.	Route	Goose Bay - Prestwick	Direct
61.	"	Goose Bay - Shannon	"
62.	"	Goose Bay - Fastnet Rock	"
63.	"	Goose Bay - Santa Maria	"
64.	"	Montreal - Keflavik	"
65.	"	Montreal - Keflavik	Via Fort Chimo

2.1.7 METEOROLOGY

2.1.7.1 Basic meteorological reports, surface and upper air, should be made and distributed on a routine basis with sufficient geographical distribution and frequency of observation to protect operations at levels up to 15,000 metres or 50,000 feet.

2.1.7.1.1 Appropriate climatological records should be maintained on upper air information up to 17,000 metres or 55,000 feet for future North Atlantic operations.

2.1.7.2 Routine meteorological observations should be made hourly and special observations should also be made at all international aerodromes. The selection of values for which special observations should be made at each aerodrome should include at least those values in paragraph 2, Appendix 1, of the MET Specifications, most closely corresponding to each of the operating minima of all operators regularly using the aerodromes, and to any other limits required by local procedures of Air Traffic Services.

2.1.7.2.1 These routine hourly observations, and Selected Special Observations, should be distributed so as to meet the requirements of operational and meteorological needs.

2.1.7.3 Aerodrome forecasts should be made for all international aerodromes with periods of validity sufficient to meet the requirements of all users acknowledged in agreed procedures and should be maintained current by means of amendments.

2.1.7.4 Information is required on the location of "jet streams" together with such additional information (including temperature differential, velocity, width, height, depth and direction) as is appropriate to the most effective utilization of the jet stream in air navigation.

2.1.7.5 Forecasts, briefing and meteorological service for pre-flight operations planning should be available for all international flights.

2.1.7.6 Forecasting service should be provided on a routine basis for aircraft currently flying up to the 9,000 metre or 30,000 foot altitude range.

2.1.7.6.1 Forecasting service will be required for planned future high level operation up to 15,000 metres or 50,000 feet for which meteorological services should take appropriate action.

2.1.7.7 Transmission of meteorological information to aircraft in flight should be in accordance with Recommendation No. 22 of the First Air Navigation Conference and with directives to be transmitted separately by Subcommittee 1. Additionally, because of the difficulties inherent in flight planning for great distances over oceans in areas of extreme weather variations, it is frequently necessary for the pilot while in flight to obtain weather information for en-route and terminal points other than his flight planned destination (which may be his ultimate or scheduled destination). This should be made available promptly on request.

2.1.7.8 Ground exchange of operational meteorological information should be so rapid as to be adequate for efficient utilization of the information at all authorized receiving points.

2.1.7.9 A system of collecting centres for aircraft meteorological reports should be adequate to guarantee rapid dissemination of aircraft meteorological reports in regular bulletins, for use at meteorological offices and analysis centres to augment upper air information obtained from other sources.

2.1.7.10 Appropriate meteorological information should be available to ATS units and operators to enable them to (1) plan the routing of aircraft in the most efficient manner, (2), anticipate situations which may require diversions or permit reclearance of flight to a different point, and (3) apply the altimeter setting procedures adopted for the region.

Chapter 2

STATEMENT OF THE OPERATIONAL REQUIREMENTS TO MEET THE
JOINT NEEDS OF THE OPERATORS, THE METEOROLOGICAL SERVICES
AND THE AIR TRAFFIC SERVICES FOR THE EXCHANGE OF
AERONAUTICAL METEOROLOGICAL INFORMATION IN THE NAT REGION

2.2.1 OPERATIONAL NEED AND PURPOSE OF DIFFERENT CATEGORIES OF
AERONAUTICAL METEOROLOGICAL INFORMATION

Operational NeedPurposea) Hourly Meteorological Reports

i) To provide an indication of the actual meteorological conditions at aerodromes and the current trend of those conditions.

ii) To determine the probable meteorological conditions existing along or adjacent to the route, using the reports from significant stations (e.g. to meet the requirements of Annex 6 for IFR/VFR flights).

b) Aerodrome Forecasts

To provide information on the expected meteorological conditions at aerodromes in order to assess the practicability of landings and take-offs.

c) Amendments to Aerodrome Forecasts

In the selection of the criteria for amendments to aerodrome forecasts, the criteria for selected special reports should be used for guidance.

To ensure that the aerodrome forecasts are kept up-to-date and that the latest information on expected weather conditions at aerodromes is thus available for determining the probability of landing.

d) Special Meteorological Reports

To provide current information of actual conditions at an aerodrome of intended landing.

<u>Operational Need</u>	<u>Purpose</u>
e) <u>Selected Special Meteorological Reports</u>	To ensure that operationally significant changes of weather conditions, as shown below, are made known to users located beyond the aerodromes or points of origin during intervals between routine reports.

Criteria for selected special meteorological reports can be listed in two categories:

- a) Regional - criteria agreed upon as applicable to the entire region.
- b) Supplemental - criteria which States decide are necessary to supplement the regional criteria.

Regional criteria are -

- i) Ceiling changes: Whenever the ceiling reaches or passes through any of the following heights:

<u>Metres</u>	<u>Feet</u>
300	1000
150	500
60	200

(A change of sky condition from less than or equal to 4/8 to more than 4/8 or the reverse, associated with the limits specified above, would require the issue of a selected special report.)

- ii) Visibility changes: Whenever meteorological visibility reaches or passes through any of the following limits:

<u>Metres</u>	<u>Miles</u>
4800	3
1600	1
800	1/2

Operational NeedPurpose

- iii) Weather changes: At the beginning or end of any of the following:

Thunderstorm
Duststorm or Sandstorm
Tornado or Water Spout
Hail
Freezing Precipitation
Show and rain mixed
Squall

- iv) Surface Wind Changes:

- a) Whenever there is a wind direction change of 45° or more, the mean wind speed having previously been greater than 20 knots.
- b) The mean wind speed increases rapidly by 20 knots or more having previously been greater than 10 knots.

- f) Landing/Take-off Reports

To provide direct information on current weather conditions over that part of the aerodrome and surrounding area comprising the landing, take-off, and approach area in use at the time, in order to provide the pilot with the closest possible approximation to the values of the meteorological elements as he will observe them on landing or take-off.

- g) * Flight, Route and Area Forecasts

To provide information concerning meteorological conditions on which the flight can be planned.

- h) New or Amended Flight Forecasts

To provide information on the changes in expected meteorological conditions which may affect the progress of the flight.

* Because MMO's do not exist at all international aerodromes in the region under consideration, it is believed necessary to state these requirements which may involve communications services. MMO's may also exchange this information.

<u>Operational Need</u>	<u>Purpose</u>
i) <u>Aircraft Reports</u>	These are required to supplement information on meteorological conditions at altitudes along the route or routes.
j) <u>*Analyses</u>	To indicate the synoptic situation on which the forecast is based and to assist in an understanding of any deviations from the forecast which may become apparent.
k) <u>Selected Aircraft Reports</u> Selected aircraft reports are those aircraft reports which contain observations of rapid icing, severe turbulence, thunderstorms or hail.	<ul style="list-style-type: none">i) To provide by the quickest possible means information on important weather phenomena reported in an area through which other aircraft are expected to pass.ii) In particular to furnish information for aircraft in flight in areas, or for routes where flight meteorological watch is not provided.
l) <u>"Advisories" of important meteorological phenomena</u> To supply texts related to the existence or expectation of the phenomena listed below: <ul style="list-style-type: none">1) Active thunderstorm area,2) Violent line squall,	<ul style="list-style-type: none">i) To provide, by the quickest possible means, information on important weather phenomena expected in an area or along a route.

* See note on page Sub-34.

Operational NeedPurpose

- 3) Conditions of severe turbulence or rapid icing,
- 4) Unusual condition of wide-spread snowfall extending rapidly,
- 5) Violent wind aloft over mountainous regions,
- 6) Duststorms or sandstorms,

unless the requirement is met by other means

- ii) In particular, for aircraft in flight, to furnish information in areas or for routes where flight meteorological watch is not specified.

m) QNH Values

To provide the information required for the recommended altimeter setting procedures.

2.2.2 INFORMATION NEEDED TO FULFIL THE REQUIREMENTS
OF THE "PILOT-IN-COMMAND" BEFORE DEPARTURE

Operational Need

Purpose

a) Hourly Meteorological Reports

The basic requirement is for hourly reports to be available as follows:

i) For the aerodrome of departure and alternates.

ii) For significant weather reporting stations along the route up to a distance from the departure aerodrome which will depend on the nature of the route but will normally be that corresponding to three hours' flying time. On certain routes it may be necessary to have information from significant reporting stations off course.

iii) For the aerodrome of destination and alternates for flights of a duration up to a maximum which will depend on the nature of the route but which will normally not exceed three hours.

b) Aerodrome Forecasts

Aerodrome forecasts are required at the pre-flight planning stage as follows:

i) For the aerodrome of destination and alternates valid up to expected time of arrival at the furthest alternate plus two hours.

a) To determine whether IFR or VFR Procedures are applicable

b) To afford a basis of reference for aerodrome forecasts and for the monitoring of them.

To provide current information on expected meteorological conditions in order to determine:

<u>Operational Need</u>	<u>Purpose</u>
ii) For intermediate stops and alternates as appropriate, valid up to expected time of arrival at furthest alternate plus two hours.	a) allowable gross weight at take-off or landing,
iii) For significant en-route alternates as appropriate.	b) whether cloud height, visibility or surface wind permits a landing or take-off,
iv) For the aerodrome of departure and its alternates.	c) available alternates,
	d) whether instrument approach facilities are required.
c) <u>Amendments to Aerodrome Forecasts</u>	
All aerodrome forecasts required under b) above must be kept up-to-date by an efficient amendment service.	To ensure that the aerodrome forecasts represent current information on the expected meteorological conditions.
d) <u>Special Meteorological Reports</u>	
These are required for the aerodrome of departure only.	To ensure that significant current information concerning weather for take-off is available to the pilot-in-command.
e) <u>Selected Special Meteorological Reports</u>	
These are required from all aerodromes from which hourly reports are supplied in accordance with 2 a) above.	To ensure that significant current information concerning en route weather is available to the pilot-in-command.
f) <u>Take-off Reports</u>	
These are required for aerodrome of departure up to the time of take-off.	
g) <u>*Flight, Route and Area Forecasts</u>	To provide information concerning meteorological conditions on which the flight can be planned.

*See note on page Sub-34.

Operational NeedsPurposeh) Aircraft Reports

All aircraft reports which have been received by the Meteorological Office at the aerodrome of departure and which are applicable to the route should be available to the pilot-in-command.

To ensure that significant current information concerning en route weather is available to the pilot-in-command.

i) Selected Aircraft Reports

These are required for the full extent of the route to be flown.

To ensure that the pilot-in-command has available all information concerning specially significant enroute weather conditions.

j) Advisories of important meteorological phenomena

These are required for the full extent of the route to be flown unless the requirement is met by other means.

To ensure that the pilot-in-command has available all information concerning specially significant en route weather conditions.

k) *Analyses

To indicate the synoptic situation on which the forecast is based and to assist in an understanding of any deviations for the forecast which may become apparent.

l) QNH Values

QNH values are required from sufficient reporting stations to permit compliance with altimeter setting procedures.

To comply with altimeter setting procedures and to ensure adequate terrain clearance.

*See note on page Sub-34.

2.2.3 INFORMATION NEEDED TO FULFILL THE
REQUIREMENTS OF PILOT-IN-COMMAND DURING FLIGHT

The meteorological information required by the pilot-in-command of an aircraft in flight should be available through the communications stations through which he communicates with Air Traffic Services units. The required meteorological information should be available to the pilot through any other stations providing operational control communications in accordance with agreed procedures.

Operational Need

Purpose

a) Hourly Meteorological Reports

a) To determine:

Hourly meteorological reports are required to be available as follows:

- i) For the aerodrome of departure and alternates while the aircraft is within a distance from the departure aerodrome which will depend on the nature of the route but which will normally be that corresponding to not more than three hours' flying time.
- ii) For significant weather reporting stations along the route within a distance from the aircraft which will depend on the nature of the route but will normally be that corresponding to not more than three hours' flying time. On certain routes it may be necessary to have information from significant weather reporting stations off course.
- iii) For the aerodrome of destination and alternates while the aircraft is within a distance from the destination aerodrome which will depend on the nature of the route but which will normally be that corresponding to not more than three hours' flying time.

1) Whether surface wind, cloud height and visibility permit a landing;

ii) available alternates;

iii) whether instrument approach facilities are required;

iv) whether en route weather conditions permit procedure as originally planned.

b) To afford a basis of reference for aerodrome forecasts and for the monitoring thereof.

Operational NeedPurpose

On certain routes operational circumstances and weather conditions are such as to require hourly reports to be available while the aircraft is at a distance from the aerodrome of departure, significant weather reporting stations or aerodrome of destination greater than that corresponding to three hours' flying time.

b) Aerodrome Forecasts

Aerodrome forecasts are required to be obtainable as follows:

To determine:

- i) For the aerodrome of destination and its alternates throughout the whole flight, valid up to expected time of arrival at the furthest alternate plus two hours.
- ii) For intermediate stops and alternates until a landing at one or other has taken place or is no longer expected, valid up to expected time of arrival at furthest alternate plus two hours.
- iii) For significant en route alternates as appropriate while a landing at such an alternate may still take place, valid up to expected time of arrival there plus two hours.
- iv) For the aerodrome of departure and its alternates and for any intermediate stop and alternates until the half-way point or point of no-return, whichever is the further, on the appropriate segment of the flight, valid up to expected time of arrival at furthest alternate plus two hours.

- a) whether surface wind, cloud height and visibility permit a landing;
- b) available alternates;
- c) whether instrument approach facilities are required.

<u>Operational Need</u>	<u>Purpose</u>
c) <u>Amendments to Aerodrome Forecasts</u>	
All aerodrome forecasts required under b) above must be kept up-to-date by an efficient amendment service.	To ensure that the aerodrome forecasts represent currently expected meteorological conditions.
d) <u>Special Meteorological Reports</u>	
These are required for the aerodrome of intended landing from the appropriate agency serving the aerodrome.	To provide current information from the aerodrome of intended landing.
e) <u>Selected Special Meteorological Reports</u>	
These are required by an aircraft from those aerodromes within two hours flying time and by the meteorological and air traffic services from those aerodromes from which hourly reports are required in accordance with 3 a) above.	To ensure that information on actual weather conditions is kept up-to-date.
f) <u>Landing Reports</u>	
These are required for the aerodrome of intended landing.	

Note 1 Amendments to upper winds and other elements as agreed with the operator, contained in flight forecasts, are required for specific periods and segments on certain long routes designated by regional or local agreement and should be made available by the meteorological office at the point of departure or such alternative location as may be designated by agreement.

<u>Operational Need</u>	<u>Purpose</u>
<u>Note 2</u> New forecasts of upper winds and of other elements, as agreed with the operator, are required for specific periods and segments on certain long routes designated by regional or local agreement, and should be made available by the meteorological office at the destination or such other location as may be designated by agreement.	
<u>Note 3</u> Supplementary information of concern to the pilot-in-command may be required in an operational message containing operational advice originated by the operator's local representative in a directed transmission to the aircraft.	
<u>g) New or Amended Flight Forecasts</u> These may be required at any stage of the flight.	To ensure that information on expected route conditions is kept up-to-date.
<u>h) Selected Aircraft Reports</u> These are required for the full extent of the route ahead of the aircraft, unless the requirement is met by other means.	To ensure that the pilot-in-command has available all information concerning specially significant en route conditions.
<u>i) "Advisories" of Important Meteorological Phenomena</u> These are required for the full extent of the route ahead of the aircraft, unless the requirement is met by other means.	To ensure that the pilot-in-command has available all information concerning specially significant en route conditions.
<u>j) QNH Values</u> QNH values are required along appropriate segments of the route.	To comply with altimeter setting procedures and to ensure adequate terrain clearance.

2.2.4 REQUIREMENTS FOR OPERATIONAL PLANNING

2.2.4.1 An operator's local representative designated to carry out operational planning duties requires:

a) such information of the categories in sections 1,2, and 3 above, namely:

- Hourly meteorological reports
- Aerodrome forecasts
- Amendments to aerodrome forecasts
- Special meteorological reports for local aerodrome
- Selected special meteorological reports
- Flight/route forecasts
- Amendments to flight forecasts
- Aircraft reports received at the local meteorological office
- Selected aircraft reports
- Current and prognostic surface and upper air charts (analyses)
- Advisories of important meteorological phenomena

as is relevant to the operations for which he has responsibilities, and

b) consultation with the meteorologist.

Note 1.- In this connection the operator's local representative requires access to such relevant information of the foregoing categories as is already available in the local meteorological office as a result of the overall pilot-in-command requirements of flights through that location. Where this information is insufficient to meet the full requirements of the operator, the provision of additional information should be the subject of negotiation between the operator and the State(s) concerned, either regionally or locally.

Note 2.- In determining the location and jurisdiction of an operator's local representative designated to carry out operational planning duties, the operator should take into account the views of the State authorities responsible for the meteorological and communications services.

2.2.5 GROUPING OF OPERATIONAL REQUIREMENTS FOR
METEOROLOGICAL MESSAGES AND SUGGESTED MAXIMUM DELIVERY TIMES

- 2.2.5.1 10 minutes
Selected Special Reports
Selected Aircraft Reports
Advisories of Important Meteorological Phenomena
- 2.2.5.2 15 Minutes
New Flight Forecasts
Flight and Aerodrome Forecasts and Amendments
QNH values and Hourly Reports
Aircraft Reports
- 2.2.5.3 60 Minutes
Route and Area Forecasts
- 2.2.5.4 120 Minutes
Met. Analyses.

Chapter 3GROUND TO GROUND EXCHANGES OF METEOROLOGICAL INFORMATIONEXPECTED VOLUME OF TRAFFICLEGEND:

- H - Hourly reports - AERO
s - Selected special MET reports
Q - QNH values
P - Aircraft reports
p - Selected aircraft reports
A - Analyses
T - Terminal forecasts - TAMET/TAFOT
t - Amendments to terminal forecasts
F - Flight forecasts
f - New or amended flight forecasts
R - Route forecasts
r - New or amended route forecasts
W - Warning of storms of tropical or sub-tropical origin
w - Advisories of important meteorological phenomena.
- () - Indicates a requirement which is considered desirable but not as necessary as other requirements not so marked.
- * - As required for specific flights.

Underlining - Indicates the requirement was controversial.

Notes:

1. Peak period for terminal forecasts (T) approximately 04, 10, 16 and 22z.
2. Hourly reports (H), QNH values (Q) and pilot reports (P) have an even distribution being transmitted generally at hourly intervals.
3. It is estimated that the average daily volume of traffic for all items in this tabulation indicated by small letters (i.e. "t", "s", etc.) will amount to approximately one tenth of the total volume of traffic generated by the items indicated in large letters (i.e. "T", "H", etc.)

CHANGES REQUIRED IN EXISTING GROUND TO GROUND
EXCHANGES OF METEOROLOGICAL INFORMATION

MODIFICATIONS REQUISES DANS L'ECHANGE ACTUEL DE RENSEIGNEMENTS
METEOROLOGIQUES ENTRE STATIONS AU SOL

COLLECTING CENTRE	STATION REPORTING	REQUIREMENTS			VOLUME OF TRAFFIC		REASON FOR CHANGE
		TYPE	HOURS	DAYS	PER DAY	PEAK PERIOD	
CENTRE COLLECTEUR	STATION D'EMISSION	BESOINS			VOLUME DU TRAFIC		MOTIF DE LA MODIFICATION
		TYPE	HEURES	JOURS	PAR JOUR	HEURE DE POINTE	
1	2	3	4	5	6	7	8
BERMUDA/BERMUDES Kindley Field (additions)	Cleveland	Tt	00-24	X	144	36	(Additional requirements (for present operations (Besoins complémentaires (pour les vols actuels
CANADA Gander (additions)	Bedford	(H)	-	0	144	6	(
	Frankfurt	Tt	-	0	144	36	(
	København	Tt	00-24	X	48	36	(
	Keflavik	Hsw	00-24	X	144	6	(
	Montreal	w	00-24	X	-	-	(
	New York (La G.)	Ww	00-24	X	-	-	(Additional requirements (for present operations
	Ottawa	Tt	00-24	X	144	36	(
	Prestwick	w	00-24	X	-	-	(
	Shannon	w	00-24	X	-	-	(Besoins complémentaires (pour les vols actuels
	Stavanger	Tt	00-24	X	144	36	(
	Toronto	Hs	00-24	X	144	6	(
CANADA Goose (additions)	Baltimore	(H)	00-24	X	144	6	(
	Buffalo	Tt	-	0	144	36	(
	Frankfurt	Tt	-	0	144	36	(
	Gander	Ww	00-24	X	-	-	(
	Indianapolis	Tt	-	0	144	36	(
	Keflavik	Hsw	00-24	X	144	6	(
	København	Tt	00-24	X	144	36	(
	Lisboa/Portela	Tt	-	0	144	36	(
	London Airport	(H)	00-24	X	144	6	(
	Milwaukee	HTt	-	0	288	42	(
	Montreal	w	00-24	X	-	-	(

COLLECTING CENTRE	STATION REPORTING	REQUIREMENTS			VOLUME OF TRAFFIC		REASON FOR CHANGE
		TYPE	HOURS	DAYS	PER DAY	PEAK PERIOD	
CENTRE COLLECTEUR	STATION D'EMISSION	BESOINS			VOLUME DU TRAFIC		MOTIF DE LA MODIFICATION
		TYPE	HEURES	JOURS	PAR JOUR	HEURE DE POINTE	
1	2	3	4	5	6	7	8
CANADA Goose (additions) (suite)	Newark	(Hs)	00-24	X	144	6	(Additional requirements
	New York (La G.)	Ww	00-24	X	-	-	(for present operations
	Oslo	Tt	00-24	X	144	36	(
	Ottawa	Tt	00-24	X	144	36	(
	Paris	(H)	00-24	X	144	6	(
	Philadelphia	(Hs)	00-24	X	144	6	(
	Pittsburg	(Hs)	00-24	X	144	6	(Besoins complémentaires
	Prestwick	w	00-24	X	-	-	(pour les vols actuels
	Shannon	w(H)(s)	00-24	X	144	6	(
	Stavanger	Tt	00-24	X	144	36	(
	Toronto	Hs	00-24	X	144	6	(
	Washington	(Hs)	00-24	X	144	6	(
CANADA Montreal (additions)	Burlington	HsTt	00-24	X	288	42	(Additional requirements
	Frankfurt	Tt	-	0	144	36	(for present operations
	Gander	w	00-24	X	-	-	(
	København	Tt	00-24	X	144	36	(Besoins complémentaires
	New York (La G.)	w	00-24	X	-	-	(pour les vols actuels
	Stavanger	Tt	00-24	X	144	36	(
CANADA Moncton*) Stephenville*) (additions)	Bedford	(H)	-	0	144	6	(Additional requirements (for present operations (Besoins complémentaires (pour les vols actuels
CANADA Sydney* (additions)	Buffalo	Tt	-	0	144	36	(Additional requirements
	Columbus	(H)Tt	-	0	288	42	(for present operations
	Detroit	HT	-	0	288	42	(
	Gander	w	00-24	X	200	50	(
	Goose	p	00-24	X	200	50	(
	København	Tt	00-24	X	144	36	(Besoins complémentaires
	Lages	Tt	00-24	X	144	36	(pour les vols actuels
	Lisboa/Portela	Tt	00-24	X	144	36	(
	London Airport	(H)	00-24	X	144	6	(

COLLECTING CENTRE	STATION REPORTING	REQUIREMENTS			VOLUME OF TRAFFIC		REASON FOR CHANGE
		TYPE	HOURS	DAYS	PER DAY	PEAK PERIOD	
CENTRE COLLECTEUR	STATION D'EMISSION	BESOINS			VOLUME DU TRAFIC		MOTIF DE LA MODIFICATION
		TYPE	HEURES	JOURS	PAR JOUR	HEURE DE POINTE	
1	2	3	4	5	6	7	8
CANADA Sydney* (additions) (suite)	Lyons	Tt	-	0	144	36	{ Additional requirements for present operations Besoins complémentaires pour les vols actuels }
	Milwaukee	(H)Tt	-	0	288	42	
	Oslo	Tt	00-24	X	144	36	
	Paris	(H)	00-24	X	144	6	
	Pittsburgh	(Hs)Tt	-	0	288	42	
	Reykjavik	Tt	00-24	X	144	36	
	Rhein/Main	Tt	00-24	X	144	36	
	Santa Maria	(s)pW	00-24	X	200	50	
	Shannon	(H)(s)	00-24	X	144	6	
	Windsor Locks	Tt	-	0	144	36	
DENMARK/DANEMARK København (additions)	Frobisher	Tt	Sched. not yet decided		144	36	{ Projected new routes Nouvelles routes en projet København-New York direct and København-Søndre Strømfjord Operations commence Nov. 1954 (L'exploitation commence en nov. 1954 Gardermoen now available for emergency use only Gardermoen actuellement utilisable en cas d'urgence seulement }
	Gander	Tt	Horaire		144	36	
	Goose	Tt	non fixé		144	36	
	Prins Christian Sund	Tt	"		144	36	
	Søndre Strømfjord	Tt	"		144	36	
	Thule	Tt	"		144	36	
	New York	Tt	"		144	36	
	Boston	Tt	"		144	36	
FRANCE Paris-Orly (deletions) (suppressions)	Oslo/Gardermoen	Tt	00-24	X	144	36	

2.- Operational Requirements
2.- Besoins de l'exploitation

Sub-49

COLLECTING CENTRE	STATION REPORTING	REQUIREMENTS			VOLUME OF TRAFFIC		REASON FOR CHANGE
		TYPE	HOURS	DAYS	PER DAY	PEAK PERIOD	
CENTRE COLLECTEUR	STATION D'EMISSION	BESOINS			VOLUME DU TRAFIC		MOTIF DE LA MODIFICATION
		TYPE	HEURES	JOURS	PAR JOUR	HEURE DE POINTE	
1	2	3	4	5	6	7	8
FRANCE Paris (additions)	Bedford	W	00-24	X	-	-	(Additional requirements for present operations
	Boston	W	00-24	X	-	-	
	Bournemouth	HsTt	00-24	X	288	42	
	Bruxelles	s	00-24	X	-	-	
	Dublin	HsTtw	00-24	X	288	42	
	Gander	(H)pw	00-24	X	144	6	
	Goose	W	00-24	X	-	-	
	Keflavik	HTtw	00-24	X	288	42	
	Kindley Field	Tt	00-24	X	144	36	
	Lajes	pw	00-24	X	-	-	
	Lisoon	Hsw	00-24	X	144	6	
	Lyon	s	00-24	X	-	-	
	London	sTtw	00-24	X	144	36	(Besoins complémentaires pour les vols actuels
	Manston	HsTt	00-24	X	288	42	
	Marseille	s	00-24	X	-	-	
	Moncton	W	00-24	X	-	-	
	Montreal	W	00-24	X	-	-	
	New York Int.	W	00-24	X	-	-	
	New York (La G.)	W	00-24	X	-	-	
	Prestwick	Hx	00-24	X	144	6	
	Reykjavik	W	00-24	X	-	-	
	Rhein/Main	s	00-24	X	-	-	
	Santa Maria	Hpw	00-24	X	144	6	
	Shannon	s	00-24	X	-	-	
	Stephenville	Ttpw	00-24	X	144	36	
	Sydney	W	00-24	X	-	-	
	Washington	W	00-24	X	-	-	

COLLECTING CENTRE	STATION REPORTING	REQUIREMENTS			VOLUME OF TRAFFIC		REASON FOR CHANGE
		TYPE	HOURS	DAYS	PER DAY	PEAK PERIOD	
CENTRE COLLECTEUR	STATION D'EMISSION	BESOINS			VOLUME DU TRAFIC		MOTIF DE LA MODIFICATION
		TYPE	HEURES	JOURS	PAR JOUR	HEURE DE POINTÉ	
1	2	3	4	5	6	7	8
GREENLAND/ GROENLAND Søndre Strømfjord (additions)	Aalborg	Tt	Sched. not yet decided		144	36	(Projected new routes (to be specified)
	Calgary	Tt	Horaires		144	36	
	Churchill	Tt	non fixé		144	36	
	Edmonton/Winnipeg	Tt	"		144	36	
	Frobisher	Tt	"		144	36	
	Göteborg	Tt	"		144	36	(Nouvelles routes projetées (à préciser)
	Keflavik	Tt	"		144	36	
	København	Tt	"		144	36	
	Lethbridge	Tt	"		144	36	
	Oslo/Fornebu	Tt	"		144	36	
	Prestwick	Tt	"		144	36	
	Stavanger	Tt	"		144	36	
ICELAND/ISLANDE Keflavik (additions)	Bodø	Tt	Sched. not yet decided		144	36	(Flight meteorological watch (for projected new route Bodø-Fairbanks
	Søndre Strømfjord	HsTt	Horaires		288	42	
	Frobisher	(H) sTt	non fixé		288	42	
	Fairbanks	Tt	"		144	36	
	Anchorage	Tt	"		144	36	
	One addl. alternate	Tt	"		144	36	(Veille météorologique de vol pour la nouvelle route projetée Bodø-Fairbanks
	Gander	w	00-24	X	-	-	(Additional requirements for present operations Besoins complémentaires pour les vols actuels
	New York (La. G.)	PWw	00-24	X	200	50	
	Ottawa	Tt	-	0	144	36	
	Prestwick	w	00-24	X	-	-	
	Reykjavik	H	00-08	0	144	6	
	Shannon	w	00-24	X	-	-	(Gardermoen available for emergency use only Gardermoen utilisable en cas d'urgence seulement
	LAFB Oslo/Fornebu	s	00-24	X	-	-	
	LAGM Oslo/Gardermoen	sTt	00-24	X	238		
(deletions) (suppressions)							

COLLECTING CENTRE	STATION REPORTING	REQUIREMENTS			VOLUME OF TRAFFIC		REASON FOR CHANGE
		TYPE	HOURS	DAYS	PER DAY	PEAK PERIOD	
CENTRE COLLECTEUR	STATION D'EMISSION	BESOINS			VOLUME DU TRAFIC		MOTIF DE LA MODIFICATION
		TYPE	HEURES	JOURS	PAR JOUR	HEURE DE POINTE	
1	2	3	4	5	6	7	8
IRELAND/IRLANDE Shannon (additions)	Amsterdam	<u>sw</u>	00-24	X	-	-	(Additional requirements for present operations
	Bruxelles	<u>s</u>	00-24	X	-	-	
	Frankfurt	<u>HQtt</u>	00-24	X	-	-	
	Gander	<u>Ppw</u>	00-24	X	1 440	60	
	Keflavik	<u>spw</u>	00-24	X	-	-	
	København	<u>HsQTtw</u>	00-24	X	288	42	(Besoins complémentaires pour les vols actuels
	London	<u>sw</u>	00-24	X	-	-	
	New York (La G.)	<u>w</u>	00-24	X	-	-	
	Ottawa	<u>Tt</u>	-	0	144	36	
	Prestwick	<u>spw</u>	00-24	X	-	-	
	Reykjavik	<u>HsQTt</u>	00-24	X	288	-	
	Stavanger	<u>HsQTt</u>	00-24	X	288	-	

COLLECTING CENTRE	STATION REPORTING	REQUIREMENTS			VOLUME OF TRAFFIC		REASON FOR CHANGE
		TYPE	HOURS	DAYS	PER DAY	PEAK PERIOD	
CENTRE COLLECTEUR	STATION D'EMISSION	BESOINS			VOLUME DU TRAFIC		MOTIF DE LA MODIFICATION
		TYPE	HEURES	JOURS	PAR JOUR	HEURE DE POINTE	
1	2	3	4	5	6	7	8
NETHERLANDS/ PAYS-BAS Schiphol Airport Amsterdam (additions)	Ottawa	Tt	00-24	X	144	36	(Additional requirements for present operations (Besoins complémentaires pour les vols actuels
	NORWAY/NORVEGE Oslo/Fornebu (additions)	Tt	Sched. not yet decided		144	36	(Projected new route Oslo- Fairbanks
	Anchorage One addl. alternate	Tt	Horaire non fixé		144	36	(Nouvelle route projetée Oslo-Fairbanks
PORTUGAL Lisboa (additions)	Dakar	Pw	00-24	X	1 440	60	(Additional requirements for present operations
	Reykjavik	Pp	00-24	X	270	12	(
	Sal	W	00-24	X	-	-	(Besoins complémentaires pour les vols actuels
	Santa Maria	W	00-24	X	-	-	(
	Shannon	Pp	00-24	X	2 440	100	(
	Thies	Tt	00-24	X	144	36	(
PORTUGAL Santa Maria (additions)	Barbados	Tt	00-24	X	-	-	(Additional requirements for present operations
	Gander	(H)sQ	00-24	X	216	9	(
		Pp	00-24	X	1 440	60	(
		W	00-24	X	-	-	(
	Georgetown	Tt	00-24	X	144	36	(
	Guadeloupe	Tt	00-24	X	144	36	(
	Kindley Field	HsQ	00-24	X	216	9	(
	Lajes	HsQ	00-24	X	216	9	(Besoins complémentaires pour les vols actuels
	Lisboa	Tt	00-24	X	144	6	(
	Paramaribo	PpTtFFWw	00-24	X	1 264	166	(
	Port of Spain	PpTtFFWw	00-24	X	1 464	216	(
	San Juan	PpW	00-24	X	920	80	(

COLLECTING CENTRE	STATION REPORTING	REQUIREMENTS			VOLUME OF TRAFFIC		REASON FOR CHANGE
		TYPE	HOURS	DAYS	PER DAY	PEAK PERIOD	
CENTRE COLLECTEUR	STATION D'EMISSION	BESOINS			VOLUME DU TRAFIC		MOTIF DE LA MODIFICATION
		TYPE	HEURES	JOURS	PAR JOUR	HEURE DE POINTE	
1	2	3	4	5	6	7	8
SWEDEN/SUEDE Stockholm/TEL SMHI ⁵⁾ (additions)	Fairbanks	Tt	Sched. not				
	Anchorage	Tt	yet decided		144	36	(Projected new route
	One addl. alternate	Tt	Horaires non fixé		144	36	(Stockholm-Fairbanks (Nouvelle route projetée (Stockholm-Fairbanks
SWITZERLAND/ SUISSE Zurich (additions)	Gander	Pp	00-24	X	1 440	60	(Additional requirements for
	Keflavik	Pp	00-24	X	270	12	(present operations
	New York	Pp	00-24	X	500	20	(
	Prestwick	Pp	00-24	X	800	35	(Besoins complémentaires
	Santa Maria	Pp	00-24	X	80	3	(pour les vols actuels
	Shannon	Pp	00-24	X	2 440	100	(

COLLECTING CENTRE	STATION REPORTING	REQUIREMENTS			VOLUME OF TRAFFIC		REASON FOR CHANGE
		TYPE	HOURS	DAYS	PER DAY	PEAK PERIOD	
CENTRE COLLECTEUR	STATION D'EMISSION	BESOINS			VOLUME DU TRAFIC		MOTIF DE LA MODIFICATION
		TYPE	HEURES	JOURS	PAR JOUR	HEURE DE POINTE	
1	2	3	4	5	6	7	8
UNITED KINGDOM/ ROYAUME-UNI London (additions)	Baltimore	Tt	-	0	144	36	(Additional (requirements (for present (operations (((Besoins (complémentaires (pour les vols (actuels (((Not required (now (Pas nécessaire (à l'heure actuelle
	Bedford	Tt	-	0	144	36	
	Chicago	Tt	00-24	X	144	36	
	Cleveland	Tt	-	0	144	36	
	Halifax	Tt	-	0	144	36	
	Keflavik	H	00-24	X	144	6	
	Milwaukee	Tt	-	0	144	36	
	Pittsburg	Tt	-	0	144	36	
	Rhein Main	Tt	00-24	X	144	36	
	Reykjavik	H	00-24	X	144	6	
	Richmond	Tt	-	0	144	36	
	Windsor Locks	Tt	-	0	144	36	
	Munich	Tt	00-24	X	144	36	
	Newark	Tt	00-24	X	144	36	
	Norfolk	Tt	00-24	X	144	36	
	Tbrkey	Tt	00-24	X	144	36	
(deletions) (suppressions)							
UNITED KINGDOM/ ROYAUME-UNI Prestwick (additions)	Aalborg	HsTt	00-24	X	288	42	(Additional (requirements (for present (operations (((Besoins (complémentaires (pour les vols (actuels (
	Bedford	<u>W</u>	-	0	-	-	
	Chicago	Tt	00-24	X	144	36	
	Cleveland	Tt	-	0	144	36	
	Frankfurt	HQ	00-24	X	180	9	
	Gander	(H) (W)	00-24	X	144	6	
	Goteborg	HsTt	00-24	X	288	42	
	Köbenhavn	HsTt	00-24	X	288	42	
	Lisboa	Tt	00-24	X	144	36	
	Malmö	Tt	00-24	X	144	36	
	Milwaukee	Tt	-	0	144	36	
	New York (La G.)	Ww	00-24	X	200	50	

COLLECTING CENTRE	STATION REPORTING	REQUIREMENTS			VOLUME OF TRAFFIC		REASON FOR CHANGE
		TYPE	HOURS	DAYS	PER DAY	PEAK PERIOD	
CENTRE COLLECTEUR	STATION D'EMISSION	BESOINS			VOLUME DU TRAFIC		MOTIF DE LA MODIFICATION
		TYPE	HEURES	JOURS	PAR JOUR	HEURE DE POINTE	
1	2	3	4	5	6	7	8
UNITED KINGDOM/ ROYAUME-UNI Prestwick (additions) (suite) (deletions) (suppressions)	Norfolk	Tt	-	0	144	36	(Additional
	Norrköping	Tt	00-24	X	144	36	(requirements
	Ottawa	Tt	-	0	144	36	(for present
	Reykjavik	H	00-24	X	144	6	(operations
	Keflavik	H	00-24	X	144	6	(
	Stavanger	HsQtTt	00-24	X	360	45	(Besoins
	Stockholm	Tt	00-24	X	144	36	(complémentaires
	Toronto	Tt	00-24	X	144	36	(pour les vols
	Washington	(w)	00-24	X			(actuels
	Windsor Locks	Tt	-	0	144	36	(
	Albany	Tt	00-24	X	144	36	(Not required
	Bedford	Tt	00-24	X	144	36	(now
	Greenwood	Tt	00-24	X	144	36	(
	Pittsburg	Tt	00-24	X	144	36	(Pas nécessaire
	Richmond	Tt	00-24	X	144	36	(à 1'heure actuelle
UNITED STATES/ ETATS-UNIS Chicago (addition) Detroit (additions)	Prestwick	Tt	00-24	X	144	36	(Additional
							(requirements
							(for present
							(operations
	Gander	HsTt	00-24	X	288	42	(
	Goose Bay	HsTt	00-24	X	288	42	(Besoins
	Moncton	HsTt	00-24	X	288	42	(complémentaires
	Mont-Joli	HsTt	00-24	X	288	42	(pour les vols
	Montreal	HsTt	00-24	X	288	42	(actuels
	Stephenville	HsTt	00-24	X	288	42	(
	Sydney	HsTt	00-24	X	288	42	(

COLLECTING CENTRE	STATION REPORTING	REQUIREMENTS			VOLUME OF TRAFFIC		REASON FOR CHANGE
		TYPE	HOURS	DAYS	PER DAY	PEAK PERIOD	
CENTRE COLLECTEUR	STATION D'EMISSION	BESOINS			VOLUME DU TRAFIC		MOTIF DE LA MODIFICATION
1	2	TYPE	HEURES	JOURS	PAR JOUR	HEURE DE POINTE	
UNITED STATES/ ETATS-UNIS New York (additions).	Frankfurt Gander Goose Bay Hamburg Lajes Lisboa London Moncton Paris Port of Spain Prestwick Reykjavik San Juan Stephenville Sydney Toronto Kobenhavn	Tt cw s Tt p p (H) p s (H) Tt Pp Tt Hs s s Tt Tt	00-24 00-24 00-24 00-24 Irreg. Irreg. 00-24 00-24 00-24 00-24 00-24 00-24 00-24 00-24 00-24 00-24 00-24 00-24	X X X X X X X X X X X X X X X X X X	144 — — 144 — — 144 — 144 144 800 144 144 — — 144 144	36 — — 36 — — 6 — 6 36 35 36 6 — — 36 36	(Additional (requirements (for present (operations (Besoins (complémentaires (pour les vols (actuels

SECTION 3 - PROCEDURES3.1 Aeronautical Information Services

3.1.1 International NOTAM Offices. The Subcommittee was satisfied that the existing organization of International NOTAM Offices in the North Atlantic Region is adequate to meet the requirements for the exchange of NOTAMS internationally.

3.1.2 Basic data for Aeronautical Information Services and Charts. The Subcommittee discussed at some length the desirability of all States making available their basic data in the form of a self-contained AIP in accordance with the Standards and Recommended Practices contained in Chapter 4 of Annex 15. The Subcommittee recognized the difficulties confronting certain States in the implementation of Chapter 4 but considered that in the absence of such implementation, there was a need to assist users of the data to obtain it as simply, quickly, and completely as possible. An index of the documents available, with details of their contents and indicating where particular subjects could be found, was suggested as the best guide which could be provided in the existing circumstances. Accordingly,

Recommendation No.1Aeronautical Information Index

It is recommended that those States which are unable to produce an AIP in conformity with Chapter 4 of Annex 15 should provide a single comprehensive and up-to-date index of current aeronautical legislation and other relevant information documents to facilitate the use of such aeronautical information by other States and operators. This index should be amended at regular intervals.

3.1.3 Basic Data. The only specific requirements for basic data put forward were the following:

Bermuda. There is a requirement for basic data to be published by the responsible authorities.

Greenland. There is a requirement for basic data to be published by the responsible authorities. (It has been agreed that Denmark will undertake this service for the whole of Greenland.)

Iceland and Ireland. There is a requirement for an AIP for both these countries (in each case it is in the course of preparation).

Portugal. There is a requirement for basic data on the Azores (including Lages).

3.1.4 Advance issue of NOTAMS. It would appear that not all States are complying with the Recommendations in paragraphs 5.1.2 and 5.1.2.1 of Annex 15 and the Subcommittee therefore considers that all States in the North Atlantic Region should be required in appropriate cases to originate NOTAMS sufficiently far in advance of the occurrence to enable appropriate action to be taken by all concerned. Accordingly,

Recommendation No.2

Date of issue of NOTAMS

It is recommended that whenever possible NOTAMS should be originated sufficiently far in advance of the occurrence to ensure their receipt by the designated offices at least 15 days in advance in the case of changes in aeronautical facilities and at least 30 days in advance in the case of procedures for air navigation, to permit aircraft operators to make adequate arrangements.

3.1.5 NOTAMS Class 1.

3.1.5.1 The Subcommittee agreed that there is a failure among some of the North Atlantic States to comply with the Recommendation in paragraph 5.1.1.1 of Annex 15 in so far as concerns the cancellation of NOTAMS Class 1 upon the return of facilities to operation. The Subcommittee considers that all States should comply with this recommendation. Accordingly,

Recommendation No.3

Cancellation of Obsolete NOTAMS Class 1

It is recommended that States give particular attention to the application of those provisions of paragraph 5.1.1.1 of Annex 15 which relate to the cancellation of NOTAMS Class 1 when facilities are returned to operation.

3.1.5.2 Bearing in mind the communication difficulties peculiar to the North Atlantic Region, States should also supplement the procedure in paragraph 3.1.5.1 with a monthly check list of current NOTAMS Class 1 (in accordance with the Recommendation in paragraph 5.3.4 of Annex 15).

Recommendation No. 4Check List of Valid NOTAMS Class 1

It is recommended that States issue a monthly check list of NOTAMS Class 1 in force in accordance with 5.3.4 of Annex 15.

3.1.5.3 The Subcommittee took note of the fact that the New York International NOTAM Office is responsible for the distribution of NOTAMS Class 1 originating in Bermuda and that the Gander International NOTAM Office is responsible for the distribution of NOTAMS Class 1 originating in Greenland. The Subcommittee was informed that the responsibility for issuing NOTAMS for these territories would be the subject of discussions between the Contracting States concerned.

3.1.6 NOTAMS Class 2.

3.1.6.1 The Subcommittee considered that those States which are not at present issuing at intervals of not more than six months check lists of Class 2 NOTAMS currently in force (in accordance with the Recommendation at paragraph 5.3.4 of Annex 15) should do so. Accordingly,

Recommendation No. 5Check List of Valid NOTAMS Class 2

It is recommended that those States which are not issuing check lists, at intervals of not more than six months, of NOTAMS Class 2 currently in force (in accordance with 5.3.4 of Annex 15) should do so.

3.1.6.2 There are specific requirements for the publication of NOTAMS Class 2 in the case of Bermuda and Greenland (Denmark has agreed to resume publication of NOTAMS Class 2 for the whole of Greenland).

3.1.7 Aeronautical Charts

3.1.7.1 The Subcommittee took note of the IATA view that the charts produced or planned for production, as indicated in the ICAO Aeronautical Chart Catalogue, in the main met the operators' requirements. However, with particular regard to the Polar regions, there is a requirement that the special Polar navigation charts now known to be produced be included in this chart catalogue and thereby be made readily available to all operators.

3.1.7.2 The Subcommittee was concerned at the lack of both aeronautical charts to cover certain areas in the NAT Region and of basic topographical data from which to produce the charts. Accordingly,

Recommendation No. 6

Arctic Charts

It is recommended that

- a) ICAO invite the attention of the Contracting States concerned with regard to charts of the Arctic areas, which in some cases show conflicting information, and are of questionable reliability;
- b) Contracting States should be encouraged to exchange basic compilation data as it becomes available in order that the accuracy and reliability of the charts may be improved;
- c) Contracting States be urged to ensure that operators who may be concerned are made aware of the deficiencies in the available aeronautical charts in the Polar areas of the Region, particularly in the accuracy of elevation of the ice cap of Greenland;
- d) In view of the increased requirement for maps and charts to cover the new FIR's of the NAT Region, the States concerned exchange information regarding topographical and aeronautical data in order to facilitate map production by the State to which responsibility for that area has been allocated.

3.1.7.3 It was noted that the OPS Division Recommendation calling for the preparation of aerodrome obstruction charts had not been implemented in respect of most international aerodromes in the NAT Region and agreed that this urgent requirement should be satisfied as soon as possible. These charts, the specifications for which are contained in Annex 4, are required by operators in applying the performance requirements of Annex 6. During the discussion of this subject several Delegations indicated that the current specification was not consistent with the work of the last AGA Division and that experience gained in preparing such charts indicated the need for a re-examination of this specification. It was agreed that failure to keep this specification up-to-date could be responsible for the smallness of the number of charts which had been produced to date. Accordingly,

Recommendation No. 7Aerodrome Obstruction Plans and ProfilesIt is recommended that:

- a) The current specification for Aerodrome Obstruction Charts (Chapter 11 of Annex 4) be reviewed in the light of experience gained in producing such charts and that inconsistencies with other ICAO specifications be eliminated as soon as possible.
- b) States give urgent consideration to the production of aerodrome obstruction plan and profile charts, in accordance with the specification found in Chapter 11 of Annex 4, since these charts are required by operators in applying the performance requirements of Annex 6.

3.1.8 Aeronautical Briefing. The existing arrangements for aeronautical briefing in the NAT Region appeared in general to the Subcommittee to be satisfactory.

PROPOSED INTERNATIONAL EXCHANGE OF NOTAMS CLASS 1

PROJET D'ÉCHANGE INTERNATIONAL DE NOTAM DE 1ÈRE CLASSE

<div> <div>REQUIRED BY</div> <div>REQUIS PAR</div> <div>TO BE SENT BY</div> <div>À ENVOYER PAR</div> </div>		COUNTRY PAYS		NOF	
		COUNTRY	PAYS	NOF	
		ALASKA	ANCHORAGE		
		BAHAMAS	NASSAU		
		BELGIUM	BRUXELLES		
		BERMUDA	NEW YORK		
		CANADA	GANDER		
			VANCOUVER		
		COLOMBIA	BOGOTA		
		CUBA	HABANA		
		DENMARK	KØBENHAVN		
		FRANCE	PARIS		
		FRENCH WEST AFRICA	DAKAR		
		GERMANY	FRANKFURT		
		GREENLAND	GANDER		
		ICELAND	REYKJAVÍK		
		IRELAND	SHANNON		
		ITALY	ROMA		
		JAMAICA	KINGSTON		
		MEXICO	MEXICO		
		NETHERLANDS	AMSTERDAM		
		NORWAY	OSLO		
		PORTUGAL	LISBOA		
			SANTA MARIA		
		PUERTO RICO	SAN JUAN		
		SPAIN &	MADRID		
		CANARY IS.			
		SURINAM	PARAMARIBO		
		SWEDEN	STOCKHOLM		
		SWITZERLAND	ZÜRICH		
		TRINIDAD	PORT OF SPAIN		
		UNITED KINGDOM	LONDON		
		UNITED STATES	MIAMI		
		OF AMERICA	NEW YORK		
		VENEZUELA	CARACAS		

F = FUTURE REQUIREMENTS

F = BESOINS FUTURS

[To form part of regional plan of Suppl. 1 Page]

3.2 Altimeter Setting ProceduresRecommendation No. 8*Implementation of Altimeter Setting Procedures
in Part 1 of Doc 7030

It is recommended that the Altimeter Setting Procedures found in Part 1 of Doc 7030 (as amended by this meeting) be fully implemented throughout the North Atlantic Region, i.e. in the following flight information regions: New York Oceanic, Santa Maria, Gander Oceanic, Shannon/Prestwick, Narsarssuak, Reykjavik, Stavanger Oceanic, Tromsø Oceanic, Nord, Thule.

Recommendation No. 9Amendment to para. 1.1.6.3 of Part 1 of Doc 7030

It is recommended that paragraph 1.1.6.3 of Part 1, Doc 7030 be deleted and the following be inserted in its place:

"1.1.6.3

The transition from flight levels to altitudes and vice versa while en route between the NAT Oceanic FIR's and the adjoining EUM FIR's shall be made on instructions or advice from the appropriate air traffic service authorities, which will normally be given when the aircraft estimates it is at the boundary of the Oceanic FIR's. The air traffic service authorities may, at their discretion, give this instruction or advice earlier or later either on request from a pilot or for air traffic service reasons."

NAT

Recommendation No. 10Amendment to para. 1.4.4.1 of Part 1 of Doc 7030

It is recommended that para. 1.4.4.1 of Part 1, Doc 7030 be amended by deleting the designator NAT and adding a new paragraph with the designator NAT, as follows:

"Meteorological information available for use in briefing shall include that required to determine the lowest safe flight level."

* See statement by the United States of America at Appendix A.

SECTION 4 - MATTERS REFERRED TO THE SUBCOMMITTEE
BY THE GENERAL COMMITTEE OR BY THE TECHNICAL COMMITTEES4.1 - General CommitteeMatter Referred

4.1.1 The General Committee agreed at its first meeting that Subcommittee 1 should decide whether Item 1.3.2 of the MET agenda need be considered by the MET Committee, in view of the content of Item 1.5 of the COM agenda, and Subcommittee 1's own agenda.

Action Taken

4.1.2 Subcommittee 1 agreed that there need be no consideration, by the MET Committee, of Item 1.3.2 of its agenda. Accordingly the COM Committee was directed to take the necessary action under Item 1.5 of its agenda, and the MET Committee to consider Item 1.3.2 of its agenda to be deleted.

4.2 - METMatter Referred

4.2.1 The MET Committee reviewed Part 1, paragraph 1.4 of the Supplementary Procedures - NAT. It is the opinion of the MET Committee that the substance of the procedures is satisfactory from the meteorological point of view, pending the outcome of the Secretariat study undertaken as a result of EUM III MET Recommendations 31, 32, and 33 and SEA/SOP MET Recommendation 55, dealing with the procedures to be followed by Meteorological Services for the provision of atmospheric data to AIS Units so as to enable minimum safe flight levels and transitional levels at aerodromes to be established.

4.2.2 The Committee recommends to Subcommittee 1 that paragraph 1.4.4.1 of Doc 7030 be amended to read:

"Meteorological information available for use in briefing shall include that required to determine the lowest safe flight level."

The reason for this proposed rewording of the paragraph is to bring the phraseology in line with that appearing in the draft MET-PANS, Appendix 4, paragraph 4, proposed by the MET Division, Fourth Session. This new wording avoids the ambiguity of the present text, which might led to the conclusion that meteorological briefing requires the inclusion of atmospheric data, even in cases when the flight plan calls for long over-water flights without terrain obstacles.

Action Taken

4.2.3 The Subcommittee agreed to recommend amendment of para. 1.4.4.1 of Doc 7030 as proposed. (See Recommendation No. 10)

4.3 - METMatter Referred

4.3.1 In considering the need for hourly meteorological reports from Hólar or Höfn or some other location near the south coast of Iceland, the MET Committee would like to take into account the need for QNH reports from the same area, in view of the possibility of effecting economies if both kinds of observations can be made at the same location.

4.3.2 Forecast regional QNH's are used at present for Iceland and these are based on 3-hourly observations. The Delegate of Iceland has expressed the view that, if hourly QNH reports were made for Hólar or Höfn, the extreme errors in the forecast QNH's for the surrounding area, which includes mountains rising to 2119 m (approximately 7,000 ft.), might be reduced by as much as 10 millibars, which is equivalent to a reduction of the error in altimeter reading by about 82 m (approximately 270 ft.).

4.3.3 The decision as to whether hourly QNH reports are required or not therefore appears to depend on how necessary it is to reduce by 82 m (approximately 270 ft.) the safety allowance above the terrain in the neighbourhood of South East Iceland.

4.3.4 The MET Committee requests the guidance of Subcommittee 1 on this matter as soon as possible.

Action Taken

4.3.5 The Subcommittee considered the only question involved in this matter to be the availability of adequate airspace to meet ATC requirements, as the requirement for terrain clearance could be adequately met by the safety margins incorporated in forecast QNH's. It therefore requested the RAC/SAR Committee to examine the question. The RAC/SAR Committee concluded that there was no international requirement for utilization of airspace to an order of accuracy that would justify the hourly QNH reports in question, with which conclusion Subcommittee 1 agreed.

SECTION 5 - REVIEW OF REPORTS OF TECHNICAL COMMITTEES5.1 AGA ReportRAC/SAR ReportMET Report

These Reports were reviewed with no comments by Subcommittee 1 being considered necessary.

5.2 COM Report

5.2.1 Subcommittee 1 noted that the radio navigational aids located on board Ocean Station Vessels are not included in the tables which list the radio navigational aids at para. 10.3 on pages COM-66 to COM-81 inclusive, but are the subject of a separate recommendation (No. 44, in para. 6.2 on page COM-62). The Subcommittee found this to be consistent with its decision respecting these facilities, reached when specifying requirements for radio navigational aids, and reported in Section 1 of the present report at para. 1.2.1.4.7.

SECTION 6 - URGENT OPERATIONAL REQUIREMENTS6.1 Recommendation No. 11

It is recommended that; in view of the importance and growth of North Atlantic traffic and the temporary expedient of increased separation between aircraft on trans-Atlantic routes, the provision of the facilities needed to permit accurate fixing of position and adequate air traffic service communications, should be considered a matter of urgency; this refers specifically to the following communications requirements:

Canada Circuit 2005 (Ref. ~~Doc 7533~~^{COM-} Rec. 11, page 21)
Ireland

Requirement: improvement in efficiency

Reason: To improve serviceability during periods of poor propagation.

Canada Gander-Moncton LLT Circuit (Ref. ~~Doc 7533~~^{COM} Rec. 12, page 22)

Requirement: Improvement in efficiency

Reason: To permit fulfilment of transit time requirements

Canada Gander-Southern Tip Greenland RTT (Ref. ~~Doc 7533~~^{COM} Rec. 10, page 21)
Greenland

Requirement: Establish RTT circuit

Reason: To permit transmission of ATS information between the Southern Greenland air/ground station and Gander ATC.

Greenland Southern Tip of Greenland - Reykjavik RTT (Ref. ~~Doc 7533~~^{COM} Rec. 10, page 21)
Iceland

Requirement: Establish RTT circuit

Reason: To permit efficient transmission of ATS information between ATC at Gander and Reykjavik and between the air/ground stations at Gander and the southern tip of Greenland.

Canada Aeronautical Stations at Gander, Southern tip of
Greenland Greenland, Reykjavik, Shannon. (Ref. Doc. 7539;
Iceland Recs. 35, 36 and 37, page 42)
Ireland

Requirement: Implement ground wave propagation techniques at these stations.

Reason: To improve communication with aircraft during periods of poor propagation conditions.

6.2

Recommendation No.12

It is recommended that in order to meet urgent operational requirements, States consider as urgent the following improvements:

AGA

United States - Boston: Runway surface

Requirement: Improvement in surface of runway 4R.

Reason: The surface of runway 4R is sufficiently rough to render take-offs and landings difficult.

Approach lighting

Requirement: Approach lighting system to serve runway 4R.

Reason: Approach lighting for runway 4R is required for low visibility conditions.

MET

Requirement: Improvement in the New York - Santa Maria - Paris meteorological teletype circuit.

Reason: Improvement of the present exchange of meteorological data between Europe and North America.

SECTION 7 - DATES FOR IMPLEMENTATION OF PROCEDURES AND FACILITIES

7.1 The Subcommittee reviewed the dates of implementation for facilities, services and procedures as recommended by the AGA, COM, MET and AC/SAR Committees and agreed upon the following overall schedule.

7.1.1 Recommendation No.13

FACILITIES AND SERVICES

It is recommended that the facilities agreed upon by the meeting be provided as follows:

AGA*

- a) Improvement of international land aerodromes required for regular use. (See page AGA 8, Rec. No. 1).

As soon as possible within period of 18 months from date of approval by Council.

- b) Improvement of international land aerodromes required for future regular use. (See page AGA 8, Rec. No.2)

As soon as possible and not later than 1 January 1960.

- c) Visual aids to approach. (See page AGA 9, Rec. No.6)

As soon as possible.

COM

- a) AFTN plan for the NAT Region. (See page COM 9, Rec.No.1)

Required improvements and modifications to circuits to be made as soon as practicable and ICAO to be informed by 1 May 1955 of the programme States intend to follow.

- b) Additional AFTN circuits, South Greenland - Gander, South Greenland - Reykjavik. (See page COM 21, Rec.No.10)

To be implemented as soon as possible.

* See also Recommendation No. 10, page AGA-24

- c) Aeronautical mobile communications. (See page COM 36, Rec. No. 19)

Aeronautical mobile plan to be implemented from the date that approval by Council is notified to States except for portions for which other specific dates have been specified.

- d) HF - A3 Frequencies of Family "B". (See page COM 39, Rec. No. 26)

To be implemented on 1 January 1956.

- e) VHF en-route facilities in plan. (See page COM 42, Rec. No. 34)

To be implemented not later than 1 January 1956.

- f) All radionavigation aids. (See page COM 63, Rec. No. 46)

New aids or changes to existing aids recommended to be implemented as soon as practicable and ICAO to be informed by 1 May 1955 of programme States intend to follow.

- g) MET broadcast to aircraft (VOLMET). (See page COM 83, Rec. No. 48)

Agreed plan to be implemented at 1200 hours GMT on 1 April 1955, subject to satisfactory coordination of frequencies and time schedule being achieved.

MET

- a) Additional upper air observations. (See page MET 17, Rec. No. 9)

The additional meteorological observations referred to in Recommendations Nos. 7 and 8 to be implemented as soon as practicable, taking into account the fact that the following are required in connection with new air services commencing on the dates indicated:

- a) Jan Mayen radio/radar wind observations - required for flights on the København-Søndre Strømfjord route, commencing November 1954.
- b) Bjørnøya radiosonde observations and Bjørnøya, Tromsø and Danmarkshavn radio/radar wind observations - required for "polar" flights commencing mid-1956.
- b) Operational facilities and services. (See page MET 28, Rec. No. 16)

MET Tables 1, 4, 6, 7 and 2 (except exchange plan for air-reports):

on the date set for implementation of the proposed new Supplementary Procedures - MET;

MET Table 2, in so far as it shows the exchange plan for air-reports:

not later than four months after approval by Council of this part of the plan;

MET Tables 8 and 9:

on the date recommended by the COM Committee.

RAC/SAR

All facilities recommended. (See page 12, Rec. No. 12)

As soon as possible except Nord and Tromsø FIR's, Tromsø oceanic SAR area and part of the Thule SAR area which are to be implemented when scheduled operations commence.

7.1.2 Recommendation No. 14

PROCEDURES

It is recommended that the procedures agreed upon by the meeting be implemented as follows:

COM Supplementary Procedures. (See page COM 89, Rec. No. 61)

4 months after date of approval by Council.

MET

MET Supplementary Procedures. (See page MET 43, Rec. No. 33)

New MET Supplementary Procedures to be applied on the date on which the expanded Annex 3 and the PANS-MET become applicable.

RAC/SAR

a) RAC/SAR Supplementary Procedures. (See page RAC/SAR 14, Rec. No. 14)

4 months after date of approval by Council.

Subcommittee 1

publ - 7030

AWW 10/11/97

Altimeter Setting Procedures. (See page Sub-64, Recs. Nos. 8, 9, 10)

2 months after date of publication in Doc 7030.

SECTION 8 - OTHER RECOMMENDATIONS.8.1 Recommendation No. 15^{*}CONSOL Network

That long range radionavigational fixing coverage, as defined below, be provided to serve all aircraft; and that present LORAN and CONSOL stations be continued in operation.

Additional CONSOL stations are required to meet the foregoing requirement at appropriate locations in the following places:

1. Iceland
2. Southern Greenland
3. Azores
4. Eastern Newfoundland
5. Labrador (Goose Bay Area)
6. Nantucket Island, Mass.
7. Atlantic City, N.J.

The areas to be served by the above additional CONSOL stations are:

1. The area in latitudes N of latitude 50°N lying between the existing LORAN, CONSOL stations coverage.

2. The area in the central portion of the North Atlantic lying approximately between latitudes 30°N and 50°N.

3. The eastern approaches to the U.S. and Canadian seaboard.

Note.- Long range navigational fixing cover is defined as the area in which a fix accuracy of 20 NM is obtainable for 95% of the time.

Comment.

In considering the problems indicated in paragraphs 1.2.1.4.1 - 1.2.1.4.5 inclusive (Section I of the present Report) three interim solutions appeared possible.

a) To extend LORAN coverage over all of the North Atlantic and to require all transatlantic operators to equip their aircraft with LORAN receivers;

^{*} See Canadian Reservation and Statement by the United States of America at Appendix A.

b) To provide coverage over all of the North Atlantic partly by LORAN and partly by CONSOL;

c) To extend CONSOL fixing coverage over the North Atlantic.

The possibility indicated in a) was considered impracticable. Possible sites at which LORAN stations might be located in order to provide complete coverage do not exist and, furthermore, ensurance of implementation of the requirements that all operators equip their aircraft with LORAN receivers is considered to be impracticable.

The success of the possibility indicated in b) must also clearly be predicated on all transatlantic operators equipping their aircraft with LORAN receivers as evidently without these receivers the fixing service available would be limited to those areas in which CONSOL fixes could be obtained and such other very limited areas where fixes might be obtained from NDB, Ocean Station Vessels and shore based short distance aids. Thus because of the impracticability of ensuring that all transatlantic aircraft will be equipped with LORAN receivers the provision of fixing coverage partly by LORAN and partly by CONSOL at best will only provide a very limited improvement in the present conditions.

The possibility indicated in c) does not suffer from the disabilities indicated in respect to a) and b) as CONSOL fixing coverage would be available to all aircraft flying across the North Atlantic without the need for carrying special equipment. For this reason and because of the technical suitability of the CONSOL system, it is considered that the extension of CONSOL fixing coverage over the North Atlantic from the present coverage to the North American seaboard offers the best interim solution. The coverage criteria upon which these conclusions were based are stated in paras. 1.2.1.4.1 to 1.2.1.4.5 of Section I of the present Report.

8.2 Recommendation No. 16⁴

Continuous operation of NDB at Knob Lake (Quebec)

That pending implementation of an extension of the North Atlantic long range navigational coverage to include the Knob Lake area the NDB now existing at Knob Lake should be operated on a 24-hour basis.

Comment

The Committee accepted this recommendation on the basis of a statement of the operational requirement submitted by IATA. It considered that the requirement as stated offered prima facie evidence of the need for continuous operation of the NDB. However, it was recognized that

⁴ See Canadian Reservation at Appendix A.

further evidence was desirable, particularly in respect to the frequency with which the aid would be used, in order to fully justify the requirement. The following statement in this connection has been provided by IATA:

"That recommendation for continuous operation of the NDB at Knob Lake pending the implementation of CONSOL coverage in this area, is considered by IATA to be operationally necessary for the following reasons:

i) minimum flight paths across the North Atlantic; based on the atmospheric pressure structures, are such as to make the Knob Lake area of navigational importance;

ii) an increasing number of aircraft with the ability to make non-stop flights between Europe and North America are being flown today. Consequently, a higher percentage of scheduled operations could be conducted in a more efficient manner by utilizing minimum flight path techniques;

iii) studies which have been performed in the U.K. and published in the Journal of the Institute of Navigation indicate that around 30% of westbound trans-Atlantic flights could reasonably be routed in the vicinity of Knob Lake if the maximum advantage is to be taken of the pressure structure;

iv) flights now being so routed are limited by the uncertainty of being able to receive the existing facility and although the present number of operations in the area is several per week, it is felt that the actual number is misleading since it is low compared with the number who would wish and be able to adopt this routing if a regular NDB were available at Knob Lake."

8.3

Recommendation No. 17

NDB at Prins Christianssund, Greenland

That pending the implementation of the long range navigational service providing coverage in the North Central Atlantic, the NDB at Prins Christianssund be maintained in operation on a 24-hour basis with the existing coverage.

Comment

The NDB at Prins Christianssund provides an essential service pending the completion of long range navigational coverage in the North Central Atlantic area in that:

a) It is the only land based aid providing reliable service to aircraft approaching Southern Greenland from the East. Due to high mountains, the emissions of the NDB at Narsarssuak and the radio range at Simiutak are severely attenuated to the east and are unusable in that direction;

b) An NDB at Prins Christianssund provides essential guidance for aircraft flying from Iceland to Gander/Goose Bay or vice versa which, because of the altitude selected for the flight, must avoid flying over Greenland;

c) A requirement exists to provide for relatively short range aircraft flying the route Goose Bay - Narsarssuak - Keflavik and which must normally be routed via Cape Farewell (Prins Christianssund);

d) The NDB at Prins Christianssund provides the only present guide to the east of Greenland for aircraft that may have to return or divert to Narsarssuak in emergencies.

8.4 Recommendation No. 18

Operational Meteorological Exchange Tabulations

a) ICAO should prepare forms for use by States in submitting to regional meetings information on meteorological exchanges which indicate

1) current exchanges for current air operations,

2) proposed modifications (deletions, additions and other changes) of current exchanges for current operations, and

3) proposed additions or other changes for future air operations.

b) Justification for changes required should be given in as much detail as practicable.

c) Forms should be circulated to States in time for the completed forms to reach ICAO Headquarters three months before the meeting in order that the content may be incorporated in a consolidated list which may be studied by States prior to the meeting.

8.5

Recommendation No. 19

It is recommended that

a) States examine the problem of the exchange of operational meteorological information, taking into consideration the possibility of establishing separate circuits for this purpose, provided that the volume of traffic justifies such action, and communicate their conclusions to ICAO. ICAO should then circulate this information to States in the Region.

b) States keep under review the present procedure of exchange of operational meteorological information over AFTN circuits with a view to maintaining the best possible transit times.

APPENDIX ASTATEMENTS AND RESERVATIONS BY DELEGATIONS1. CANADIAN RESERVATIONOPERATIONAL REQUIREMENTS FOR SHORT RANGE NAV AIDS

(Reference Recommendation No. 16)

The beacon at Knob Lake which is not owned or operated by the Canadian Government has been in intermittent operation for a number of years. If, as was stated by IATA, this beacon has proven very useful to NAT operators, the question of its continuous operation should have been taken up with the owner, the Canadian Government, or both. There is little doubt some suitable arrangement for continuous operation could have been reached with the owners.

The introduction of this beacon as an operational requirement without any advance notification and after the commencement of the meeting has made it necessary for the Canadian Delegation to oppose its inclusion in the statement of basic operational requirements for the NAT Region and the Regional Plan.

It is quite obvious that the Canadian Delegation and possibly other delegations had little opportunity to assess the overall operational value of this beacon to NAT operators and the existence of a privately-owned facility which is operated for a specific purpose cannot be accepted as the basis for a new operational requirement for the North Atlantic Region.

Furthermore, Canada cannot accept such a commitment involving a privately-owned and privately operated facility without having had an opportunity to consult with the owners.

2. STATEMENT BY THE DELEGATION OF THE UNITED STATES OF AMERICA

(Reference Recommendation No. 8)

The United States of America considers that the standard pressure altimeter setting procedure which was adopted by the III NAT RAN for use throughout the NAT Region is not suitable. The United States believes that the procedure best suited for use in the intermediate island areas involves a transition from standard pressure to QNH at a vertical boundary approximately 100 miles seaward from these islands for the following reasons:

1. Greater uniformity will be obtained by applying the same procedure over these land areas as presently exists in the major terminal areas adjoining the North Atlantic Region.

2. Domestic and local aircraft require information to insure terrain clearance. Only QNH will satisfy this requirement. QNH also provides the same information for transient aircraft. The use of QNH provides the simplest and easiest applied method which can provide air traffic separation and terrain clearance at the same time. Any other system seriously penalizes domestic and local aircraft operations.
3. Only this procedure will satisfy the safety requirements for all aircraft, especially those equipped only with one altimeter.
4. This procedure will insure the maximum safe utilization of all available airspace regardless of barometric variations.
5. No evidence has been presented to the United States that this procedure, which has been in effect in these areas in the North Atlantic Region for many years, when properly applied, does not fulfill the safety requirements of all users both local and transient.

3. STATEMENT BY THE DELEGATION OF THE UNITED STATES OF AMERICA
(Reference Recommendation No. 15)

The Delegation of the United States is of the opinion that the comprehensive and constructive action proposed by this meeting, especially as evidenced by the report of the Communications Committee, should be a source of considerable satisfaction to the participating States. This is particularly so with regard to the recommendations concerning long distance radio navigational aids.

The United States' support of the latter action is based on the philosophy expressed at the 5th Communications Division by Recommendation No. 1 of that meeting. It is the U.S. understanding that the purpose of the 5th COM Division action on long distance aids was to encourage the implementation of interim aids to provide essential navigational aid coverage, and that improvements should be attained by the use of one of the available aids on the basis of an analysis of the operational requirements by Regional Air Navigation Meetings, and, further, that analyses should be made without prejudice to any aid. This is exactly what has occurred at this meeting.

The United States desires to emphasize that its strong endorsement of the Consol recommendations made here at the Third NAT RAN Meeting does not indicate a departure from its previously expressed position calling for equal status of Consol, LORAN and NDB's, and specifically that future considerations of Regional long-distance aid requirements must be made on their own merits with the understanding that retention and/or expansion of any one of the three aids may be appropriate.

4. STATEMENT BY THE BELGIAN DELEGATION

The Belgian delegation has approved the present Report. It wishes to express its gratitude to those States that will have to incur considerable expenditure to improve air safety in the Atlantic region in benefit of all ICAO member States. Certain facilities will probably have to be provided through joint financing. The approval of the present Report by the Belgian delegation, however, does not imply an automatic consent by the Belgian Government to participation in any such joint financing, since the amount of expenditure involved is unknown.

The Belgian delegation observes, furthermore, that the meeting has not made any recommendations on navigational aids providing the pilot, by means of a direct reading, with his distance from any given point. Such a navigational aid will become necessary in the future for the rapid flow of traffic at congested points such as Gander and Shannon.

It hopes that this matter will be kept in mind at the next NAT Meeting.

5. STATEMENT BY THE CANADIAN DELEGATION

The Canadian delegation is unable to support the plan for the installation of CONSOL (Recommendation No. 40) insofar as it duplicates existing long-distance aids (Loran) which now cover the western section of the North Atlantic. It is to us illogical to duplicate an existing aid with an aid which is also of "interim" status.

Furthermore, the Canadian delegation is unable to accept the plan because they are of the opinion that a proposal of this magnitude could not be examined to the extent necessary in the limited time available at this meeting.

6. STATEMENT BY THE FRENCH AND ITALIAN DELEGATIONS

Taking into account the provisions appearing in paragraph 2.4 of the Sub-Committee 1 directives and in paragraph 4, Part 2, of the documents entitled "Rules of Procedure and Directives for Regional Navigation Meetings", the French and Italian delegations wish to point out that certain services and facilities in Greenland and in Iceland are, for the first time, recommended by the Committee for incorporation into the Regional Plan.

Having regard to the fact that other services and facilities in these territories were installed or maintained only by means of joint financing under ICAO, the French and Italian delegations must make all necessary reservations as to the intentions of the French and Italian Governments relating

to their possible participation in a joint financing scheme that would entail greater obligations than those previously accepted.

The French and Italian delegations further state that, in their opinion, before approving the plan that will result from the Recommendations of the Regional Meeting, the ICAO Council should, in the first place, ascertain that such a plan does not raise insurmountable difficulties from the financial point of view.

It is only subject to the above observations that the French and Italian delegations give their approval to the Final Reports of the present meeting.

7. STATEMENT BY THE UNITED KINGDOM DELEGATION

The United Kingdom regards facilities recommended for polar flights as being beyond those generally required for the region and accordingly reserves its position with regard to recommendations for such facilities.

- END OF PART II -

PART III
AERODROMES, AIR ROUTES
AND GROUND AIDS COMMITTEE

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LIST OF RECOMMENDATIONS

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THIRD NORTH ATLANTIC REGIONAL AIR NAVIGATION MEETINGMONTREALOCTOBER 1954AERODROMES, AIR ROUTES AND GROUND AIDS COMMITTEESECTION 1 - CHAIRMAN'S REPORT1.1-Historical Statement1.1.1 Meetings

The Aerodromes, Air Routes and Ground Aids Committee held 3 plenary meetings in open session at the ICAO Headquarters, Montreal, from 11 October to 21 October 1954, under the Chairmanship of Mr. A.L. Catudal, Delegate of the United States. In addition to the plenary meetings, the Committee met during all working hours of the Conference as a working group of the whole under the Chairman of the Committee or as a drafting group.

1.1.2 Representation

A list of the States and International Organizations represented at committee meetings appears at Appendix A of the Report of the General Committee.

1.2-Report on the Agenda1.2.1 Election of Officers

The Committee elected Mr. A.L. Catudal (United States) and Mr. T.L. Hogan (Ireland) as its Chairman and Vice-Chairman respectively.

1.2.2 Explanation of ICAO policy, directives and technical publications in the field of Aerodromes, Air Routes and Ground Aids

The Secretary, Mr. J.M. Lerew, gave a brief explanation of the ICAO publications relevant to this meeting, and outlined the procedure that would follow the adoption by the Committee of its Final Report.

In view of the current policy in regard to the publication of a regional plan subsequent to the meeting and the directive from the Air Navigation Commission to prepare the report in a form designed to facilitate the development

and publication of the plan, the Committee agreed to include all historical and explanatory material in the Chairman's Report, Section 1, and to present in Section all the recommendations directly concerning the Regional Plan together with all tabulations in a form in which they could be issued later in the Regional Plan publication.

1.2.3 Agenda Item 1: Preparation of a regional plan for land aerodromes and for water aerodromes including recommendations relating to:

1.2.3.1 1.1: locations, coupled with details as to the purpose for which each aerodrome is required.

General

The Committee, after examination of the report on international air operations, decided that in view of the extensive changes that had taken place since the previous NAT AGA recommendations had been prepared, and in view of the extensive modifications that had been made by subsequent regional meetings dealing with areas that overlap the NAT Region, agreed to rewrite the AGA facilities plan so as to indicate completely the present and future requirements for the NAT Region.

The Committee used as a basis for its work the information furnished by ICAO and the States and International Organizations attending the Meeting. The Committee also received the statement of operational requirements supplied by Sub-Committee 1 of the General Committee, of which Appendix "A" paragraphs 1, 2 and 3 of Section 2 were particularly relevant to the Committee's work. (See Section 2 of Sub-Committee 1 Report).

Facilities outside the North Atlantic Region and which may be required for the "Polar routes" have been listed separately in Section 2 of the report and clearly annotated that they do not form part of the recommended plan.

Land Aerodromes

On the basis of the air route data provided by Sub-Committee 1 and additional data furnished by States and IATA, the Committee listed the "Land aerodromes required for regular use by international air services for traffic or refuelling purposes". For each specified aerodrome operational requirements for regular use were incorporated by stating the types of aircraft having the most exacting runway requirements for present and for future operations.

When listing aircraft presently using the aerodrome the Committee considered that all aircraft now being used as well as any aircraft that were firmly planned to start operating within the next 18 months should be included as present operations. In cases where one aircraft was the most exacting for length, and another aircraft was the most exacting for strength, both aircraft have been listed.

The Committee examined the requirements for alternate aerodromes, taking into account the nature and length of route segments, the types of aircraft involved and the relevant meteorological conditions encountered. As a result of this study it was apparent that the aerodromes planned for regular use in the region would in many cases meet the requirements for alternate aerodromes. A further number of aerodromes was, however, found to be required to serve as alternates in the interests of safety, regularity and efficiency of operations. In the majority of cases it was found possible to select for this purpose aerodromes used as regular or alternate aerodromes by international air services in other regions or by domestic air services and which did not require any extensive development.

Water Aerodromes

The Committee found that there were no transatlantic sea plane operations at present or planned for the future, thus there was no requirement for water aerodromes in this region other than those already recommended as a result of the AFI II RAN Meeting.

1.2.3.2 Agenda Item 1.2: Physical characteristics, according to the types of aircraft to be accommodated, as well as the circumstances under which, and the extent to which various types will use particular aerodromes.

Runway Requirements - On the basis of information supplied by the Secretariat and amendments thereto supplied by States and IATA the Committee included in Table AGA-1 the characteristics and runway requirements of aircraft types in use or proposed for use in International services. The figures given for aircraft weights are the normal maximum allowable figures and the basic runway length requirements listed are for operation at these weights.

Aerodromes for regular use - The Committee considered that the basis for determining the physical characteristics of aerodromes required for regular use should be the basic runway length and runway strength necessary to meet the most exacting requirement of all aircraft listed for regular use for any given aerodrome. In accordance with this principle the Committee made Recommendations 1 and 2.

Aerodromes for regular use required for use as alternates - In accordance with directive given by Sub-Committee 1 of the General Committee (last sentence of Appendix "A" paragraph 3.1 of the statement of operational requirements) the Committee studied in detail the cases where the aircraft requiring an aerodrome for alternate use were more critical for length or strength than the aircraft requiring the aerodrome for regular use. Existing runway lengths, stage distances, frequency of operations and known plans for the development of aerodromes in accordance with the announced plans of the State of jurisdiction as well as the possibility of using stopways and clearways and of permitting occasional operations of aircraft imposing greater stresses on the runway than those imposed by aircraft normally using it, were taken into account. The Committee did not consider that the development of the physical characteristics of any of the aerodromes

specifically for alternate purposes was necessary and decided not to recommend any such development.

Aerodromes included in the Regional Plan for use as alternates only - A full study of the characteristics of the aerodromes tabulated in the Regional Plan for use as alternates lead to the conclusion that, with the exception of the aerodromes noted hereunder, all were of adequate physical size and strength to accommodate now and in the future the aircraft proposed to use them as alternates in the circumstances under which they will probably be used. The Committee therefore made Recommendation No. 3.

The Committee noted that in certain cases such as Bordeaux, Marseille, Nice, Saudarkrokur, Dublin, Bovingdon, Blackbushe and Burlington, the aerodromes were not capable of meeting the needs of the most critical aircraft for use as alternates under all conditions, but it agreed that, in view of the large number of aerodromes available for use as alternates in the Region, they would serve a useful purpose in meeting the needs of many aircraft requiring to use them as alternates in their present state.

Other Aerodromes - The Committee noted that additional aerodromes in the Region were available for use by North Atlantic traffic in special circumstances, when, for example, for technical reasons, an aircraft was unable to reach its destination or planned alternate. The location and information regarding such aerodromes may be found in the appropriate aeronautical publications of the State concerned.

Long Term Planning - The Committee emphasized the importance of long-term planning by States to safeguard aerodromes sites for future development and made Recommendation No. 4.

1.2.3.3 Agenda Item 1.3: Visual ground aids, dependent insofar as lighting is concerned on the nature of anticipated operations, the relative importance of the air service's regularity and the local meteorological conditions.

Day Marking Aids

Day marking aids to approach - The Committee considered that there was a requirement for day marking aids to approach at a number of aerodromes included in the Regional Plan. However, as approach or lead-in lighting systems have been recommended for installation at these places, and since in accordance with Annex 14 the lights or their supporting structures have to be made sufficiently conspicuous to provide guidance to aircraft approaching to land by day, no special recommendations have been made for day marking aids to approach.

Day marking aids to landing and taxiing - From an operational viewpoint, at certain aerodromes where terrain colourings make it difficult to distinguish the location and orientation of runways and taxiways, the provision of aerodrome day marking aids in accordance with the Standards and Recommended Practices of Annex 14 is most desirable. The Committee therefore made Recommendation No. 5.

Lighting Aids

Lighting aids to approach - The Committee received, from Sub-Committee 1 of the General Committee, the statement of operational requirements for the Region in which, under Appendix "A" paragraph 3.2, were listed the requirements for approach and lead-in lighting systems. As Sub-Committee 1 had indicated that the list was not necessarily complete since the Aerodrome Plan had not been established at that stage and as Sub-Committee 1 had directed the AGA Committee to examine certain sites from the point of view of the technical feasibility of installing such lighting systems, the AGA Committee made a detailed review of the requirements at all aerodromes. The Committee took into account relevant factors such as cloud and visibility conditions, local terrain, frequency of operations, frequency of diversions, proximity of alternates, and special flight circumstances, such as long stage distances and concluded that there was an operational requirement for lighting aids to approach at the aerodrome as indicated in Recommendation No. 6.

The following changes were made to Sub-Committee 1's list of requirements for the reasons indicated hereunder.

Stockholm - Since the new aerodrome at Halmstön was being developed to serve as an additional regular aerodrome for Stockholm and as the same operational requirements existed as for Bromma, it was agreed to recommend the installation of approach lights at both aerodromes. Chicago and Detroit - As these aerodromes were subsequently included in the Plan as regular aerodromes, they were examined in the light of operational requirements and the Committee agreed to recommend that the existing approach lighting systems be brought into conformity with the Specifications of Annex 14. Marseille - A careful examination of all available data on this site indicated that it was unlikely to be technically feasible to install approach or lead-in lighting, the Committee agreed to delete this requirement. Reims, Tours, Groningen and Bardufoss - As these aerodromes had subsequently been included in the Regional Plan, the Committee made a careful examination of the operational requirements for visual aids to approach and agreed to recommend that the existing approach and lead-in lighting systems be brought in conformity with the Specifications of Annex 14. Santa Maria - The Committee had insufficient information to determine the technical feasibility of providing an approach lighting system at both ends of the runway at this aerodrome and thus recommended that the State of jurisdiction make this determination. United States - In view of the extensive changes in the aerodrome plan for alternates, the Committee agreed to examine all locations and established requirements as indicated in Recommendation No. 6.

Aerodrome beacons, obstruction, runway threshold and taxiway lighting -
 Since all aerodromes in this Region are needed for night operations complete lighting facilities in accordance with Specifications of Annex 14 will be required. The Committee agreed, however, that there was no necessity to make a recommendation concerning the details of such facilities since their provision was already covered by the Annex. The Committee therefore made Recommendation No. 7.

1.2.3.4 Agenda Item 1.4: Other equipment and facilities not at present called for in ICAO AGA publications.

The Committee, after consideration of the instructions from Subcommittee 1 of the General Committee made recommendations 8 and 9 concerning crash, fire and rescue facilities.

1.2.4 Agenda Item 2: Consideration of specific problems consequent upon the introduction of turbo-jet operations in the Region, with relation to:

- a) Icy runways
- b) Provision of taxiway holding or run-up areas
- c) Handling of jet aircraft on aprons

The Committee treated this item as an "exchange of technical views" on the subject. A half-day meeting was held after completion of the other items of its Agenda and it was agreed that the subject was not sufficiently mature to make any specific recommendation concerning it.

1.2.5 Agenda Item 3: Recapitulation of previous North Atlantic AGA recommendations with a view to eliminating those which are no longer applicable.

As previously mentioned, the Committee elected to produce a regional plan complete in all respects. However, the Committee did agree that, in cases where the facility recommended was no more critical than that recommended by other regional meetings dealing with facilities in the areas of overlap with the NAT Region, the implementation dates recommended by the previous meetings should remain in effect and not be superseded by the new dates established under Agenda Item 5 hereunder. Accordingly, the Committee made Recommendation No. 10.

- 1.2.6 Agenda Item 4: Preparation for transmission to Sub-Committee 1 of a list of AGA facilities and services included in the revised regional plan that are considered of critical importance to air operations in the Region and that for this reason should be given priority in the implementation plans of the State concerned.

The Committee received information regarding a number of locations at which operational difficulties were being encountered. After careful examination it was agreed that the following facilities were of critical importance to air operations in the Region and that for this reason should be given priority in the implementation plans of the State concerned. The Committee was informed, however, that, with the exception of one aerodrome, namely Boston, construction work was actually in progress on these facilities as indicated hereunder. The Committee therefore agreed to limit the list of AGA facilities transmitted to Sub-Committee 1 to Boston only. This was done by means of a memorandum.

<u>Aerodrome</u>	<u>Facility</u>	<u>Comments</u>
Gander	Enlarge apron facilities Complete new runway with facilities Complete new taxiway system Improve taxiway lighting	All work in progress
Keflavik	Dependability of aerodrome lighting to be improved	Construction work in progress. Every effort being made to ensure reliability of lighting
Prestwick	Additional runway	Runway under construction
Boston	Improve surface of runway 4R and install approach lighting to serve this runway.	Notified to Sub-Committee 1

- 1.2.7 Agenda Item 5: Recommendation of dates for implementing the recommended facilities plan.

The Committee considered it more useful to include specific indication of the dates by which recommendations are to be implemented in the recommendations themselves rather than to provide a separate recommendation on this subject. Accordingly, when appropriate, dates of recommended application are to be found in the recommendations of this report.

- - - - -

SECTION 2 - REPORT AND RECOMMENDATIONS ON FACILITIESREGIONAL PLANRecommendation No. 1

That all land aerodromes required for regular use by international air services for traffic or refuelling purposes for present operations, indicated by "REG" in the Regional Plan (Table AGA-2), be improved, where necessary, as soon as possible within a period of eighteen months from the date of approval of this report by the Council, by providing a runway length equal to at least the basic length required for the aircraft listed in column 4 for regular use, plus all necessary corrections; and by providing at least the runway strength required for the aircraft listed in column 5 for regular use; and further, by improving all other physical characteristics to meet the relevant provisions of Annex 14.

Recommendation No. 2

That all land aerodromes required for regular use by international air services for traffic or refuelling purposes for future operations, indicated by "REG" in the Regional Plan (Table AGA-2), be improved, where necessary, as soon as possible and not later than 1 January 1960, by providing a runway length equal to at least the basic length required for the aircraft listed in column 4 for regular use, plus all necessary corrections; and by providing at least the runway strength required for the aircraft listed in column 5 for regular use; and further by improving all other physical characteristics to meet the relevant provisions of Annex 14.

Recommendation No. 3

That all land aerodromes required for use as alternate aerodromes by international air services, indicated by "ALT" in the Regional Plan, be maintained in at least their present physical size and strength or improved in accordance with the announced plans of the State of jurisdiction.

Recommendation No. 4

That States, after making a careful assessment of the long term future requirements of aerodromes listed in the Regional Plan arrange to take the necessary steps to safeguard the development of these aerodromes to meet the assessed requirements.

Recommendation No. 5

That States give special consideration to the early implementation of the Standards and Recommended Practices of Annex 14 concerning runway centre line,

runway threshold, runway side stripe and taxiway longitudinal markings with a view to providing these markings particularly at regular aerodromes where lack of contrast exists between the runways and taxiways and the surrounding terrain.

Recommendation No. 6

That visual aids to approach, as specified in each case in the Regional Plan (Table AGA-2), be installed as soon as possible in conformity with the Specifications of Annex 14.

REGULAR AERODROMES

<u>COUNTRY</u>	<u>LOCATION</u>	<u>REQUIREMENT</u>
Belgium	Bruxelles/National	Ae
Bermuda	Kindley Field	Ae (1)
Canada	Gander/Gander, Nfld.	A (on runways 04 and 14)
Canada	Montreal/Montreal, Que.	Ae
Denmark	København/Kastrup	Le
France	Paris/Orly	Ae (2) (on runways 03 and 26)
Germany	Frankfurt/Main	Ae
Iceland	Keflavík/Keflavík	Ae (3)
Ireland	Shannon/Shannon	Ap
Netherlands	Amsterdam/Schiphol	Ae
Norway	Bodø/Bodø	Ae
Norway	Oslo/Torshavn	A (2)
Norway	Stavanger/Sola	Ae
Portugal	Lisboa/Lisboa	Ae
Portugal	Santa Maria/Santa Maria, Santa Maria I.	A (on runway 01 and 19) (5)
Spain	Madrid/Barajas	A
Sweden	Stockholm/Bromma	Ae
Sweden	Stockholm/Hälsjö	Ap
Sweden	Göteborg/Torslanda	Ae
Switzerland	Genève/Cointrin	Ae
United Kingdom	London/London	Ae
United Kingdom	Prestwick/Prestwick	Ap (on runways 13 and 31)
United States	Boston/Logan	Ap
United States	Chicago/Chicago Midway	Ae (2)
United States	Detroit/Wayne-Major, Mich.	Ae (2)
United States	New York/New York International, N.Y.	Ae (2) (4)

ALTERNATE AERODROMES

Canada	Goose/Goose, Nfld.	A
Canada	Moncton/Moncton, N.B.	A
Canada	Ottawa/Uplands, Ont.	Ae
Canada	Sydney/Sydney, N.S.	A
Denmark	Aalborg/Aalborg	Ae (2)
France	Bordeaux/Mérignac	Ae (2)
France	Paris/Le Bourget	A (2)
France	Reims/Champagne	L (2)
France	Tours/St. Symphorien	L (2)

ALTERNATE AERODROMES

(Cont'd)

<u>COUNTRY</u>	<u>LOCATION</u>	<u>REQUIREMENT</u>
Germany	Düsseldorf/Düsseldorf	Ae
Germany	Hamburg/Hamburg	Ae
Germany	München/München	Ae
Germany	Hannover/Hannover	Ae
Germany	Bremen/Bremen	Ae
Ireland	Dublin/Dublin	Ap
Netherlands	Groningen/Eelde	A
Norway	Bardufoss	L
Portugal	Lajes/Lajes, Terceira I.	
	Azores.	Le
Spain	Barcelona/Barcelona	A
Spain	Sevilla/San Pablo	A
Sweden	Norrköping/Kungsängen	Le
Sweden	Malmö/Bulltofta	Ae
Switzerland	Zürich/Kloten	Ae
United Kingdom	Bournemouth/Hurn	Ap
United Kingdom	Reading/Blackbushe	Le
United States	Baltimore/Friendship	
	International, Md.	Le (2)
United States	Buffalo/Buffalo, N.Y.	Le (2)
United States	Cleveland/Cleveland	
	Hopkins, Ohio.	Ae
United States	Milwaukee/General	
	Mitchell, Wis.	Le (2)
United States	Newark/Newark	Ae
United States	New York/La Guardia, N.Y.	A (2)
United States	Pittsburg/Greater	
	Hopkins, Ohio.	Le (2)
United States	Philadelphia/Philadelphia	
	International, Pa.	Le (2)
United States	Washington/Washington	
	National, D.C.	Ae

LEGEND

- A - Approach lighting required
- Ae - Approach lighting required and existing
- L - Lead-in lighting required
- Le - Lead-in lighting required and existing
- Ap - Approach lighting required and projected
- (1) - In view of the United States, this requirement has been met insofar as practicable.
- (2) - Requirement to bring aid into conformity with the Specifications of Annex 14
- (3) - Approach lighting required on runway 21; State concerned to consider also installation of approach lights for 12 in lieu of existing lead-in lights.
- (4) - Second approach lighting required with installation of second ILS facility.
- (5) - Technical feasibility to be determined by the State of jurisdiction.

NOTE: The above recommendations do not go farther than the conditions of application of Annex 14 giving new installations priority over the improvement of existing ones.

Recommendation No. 7

That all aerodromes be equipped for use at night and that States give careful consideration to the Specifications of Annex 14 concerning the provision, configuration, minimum desirable intensity, light distribution and intensity control of runway and threshold lights and the provision of taxiway lights and that in cases where present or proposed lighting systems do not meet these recommendations the lights be improved or replaced with lights that meet the recommendations as soon as possible.

Recommendation No. 8

That when considering the scale to which crash fire and rescue equipment should be provided at aerodromes, States give consideration to the advice contained in ICAO Circular 4-AN/3 "Crash fire and rescue equipment at aerodromes". Particular attention should be given to paragraphs 15 and 16 of this circular dealing with the required complements and training of personnel.

Recommendation No. 9

That States give serious consideration to the provision of launches or other appropriate vessels or amphibious vehicles suitable for crash fire and rescue purposes along with appropriately trained personnel as a part of the aerodrome crash fire and rescue services at all aerodromes having approach or take-off traffic patterns over water.

TABLE - TABLEAU
AGA 1

CHARACTERISTICS AND RUNWAY REQUIREMENTS OF AIRCRAFT TYPES IN USE OF PROPOSED FOR USE IN
INTERNATIONAL AIR SERVICES
CARACTÉRISTIQUES DES TYPES D'AVIONS ACTUELS OU ENVISAGÉS ET CARACTÉRISTIQUES DES PISTES
NÉCESSAIRES À LEUR UTILISATION DANS LES SERVICES AÉRIENS INTERNATIONAUX

AIRCRAFT TYPE	TAKE-OFF				LANDING				NO. OF WHEELS ON EACH MAIN UNDER- CARRIAGE LEG	PRESSURE IN EACH MAIN WHEEL TYRE		MAXIMUM SINGLE ISOLATED WHEEL LOAD **	
	BASIC RUNWAY LENGTH *		WEIGHT		BASIC RUNWAY LENGTH		WEIGHT			1b/in ²	kg/cm ²	1b.	kg.
	ft.	m	lb.	kg.	ft.	m	lb.	kg.					
TYPE D'AVION	DECOLLAGE				ATERRISSAGE				NOMBRE DE ROUES A CHA- QUE JAMBE DU TRAIN D'AT- TERRISSAGE PRINCIPAL	PRESSION DANS CHAQUE PNEU. DE ROUE PRINCIPALE		CHARGE MAXIMUM PAR ROUE ISOLEE SIMPLE **	
	longueur de base des pistes *		POIDS		longueur de base des pistes		POIDS			1/in ²	kg/cm ²	livres	kg.
	pieds	m	livres	kg.	pieds	m	livres	kg.					
1	2	3	4	5	6	7	8	9	10	11	12	13	14
AIRSPED AS57 AMBASSADOR	4720	1439	52500	23800	4140 ¹	1262 ¹	50000	22689	2	69.0	4.8	18900	8600
AIRSPED AS65 CONSUL	3200	976	8250	3740	2570 ¹	783 ¹	8250	3740	1	-	-	3700	1678
AVRO 683 YORK	6820	2079	70000	31752	6790 ¹	2069 ¹	65000	29500	1	58.0	4.1	30600	13900
BEECHCRAFT D 18-C-1	4115	1255	9000	4082	4150	1266	9000	4070	1	-	-	4000	1814
BOEING 307 STRATOLINER	4000	1219	54000	24494	4330	1320	47000	21319	-	-	-	-	-
BOEING B-377 STRATOCRUISER	7075	2157	145800	66134	6420	1958	121700	55409	2	1. 101 E. 116 97	7.4	51000	23133
BREGUET 763 DEUX PONTS	5550	1692	105800	48000	5550	1692	101000	44000	2	-	6.8	37000	16800
BRISTOL 175 BRITANNIA	6000	1829	150000	68040	5400	1646	115000	52164	4	-	-	-	-
- SERIES 100 EST.	7000	2134	165000	74838	6200	1890	125000	56700	4	120	8.4	31400	14242
- SERIES 300 LR EST.	4140	1262	40000	18144	3340 ¹	1018 ¹	40000	18144	2	-	-	-	-
BRISTOL 170 - MK21	3900	1189	44000	19958	4110 ¹	1253 ¹	44000	19958	2	-	-	-	-
- MK23	5200	1586	82000	37200	4220	1285	70000	31752	2	90	6.3	28100	12800
CANADAIR DC-4M	4360	1329	41790	18956	3920	1195	39800	18069	2	95	6.6	14625	6634
CONSOLIDATED VULTEE	4500	1370	47000	21320	4250	1296	45000	20408	2	90-100	6.3-7.0	-	-
CV-240 CONVAIR LINER	4955	1511	48000	21772	3220	982	48000	21750	1	-	-	21600	9798
CONSOLIDATED VULTEE	2280	684	5750	2608	2780 ¹	847 ¹	5750	2360	1	-	-	2587	1173
CV-340 CONVAIR LINER	3200	976	8500	3900	3215 ¹	981 ¹	8500	3860	1	50	3.5	3800	1700
CURTIS COMMAND C-46	7300	2225	105000	47600	5900 ¹	1798	80000	36288	4	120	8.4	23100	10500
DE HAVILLAND DH-89 RAPIDE	6200	1890	120000	54430	6300	1920	84000	38102	4	110	7.7	30000	13608
DE HAVILLAND DH-104 DOVE	6500	1981	150000	68040	6400	1951	110000	49900	4	150	10.5	33200	15060
DE HAVILLAND DH-106	4570	1393	26200	11882	3640	1110	26200	11882	1	43	3.0	12150	5512
COMET - SERIES I EST.	5050	1540	73000	33112	4620	1408	63500	28800	2	90	6.3	25550	11585
- SERIES II EST.	5400	1646	93200	42272	4490	1368	75000	34100	2	110	7.7	32820	14796
- SERIES III EST.	5988	1825	107140	48600	5150	1570	88200	40000	2	110	7.7	37500	17010
DOUGLAS DC-3	6050	1844	122200	55428	5840	1780	97000	43999	2	-	-	40880	18543
DOUGLAS DC-4	6950	2118	140000	63500	5400	1646	107000	48535	2	-	-	-	-
DOUGLAS DC-6													
DOUGLAS DC-6B													
DOUGLAS DC-7													
DOUGLAS DC-7C													
FIAT G-212 MONTEROSA	3640	1110	39640	17981	3278.	1000	38325	17400	1	-	-	17857	8100
FOCKER F-27	-	-	34200	15500	-	-	-	-	2	80	5.6	12000	5400
HANDLEY PAGE HP-81													
HERMES IV	5120	1561	86000	39000	5410 ¹	1649 ¹	78000	35380	2	70	4.9	30100	13700
HANDLEY PAGE HERMES IVA	5765	1757	86000	39000	5140 ¹	1568 ¹	75000	34100	2	70	4.9	30100	13653
LOCKHEED L-18 LODESTAR	-	-	-	-	-	-	-	-	-	-	-	-	-
LOCKHEED L-049													
CONSTELLATION	3680	1122	90000	40823	3674	1121	77800	35400	2	95	6.7	31500	14288
LOCKHEED L-749	4680	1427	102000	46266	4580	1397	84500	38400	2	100	7.0	35700	16193
CONSTELLATION													
LOCKHEED L-749A	5400	1647	107000	48534	4820	1470	89500	40600	2	120	8.4	37450	16987
CONSTELLATION													
LOCKHEED L-1049A	6137	1870	120000	54431	5550	1692	98500	44600	2	-	-	42000	19051
CONSTELLATION													
LOCKHEED L-1049C	5780	1762	133000	60328	5650	1720	105000	47650	2	-	-	45500	20640
CONSTELLATION													
LOCKHEED L-1049E	5960	1818	133000	60328	5660	1726	110000	49900	2	-	-	45500	20640
CONSTELLATION													
LOCKHEED L-1049G	6620	2018	137500	62369	5810	1771	113000	51256	2	-	-	48125	21829
CONSTELLATION EST													
MARTIN 2-0-2	3510	1070	39900	18098	4000	1219	38000	17237	2	60	4.2	15050	6806
MARTIN 2-0-2A	4000	1219	43650	19800	3920	1195	43000	19504	2	58	4.0	15280	6931
MARTIN 4-0-4	3630	1106	43000	19504	3900	1189	41000	18597	2	-	-	-	-

TABLE - TABLEAU
AGA 1

AGA-13

AIRCRAFT TYPE	TAKE-OFF				LANDING				NO. OF WHEELS ON EACH MAIN UNDER- CARRIAGE LEG	PRESSURE IN EACH MAIN WHEEL TYRE		MAXIMUM SINGLE ISOLATED WHEEL LOAD **	
	BASIC RUNWAY LENGTH *		WEIGHT		BASIC RUNWAY LENGTH		WEIGHT			lb/in ²	kg/cm ²	lb.	kg.
	ft.	m	lb.	kg.	ft.	m	lb.	kg.					
1	2	3	4	5	6	7	8	9	10	11	12	13	14
PERCIVAL P50 PRINCE MKI	3200	975	11000	5000	3690	1124	11000	5000	1	42	2.9	-	-
SAAB 90 A2 SCANDIA S.N.C.A.S.E. SE-161	3940	1200	35200	16000	3100	945	34400	15600	1	83	5.8	15900	7200
LANGUEDOC S.N.C.A.S.E. SE-2010	4593	1400	50900	23300	5250	1600	44092	20000	1	60	4.2	22900	10400
ARMAGNAC	6090	1856	168000	76000	5570	1700	43300	65000	2	132	9.0	59000	26800
SHORT S25 HYTHE FLYINGBOAT	7650	2332	57000	25855	6000	1829	56000	25401	-	-	-	-	-
SHORT SOLENT	6940	2115	78000	35380	7720	2353	78000	35380	-	-	-	-	-
SHORT SANDRINGHAM	7410	2250	60000	27216	6540	1993	60000	27216	-	-	-	-	-
SIAI-MARCHETTI SM-95 S.N.C.A.S.O. SO-30P	4000	1220	52800	23950	3820	1165	48400	22000	1	-	-	23900	10841
BRETAGNE S.N.C.A.S.O. SO-95	5250	1602	40800	18500	5578	1700	40785	18500	1	74	5.2	18400	8300
CORSE II	4420	1350	12300	5600	3445	1858	12345	5600	1	54	3.8	5600	2500
VICKERS VIKING	4800	1464	34000	15400	5250 ¹	1600 ¹	33250	15083	1	56	3.9	15300	6900
VICKERS VISCOUNT 701	4950	1509	57000	25855	3680 ¹	1122 ¹	50000	22600	2	91	6.4	21300	9600

NOTES

* - Basic runway length in figures for take-off quoted for aircraft throughout this list, are expressed in terms of "Balanced Field Length" (i.e. take-off distance equal to accelerate-stop distance) that would be required if aircraft were operating at the weight indicated from a level site where standard sea level atmospheric conditions prevailed and there was zero wind. Actual length of runways required is obtained by applying to the selected basic length, all necessary corrections to take into account the different local factors that influence the performance of aircraft (see Annex 14), additionally attention is drawn to the concept contained in Annex 14, whereby combinations of runway, stopway and clearway, may be used to meet take-off requirements. A note on landing requirements as affecting runway lengths is also to be found in Annex 14, Attachment B.

** - In the case of aircraft having undercarriage legs with single main wheels, the single isolated wheel load has been assumed to be 0.45 of the maximum permissible take-off weight. In the case of dual or dual tandem wheels, it is known that the single isolated wheel load does not only depend upon the undercarriage arrangement but also on the characteristics of the runway and the quality of the subgrade and

that in the case of dual wheels, the equivalent single isolated wheel load lies somewhere between 0.375 and 0.3 of the take-off weight; in the case of dual tandem wheels, the equivalent single isolated wheel load lies between 0.28 and 0.17 of the take-off weight. For the purpose of this table, the single isolated wheel load has been taken as being 0.35 of the take-off weight in the case of dual wheels and 0.22 of the take-off weight in the case of dual tandem wheels. The tyre pressure assumed for the equivalent single isolated wheel load is the pressure of the main wheel tyre, except in the case of the Boeing Stratocruiser, where it is the pressure of the outboard main wheel tyre (120 lbs./sq. inch.). Wheel loading figures given above are in no sense "official", being simply intended as a guide.

1. Landing requirements for British aircraft

Landing distances given for these aircraft are based on UK performance regulations which call for the use of a 70% factor with full temperature accountability.

2. Figures given are experimental and not based on airline operational experience and are therefore subject to change.

* Les valeurs numériques indiquées dans la liste ci-dessus pour la longueur de base des pistes correspondant au décollage des divers aéronefs sont calculées dans le cas où la distance de décollage est égale à la distance accélération-arrêt (Balanced-Field Length). Ce sont les longueurs qui seraient nécessaires si les aéronefs étaient utilisés sur un terrain nivelé, dans les conditions de l'atmosphère type au niveau de la mer, et par vent nul. La longueur réelle d'une piste est calculée en appliquant à la longueur de base choisie toutes les corrections nécessaires pour tenir compte des différents facteurs locaux qui peuvent influencer sur les performances des aéronefs (cf. Annexe 14). De plus, il convient de rappeler la notion introduite dans l'Annexe 14: on peut associer à la piste des prolongements d'arrêt et des prolongements dégagés en vue de répondre aux spécifications pour le décollage. Le supplément B à l'Annexe 14, contient également une note sur l'influence des caractéristiques d'atterrissage sur la longueur de piste.

** - Dans le cas d'aéronefs dont les jambes d'atterrissage ont des roues principales simples, on a supposé que la charge par roue isolée simple était égale à 45% du poids maximum autorisé au décollage. Dans le cas de roues jumelées ou de bogies à quatre roues, la charge par roue isolée simple ne dépend pas uniquement de la disposition du train d'atterrissage, mais aussi des caractéristiques de la piste et de la qualité du sous-sol. Pour les roues jumelées, la charge équivalente par roue isolée simple a une valeur comprise

entre 37,5% et 30% du poids au décollage; enfin dans le cas de bogies à quatre roues, la charge équivalente par roue isolée simple a une valeur comprise entre 28% et 17% du poids au décollage. Pour dresser le tableau, on a pris comme charge par roue isolée simple 35% du poids au décollage dans le cas d'atterrisseurs à roues jumelées, et 22% du poids au décollage dans le cas d'atterrisseurs à bogies de quatre roues. La pression de gonflage admise pour la charge équivalente par roue isolée simple est celle du pneu de la roue principale, sauf dans le cas du Boeing Stratocruiser, pour lequel on a pris la pression du pneu de la roue principale extérieure (8,4 kg/cm²). Les valeurs données ci-dessus pour la charge par roue ne sont pas des valeurs nominales, et ne sont données qu'à titre indicatif.

1. Distance d'atterrissage nécessaire pour les aéronefs britanniques

Les distances d'atterrissage indiquées pour ces aéronefs sont établies à partir des normes de performances du Royaume-Uni, qui prescrivent de faire intervenir un coefficient de 70% et de tenir pleinement compte de la variable température.

2. Les chiffres donnés correspondent aux essais et non à l'expérience acquise en exploitation sur les lignes aériennes; ils sont de ce fait susceptibles d'être modifiés.

TABLE AGA 2 — LAND AERODROMES
TABLEAU AGA 2 — AÉRODROMES TERRESTRES

EXPLANATION OF TABLE

Column	Column
1 Name, latitude and longitude of aerodrome reference point preceded by <div style="display: flex; align-items: center; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">R</div> <div style="margin-right: 10px;">Regular or</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">A</div> <div>Alternate.</div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">E</div> <div style="margin-right: 10px;"></div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">L</div> <div></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">G</div> <div style="margin-right: 10px;"></div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">T</div> <div></div> </div> <p>Note: Aerodromes outside the North Atlantic Region, required for POLAR operations - not indicated in the plan are given on page 23.</p>	5 Present and future critical aircraft for runway strength as ascertained from the list of characteristics and runway requirements of aircraft types (table 1); where for both present and future operations the critical aircraft type is identical a single entry appears. Existing runway strengths, SIW (single isolated wheel load), or AUW (all up weight), expressed in kg (kilogrammes), and lb (pounds). Where the aircraft requiring the aerodrome for alternate use is more critical it is indicated by ALT.
2 Elevation of highest point of usable landing area expressed in m (metres) and ft (feet).	6 Approach lights
3 Runway number (whole number nearest one - tenth of the magnetic azimuth).	7 Lead-in lights
4 Present and future critical aircraft for runway length as ascertained from the list of characteristics and runway requirements of aircraft types (table 1); where for both present and future operations the critical aircraft type is identical a single entry appears. Existing runway lengths are expressed in m (metres), and ft (feet). Where the aircraft requiring the aerodrome for alternate use is more critical it is indicated by ALT.	8 Threshold lights
	9 Runway lights
	10 Aerodrome beacon
	11 Obstruction lights
	0 Required lighting - in the case of approach or lead-in lighting the requirement listed is normally for one system cf. Aalborg, however, where the requirement is for two systems cf. Gander, an appropriate notation appears.
	X Existing lighting - in the case of approach or lead-in lighting the lighting listed serves both ends of the runway cf. Bruxelles, where, however, a lighting system serves one runway cf. Zürich, the appropriate QFU appears.
	12 Information supplementary to the above including references to significant notes regarding the development or provision of recommended facilities.

EXPLICATION DU TABLEAU

Colonne

- 1 Nom de l'aérodrome, latitude et longitude du point de référence précédés de l'abréviation

R
E
G

(régulier) ou

A
L
T

(de dégagement)

Note: Aérodromes hors de la région Atlantique nord nécessaires pour les opérations arctiques - ne font pas partie du plan (cf. page 23).

- 2 Altitude du point le plus élevé de l'aire d'atterrissage utilisable, exprimée en mètres (m) et en pieds (ft).
- 3 Numéro de la piste (dixième de l'azimut magnétique arrondi au nombre entier le plus proche).
- 4 Aéronef critique (actuel et futur) au point de vue de la longueur de piste, d'après le tableau des caractéristiques des types d'aéronefs et des caractéristiques des pistes nécessaires à l'utilisation de ces aéronefs (cf. tableau 1). Si le type d'aéronef critique que les services aériens se proposent d'utiliser est le même que celui déjà utilisé, une seule indication est portée dans la colonne. Les longueurs actuelles de piste sont exprimées en mètres (m) et en pieds (ft). Lorsque l'aéronef critique est un aéronef utilisant l'aérodrome comme aérodrome de dégagement, cette particularité est indiquée par l'abréviation ALT.
- 5 Aéronef critique (actuel et futur) au point de vue de la résistance de piste, d'après le tableau des caractéristiques des types d'aéronefs et des caractéristi-

Colonne

ques des pistes nécessaires à l'utilisation de ces aéronefs (cf. tableau 1). Si le type d'aéronef critique que les services aériens se proposent d'utiliser est le même que celui déjà utilisé, une seule indication est portée dans la colonne. La résistance actuelle de piste, SIW (charge par roue isolée simple) et AOW (poids total) est exprimée en kilogrammes (kg) et en livres (lb). Lorsque l'aéronef critique est un aéronef utilisant l'aérodrome comme aérodrome de dégagement, cette particularité est indiquée par l'abréviation ALT.

- 6 Feux d'approche

- 7 Feux de prise de terrain

- 8 Feux de seuil

- 9 Feux de piste

- 10 Phare d'aérodrome

- 11 Feux d'obstacle

- 0 Balisage lumineux nécessaire - dans le cas des dispositifs lumineux d'approche ou de prise de terrain, le besoin indiqué dans la liste se rapporte en principe à un seul dispositif (cf. Aalborg); toutefois lorsque deux dispositifs sont nécessaires (cf. Gander), une annotation appropriée figure dans la liste.
- X Balisage lumineux existant - Dans le cas des dispositifs lumineux d'approche ou de prise de terrain, le balisage indiqué dans la liste dessert les deux extrémités de la piste (cf. Bruxelles); toutefois, lorsqu'un dispositif lumineux dessert une seule direction de piste (cf. Zürich), le QFU correspondant est indiqué.

- 12 Renseignements complétant ceux indiqués ci-dessus (notamment renvoi à des notes importantes sur la mise en place ou l'amélioration des installations et services recommandés).

TABLE - TABLEAU
AGA 2

CITY/AÉRODROME COORDINATES	ELEV. m ft.	QFU	LENGTH m (ft.)	STRENGTH kg (lb.)	LIGHTING						REMARKS
VILLE/AÉRODROME COORDONNÉES	ALT. m ft.	QFU	LONGUEUR m (ft.)	RÉSISTANCE kg (lb.)	BALISAGE LUMINEUX						OBSERVATIONS
1	2	3	4	5	6	7	8	9	10	11	12
BELGIUM-BELGIQUE											
BRUXELLES/NATIONAL 5054N 0429E	48 158		B377	B377	0		0	0	0	0	
R E G		02/20 07/25 12/30	2025 (6644) 2450 (8038) 1600 (5249)	AUW 70000 (154320) AUW 70000 (154320) AUW 70000 (154320)	X X X	X X X	X X X	X X X	X X X	X X X	
BERMUDA-BERMUDES											
KINDLEY FIELD 3222N 6441W	3 10		B377	B377	0		0	0	0	0	
R E G		01/19 08/26 12/30	1548 (5080) 1789 (5870) 2521 (8270)	AUW 54431 (120000) AUW 54431 (120000) AUW 54431 (120000)		X X X	X X X	X X X	X X X	X X X	
CANADA											
GANDER/GANDER, Nfld. 4857N 5434W	150 493		B377	B377	0*		0	0	0	0	*QFU 04 & 14. *UNDER CONSTRUCTION EN CONSTRUCTION.
R E G		04/22 09/27 14/32 18/36	2499 (8200) 1884 (6180) 2621 (8600) 1829 (6000)	AUW 13608 (30000) AUW 68040 (150000) AUW 68040 (150000)		X 32 X X	X X X	X X X	X X X	X X X	
GOOSE/GOOSE, Nfld. 5319N 6025W	46 150		B377	B377	0		0	0	0	0	
A L T		05/23 09/27 17/35	1782 (5845) 2926 (9600) 2917 (9570)	AUW 40823 (90000) AUW 40823 (90000) AUW 40823 (90000)		X X X	X X X	X X X	X X X	X X X	
MONCTON/MONCTON, N.B. 4607N 6441W	71 232		B377	B377	0		0	0	0	0	
A L T		02/20 07/25 11/29	1120 (3676) 1341 (4398) 1916 (6285)	AUW 29484 (65000) AUW 29484 (65000) AUW 45359 (100000)		X X X	X X X	X X X	X X X	X X X	
MONTREAL/MONTREAL, QUE. 4528N 7345W	32 104		B377	B377	0		0	0	0	0	
R E G		06/24 10/28	2134 (7000) 2134 (7000)		10	X 28	X X	X X	X X	X X	
OTTAWA/UPLANDS, ONT. 4520N 7541W	114 374		B377	B377	0		0	0	0	0	
A L T		04/22 07/25 14/32 17/35	1006 (3300) 1829 (6000) 2682 (8800) 1250 (4100)	AUW 45359 (100000) AUW 45359 (100000) AUW 45359 (100000) AUW 45359 (100000)		22 X X X	X X X	X X X	X X X	X X X	
STEPHENVILLE/HARMON FIELD, Nfld. 4832N 5833W	26 86		B377	B377			0	0	0	0	OFFERED IN EXISTING STATE. OUVERT AU TRAFIC DANS SON ÉTAT ACTUEL.
A L T		03/21 10/28	1647 (5404) 3048 (10000)			X X	X X	X X	X X	X X	
SYDNEY/SYDNEY, N.S. 4610N 6002W	62 202		B377	B377	0		0	0	0	0	
A L T		01/19 07/25 14/32	1585 (5200) 2134 (7000) 1585 (5200)	AUW 29484 (65000) AUW 29484 (65000) AUW 29484 (65000)		X X X	X X X	X X X	X X X	X X X	

TABLE - TABLEAU
AGA 2

AGA-17

CITY/AERODROME COORDINATES	ELEV. m ft.	QFU	LENGTH m (ft.)	STRENGTH kg (lb.)	LIGHTING						REMARKS
					A	L	T	R	B	O	
1	2	3	4	5	6	7	8	9	10	11	12
DENMARK-DANEMARK											
AALBORG/AALBORG 5706N 0951E	3 10		DC6B-DC7C	DC6B-DC7C	0		0	0	0	0	
ALT		04/22 09/27 15/33	1400 (4593) 2650 (8694) 1800 (5906)	AUW 100000 (220460) AUW 100000 (220460) AUW 100000 (220460)	X		X X X	X X X	X X X	X X X	
KØBENHAVN/KASTRUP 5537N 1239E	6 19		DC6B-DC7C	DC6B-DC7C		0	0	0	0	0	
REG		04/22 09/27 12/30 17/35	2300 (7546) 1200 (3937) 1800 (5906) 1800 (5906)	AUW 100000 (220460) AUW 100000 (220460) AUW 100000 (220460) AUW 100000 (220460)		X X X X	X X X X	X X X X	X X X X	X X X X	
FRANCE					0		0	0	0	0	
BORDEAUX/MÉRIGNAC 4450N 0043W	48 157	05/23 05/23 12/30	2026 (6647) 1300 (4265) 1684 (5525)	AUW 50000 (110230) AUW 50000 (110230) AUW 50000 (110230)	23		X X X	X X X	X X X	X X X	OFFERED IN EXISTING STATE. OUVERT AU TRAFIC DANS SON ÉTAT ACTUEL.
MARSEILLE/MARIGNANE 4326N 0513E	17 56	14L/32R 14R/32L	1650 (5413) 2000 (6562)	AUW 60000 (132276)			0 X	0 X	0 X	0 X	OFFERED IN EXISTING STATE. OUVERT AU TRAFIC DANS SON ÉTAT ACTUEL.
NICE/Le VAR 4340N 0713E	3 10	05/23 2000	1700 (5577) 2000 (6562)	AUW 45000 (99207) SIW 20000 (44092)			0 X	0 X	0 X	0 X	OFFERED IN EXISTING STATE. OUVERT AU TRAFIC DANS SON ÉTAT ACTUEL.
PARIS/Le BOURGET 4858N 0226E	55 180	03/21 09/27	2400 (7874) 1960 (6430)	SIW 50000 (110231) SIW 20000 (44092)	0		0 X	0 X	0 X	0 X	UNDER CONSTRUCTION TO REPLACE THE PRESENT RUNWAY. - EN CONSTRUCTION, EN REMPLACEMENT DE LA PISTE ACTUELLE.
PARIS/ORYLY 4844N 0223E	90 295	03L/21R 03R/21L 08/26	2400 (7874) 1850 (6069) 1830 (6004)	SIW 45000 (99207) AUW 70000 (154320) SIW 45000 (99207)	0*		0 X X	0 X X	0 X X	0 X X	*QFU 03 & 26.
REIMS/CHAMPAGNE 4919N 0403E	94 308	07/25	2400 (7874)	AUW 60000 (132276)	25		0 X	0 X	0 X	0 X	
TOURS/St. SYMPHORIEN 4726N 0043E	110 361	02/20 16/34	2400 (7874) 1250 (4101)	AUW 60000 (132276) AUW 12000 (26460)	20		0 X X	0 X X	0 X X	0 X X	
FRENCH ANTILLES-ANTILLES FRANÇAISES											
FORT-DE-FRANCE/ LA MONTIN, MARTINIQUE 1435N 6100W	4 13	09/27	1700 (5577)	AUW 60000 (132277)			0 X	0 X	0 X	0 X	STATE OF JURISDICTION WILL SELECT ONE OF THESE AERODROMES AS THE REGULAR AERODROME. L'ÉTAT RESPONSABLE DÉSIGNERA UN DES DEUX AÉRODROMES CI-CONTRE COMME AÉRODROME RÉ- GULIER.
POINTE-À-PITRE/ LE RAIZET, GUADELOUPE 1616N 6131W	11 36	11/29	1600 (5249)	AUW 60000 (132277)			0 X	0 X	0 X	0 X	

STATE OF JURISDICTION
WILL SELECT ONE OF
THESE AERODROMES AS
THE REGULAR AERODROME.
L'ÉTAT RESPONSABLE
DÉSIGNERA UN DES DEUX
AÉRODROMES CI-CONTRE
COMME AÉRODROME RÉ-
GULIER.

TABLE - TABLEAU
AGA 2

CITY/AERODROME COORDINATES	ELEV. m ft.	QFU	LENGTH m (ft.)	STRENGTH kg (lb.)	LIGHTING						REMARKS
					A	L	T	R	B	O	
1	2	3	4	5	6	7	8	9	10	11	12
GERMANY-ALLEMAGNE											
BREMEN/BREMEN 5303N 0047E	3.3 11		B377	B377	0		0	0	0	0	
ALT		06/24 09/27 14/32	1057 (3467) 2034 (6672) 1293 (4241)	SIW 8000 (17500) SIW 27000 (60000) SIW 11500 (25600)	27		X	X	X	X	
DÜSSELDORF/DÜSSELDORF 5117N 0645E	37.2 122		B377	B377	0		0	0	0	0	
ALT		06/24 16/33	2475 (8120) 1450 (4757)	SIW 35000 (77162) SIW 35000 (77162)		X X	X X	X X		X	
FRANKFURT/MAIN 5003N 0835E	112 368		B377	B377	0		0	0	0	0	
REG		07L/25R 07R/25L	2134 (7000) 1829 (6000)	SIW 45000 (99207) SIW 35000 (77162)	25		X X	X X	X X	X X	
HAMBURG/HAMBURG 5338N 0959E	11 36		DC6B-L1049G	DC6B-L1049G	0		0	0	0	0	
REG		05/23 16/34	1880 (6169) 1469 (4818)	SIW 27000 (59525) SIW 27000 (59525)		X X	X X	X X		X	
HANNOVER/HANNOVER 5027N 0942E	54.5 179		B377	B377	0		0	0	0	0	
ALT		10/28	1980 (6496)	SIW 35000 (77162)		X	X	X	X	X	
MÜNCHEN/MÜNCHEN 4808N 1142E	528 1732		B377	B377	0		0	0	0	0	
ALT		07L/25R 07R/25L 13/31	1451 (4760) 1908 (6260) 1870 (6135)	AUW 70000 (154320) AUW 100000 (220460) AUW 70000 (154320)	25		X	X	X	X	
GREENLAND - GROENLAND											
NARSSARSSUAK/ NARSSARSSUAK 6109N 4525W	41 136		DC6B-DC7C	DC6B-DC7C							DAYLIGHT OPERATIONS ONLY. DE JOUR SEULEMENT.
ALT		08/26	1981 (6500)					X		X	
SANDRESTRÖM/ SANDRESTRÖM (BWB) 6701N 5042W	49 150		DC6B-DC7C	DC6B-DC7C			0	0	0	0	
REG		12/30	1829 (6000)					X	X	X	
ICELAND - ISLANDE											
KEFLAVÍK/KEFLAVÍK 6359N 2237W	51 168		B377	B377	0		0	0	0	0	
REG		03/21 07/25 12/30 16/34	1999 (6560) 2117 (6945) 3048 (10000) 1750 (5740)	AUW 90718 (200000) AUW 90718 (200000) AUW 90718 (200000) AUW 90718 (200000)			X X X X	X X X X	X X X X	X X X X	
REYKJAVÍK/REYKJAVÍK 6408N 2156W	14 45		DC4	DC4			0	0	0	0	
REG		02/20 07/25 14/32	1436 (4710) 1262 (4140) 1399 (4590)	AUW 45359 (100000) AUW 45359 (100000) AUW 45359 (100000)			X X X	X X X	X X X	X X X	
SAUDARKROKUR/ SAUDARKROKUR 6544N 1938W	3 10		DC4	DC4			0	0	0	0	OFFERED IN EXISTING STATE. OUVERT AU TRAFIC DANS SON ÉTAT ACTUEL.
ALT		01/19	1408 (4620)	AUW 34019 (75000)			X	X			

TABLE - TABLEAU
AGA 2

AGA-19

CITY/AERODROME COORDINATES	ELEV. m ft.	QFU	LENGTH m (ft.)	STRENGTH kg (lb.)	LIGHTING						REMARKS
					A	L	T	R	B	O	
1	2	3	4	5	6	7	8	9	10	11	12
IRELAND - IRLANDE											
DUBLIN/DUBLIN 5326N 0615W ALT	68 222	06/24 12/30 17/35	1612 (5288) 1356 (4450) 1463 (4800)	AUW 68039 (150000) AUW 68039 (150000) AUW 68039 (150000)	24 30 17	X X X	X X X	X X X	X X X	X X X	OFFERED IN EXISTING STATE. OUVERT AU TRAFIC DANS SON ETAT ACTUEL. NOT OPEN CONTINUOUSLY. FONCTIONNEMENT INTER- MITTENT. ALTERNATE TO SHANNON ONLY. DEGAGEMENT DE SHANNON SEULEMENT.
SHANNON/SHANNON 5242N 0855W REG	4.6 15	05/23 09/27 14/32 18/36	2141 (7024) 1707 (5600) 1720 (5643) 1608 (5275)	AUW 63503 (140000) AUW 63503 (140000) AUW 63503 (140000) AUW 63503 (140000)	23 27	X X X X	X X X X	X X X X	X X X X	X X X X	
NETHERLANDS - PAYS-BAS											
AMSTERDAM/SCHIPHOL 5219N 0447E REG	-4 -13	01/19 05/23 09/27 14/32 18/36	1600 (5249) 2150 (7054) 1760 (5774) 1800 (5906) 850 (2789)	AUW 150000 (330690) AUW 70000 (154320) AUW 70000 (154320) AUW 150000 (330690) AUW 70000 (154320)	23 05	X X X X X	X X X X X	X X X X X	X X X X X	X X X X X	
GRONINGEN/EELDE 5307N 0635E ALT	3.5 10	01/19 06/24	1500 (4921) 1200 (3937)	AUW 60000 (132276) AUW 60000 (132276)							*BEING EXTENDED TO EST PORTÉE À 1800m (5906ft).
NORWAY - NORVÈGE											
BARDUFØSS/BARDUFØSS 6903N 1832E ALT	65 215	10/28	1573 (5160)		28	X	X				
BODØ/BODØ 6716N 1422E REG	7 23	08/26	2560 (8400)		X	X	X				
OSLO/FORNEBU 5945N 1037E REG	17 56	01/19 05/23 14/32	1750 (5741) 1156 (3793) 785 (2575)	SIW 45000 (99207) SIW 45000 (99207) SIW 45000 (99207)	X	X X X	X X X		X		
STAVANGER/SOLA 5853N 0538E REG	8.5 28	04/22 11/29 14/32 18/36	2000 (6562) 2420 (7940) 1800 (5906) 2550 (8336)	SIW 45000 (99207) SIW 45000 (99207) SIW 45000 (99207) SIW 45000 (99207)	22 29 X X	X X X X	X X X X		X		
PORTUGAL											
LAJES/LAJES, TERCEIRA I., AZORES 3846N 2705W ALT	52 171	03/21 11/29 16/34	1860 (6102) 1890 (6201) 3230 (10597)	SIW 35000 (77162) SIW 35000 (77162) SIW 35000 (77162)	11 X	X X X	X X X	X X X	X X X	X X X	
LISBOA/LISBOA 3846N 0908W REG	110 361	05/23 09/27 14/32 18/36	2080 (6824) 1020 (3346) 1300 (4265) 2000 (6562)	SIW 35000 (77162) SIW 35000 (77162) SIW 35000 (77162) SIW 35000 (77162)	X	X X X X	X X X X				

TABLE - TABLEAU
AGA 2

CITY/AERODROME COORDINATES	ELEV. m. ft.	QFU	LENGTH m (ft.)	STRENGTH kg (lb.)	LIGHTING						REMARKS
					A	L	T	R	B	O	
1	2	3	4	5	6	7	8	9	10	11	12
PORTUGAL (CONT'D.-SUITE)											
SANTA MARIA/SANTA MARIA, SANTA MARIA I., AZORES 3658N 2510W REG	93 305		L1049G-BR300LR	L1049G-DC7C	0*		0	0	0	0	* QFU 01 & 19.
		01/19	2440 (8005)	SIW 35000 (77162)		X	X	X	X	X	
		05/23	1420 (4659)	SIW 35000 (77162)			X	X	X	X	
		15/33	1830 (6004)	SIW 35000 (77162)			X	X			
PUERTO RICO-PORTO RICO											
SAN JUAN/ISLA VERDE 1827N 6558W ALT			L1049G	L1049G			0	0	0	0	UNDER CONSTRUCTION EN CONSTRUCTION.
		09/27	2377 (7800)				X	X	X		
SPAIN-ESPAGNE											
BARCELONA/BARCELONA 4118N 0205E ALT	4 13		L1049G-DC7C	L1049G-DC7C	0		0	0	0	0	
		02/20	1743 (5718)								
		07/25	1765 (5791)	AUW 67000 (147710)			X	X	X	X	
		13/31	1375 (4510)	@ 7 @ (100)			X	X	X	X	
		17/35	2000 (6562)				X	X			
MADRID/BARAJAS 4028N 0334W REG	605 1985		DC6B-BR300LR ALT	DC6B-L1049G L1049G-DC7C	0		0	0	0	0	
		01/19	2600 (8530)								
		05L/23R	2600 (8530)	AUW 6800 (132277)		X	X	X	X	X	
		05R/23L	2600 (8530)	@ 6 @ (85)			X	X			
		10/28	2600 (8530)				X	X			
		15/33	3050 (10007)		X		X	X			
SEVILLA/SAN PABLO 3725N 0553W ALT	30 98		L1049G-DC7C	L1049G-DC7C	0		0	0	0	0	
		02/20	1525 (5003)	AUW 62000 (136687)			X	X	X	X	
		05/23	1948 (6391)	@ 6 @ (85) AUW 67000 (147710)			X	X			
		09/27	2150 (7054)	@ 6 @ (85) AUW 67000 (147710)							
				@ 6 @ (85)							
SWEDEN-SUÈDE											
GÖTEBORG/TORSLANDA 5743N 1147E REG	4 13		DC6B	DC6B	0		0	0	0	0	
		04/22	1850 (6070)	SIW 12000 (26455)	22	X	X	X	X	X	
		09/27	1160 (3806)	SIW 12000 (26455)		X	X	X			
		14/32	1140 (3740)	SIW 12000 (26455)		X	X	X			
MALMÖ/BULLTOFTA 5536N 1304E ALT	8 26		DC6B-DC7C	DC6B-DC7C	0		0	0	0	0	UNDER CONSTRUCTION EN CONSTRUCTION.
		06/24	1800 (5904)	SIW 20000 (44092)	24	06*	X	X	X	X	
NORRKÖPING/KUNGSÄNGEN 5835N 1615E ALT	5 16		DC6B	DC6B			0	0	0	0	
		09/27	1700 (5577)	SIW 13000 (28660)		X	X	X	X	X	
STOCKHOLM/BROMMA 5921N 1757E REG	14 46		DC6B-DC7C	DC6B-DC7C	0		0	0	0	0	
		05/23	1220 (4000)	SIW 12000 (26455)		X	X	X	X	X	
		09/27	970 (3182)	SIW 12000 (26455)							
		13/31	2025 (6644)	SIW 15000 (33069)	13	X	X	X	X	X	
		16/34	1410 (4623)	SIW 12000 (26455)		34	X	X			

TABLE - TABLEAU
AGA 2

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CITY/AERODROME COORDINATES	ELEV. m ft.	QFU	LENGTH m (ft.)	STRENGTH kg (lb.)	LIGHTING						REMARKS
					A	L	T	R	B	O	
1	2	3	4	5	6	7	8	9	10	11	12
SWEDEN-SUÈDE (CONT'D.-SUITE)											
STOCKHOLM/HALMSJÖN 5940N 1757E REG	39 128		DC6B	DC7C	0		0	0	0	0	UNDER CONSTRUCTION EN CONSTRUCTION
		08/26	2300 (7544)	SIW 45000 (99207)							
SWITZERLAND-SUISSE											
GENÈVE/COINTRIN 4614N 0606E REG	429 1407		DC6B	DC6B	0		0	0	0	0	
		05/23	2000 (6562)	SIW 35000 (77162)	23		X	X	X	X	
ZÜRICH/KLOTEN 4727N 0833E ALT	431 1414		DC6B	DC6B	0		0	0	0	0	
		02/20	1535 (5036)	SIW 63000 (138891)			X	X	X	X	
		10/28	1900 (6234)	SIW 63000 (138891)			X	X	X	X	
		16/34	2600 (8530)	SIW 63000 (138891)	16	34	X	X			
UNITED KINGDOM-ROYAUME-UNI											
BOURNEMOUTH/HURN 5047N 0150W ALT	11 36		B377	B377	0		0	0	0	0	
		09/27	1838 (6031)	SIW 25401 (56000) @ 7,7 @ (110)			X	X	X	X	
		13/31 17/35	1077 (3535) 1466 (4810)			31 X	X X				
LONDON/BOVINGDON 5144N 0033W ALT	163 535						0	0	0	0	OFFERED IN EXISTING STATE. OUVERT AU TRAFIC DANS SON ÉTAT ACTUEL.
		04/22	1494 (4902)	SIW 18144 (40000) @ 6,4 @ (92)			X	X	X	X	
		09/27	1321 (4335)			X	X				
LONDON/LONDON 5128N 0027W REG	24 80		B377	B377	0		0	0	0	0	
		05L/23R	1908 (6261)				X	X	X	X	
		05R/23L	2358 (7735)				X	X	X	X	
		10L/28R	1901 (6237)				X	X	X	X	
		10R/28L	2917 (9570)				X	X	X	X	
		15L/33R	1775 (5823)				X	X	X	X	
PRESTWICK/PRESTWICK 5530N 0435W REG	19 63		B377	B377	0		0	0	0	0	ADDITIONAL RUNWAY UNDER CONSTRUCTION- PISTE ADDITIONNELLE EN CONSTRUCTION. #EMERGENCY DISTANCE OF 2438m (7997ft) FOR TAKE-OFF RWY 31- LONGUEUR D'URGENCE DE 2438m (7997ft) POUR DÉCOLLAGE RWY 31.
		08/26	1375 (4510)	SIW 25401 (56000) @ 7,7 @ (110)			X	X	X	X	
		13/31	2133 (6997)			X	X	X	X		
READING/BLACKBUSHE 5120N 0051W ALT	100 329						0	0	0	0	OFFERED IN EXISTING STATE FOR AIRCRAFT ON DIVERSION NOT EXCEEDING- OUVERT AU TRAFIC DANS SON ÉTAT ACTUEL POUR AÉRONEFS DÉROUÉS N'EX- CÉDANT PAS-AUW 45359 kg@7,7/cm ² (100000 lb @110lb/in ²)
		08/26 14/32	1830 (6003) 1285 (4218)				X X	X X	X X	X X	

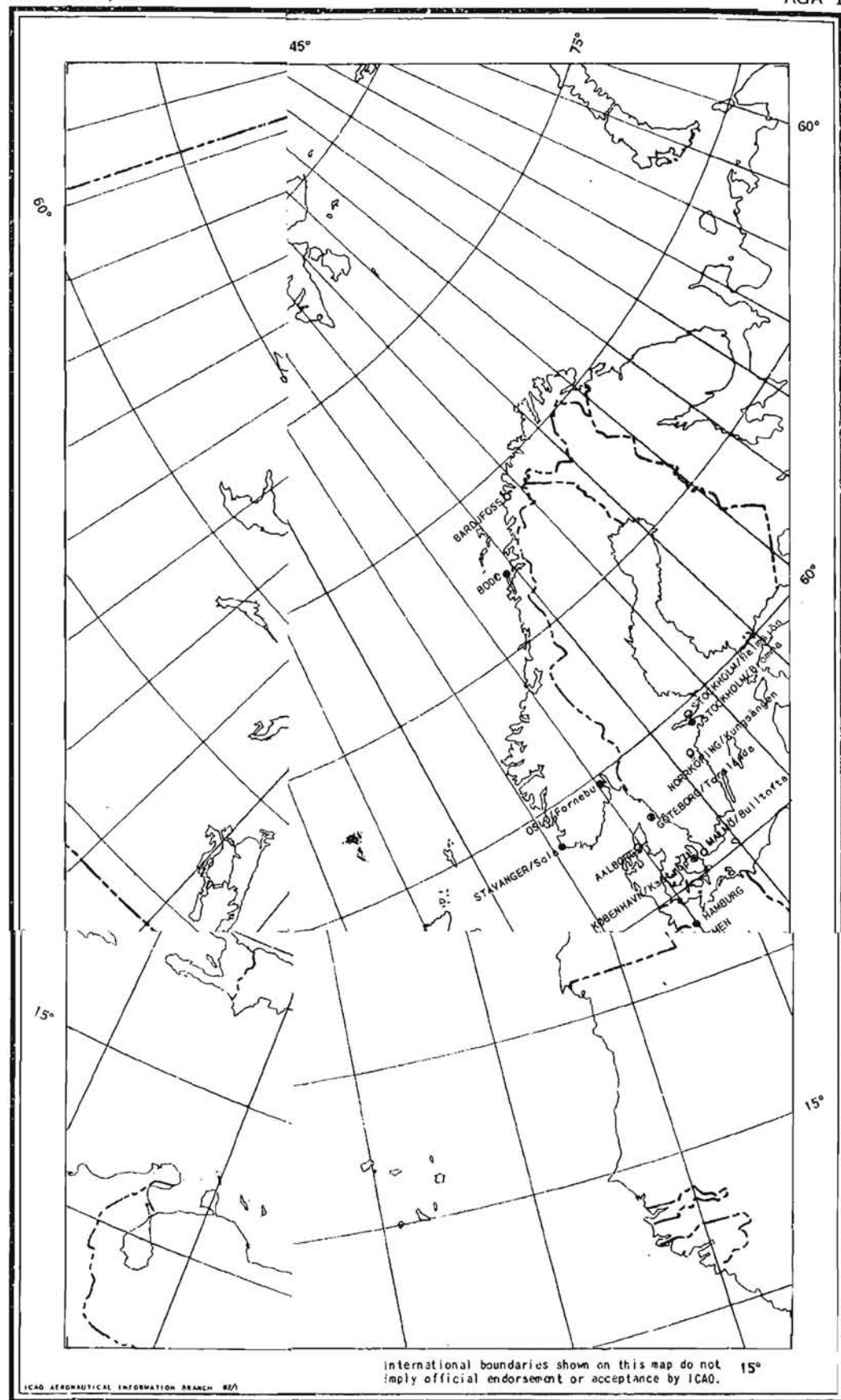
TABLE - TABLEAU
AGA 2

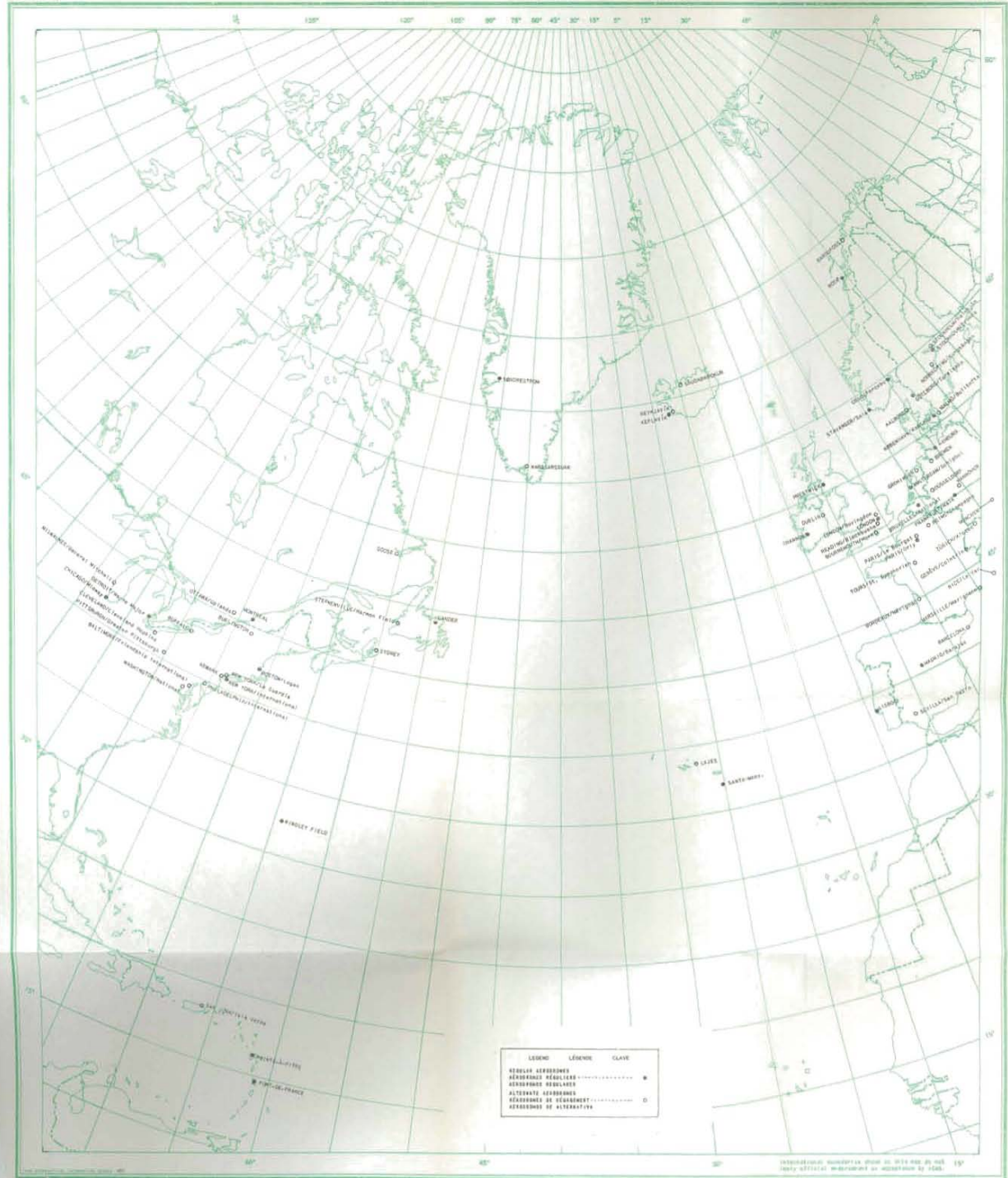
CITY/AERODROME COORDINATES	ELEV. m ft.	QFU	LENGTH m (ft.)	STRENGTH kg (lb.)	LIGHTING						REMARKS
					A	L	T	R	B	O	
1	2	3	4	5	6	7	8	9	10	11	12
UNITED STATES OF AMERICA-ÉTATS-UNIS D'AMÉRIQUE											
BALTIMORE/FRIENDSHIP INTERNATIONAL, Md. 3910N 7640W A L T	44 146		B377	B377			0	0	0	0	
		04/22	1829 (6000)	45359 (100000)				X	X		
		10/28	2880 (9450)	45359 (100000)			10	X	X	X	
		15/33	1963 (6440)	45359 (100000)				X	X		
BOSTON/LOGAN, Mass. 4222N 7101W R E G	6 19		B377	B377	0		0	0	0	0	
		04L/22R	2399 (7870)	34019 (75000)				X	X		
		04R/22L	3052 (10012)	34019 (75000)		04		X	X	X	
		09/27	2135 (7003)	34019 (75000)				X	X		
BUFFALO/BUFFALO, N.Y. 4256N 7844W A L T	217 711		B377	B377			0	0	0	0	
		05/23	1716 (5630)	27216 (60000)			23	X	X		
		09/27	1110 (3642)	27216 (60000)				X	X		
		13/31	1633 (5358)	27216 (60000)				X	X		
BURLINGTON/BURLINGTON, Vt. 4428N 7309W A L T	102 334						0	0	0	0	
		01/19	1097 (3600)	6804 (15000)				X	X		
		10/28	1111 (3645)	6804 (15000)				X	X		
		15/33	2430 (7972)					X	X		
CHICAGO/MIDWAY, ILL. 4147N 8745W R E G	188 618		B377	B377	0		0	0	0	0	
		04L/22R	1480 (4857)	27216 (60000)				X	X		
		04R/22L	1806 (5925)	27216 (60000)				X	X	X	
		09L/27R	1438 (4717)	27216 (60000)				X	X		
CLEVELAND/CLEVELAND HOPKINS, OHIO 4124N 8151W A L T	240 789		B377	B377	0		0	0	0	0	
		05L/23R	1903 (6242)	15876 (35000)			05	X	X		
		05R/23L	1829 (6000)	9979 (22000)				X	X		
		09/27	1681 (5514)	27216 (60000)				X	X		
DETROIT/WAYNE-MAJOR, Mich. 4213N 8321W R E G	186 639		DC6B	DC6B	0		0	0	0	0	
		03L/21R	2408 (7900)					X	X		
		03R/21L	2143 (7031)					X	X	X	
		09/27	2310 (7578)					X	X		
MILWAUKEE/GENERAL MITCHELL, Wis. 4257N 8754W A L T	213 698		B377	B377			0	0	0	0	
		01/19	2051 (6730)	45359 (100000)			01	X	X		
		06/24	1455 (4775)	13608 (30000)				X	X	X	
		07/25	1610 (5610)	45359 (100000)				X	X		
NEWARK/NEWARK, N.J. 4042N 7410W A L T	6 18		B377	B377	0		0	0	0	0	
		04/22	2134 (7000)	13608 (30000)			04	X	X		
		11/29	1705 (5593)	13608 (30000)				X	X	X	
NEW YORK/LA GUARDIA, N.Y. 4047N 7352W A L T	6 20		B377	B377	0		0	0	0	0	
		04/22	1482 (4863)	22680 (50000)			04	X	X		
		09/27	1316 (4319)	22680 (50000)				X	X	X	
		13/31	1798 (5900)	22680 (50000)				X	X		

REG

SECTION 3 - ADDITIONAL RECOMMENDATIONS3.1 Relationship between the contents of
this Report and that of previous Regional
AGA Committee Reports already approved by
CouncilRecommendation No. 10.

That the recommendations of this report, except as they concern dates of implementation for equal or lesser facilities relisted in this report, supersede the recommendations of the previous North Atlantic Regional Air Navigation Meeting. Where they exceed the recommendations of other regional Meetings dealing with AGA facilities in the areas of overlap with the North Atlantic Region, they supersede the recommendations of those regional meetings.



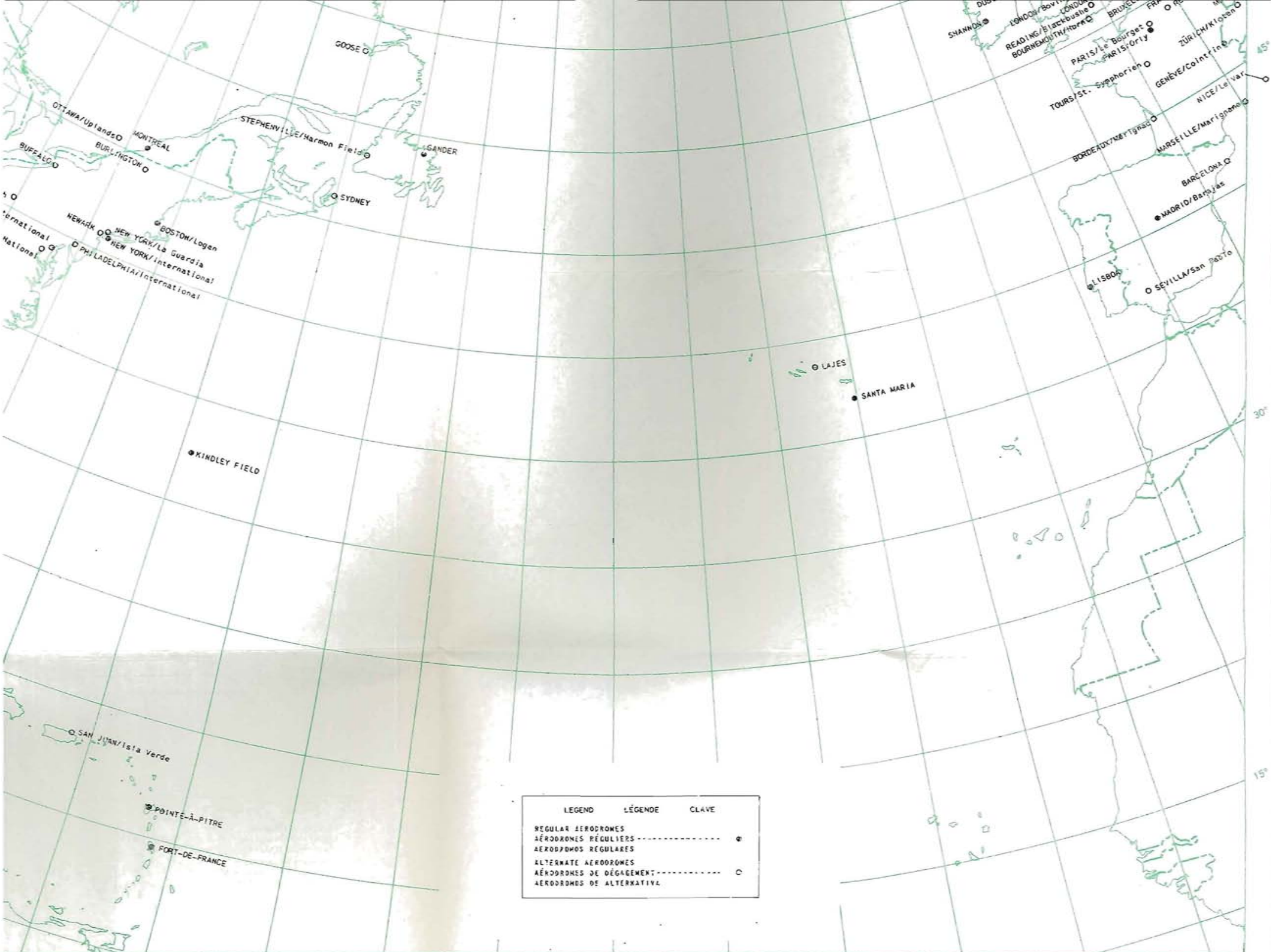


AERODROMOS

AÉRODROMES

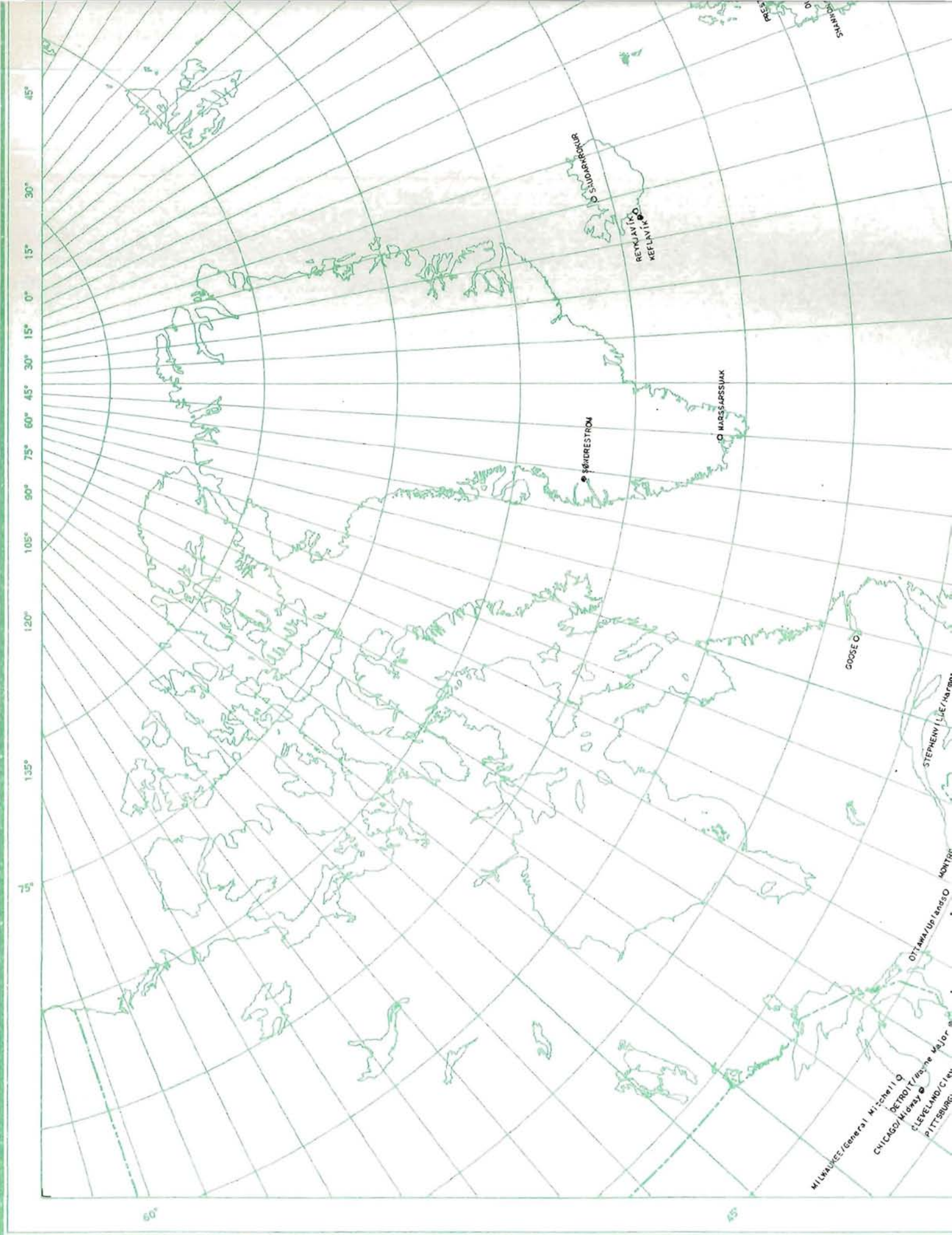
AERODROMES

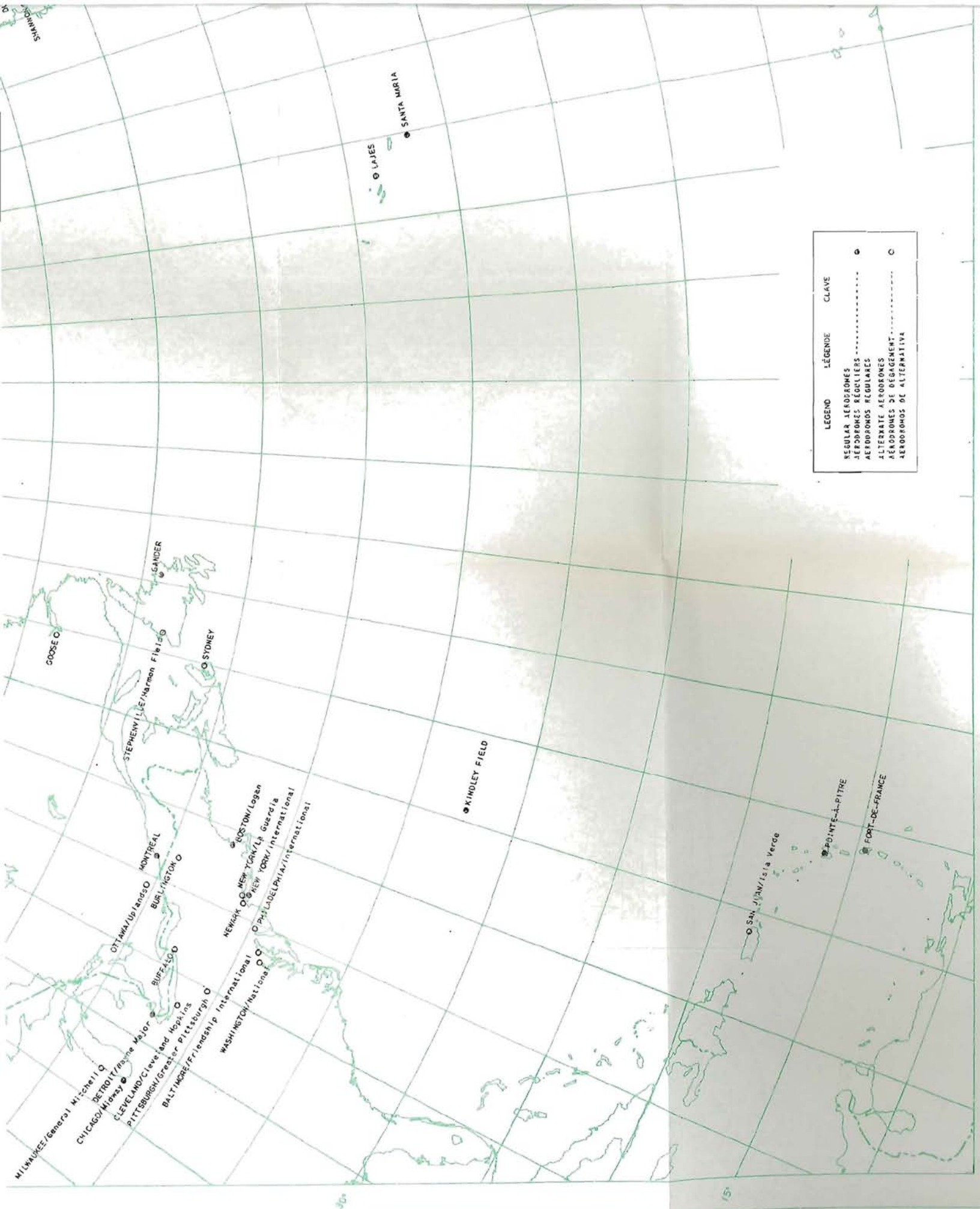
CHART
AGA 1



LEGEND	LÉGENDE	CLAVE
REGULAR AERODROMES	AÉRODROMES RÉGULIERS	●
AERODROMOS REGULARES		
ALTERNATE AERODROMES	AÉRODROMES DE DÉGAGEMENT	⊗
AERODROMOS DE ALTERNATIVA		

International boundaries shown on this map do not imply official endorsement or acceptance by ICAO.





LEGEND	LÉGENDE	CLAVE
REGULAR AERODROMES	AERODROMES RÉGULIERS	●
AERODROMES RÉGULIERS	AERODROMOS REGULARES	○
ALTERNATE AERODROMES	AERODROMOS DE DESGAGEMENT	○
AERODROMOS DE ALTERNATIVA		

APPENDIX "A"STATEMENTS BY DELEGATIONS"1. Statements of the French and Italian Delegations

Taking into account the provisions appearing in paragraph 2.4 of the Sub-Committee 1 directives and in paragraph 4, Part 2, of the document entitled "Rules of Procedure and Directives for Regional Air Navigation Meetings", the French and Italian Delegations wish to point out that certain services and facilities in Greenland are, for the first time, recommended by the Committee for incorporation into the Regional Plan.

Having regard to the fact that other services and facilities in this territory were installed or maintained only by means of joint financing under ICAO, the French and Italian Delegations must make all necessary reservations as to the intentions of the French and Italian Governments relating to its possible participation in a joint financing scheme that would entail greater obligations than those previously accepted.

The French and Italian Delegations further state that, in their opinion, before approving the plan that will result from the Recommendations of the Regional Meeting, the ICAO Council should, in the first place, ascertain that such a plan does not raise insurmountable difficulties from the financial point of view.

It is only subject to the above observations that the French and Italian Delegations are able to give their approval to the Report presented by the AGA Committee."

PART IV
COMMUNICATIONS COMMITTEE

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THIRD NORTH ATLANTIC REGIONAL AIR NAVIGATION MEETINGMONTREALOCTOBER 1954COMMUNICATIONS COMMITTEEHistorical Statement1. Meetings

The Communications Committee held five plenary meetings in open session at the ICAO Headquarters, Montreal, from 11 October to 24 October 1954, under the Chairmanship of Mr. J.C. Farmer, Delegate of the United Kingdom. The Vice-Chairman of the Committee was Mr. G.E. Enright, Delegate of Ireland.

2. Organization of the Committee

The detailed work of the Committee was undertaken by three Working Groups as follows:

Working Group A, under the Chairmanship of Mr. E.V. Shores, Delegate of the United States, dealt with matters related to the Aeronautical Fixed Telecommunications Services.

Working Group B, under the Chairmanship of Mr. M.P. Chef, Delegate of France, dealt with matters related to the Aeronautical Mobile and Meteorological Broadcast Services.

Working Group C, under the Chairmanship of Mr. O.L. Britney, Delegate of Canada, dealt with matters related to Radio Navigation Aids.

3. Representation

A list of the States and International Organizations represented at meetings of the Committee appears at Appendix A of the Report of the General Committee.

4. Secretariat

Mr. P.J. Greven, Secretary COM Committee, with the assistance of Mr. H.R. Adam, Mr. P. Oomen and Mr. L.J. Rose.

Report on the Agenda

Agenda Item 1: Consideration of specific proposals for amendments to the existing ICAO plan, with particular reference to:

1.1: Aeronautical Fixed Telecommunications Services:

Plan for AFTN

The existing AFTN plan for the NAT region was reviewed in detail. The requirements for meteorological transmissions, RAC/SAR purposes, and those stated by IATA were taken into account in the preparation of the new Plan shown in Section 2, Part I of this Report. AFTN circuits in the adjacent regions were considered and it was decided that these circuits would not be included in the NAT AFTN Plan.

It is to be noted that dates of implementation were not considered necessary for any portion of the plan.

Transmission of NOTAM Information

The requirements for NOTAM traffic were given careful consideration and it was found that all NOTAM distribution requirements could be met on the existing AFTN.

RAC/SAR Inter-area Communications

It was noted that Subcommittee 1 had asked RAC/SAR to inform the GOM Committee of its requirements for inter-area communications and Subcommittee 1 further requested the GOM Committee to consider such requirements forwarded by the RAC/SAR Committee and to make provision in the NAT Plan for sufficient aeronautical fixed service communications to meet these requirements.

As a result the RAC/SAR requirements were subsequently considered by the GOM Committee. These requirements were:

- 1) For interphone type communications to link directly together NAT Area Control Centres and/or Flight Information Centres at Gander, Lisbon, Narsarssuak, New York, Nord, Paris, Prestwick, Reykjavik, Santa Maria, Shannon, Thule and Tromsø. These circuits to be provided with automatic switching devices that will permit direct communications between the stations. In addition, the Area Control Centres and/or Flight Information Centres at each of these locations are to be tied directly to the air-ground station. As elements of the NAT plan this interphone type network will directly link together Area Control Centres and/or Flight Information Centres and air/ground communication stations serving Area Control Centres and Flight Information Centres in the NAT Region.
- 2) For these interphone circuits to facilitate closer inter-centre coordination, and to be used only for high priority ATS and SAR messages.
- 3) For these interphone circuits to be equipped with automatic switching through intermediate stations to permit direct communications between Air Traffic Controllers.

- 4) For the provision of interphone connections in the NAT Region between each Rescue Coordination Centre and its associated Area Control Centre or Flight Information Centre.
- 5) In detail, for those communications specified between the Centres listed at page COM 31 and for direct speech communications to be established between the Controllers at the Centres to be connected, normally within 15 seconds, except for the following connections where printed communications would be acceptable with a transit time of 30 minutes or less: New York-Sal Island, Prestwick-Bordeaux, Prestwick-Madrid, Reykjavik-Tromsø, Shannon-Bordeaux, Shannon-Madrid, Stavanger-Trondheim, Tromsø-Trondheim and Santa Maria-Casablanca.

In order for the COM Committee to consider all these requirements, both separately and collectively, an appraisal (refer page COM 23) was made of the various methods and techniques that might be employed to meet these requirements in whole or in part.

It will be seen from this appraisal that as far as the North American Eastern seaboard and the European Western seaboard were concerned, these requirements have either already been met, or are capable in many cases of being met without too many serious difficulties.

However, in particular, where the requirements concern Iceland, Greenland and the main Ocean area, the technical and organizational complexities as outlined in the appraisal, prevented the determination at this meeting of the detailed methods as to how the particular requirements could or should be met within the NAT Plan.

Nevertheless, it was considered that the appraisal should assist considerably in the further consideration by States of the methods to meet the RAC/SAR requirements. (Refer Recommendations No. 14 and No. 15.)

In consideration of the SAR requirement for the provision of interphone connections between each Rescue Coordination Centre and its associated Area Control Centre or Flight Information Centre it was decided that this was a matter for internal domestic consideration by each State concerned since the authorities involved are normally in each case located within one State, and frequently involve arrangements with military organizations.

1.1.1: Effecting improvements to the AFTN circuits Europe-Iceland-Greenland-North America, as protection particularly against periods of poor propagation.

In considering the improvements that might be made to the NAT AFTN, a number of circuits were found to be deficient. Recommendations intended to reduce

these deficiencies have been included in Section 2, Part I, of this Report. A form for reporting circuit failures has been recommended and when brought into use should provide useful factual information to all States in the Region. While not considered part of the Report to be approved by the Meeting, the United Kingdom has submitted data on performance of certain AFTN circuits using improved equipment and this material has been included as an Appendix.

1.1.2: The possibility of a southern alternate route Europe-North America, as protection against periods of poor propagation.

Consideration was given, through an exchange of views, to the general problems encountered in the Region. It was agreed that tests should be undertaken with view to a possible resolution of this problem. (See Rec. No. 2).

1.1.3: Effecting improvements to the AFTN circuits for meteorological communications between Europe and North America.

The requirements for the transmission of meteorological information as defined by the MET Committee were carefully reviewed in respect of the additional or new traffic load to be handled by the AFTN or other means. The requirements in respect to transit times were not considered in detail owing to the fact that the transit times suggested by the MET Committee were not consistent with those agreed by Sub-Committee 1 for the AFTN. As the transit times for the AFTN are maximum times, it was considered that many of the MET suggestions would be satisfied, but in a number of cases, the requirements would not be met in the presently planned AFTN. It was considered that this problem might be resolved by a joint COM/MET group under the direction of Sub-Committee 1. Certain deficiencies referred to the COM Committee by the MET Committee relating to operational MET exchanges accomplished by means of the AFTN were examined and it was determined that these deficiencies will be remedied by improvements being made to the AFTN.

1.2: Aeronautical Mobile Telecommunications Services:

1.2.1: VHF/RT requirements in the Region.

In considering the assignment of VH frequencies for en-route communication, it was found that the differing manner of deployment of VHF in North America and in Europe precluded the use of a common frequency at all stations in the Region, though operationally this would have been desirable.

Recommendations on this Agenda Item are contained in Section 2, Part II of this report.

1.2.2: Consideration of means of maintaining communications in periods of poor propagation.

The Committee gave careful consideration to this Agenda item and has included appropriate recommendations in Section 2, Part II of this Report.

1.3: Integration of Aeronautical Fixed and Mobile Telecommunications Services, including:

A review of the Agenda item revealed that little new material was available on this question, apart from that already included in the reports of the COM Division, Fourth and Fifth Sessions.

The action of the meeting on Agenda Item 1.3 is contained in Section 2, Part V of the report.

1.3.1: Review of the HF/RT network organization taking into account present experience and future requirements, and in the light of developments in the AFTN in the Region.

After discussion of the question of adjacent channel operations, it was agreed that the problems created were soluble by engineering improvements, and any alternative assignments would make likely the generation of cross-modulation products the result of which was liable to be more harmful than the risk of adjacent channel interference.

Recommendations on this Agenda Item are contained in Section 2, Part II of this report.

1.4: Radio Navigational Aids (Complementary to the decisions of Subcommittee 1 on requirements for these aids).

Radionavigation Aid Plan

The plan for radionavigation aids in the North Atlantic region was developed on the basis of requirements stated by Subcommittee 1 of the General Committee and the RAC Committee. It was found practicable to specify aids to meet all requirements stated with the exception of aids for aerodrome surface movement. The Committee considered that development of aids for this purpose was not sufficiently mature to warrant their inclusion in the plan prepared by the meeting.

The RAC Committee requested that the COM Committee prepare specifications for surveillance radar equipment (TAR) with a useful range of at least 100 NM and provision for moving target indicators. It was not practicable, however, to develop such specifications at this time, furthermore it was considered that their development would not be appropriate to the work of a Regional Meeting and should be referred to the next appropriate Communications Division or Conference.

The Committee prepared a complete plan for radionavigation aids for the region in one tabulation including therein all existing aids and new aids (Long distance, Short distance, Approach and Landing, Surveillance Radar) that were considered necessary to meet the operational requirements stated by Subcommittee 1 and the RAC Committee.

Long distance radio navigation aids

The Committee considered requirements for CONSOL and LORAN fixing coverage specified by Sub-Committee 1 of the General Committee and examined possibilities of siting new CONSOL stations at the various locations suggested. The Representative of Denmark was able to provide valuable information on siting possibilities in Greenland including a film showing terrain conditions at possible sites. The Representatives of Portugal, Canada and Iceland were also able to provide information that facilitated detailed studies of siting possibilities in the Azores, Labrador, Newfoundland and Iceland. Specific recommendations were made on locations and orientation for new CONSOL, for the improvement of existing CONSOL stations and for the retention of existing LORAN and CONSOL stations.

NDB operation on board Ocean Station Vessels

The Committee studied results of trials which had been made as a result of Recommendation No. 4 of the Fourth North Atlantic Ocean Station (NAOS) Conference and approved Recommendation No. 44.

1.5 Meteorological Broadcast Services:1.5.1: Revision of radiotelephony and radiotelegraphy MET Broadcast Plan, complementary to the decisions of Sub-committee 1 on requirements.

A plan for meteorological broadcasts to aircraft in flight (VOLMET) was prepared, taking into account the directives of Sub-Committee 1, the principles of the First Air Navigation Conference on this subject and the limitations of the frequencies and transmission time available. The relevant recommendations and the plan are contained in Section 2, Part IV of the Report.

1.6: Amendments to the frequency plans, resulting from consideration of Agenda Items 1.1, 1.2, 1.3, 1.4 and 1.5.

For the purpose of frequency assignment, North Atlantic A3 en-route communication frequencies at certain stations in Canada and A1 in the Caribbean region were listed though the facilities concerned do not form part of the NAT regional plan.

Agenda Item 2: Consideration of specific problems relating to the collection and exchange of meteorological data from Ocean Station Vessels.
(Associated with Item 2 on the Agenda of the MET Committee).

It was noted that the problem of OSV Meteorological communications has been discussed in considerable detail by a continuing Working Group of the 4th NAOS Conference and that this Group had proposed a communications plan which provided for both broadcast and ship-to-shore methods of transmitting MET information. This plan appeared to be adequate except in respect of OSV A. A recommendation to provide

for alternative routing during periods of ionospheric disturbances was prepared to cover this apparent deficiency.

The requirement for a transit time of one hour between time of filing a message on an OSV and the time of delivery at interested MMO's was taken into account. It was considered that an improvement in equipment and operating techniques in respect of the special MET circuits would assist in reducing present difficulties and suitable recommendations are included in Section 2, Parts I and V of this Report.

Agenda Item 3: Preparation of any regional procedures necessary to supplement Annex 10 and the Radio Telephony Procedures (Doc 7181-COM/546), including:

3.1: Amendments to Radio Telephony Procedures arising from Agenda Item 1.2

In dealing with the aeronautical mobile services, the Committee formulated certain Supplementary Procedures. These will be found in Section 3 of this Report.

With respect to mobile service operations, detailed examination of all proposals submitted for supplementary procedures indicated that, in current operations, many of the prescribed ICAO world-wide radiotelephony procedures in Annex 10, Part III (reproduced in Doc 4478-COM/501/2) and Doc 7181-COM/546/1 "Radiotelephony Procedures" were not adhered to; the majority of these proposals were rejected for the reason that the desired operational effect intended by the proposed supplementary procedures could be achieved by application of the world-wide procedures already approved for use by the Council of ICAO. The Meeting considered it essential, therefore, to draw attention to this problem and has, accordingly, made Recommendation No. 62.

3.2: Handling of "dead traffic" on the AFTN

The recommendations of the COM Division, Fifth Session, concerning handling of "dead traffic" were reviewed and it was considered that no supplementary procedures were required in the NAT Region.

There also appeared to be no requirement for supplementary procedures for the fixed services.

Agenda Item 4: Recapitulation of previous North Atlantic Regional COM recommendations with a view to eliminating those which are no longer applicable.

The Committee considered the recommendations of the First and Second NAT RAN Meetings (Doc D293 COM/D-33 and Doc NA/202, COM-NA/36) and concluded that all recommendations of these meetings were either obsolete or had been superseded by action of the present meeting. The same consideration was given to the Recommendations contained in the NAT frequency assignment plan (Doc 7012-COM/541).

In respect of the Special MET/COM meeting held in London 1949 (Doc 6815), the following comments are to be noted.

As a result of a joint ad hoc meeting of the Chairmen and certain delegates of the MET and COM Committees, a common proposal was drafted in respect of Recommendations Nos. 1, 3 and 4 of the Special MET/COM meeting (Doc 6815).

At its plenary session on 22 October 1954, the COM Committee agreed to the common proposal to include Recommendation No. 1 as amended and 3 in Section 2, Part V of the Report. With respect to Recommendation No. 4, the COM Committee agreed that neither the former Recommendation 4 nor the additional text proposed should be included in the final report of this committee.

In reaching this decision the COM Committee took into account the fact that, whilst at present there appeared to be a weakness in one leg of the existing New York-Santa Maria-Paris primary circuit, the administration concerned had agreed to take appropriate steps to overcome this weakness. Inasmuch as no major technical difficulty is involved in this action the COM Committee believes it reasonable to expect that, in the near future, the weakness will be overcome and circuit reliability thereby increased so as to meet the MET requirements.

The COM Committee also noted that at the present time the use of alternative routing by Santa Maria via the Santa Maria-Shannon-Paris circuit was of assistance in overcoming the present weakness of the New York-Santa Maria-Paris primary circuit.

Agenda Item 5: Preparation for transmission to Sub-committee 1 of a list of COM facilities and services included in the revised regional plan that are considered of critical importance to air operations in the Region, and that for this reason should be given priority in the implementation plans of the State concerned.

While recognizing the critical importance of some measure of the overall improvements to be anticipated through implementation of the radio navigation aid plan and fixed services plans, the Committee was unable to isolate a list of items which it felt competent to judge as being of critical importance.

Agenda Item 6: Recommendation of dates for implementing the recommended facilities and procedures.

Recommendations concerning dates of implementation appear in Sections 2 and 3 of this Report.

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SECTION 2Part I. Aeronautical Fixed Telecommunication Service1. AFTN Plan for the NAT RegionRecommendation No. 1

That the circuits given in the tabulation hereafter except where specifically noted otherwise be approved as the AFTN Plan for the NAT Region and;

That any improvements or modifications required to these circuits be made at the earliest practicable date and;

That States concerned inform ICAO by 1 May 1955 of the implementation program they intend to follow.

NOTE - The frequencies listed in this tabulation do not form part of the AFTN Plan.

INDEX No.	STATIONS	INTER-WORKING	OPERATION	FREQUENCIES (NOT PART OF PLAN)	REMARKS																		
1	2	3	4	5	6																		
1032	Prestwick Reykjavik	PR-RE	MAS	121.6 [*] 109.35	This circuit standby to circuit No. 1521 [*] Reykjavik transmits on 121.6 - 109.35 used in both directions.																		
1050	New York Paris	NE-PA	RTT dx	<table><thead><tr><th>NE <u>Transmits</u></th><th>PA <u>Transmits</u></th></tr></thead><tbody><tr><td>4648.5</td><td>4052</td></tr><tr><td>6805</td><td>5294</td></tr><tr><td>9222.5</td><td>8102.5</td></tr><tr><td>13792.5</td><td>12201</td></tr><tr><td>18363</td><td>15943</td></tr><tr><td></td><td>20615</td></tr></tbody></table>	NE <u>Transmits</u>	PA <u>Transmits</u>	4648.5	4052	6805	5294	9222.5	8102.5	13792.5	12201	18363	15943		20615					
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	20615																						
1510	London New York	LO-NE	RTT dx	<table><thead><tr><th>LO <u>Transmits</u></th><th>NE <u>Transmits</u></th></tr></thead><tbody><tr><td>4560</td><td>3065</td></tr><tr><td>5422.5</td><td>4065</td></tr><tr><td>9255</td><td>5942.5</td></tr><tr><td>11938</td><td>8720</td></tr><tr><td>14630</td><td>11090</td></tr><tr><td>15990</td><td>13625</td></tr><tr><td>20685</td><td>16065</td></tr><tr><td>20625</td><td>23234</td></tr></tbody></table>	LO <u>Transmits</u>	NE <u>Transmits</u>	4560	3065	5422.5	4065	9255	5942.5	11938	8720	14630	11090	15990	13625	20685	16065	20625	23234	
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1521	London Reykjavik	LO-RE	RTT dx	<table><thead><tr><th>LO <u>Transmits</u></th><th>RE <u>Transmits</u></th></tr></thead><tbody><tr><td>3325</td><td>3165</td></tr><tr><td>3665</td><td>3880</td></tr><tr><td>4835</td><td>6815</td></tr><tr><td>9070</td><td>7972</td></tr><tr><td>11665</td><td>9268</td></tr><tr><td>17475</td><td>10145</td></tr><tr><td></td><td>16035</td></tr></tbody></table>	LO <u>Transmits</u>	RE <u>Transmits</u>	3325	3165	3665	3880	4835	6815	9070	7972	11665	9268	17475	10145		16035			
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	16035																						
	Frobisher Ft Churchill		A1		NOTE 1																		
	Winnipeg Ft Churchill		A1		NOTE 1																		
	Mont Joli Moncton		LLT		Note: LLT projected via Montreal																		

NOTE 1 - Required for polar operations but not part of the plan. Listed as a suggestion for consideration by the appropriate authorities.

2.- Reports and Recommendations on Facilities

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INDEX No.	STATIONS	INTER- WORKING	OPER- ATIONS	FREQUENCIES (NOT PART OF PLAN)	REMARKS
1	2	3	4	5	6
1525	Shannon Amsterdam	SH-AM	RTT dx	<div>SH AM</div> <div><u>Transmits</u> <u>Transmits</u></div> <div>3562 2778</div> <div>5375 3354</div> <div>8145 5911.5</div> <div>11470 7410</div>	
1526	Shannon Paris	PA-SH	RTT dx	<div>PA SH</div> <div><u>Transmits</u> <u>Transmits</u></div> <div>3775 3398</div> <div>4547 5768</div> <div>5857 8104</div>	
1540	Prestwick Stavanger	PR-ST	MAS	<div>3240</div> <div>8125</div> <div>11480</div>	of: EUM Plan
2000	New York Gander	NE-GA	RTT dx	<div>NY GA</div> <div><u>Transmits</u> <u>Transmits</u></div> <div>3395 5368</div> <div>5860 9930</div> <div>8110 11010</div> <div>11555</div> <div>16440</div>	
2001 EUM 1522	New York Santa Maria	NE-SA	RTT dx duplex	<div>NE SA</div> <div><u>Transmits</u> <u>Transmits</u></div> <div>4055 4082</div> <div>8120 5474</div> <div>12180 8045</div> <div>16220 8160</div> <div> 12240</div> <div> 16234</div>	One channel only for AFTN, other channel exclusively for MET.
	Narsarssuak- Soendre Stroemfjord		MAS		
	Nord Thule		MAS		Not to be implemented until FIC are implemented.
	Thule Narsarssuak		MAS		Not to be implemented until FIC are implemented.
	Nord Reykjavik		MAS		Not to be implemented until FIC are implemented.
	Thule Reykjavik		MAS		Not to be implemented until FIC are implemented.

INDEX No.	STATIONS	INTER-WORKING	OPER-ATION	FREQUENCIES (NOT PART OF PLAN)	REMARKS
1	2	3	4	5	6
2002 GAR 4-FP32	New York Bermuda San Juan	NE-NE NE-SJ	RTT dx diplex see Col.6	<div> <div>NE</div> <div>BE</div> <div><u>Transmits</u></div> <div><u>Transmits</u></div> <div>3380</div> <div>4580</div> <div>3395</div> <div>10775</div> <div>5960</div> <div>8130</div> <div>12195</div> <div>SJ</div> <div><u>Transmits</u></div> <div>5922.5</div> <div>7770</div> <div>12165</div> </div>	Forked circuit NE transmits diplex BE transmits duplex to NE SJ transmits duplex to NE
2005 EUM 1502	Gander Shannon	GA-SH	RTT dx	<div> <div>GA</div> <div>SH</div> <div><u>Transmits</u></div> <div><u>Transmits</u></div> <div>3360</div> <div>2845</div> <div>4618.5</div> <div>5813.5</div> <div>8114</div> <div>9296.5</div> <div>11077.5</div> <div>12187</div> <div>16356</div> <div>17367</div> </div>	
2006	Gander Goose Montreal	GA-GO GO-MO	RTT dx	<div> <div>GA</div> <div>GO</div> <div><u>Transmits</u></div> <div><u>Transmits</u></div> <div>168</div> <div>146.1</div> </div>	Montreal receives only. Circuit GA-GO requires improve- ment to meet ICAO transit times.
2008 EUM 1500	Gander Reykjavik	GA-RE	MAS	<div> <div>GA</div> <div>RE</div> <div><u>Transmits</u></div> <div><u>Transmits</u></div> <div>4769</div> <div>5125</div> <div>7484</div> <div>7845</div> <div>9080</div> <div>11427</div> <div>11055</div> <div>17735</div> </div>	Planned to be converted to RTT.
	Reykjavik Sandarkrokur				RTF and LL now in existence. Implementation subject to implementation of air-ground facilities
	Goose Frobisher	GO-FR	RTT dx	<div> <div>GO</div> <div>FR</div> <div><u>Transmits</u></div> <div><u>Transmits</u></div> <div>3355</div> <div>5885</div> <div>5380</div> <div>7675</div> <div>7960</div> <div>9265</div> <div>11505</div> <div>11695</div> </div>	

2.- Reports and Recommendations on Facilities

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INDEX No.	STATIONS	INTER- WORKING	OPER- ATIONS	FREQUENCIES (NOT PART OF PLAN)	REMARKS
1	2	3	4	5	6
2009	Gander Santa Maria Bermuda	GA-SA BE-GA BE-SA	MAS	2095 4795 9820 12956	To be divided into two RTT circuits if necessary. See Recommendation <u>11</u>
2011	<u>Gander</u> Argentia Goose Moncton Stephenville Seven Islands	Net Work	RTF	2824 4875 7350	
2012 EUM 1503	Santa Maria Shannon	SA-SH	RTT dx	SA <u>Transmits</u> 5853 10540 12323 SH <u>Transmits</u> 2652 5367 11440	
2014	Reykjavik Stavanger	ST-RE	MAS	3250 5143 8125 10130 11480	of: EUM Plan 1541 with LF Standby ST Transmits 100.25 RE Transmits 109.35
2019	London Gander	LO-GA	RTT dx	LO <u>Transmits</u> 4645 6980 9874 13440 16225 19015 GA <u>Transmits</u> 4875.5 6996 11615 13376 15789 19285	
	London Shannon	LO-SH	LIT dx		
	Shannon Prestwick	SH-PR	LIT dx		

INDEX No.	STATIONS	INTER-WORKING	OPERATION	FREQUENCIES (NOT PART OF PLAN)	REMARKS
1	2	3	4	5	6
	Southern tip of Greenland Reykjavik	NA-RE	MAS	5125 7845 11427 17735	Circuit to be converted to RTT dx
2029	Goose Narsarssuak	GO-NA	RTT dx		Not basic AFTN circuit. Necessary that this circuit be safeguarded for AFTN traffic until new circuit Gander-Southern Greenland is implemented. See Recommendation 10.
2030 EUM 1501	Lisboa Santa Maria	LI-SA	RTT dx diplex	LI SA <u>Transmits</u> <u>Transmits</u> 3272 2020 5447 3175 9910 5893 14596 10289 15422	
2032	Sal Is. Santa Maria <u>Lisboa</u>	LI-SA LI-SI SA-SI	MAS	4759 9075 12220 17367	LI-SA and LI-SI standby for RTT
2033 EUM 1551	Lajes Santa Maria	LA-SA	VHF link multi- channel RTT dx		One channel for AFTN, others for ATS, SAR and MET
	Gander Argentia Stephenville Torbay	GA-AR AR-ST ST-TO	LLT sx		<u>Note</u> In-station handling times require improvement to meet ICAO transit times.

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INDEX No.	STATIONS	INTER- WORKING	OPER- ATION	FREQUENCIES (NOT PART OF PLAN)		REMARKS
1	2	3	4	5		6
	London Lisboa	LO-LI	RTT dx	LO <u>Transmits</u>	LI <u>Transmits</u>	cf. EUM LIT Final Plan. LONDON-MADRID-LISBON.
				3996 7525 11455	3563 8073 11640	
	Moncton Sydney Yarmouth Gander	GA-SY SY-YA YA-MO	LIT sx			Note Capacity and in-station handling times require improvement to meet ICAO transit times.
	Moncton New York		LITsx			
	Moncton Montreal		LIT sx			
2037	Paris Santa Maria	PA-SA	RTT dx	PA <u>Transmits</u>	SA <u>Transmits</u>	To be provided by diplexing the existing MET circuit
				7755 12283	6775 8174 12233	
	Gander Southern tip Greenland		RTT dx			

Improvements to AFTN

Through possible use of Southern Alternate Route

Recommendation No. 2

2.1 That the States responsible for operation of the NAT AFTN Circuits given below undertake tests with a view to possible early establishment of southern manual or automatic relay stations for use on these Trans-Atlantic circuits; and,

2.2 That ICAO be kept advised of progress in the matter in order that the information may be transmitted to all NAT States.

GANDER - SHANNON
GANDER - LONDON
NEW YORK - LONDON
NEW YORK - PARIS

Comment

It should be noted that the United States in agreement with the United Kingdom expects shortly to begin tests using San Juan as a southern relay point for the New York - London circuit. It should also be noted that at present traffic from Ireland was relayed via Santa Maria and that this routing could be tested.

It should also be noted that France is prepared to offer Dakar as a possible relay point and the Netherlands is prepared, in principle, to offer Paramaribo.

Through use of improved techniques and practices

Recommendation No. 3

2.3 That the maximum use be made of the most recent developments in the radio propagational methods and the design of radio terminal equipment to meet the operational requirements of the AFS and that both ends of a radio circuit be equipped to an equivalent standard where necessary to meet these requirements.

Comment

It is recognized that many radio circuits in the NAT Region are at present utilizing equipment of an out-of-date design and which has suffered deterioration due to prolonged use.

It is also recognized that there are new propagation techniques such as HF ground wave and VHF "beyond line-of-sight transmissions" that offer considerable possibilities and these might be further evaluated for application by the NAT States.

It was considered that important improvements could be achieved by introducing the most recent designs of transmitters, aerials and receivers.

Recommendation No. 4

2.4 That the States in the NAT Region responsible for the operation of stations terminating a radio circuit which is subject to unserviceabilities due, for example, to propagational difficulties or interference, should arrange bilaterally for the introduction of a systematic procedure whereby simultaneously steps may be most efficiently taken at the terminal stations to restore the circuit when a communication circuit failure has occurred.

Comment

Owing to the tendency for long distance radio circuits to fail simultaneously in both directions, systematic step by step procedures are required to enable intelligent and positive action to be taken at each end of a radio circuit. For example, it may be desirable under such circumstances for the two stations concerned to introduce immediately simultaneous transmission and reception both on the frequencies already in use and on the next most suitable agreed frequencies from a propagational point of view. In certain cases, for example, where special remote control techniques are employed, it may again be necessary to arrange special procedures involving the technical as well as the operating staff. In view of such variable factors, uniform procedures cannot be established for the region as a whole.

Recommendation No. 5

2.5 That States should, by careful selection and instruction of operating and supervisory personnel, assure efficiency in the handling of international aeronautical fixed service communications.

Recommendation No. 6

2.6 That States give maximum encouragement to the practising of the technical principles contained in Circular 27 - AN/24, and provide adequate quantities of this Circular at all Aeronautical Fixed Stations.

Recommendation No. 7

2.7 That States make arrangements whereby appropriate personnel at station and headquarter levels associated with the operations of the Aeronautical Fixed Service may at frequent intervals visit aeronautical stations in other States with whom they are normally in communication, in order to exchange experiences and ideas and to maintain and improve circuit efficiency.

Recommendation No. 8

2.8 That States of the NAT Region, operating an AFS or AFTN international radio circuit over a distance of 250 NM or more, complete a visual chart record of the performance on reception of these radio circuits in accordance with the general guidance instructions associated with the form given hereafter and that States operating the stations at the ends of each circuit arrange bilaterally for the mutual exchange of completed printed copies of the form at regular intervals. Should any NAT State wish to receive a copy or copies of a form concerning a circuit where none of the terminations are operated by that State, then such requests should be made to the States operating that circuit.

Form for recording circuit performancesRecommendation No. 9

2.9 That States concerned be invited to comment as soon as possible but not later than 1 February 1955 on the suggested form given hereafter with a view to its early acceptance as a standardized form. Comments should be directed, in particular, to:

- (a) dimensions of the form;
- (b) method of coding;
- (c) the scale to represent time;
- (d) the instructions for use of the form.

Note 1. Comments should take into account any specialized printing requirements; e.g. type size, type paper, etc.

Note 2. The suggested form given hereafter has been copied from a form in current use

Comment

In accordance with para. 2.4.4, Annex 10, Part III, it is intended that an interchange of the standardized circuit performance form should provide the following advantages:

- (a) an immediate visual picture of the circuit availability and analysis of the periods of unserviceability;
- (b) an immediate presentation of trends in unserviceability due to propagational disturbances;
- (c) a ready comparison in the performance of each leg of a circuit;
- (d) a ready comparison between the performance of similar circuits;
- (e) a general appraisal of the performance of the radio circuits in the NAT Region;

- (f) an exact record of the frequencies utilized and the focusing of attention on that part of the frequency spectrum where propagational difficulties are more commonly experienced;
- (g) an appreciation of the effect of interference on circuit performance;
- (h) a ready appreciation of the degree to which equipment failures are a contributory factor in circuit performance;
- (i) a ready appreciation of the operational penalties resulting from routine or special maintenance;
- (j) the form would serve detailed internal national requirements as well as provide valuable international information.

INSTRUCTIONS FOR USE OF FORM

- (a) The serviceability of the circuit should be given to the nearest 15 minutes and period in use of the frequency order in use to the nearest 30 minutes;
- (b) The printed copies of the form should be dispatched to the other States concerned within the first 14 days of the following month;
- (c) Data should be entered only for reception over the circuit concerned;
- (d) The terminals should be those given in the AFTN Plan for the NAT Region;
- (e) The term "outage" has the following meaning - "communications circuit failure".

CIRCUIT PERFORMANCES
PERFORMANCES DE CIRCUIT

Radio/Radio Teletypewriter
Téléimprimeur Radio/Radio

Month September 1954
mois septembre 1954

Circuit (Station & Place Name Abbreviation)–(Station & Place Name Abbreviation)
(Station et groupe toponymique)–(Station et groupe toponymique)

Percentage Serviceability: 94.5 %

Pourcentage de la période de fonctionnement satisfaisant **94.5 %**

Instructions for completion.
When circuit is "IN", insert figure in appropriate square indicating order of frequency (Mc/s) employed.
When circuit is "OUT" fill square according to this code.

Notes. Lorsque le circuit est "en service" indiquer dans le carré approprié l'ordre de fréquences utilisé (Mc/s). Lorsque le circuit est "hors service", remplir le carré correspondant d'après le code ci-contre.

OUTAGES
INTERRUPTIONS

Propagation failures
Mauvaise propagation



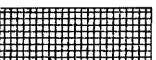
Interference
Brouillage



Equipment failures
Pannes de matériel



Planned maintenance
Entretien prévu

[illegible]

Improvements through provision of additional circuitsRecommendation No. 10

2.10 That the new circuits Southern Greenland-Gander and Southern Greenland-Reykjavik be implemented as soon as possible and that, pending the provision of these new circuits, the States concerned be urged to safeguard the requirement whereby AFTN traffic may continue to be passed over existing circuits between Narsarssuak-Goose and Narsarssuak-Reykjavik; and additionally to take immediate steps to improve, as far as practicable the speed of transmission of AFTN traffic over these circuits.

Comment

In an examination into the causes of excessive transit times over existing circuits Reykjavik-Gander, Reykjavik-Narsarssuak, Narsarssuak-Goose it was found that in the case of Reykjavik-Narsarssuak and Narsarssuak-Goose a basic cause of the difficulty stems from the necessity to use circuits established primarily to meet a requirement not directly related to international civil aviation. Under this circumstance the handling of aeronautical traffic is subject to delays when the circuits are required for their primary mission. It was therefore considered necessary to establish new circuits specifically designed to meet the international civil aviation requirement. It is of course essential that the presently used Narsarssuak-Reykjavik and Narsarssuak-Goose circuits should continue to be available for AFTN traffic until replaced by the recommended new circuits.

The circuit Reykjavik-Gander is presently required for the exchange of traffic between the FICs at these locations. Note was taken of the fact that certain improvements to this circuit which it is hoped will reduce delays, are projected. Additionally, it was considered that, after establishment of the recommended new RTT-DX circuits between Reykjavik-Southern Greenland and Southern Greenland-Gander, transit time of messages between Reykjavik-Gander via this circuit may be reduced to a point where consideration can then be given by the States concerned to deletion of the direct Reykjavik-Gander circuit.

Improvements to Existing CircuitsRecommendation No. 11

2.11 That the circuits given below be modified or otherwise improved by the States concerned, with view to improving the efficiency of operation sufficiently to ensure fulfillment of the transit time requirements established for the NAT Region.

NEW YORK - SANTA MARIA
NEW YORK - GANDER
NEW YORK - BERMUDA
SANTA MARIA - PARIS

GANDER - SHANNON
GANDER - GOOSE
NEW YORK - LONDON
GANDER - LONDON

Comment (a)

Transit times of message traffic on the circuits New York-Santa Maria, New York-Gander, New York-Bermuda, Santa Maria-Paris, Gander-Goose, Gander-Shannon, are excessive due to circuit loading and/or insufficient circuit serviceability. A requirement exists for the rapid exchange of messages between Santa Maria-Gander and Santa Maria-Bermuda which can be met by relay through New York when the efficiency of the circuits has been improved and the in-station handling time reduced at the stations mentioned. A requirement also exists for the rapid exchange of messages between Santa Maria and Paris.

(b)

Important improvements to New York-London and Gander-London circuits were made during 1954 by the provision at the London radio terminal of new high power transmitters, greatly improved aerials and a receiver of the most recent design. Prior to their full introduction into operational use the following extensive operational trials were conducted which are reported in detail in Appendix B.

Recommendation No. 12

2.12 That the AFTN LLT circuits given below be modified and improved by the State concerned, with view to the reduction of in-station handling times and to an increase of capacity sufficient to meet the transit time requirements established for the NAT Region.

(a)	(b) [*]	(c)
GANDER	GANDER	MONCTON
SYDNEY	STEPHENVILLE	MONTREAL
YARMOUTH		
MONCTON		

* This forms part of the LLT circuit Gander-Argentia-Stephenville-Torbay.

Comment

Excessive transit times have been noted in connection with message traffic handled between the locations indicated on the above circuits. It also has been noted that the circuit loading is high under normal conditions.

Additionally, circuit (a) is the alternate routing for message traffic between Gander-New York and Gander-Goose, circuit (c) is the alternate for Gander-Goose, during failure of the direct circuits resulting in excessive circuit loading during these periods.

Recommendation No. 13

2.13 That pending necessary improvements to the Reykjavik-London HF RTT circuit, the LF MAS standby circuit should continue on its present basis. The improvements which should be investigated are:

- (a) improvements in equipment and aerals at both ends of the circuits,
- (b) possible improvements to the LF circuit,
- (c) the use of other propagation methods such as VHF, MF ground wave, etc.

3. Requirements for inter-centre Communications

Recommendation No. 14

3.1 That, as a matter of urgency, States consider the methods to be employed to meet the requirements for direct fixed service RT communications between HF/RT aeronautical stations in the NAT Region, bearing in mind:

- (a) the RAC requirement for direct controller to controller communications;
- (b) improvements to the AFTN;
- (c) the use of the new communication techniques such as multiplex circuits, Selective Calling, HF ground wave transmission, etc;
- (d) the availability of frequencies.

Recommendation No. 15

3.2 That States consider the most efficient methods whereby the RAC requirements listed at page COM-31 may be met at an early date in order to establish immediate communications between area control centres and/or flight information centres. To this end States should be guided by the following appraisal and whatever estimates may be available of the type and quantity of traffic concerned.

Appraisal

3.2.1 The RAC requirement for direct speech communications between the centres noted by the letter A against the interconnections given at page ... were interpreted as requiring the establishment of speech communications between both ends of each circuit normally within 1.5 seconds. It appears that these requirements might be met by the following methods:

- 1) Exclusive cables and land lines.
- 2) Shared cables and land lines.
- 3) Exclusive radio telephone circuits.
- 4) Shared radio telephone circuits.

Exclusive Cables and Land Lines

3.2.2 This method would normally guarantee a virtual 100 percent availability of communications and the establishment of speech communication normally within 15 seconds. Over shorter distances this method may be the most desirable but might prove impracticable with respect to the longer distance paths because of extremely high costs of providing such service.

Shared Cables and Land Lines

3.2.3 The degree of sharing would clearly be limited by the traffic pattern and the traffic load. The more circuits that are shared the greater would be the complexity of the organizational arrangements governing the use of shared circuits by individual stations.*

*Note. At the present time there are no trans-Atlantic telephone cable circuits.

Exclusive Radio Telephone Circuits

Techniques:

VHF

3.2.4 Between radio line-of-sight stations VHF radio telephone would offer the advantages of availability of interference free frequencies, a high order of reliability, and a reasonably economical installation. It would also seem that new VHF propagation techniques might offer reliable service over distances of many hundreds of miles.

HF

3.2.5 Extremely reliable HF equipment is readily available, and provide an economic means for communications over great distances. In addition, numerous HF circuits already exist, the equipment of which could be used, in part, to meet the requirements. In considering the utilization of such equipment, considerable improvement in transit times would be achieved by a closer integration of AFS and APTN terminations. One hundred percent reliability of HF over many of the circuits required in the NAT Region is, however, not yet assured due to varying propagational difficulties. Should, therefore, HF/RT be used advantage should be taken of the most recent developments in transmitters, receivers, and aerial design.

MF - HF (Ground wave)

3.2.6 It is only recently that the practical advantages of this type of propagation have become generally realized. A number of NAT Regional States are in various stages of thoroughly evaluating the full advantages of this technique and there is every indication that it could be used to meet reliably the requirements for a number of circuits, over medium distances. It is, however, essential that transmissions be over a sea water path and that transmitter and receiver aerials be sited very close to the sea coast. This in certain cases would mean the provision of control cables over many miles. It is believed that this system will require relatively few frequencies.

MF/LF

3.2.7 There are varying views regarding the advantages of the use of MF/LF for radio telephone. The advantages of these frequencies would seem to vary with the propagational path concerned. The terminal installations are, however, more expensive than those for HF/VHF. In certain cases LF and MF offers the possibility of a reliable circuit when HF propagation fails, but LF frequencies might not be available.

Shared Radio Telephone Circuits

3.2.8 Fewer frequencies, transmitters, and receivers would be required for this type of operation. The degree of sharing would, however, depend upon the traffic pattern and traffic load in order to ensure that the requirements will be met. (i.e. where a number of stations are using a common family of frequencies as a part of an RT network). A number of commercial radio telephone circuits are available in the NAT Region.

Manual or automatic switching may be practical for early implementation where:

- a) sufficient frequencies are available, and
- b) where there are only three stations concerned.

The problems associated with a manual or automatic switching for more than three stations would appear to be sufficiently complex to require considerable study before implementation would be practicable.

The Requirements for Inter-Centre and Inter-Air/Ground Communication
Station Communications

3.2.9 ATS inter-area requirements are listed at page COM-31 and illustrated as shown on the plan on chart COM-32.

3.2.10 It should be noted that the circuits to meet the requirements for connecting air-ground communication stations serving area control centres and flight information centres in the NAT Region have not been specifically shown on page COM-31 or chart COM-32, since these circuits are in most cases in parallel with those shown for interconnection of ACC and FIC. In this connection it would seem to be most desirable for common circuits to be used as far as practicable. It should also be noted that relatively few of these air-ground communications stations are directly linked together at present.

3.2.11 It is noted there may be a requirement for approximately 20 radio telephone circuits. If a large number of these circuits are to be operated on network principles, it would seem to be desirable for stations to be grouped into two or more nets.

Facilities on Eastern Seaboard of North America

3.2.12 It will be noted that many of the locations on the North American Continent which are required to be connected by interphone type circuits, are located on land masses where inter-connection may readily be achieved by utilizing land-line telephone circuits and providing adequate manual or automatic switching equipment.

3.2.13 The specific locations that are interconnected by land-line telephone systems at the present time are those listed below. It is pointed out, however, that only a few of these locations are provided with adequate switching devices to meet the requirements.

Locations Interconnected by Land Line Telephone

Gander	- - - - -	New York
New York	- - - - -	Boston
New York	- - - - -	Jacksonville
New York	- - - - -	Miami
New York	- - - - -	Moncton

3.2.14 As a second consideration those existing radio telephone circuits, presently in use, which might be adaptable to meet the requirements, are listed below:

Locations Interconnected by HF Radio Telephone

Gander	- - - - -	Goose Bay
New York	- - - - -	Kindley Field (Bermuda)
* New York	- - - - -	San Juan

* It will be noted that the radiotelephone link between New York and San Juan has not yet been placed in operation.

3.2.15 It was noted that in most cases the stations located on the North American Continent which are linked together with either land line telephone or with radio telephone, would not conform to the requirements. It was felt, however, that by the provision of suitable switching equipment, where appropriate, and by providing direct telephone type links between the control centres and/or flight information centres and the air-ground communication stations serving these centres that the requirements may be met.

Facilities on the Western Seaboard of Europe

3.2.16 The following circuits already exist along the Western Seaboard of Europe.

Prestwick - Bordeaux

This interconnection is provided by the AFTN using two international relay stations.

Prestwick - Madrid

This interconnection is provided by the AFTN using two international relay stations.

Prestwick - Paris

There are AFS operational telephone landline circuits between Prestwick and Uxbridge, Uxbridge and Paris, but at present through communications are only permitted under exceptional and emergency conditions.

Prestwick - Preston

A direct AFS Operational telephone land-line circuit exists between these two stations.

Prestwick - Shannon

AFS telephone calls between these two stations may be made via Preston, Dublin and Uxbridge switchboards.

Prestwick - Uxbridge (London)

There is a direct AFS operational telephone landline circuit between these two stations.

Shannon - Bordeaux

This interconnection is provided by the AFTN using one international relay.

Shannon - Dublin

There is a direct AFS Operational telephone landline circuit between these two stations.

Shannon - Madrid

This interconnection is provided by the AFTN using one international relay.

Shannon - Paris

This interconnection is provided by an RTT AFTN circuit. Consideration might be given to utilizing the RTT equipment to serve a parallel AFS RT circuit or alternatively to utilize landline/cable circuits via the U.K.

Shannon - Uxbridge

There is a direct AFS Operational telephone landline circuit between these two stations.

Stavanger - Trondheim - Tromsø

Landline telephone circuits are projected to link these stations.

Facilities over Central North Atlantic Area

3.2.17 In the over ocean area and in Greenland cable or landline facilities do not now exist by which the requirement can be met. One or more of the techniques listed under para. 3.2.4 to 3.2.7 inclusive above could be considered for

implementation on the various circuits to meet the requirements at an early date to a degree varying with the particular circuit under consideration and the particular technique to be employed.

VHF

3.2.18 VHF might offer excellent results on many of these circuits; however, not enough is known of this technique insofar as extended coverage beyond radio line-of-sight is concerned, for its detailed application to be considered by this meeting. It is to be noted that Santa Maria - Lajes is an existing VHF link.

HF

3.2.19 It would appear that on the following circuits the use of HF would offer the more immediate solutions:

Gander - Prestwick	Santa Maria - Shannon	Thule - Narsarssuak
Gander - Shannon	Santa Maria - Sal Island	Nord - Reykjavik
Gander - Reykjavik	Santa Maria - Lisbon	Prestwick - Reykjavik
Gander - Santa Maria	Thule - Reykjavik	
New York - Santa Maria	Thule - Nord	

The limits of reliability of HF in the North Atlantic Region are well known, though in many cases, the most advanced design of transmitters, receivers and aerials are not yet in use. It would, therefore, be essential to use the most up-to-date equipment if any reasonable degree of availability is to be obtained, bearing in mind that for a given standard of equipment and technique, RT is less reliable than radioteletype in the distances involved and requires a wider bandwidth.

During the periods of non-availability of HF communications over longer distances routes, it is considered that messages might be relayed via other HF/RT centres interworking as required on a common family of frequencies.

Exclusive AFS RT circuits might also be provided by simultaneous modulation of the transmitters also used for AFTN RTT working, or by multiplexing existing AFTN circuits.

If the degree of availability of HF/RT over the longer distance routes were inadequate, the advantages of the greater reliability of RTT working could be utilized by providing a direct speech circuit from the Controller to an HF/RT operator who would simultaneously transmit directly over an exclusive AFS RTT circuit. Consideration might be given to the termination of such an RTT circuit on a teleprinter immediately in front of the receiving Controller. Whilst this and similar methods could normally be expected to meet the transit time requirements on a very high level of availability, it would, however, not meet the

requirement for direct aural reception. This technique would also appear to have the advantages of early implementation, narrow frequency band-width and the use of existing equipment (e.g. by multiplexing) and existing staff.

HF/MF Ground-Wave

3.2.20 It would appear that on the following circuits the use of MF/HF Ground-Wave technique might offer distinct advantages:

Gander	-	Narssarssuak
Goose Bay	-	Narssarssuak
Southern Greenland	-	Reykjavik
Reykjavik	-	Stavanger
Reykjavik	-	Prestwick
Reykjavik	-	Shannon

It is known that a number of North Atlantic States are engaged in a full evaluation of the advantages of this technique over varying distances and under varying conditions, at the conclusion of which the appropriateness of this technique for use over the various circuits may be more accurately determined.

Consideration might also be given to the incorporation of this technique in parallel with normal HF sky-wave propagation.

MF/LF

3.2.21 It would appear that circuits in the Polar area within the NAT Region might make use of MF/LF on regular or standby basis where frequencies are available.

Economic Factors

3.2.22 Since the requirements concern locations of an extremely varied nature, and since they may be met by a variety of methods, it is clear that installation, depreciation and running costs would vary from moderate to extremely high values. These costs would include any or all of the items listed below:

Capital costs

Transmitters
Transmitter aerials
Transmitter building
Receivers
Receiver aerials
Receiver Buildings
Power supply equipment
Standby equipment
Ancillary services and equipment
Site preparation
Installation costs

Recurring costs

Land rentals
Depreciation
Maintenance staff
Operating staff
General maintenance
Remote control cable rentals
Ancillary services.

Centres to be connected		Requirements as established by the RAC/SAR Committee *
1	2	3
Gander	Goose Bay	A
	Narsarssuak	A
	New York	A
	Prestwick	A
	Reykjavik	A
	Santa Maria	A
	Shannon	A
Kindley Field	New York	A
Narsarssuak	Goose Bay	A
	Reykjavik	A
	Thule	A
New York	Boston	A
	Jacksonville	A
	Miami	A
	Moncton	A
	Sal	B 30
	San Juan	A
	Santa Maria	A
Nord	Reykjavik	A
	Thule	A
	Tromsø	A
Prestwick	Bordeaux	B 30
	Madrid	B 30
	Paris	A
	Preston	A
	Reykjavik	A
	Santa Maria	A
	Shannon	A
	Uxbridge	A
Reykjavik	Shannon	A
	Stavanger	A
	Thule	A
	Tromsø	B 30
Santa Maria	Casablanca	B 15
	Lages	A
	Lisbon	A
	Sal	A
	Shannon	A
Shannon	Bordeaux	B 30
	Dublin	A
	Madrid	B 30
	Paris	A
	Uxbridge	A
Stavanger	Trondheim	B 30
	Tromsø	A
Tromsø	Trondheim	B 30

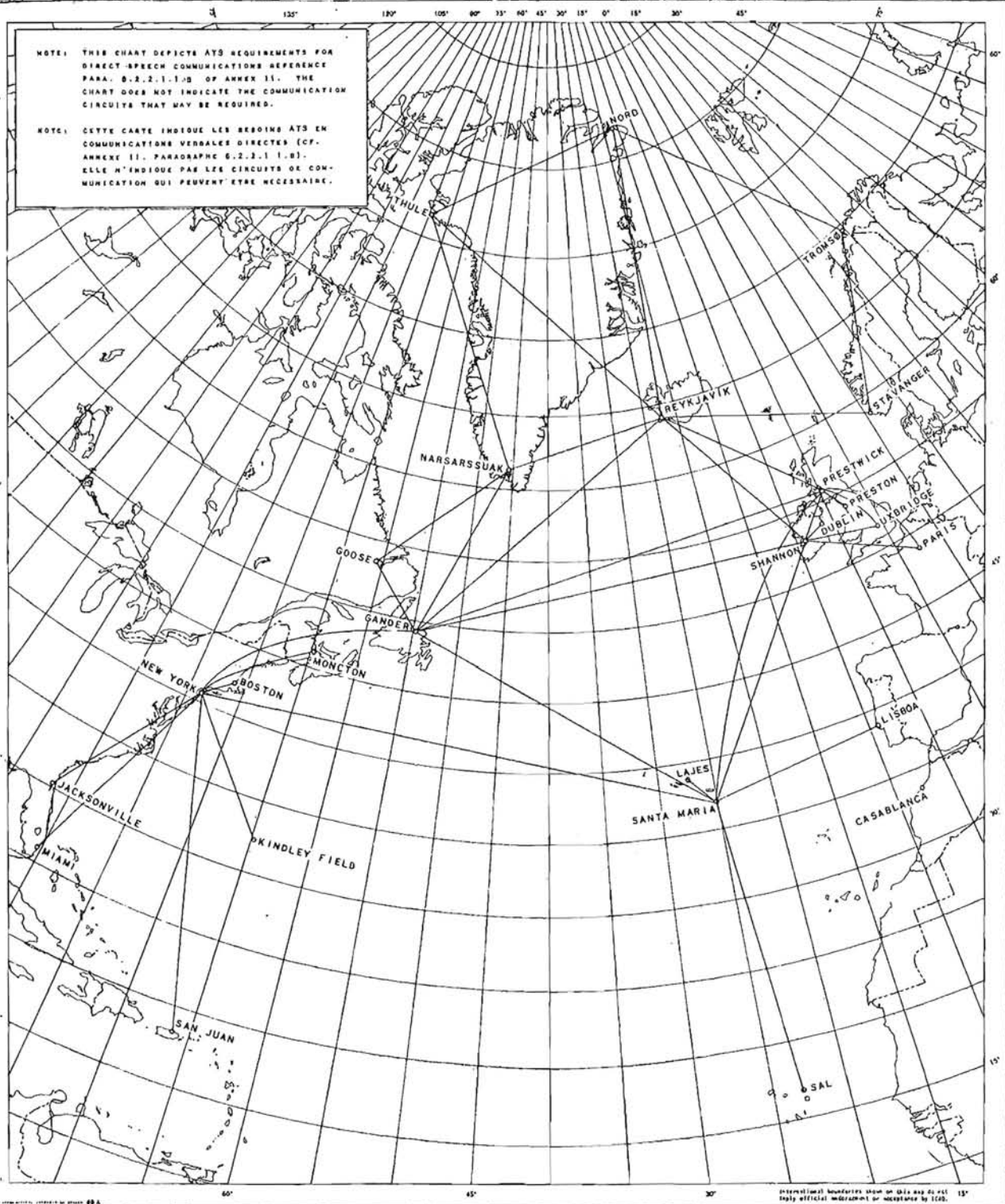
* A: Direct speech communications as from para. 6.2.2.1.1 b) of Annex 11.

B: Printed communications as from para. 6.2.2.1.1 a) of Annex 11 with a transit time of the number of minutes indicated or less.

ATS INTER-AREA COMMUNICATION REQUIREMENTS
BESOINS ATS EN COMMUNICATIONS INTER-REGIONALES

NOTE: THIS CHART DEPICTS ATS REQUIREMENTS FOR DIRECT SPEECH COMMUNICATIONS REFERRED PARA. 5.2.2.1.1-B OF ANNEX II. THE CHART DOES NOT INDICATE THE COMMUNICATION CIRCUITS THAT MAY BE REQUIRED.

NOTE: CETTE CARTE INDIQUE LES BESOINS ATS EN COMMUNICATIONS VERBALES DIRECTES (CF. ANNEXE II, PARAGRAPHE 5.2.2.1.1-B). ELLE N'INDIQUE PAS LES CIRCUITS DE COMMUNICATION QUI PEUVENT ETRE NECESSAIRES.



International boundaries shown on this map do not imply official endorsement or acceptance by ICAO.

REQUIREMENTS FOR THE EXCLUSIVE INTERCHANGE OF
AERONAUTICAL METEOROLOGICAL INFORMATION

Recommendation No. 16

4. That the circuits given below be approved as being necessary to meet the requirements for the exclusive interchange of aeronautical meteorological information.

AERONAUTICAL MET CIRCUITS

STATIONS	INTER- WORKING	OPER- ATIONS	FREQUENCIES (NOT PART OF PLAN)		REMARKS
1	2	3	4		5
Paris Santa Maria	PA-SA	RTT dx diplex	PA <u>Transmits</u>	SA <u>Transmits</u>	One channel only for MET, other channel for the AFTN
			7755 12283	6775 8174 12233	
Goose Montreal	GO-MO	RTT dx	MO <u>Transmits</u>	GO <u>Transmits</u>	
			127.2 4060 6817.5 8135 11405	146.1 3355 5380 7960 11505	
Gander Montreal	GA-MO	RTT dx	MO <u>Transmits</u>	GA <u>Transmits</u>	
			4927.5 7630 11470 13700	4990 7825 10420 13595	
Angmagssalik Frederikshavn	AN-FR	MAS		149.6 5350 7570 12105	NAT II amended

STATIONS	INTER- WORKING	OPER- ATIONS	FREQUENCIES (NOT PART OF PLAN)	REMARKS
1	2	3	4	5
New York Santa Maria	NE-SA	RTT dx diplex	<div> <div>NE</div> <div>SA</div> <div><u>Transmits</u></div> <div><u>Transmits</u></div> <div>4055</div> <div>4082</div> <div>8120</div> <div>5474</div> <div>12180</div> <div>8045</div> <div>16220</div> <div>8160</div> <div>12240</div> <div>16234</div> </div>	One channel only for MET, other channel for the AFTN
Halifax Sydney Gander		LLT		
New York Montreal		LLT (2 sx)		
New York Bermuda		RTT		

Transmission Greenland - DenmarkRecommendation No. 17

5. That the State concerned undertake engineering improvements to ensure the efficient transmission of meteorological traffic between Greenland and Denmark and make arrangements with Iceland to forward, during poor propagation periods, copies of the LF Greenland broadcast to Europe.

Designation of Communication RegionRecommendation No. 18

6. That the area in the ICAO North Atlantic Region extending north and west of the boundaries of established EUM and CAR Communication Regions to the terminals of AFTN circuits contained in the NAT regional plan in North America and Greenland be approved by the Council as the North Atlantic Communication Region and that this region be denoted by the letter B.

Comment

It should be clearly appreciated that the Communication Region proposed is intended only as a means of facilitating identification of circuits or at some future date facilitating the establishment of self routing indicators. It should be carefully distinguished from a communication area as defined in the principles for the establishment of the worldwide AFTN. In other ICAO regions, the Communication Region has generally comprised several communication areas or communication sub-areas each with its area or sub-area communication centre. At this time no communication areas or centres for the North Atlantic Communication Area are under consideration or implied in proposing a Communication Region.

SECTION 2PART IIAERONAUTICAL MOBILE TELECOMMUNICATIONS1. General1.1 Recommendation No. 19

That the plan at paragraph 3.28 of this report should be the regional plan for the Terminal Area and En-route Communications in the North Atlantic region, and should, with the exception of those parts of the plan for which separate dates of implementation are recommended, take effect on the date of approval of the report by the Council.

Comment - An explanation of the different components of the plan will be found in subsequent paragraphs of this report, together with suitable recommendations on various aspects of the Aeronautical Mobile Service and on the dates of implementation.

1.2 Recommendation No. 20

That operations on the frequencies listed in Recommendation No. 24 which do not conform to the plan in para. 3.28 should be discontinued on the date upon which the relevant part of the plan is implemented.

1.3 In considering the future development of VHF communication in the Region, it was noted that, in certain areas, the use of 100 kc/s channeling, on the basis envisaged by the Fifth Session of the COM Division for the amendment of para. 4.1.2 of Annex 10, Part II, might be necessary before the 1st January 1958, and that such use would require prior regional agreement.

1.4 Recommendation No. 21*

That, at those locations where the operational requirement cannot otherwise be met, 100 kc/s channel separation should be used prior to 1st January 1958, subject to the terms of paras. 4.1.2, 4.1.5.5 and 4.1.8.1 of Annex 10, Part II as amended by Recommendation No. 2 of the Fifth Session of the COM Division.

Comment - In making the recommendation above, it was appreciated that, though the material referred to had not yet been approved by the Council, such approval could confidently be expected.

* See Statement of the United States Delegation at Appendix A.

2. Terminal Area Communications*2.1 Recommendation No. 22

It is recommended that the primary means of communication for air traffic services in the terminal area should be VHF radiotelephony.

Comment - This recommendation was based on the Standards laid down in Annex 11, relative to the provision of air/ground communications in the terminal area.

2.2 Recommendation No. 23

It is recommended that a HF radiotelephony channel on 3023.5 kc/s should be provided on a continuous or request basis as a supplementary means of communication in the terminal area at the aerodromes against which this frequency is shown in Column 5 of the Tables in para. 3.28.

Comment - It was noted that HF radiotelephony is now provided at some international aerodromes in the Region, as an alternative to VHF radiotelephony, for terminal area functions. It was considered that these facilities should be continued in order to provide a supplementary means of communication in the terminal area in cases of airborne VHF equipment failure.

* Definitions:

1) Terminal area communications. Communications provided between aircraft and air traffic service units during the approach, aerodrome and ground movement control phases.

2) En-route communications. All communications with aircraft outside the terminal area.

3) Primary means of communication. The means of communications to be adopted normally by aircraft and ground station, under the conditions prescribed, and as a first choice where alternative means of communication exist.

4) Alternative means of communication. A means of communication provided with equal status, and in addition to the primary means.

5) Supplementary means of communication. A means of communication to be used only when unable to communicate on the primary or alternative means, especially in the event of failure of equipment.

2.3 With respect to the requirements for terminal area communications, it was considered that the provision made for these communications in agreed ICAO plans for the adjacent Air Navigation Regions, adequately covered the requirements for North Atlantic operations.

2.4 It was further considered that any amendments which might be introduced into the plans for these adjacent Regions, and which would affect the provision of facilities at North Atlantic regular and alternate international aerodromes, would be acceptable from the point of view of North Atlantic operations, provided that the needs of the NAT Region continue to be met.

3. En-Route Communications

3.1 The Meeting considered that radiotelephony should be the primary means of en-route communications but noted a continued requirement for radiotelegraphy at certain locations until operation based solely on radiotelephony is adopted by States and airline operating agencies.

3.2 It was considered that the radiotelegraphy requirement could be satisfied on one family of frequencies and the radiotelephony requirement would be met initially on two families, supplemented as soon as possible by a third family of frequencies. This third family would become available for radiotelephony when it has been withdrawn throughout the Region from its present use for radiotelegraphy service.

3.3 Recommendation No. 24*

That the frequencies available should be employed in the following manner:

Family "A" - (Radiotelegraphy)

2931	kc/s
5611.5	"
8947.5	"
13354.5	"

Family "B" - (Radiotelegraphy and, later, radiotelephony)

2987	kc/s
5671.5	"
8888	"
13284.5	"
17966.5	"

Family "C" - (Radiotelephony)

2945	kc/s
5641.5	"
8862.5	"
13264.5	"
17966.5	"

Family "D" - (Radiotelephony)

2868	kc/s
5626.5	"
8913.5	"
13324.5	"
17966.5	"

See Statement of the United States Delegation at Appendix A.

3.4 Recommendation No. 25

a) That, during the period that two families of frequencies are in use for the radiotelephony service, family "C" should be used to support operations of the principal over-ocean crossing (inner-circle operation), and family "D" primarily the outer circle but available also to the inner circle;

b) That, when the third family of frequencies (family "B") is brought into use for radiotelephony service, it should be used to support operations of the principal over-ocean crossing.

Comment - In drawing up the plan for radiotelephony operation, it was found that operations fell naturally into two categories:

- 1) Those of the principal over-ocean crossing ("inner circle" operations);
- 2) Those in the remainder of the Region ("outer circle" operations).

Stations serving operations in the inner circle are those associated with the principal Oceanic Area Control Centres, whilst the remaining stations in the Region serve the outer circle.

3.5 Recommendation No. 26

That the frequencies of Family "B" should be implemented for radiotelephony operations on 1 January, 1956.

Comment - It was noted that the transfer of family "B" from radiotelegraphy to radiotelephony operations was dependent upon the discontinuance at all locations in the Region of its use for radiotelegraphy service and that the effective date of the change should be such as to allow an adequate period of advance notice. Nevertheless, it was considered that the earliest practicable date should be selected in order to take the maximum advantage of the improvements offered.

3.6 Recommendation No. 27

That, when the two families of frequencies will be available for radiotelephony use for inner circle operations, family "B" should be used primarily for westbound flights and family "C" primarily for eastbound flights but that, however, in order that full utilization of available frequencies be achieved, the radio stations concerned should use the remaining frequencies under their control to accommodate additional traffic in the most efficient manner possible under the particular circumstances prevailing at the time.

Comment - When examining the manner in which traffic should be distributed over the two families of frequencies ultimately to be used for inner circle operations, it was concluded that one family should be used primarily for westbound flight while the other should serve primarily eastbound flight, however, since west and eastbound flights are not always evenly distributed, provision was made to assure full utilization of all available frequencies.

3.7 Recommendation No. 28

That the manner of operation and the deployment of operating staff should be such that the traffic handling capacity of a frequency family is not thereby restricted.

3.8 Recommendation No. 29

The States should keep under continuing review the use of the aeronautical fixed service for dissemination of aeronautical mobile service information to the locations at which it is required with a view to reduction of traffic on the aeronautical mobile service.

Comment - In drawing up the plan at 3.28, account was taken of the use which could be made of the AFS in providing, at certain locations, communications with aircraft in flight through an aeronautical station at another location.

3.9 The Meeting noted plans for international civil air operations from the NAT Region into the northern territory of Canada, requiring en-route communications on HF, and considered that these communications could best be carried out on the family "D" A3 frequencies extended outside the MWARA-NA on a non-interference basis, subject to clearance of these frequencies for that purpose by the States concerned.

3.10 In order to complete the en-route communication system and particularly to supplement it under conditions of poor radio propagation, the Committee considered that the maximum possible use should be made of VHF radio-telephony.

3.11 Whilst the range of VHF signals radiated isotropically using powers commonly met in the aeronautical service is substantially limited to so-called radio-line-of-sight, significant increase may be obtained by concentration of power radiated both in azimuth and elevation, and by the use of optimum siting.

3.12 The provision of stations so engineered, and integrated with the over-all en-route communication system would effect a large measure of VHF coverage over the air routes of the Region.

3.13 In addition to en-route facilities listed in 3.28, and those forming part of the EUM Regional Plan, stations at the following locations appear to offer improvement to the overall coverage:

United Kingdom

N. W. Scotland

United States

Northern Maine

3.14 Recommendation No. 30

That the greatest practicable VHF en-route communication coverage should be provided over the air routes in the Region and that in doing so States should take into account the advantages offered by the operation of this service from the HF en-route stations included in the plan.

3.15 Recommendation No. 31

That VHF en-route stations should be so engineered as to obtain the maximum practicable effective radiated power in the direction, and at the flight levels, of the air traffic pattern concerned.

3.16 It was considered that operational advantage would accrue from the use of a common VHF channel for the North Atlantic crossing, and that, subject to the recommendations of the Fourth North Atlantic Ocean Station Vessels Conference, coverage would be materially improved if this channel were guarded also by Ocean Station Vessels.

3.17 Notwithstanding this, however, the Committee believed that safety and efficiency of operations would be increased if aircraft, not otherwise engaged in communications on VHF, would guard the international emergency frequency of 121.5 Mc/s. The passing of traffic on 121.5 Mc/s should remain limited as specified in para. 4.1.3.1 of Annex 10, Part II.

3.18 Recommendation No. 32

That the frequency to be used for VHF en-route communication at stations designated for that function in the Regional Plan should be 127.9 Mc/s, except that at stations in North America and Bermuda the frequency 126.9 Mc/s will continue to be used.

Comment -- Additional frequencies required for this function in North America will be selected from 127.1, 127.3 and 127.5 Mc/s.

3.19 Recommendation No. 33*

That, to the extent that O.S.V.'s are able to guard a VHF channel in addition to 121.5 Mc/s, this channel should be 127.9 Mc/s.

* See Statement of the United Kingdom Delegation at Appendix A.

Comment - This frequency would replace 118.1 Mc/s at present carried by some O.S.V.'s.

Recommendation No. 34

That the VHF en-route facilities listed in 3.28 should be implemented not later than 1 January, 1956.

3.20 Recommendation No. 35

That aircraft, when not otherwise engaged in VHF communication, and, in addition, to the extent that they are able, should, when operating on routes over the North Atlantic, maintain communication watch on 121.5 Mc/s.

3.21 In considering other means of maintaining communication under conditions of poor radio propagation * the Committee reviewed the material contained in Part VIII of the Final Report of the Fifth Session of the Communications Division, and stressed the need for a full evaluation of any possible solution before its acceptance for application throughout the Region.

3.22 Of the items contained in Doc 7480-COM/548, the Committee considered that the use of ground wave propagation offered a prospect of rapid and relatively simple improvement of the existing service.

3.23 Recommendation No. 36

That States proceed as rapidly as possible to evaluate technically and operationally the application of HF ground wave radiotelephony transmissions.

3.24 Recommendation No. 37

That ground wave radiotelephony stations established on an operational basis should be integrated with the overall en-route communications system.

3.25 From a study of probable propagation conditions, it appeared that the most effective coverage would be obtained from stations annotated (2) in 3.28.

* Reference is also made to Recommendation No. 55. in Section 2, Part V.

3.26 It was considered that prior knowledge of impending disturbed propagation conditions might enable stations to make better use of available communications facilities. This could include making available orders of frequencies which might not otherwise be in use at the time, the adjustment of traffic load in such a manner as to assist aircraft in the affected area, etc.

3.27 Recommendation No. 38.

That States examine the application of warnings of disturbed radio propagation conditions to the maintenance of communication under such circumstances.

3.28 Regional Plan for Aeronautical Mobile CommunicationsNotes

- * To be implemented when operationally required.
- (1) The family of frequencies 2987, 5671.5, 8888 and 13284.5 kc/s, to become available for A3 operation after it is withdrawn from its present use for A1 service. (See Recommendation No. 26).
- (2) Groundwave radiators, at or associated with this location, on one or more of the frequencies 2868, 2945, 2987 kc/s, would improve communication service. (See paragraph 3.22).
- (3) In addition to its responsibility for communication to Narsarssuak, this station is also required to complete route coverage to the south and east of Greenland, and the radio station, or stations, should be so sited to meet both requirements.
- (4) A1 operation to be discontinued at the earliest feasible date subject to satisfaction of operational requirement on A3 only. (See statement of Portuguese Delegation in Appendix A of the report).
- (5) Implementation and use of one or more of the frequencies 2987, 5671.5, 8888, 13284.5, 2945, 5641.5, 8862.5, 13264.5, 17966.5 kc/s, as operationally required.
- (6) Requirement for this facility to be reviewed in the light of the ability of Mont Joli to complete communication coverage required.
- (7) These facilities, required for "polar route" operations across Northern Canada, do not form a part of the NAT Regional Plan (see Part II, paragraph 3.9).
- (8) These facilities, required for continuing A1 operation on routes from NAT Region into CAR Region - Not part of the NAT Regional Plan.
- (9) Provides VHF en-route communication by means of facilities contained in the EUM Regional Plan.
- (10) The United Kingdom will provide the greatest practicable VHF coverage for NAT operations, either by specific facilities or by the extension of those provided under the EUM Regional Plan.

- (11) O.S.V.'s will normally maintain watch on 2931 kc/s by night and 5611.5 kc/s by day. The frequency 8947.5 kc/s or 13354.5 kc/s may also be used when required. (See also Recommendation No. 33 relating to VHF guard).
- (12) Locations at which service on 121.5 mc/s is required in accordance with Annex 10, Part II, para. 4.1.3.1.
- (13) Frequencies to be selected when required in conformity with the EUM Regional Plan.
- (14) Operation of the existing air-ground facilities at Prins Christian Sund to be continued until this service can be covered by the new facilities specified under Narsarssuak.

AMC Aerodrome Surface Movement Control.

GCA Ground Controlled Approach designated approach aid frequency.

ORC Outbound Radar Control.

T Transmit.

R Receive.

STATION	TERMINAL AREA - REG. TERMINALE				EN ROUTE			REMARKS REMARQUES
	VHF (Mc/s)			HF (Kc/s)	VHF (Mc/s)	HF (Kc/s)		
	TWR	APF	OTHER FUNCTIONS AUTRES FONCTIONS			A3	A1	
1	2	3	4	5	6	7	8	9
<u>BELGIUM/BELGIQUE</u> Bruxelles/ National	118.1	124.5	119.5) 119.9) GCA	3023.5				(12)
<u>BERMUDA/BERMUDES</u> Kindley Field	118.1	119.9		3023.5	126.9	2868 5626.5 8913.5 13324.5	2931 5611.5 8947.5 13354.5	(2) (12)
<u>CANADA</u> Gander	119.1	119.7	118.1) 118.7) GCA 121.9 AMC	278T 3023.5R	126.9 127.1	2987 5671.5 8888 13284.5 2945 5641.5 8862.5 13264.5 2868 5626.5 8913.5 13324.5 17966.5*	2931 5611.5 8947.5 13354.5 2987 5671.5	(1) (2) (12)
Goose	119.1	119.7		278T 3023.5R	126.9	2868 5626.5 8913.5 13324.5*	2931 5611.5 8947.5 13354.5*	(12)
Moncton	118.3	119.7	121.9 AMC	278T 3023.5R	126.9	2868 5626.5 8913.5		(12)
Mont Joli					126.9	2868 5626.5 8913.5		
Montreal	119.1	119.7	121.9 AMC	278T 3023.5R	126.9	2868 5626.5 8913.5 13324.5*		(12)
Ottawa	118.3 119.5	118.3 119.5	121.9 AMC	278T 3023.5R				(12)

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2.- Reports and Recommendations on Facilities
2.- Rapport et recommandations sur les installations et services

1	2	3	4	5	6	7	8	9
CANADA (Cont'd) (Suite) Stephenville, Nfld.	121.5	118.1		278T 3023.5R				(12)
Sydney	119.1		121.9 AMC	278T 3023.5R	126.9			(12)
Yarmouth					126.9			
Knob Lake					126.9	2868 5626.5 8913.5		(6)
Frobisher Bay						2868 5626.5 8913.5		(7)
Fort Churchill						2868 5626.5		(7)
Winnipeg						2868 5626.5 8913.5		(7)
DENMARK/DANEMARK Aalborg	118.3	120.7		3023.5				
København/ Kastrup	118.1	119.1		3023.5	(9)	2868 5626.5 8913.5*		(12)
Narsarsuaq (3)	121.5			3023.5	127.9	2868 5626.5 8913.5 2987 2945	2931 5611.5 8947.5 13354.5*	(12) (1) (2) (2)
Nord					127.9*	2868 * 5626.5* 8913.5*		
Søndrestrøm	121.5	121.5		3023.5	127.9	2868 5626.5 8913.5		(12)
Thule					127.9*	2868 * 5626.5* 8913.5*		
Prins Christian Sund						2945 2987		(1) (14)

1	2	3	4	5	6	7	8	9
<u>FRANCE</u> Bordeaux/Mérignac	118.3	119.1		3023.5				
Marseille/ Marignane	118.1	119.1		3023.5				
Nice/Le Var	118.7	121.3		3023.5				
Paris/Le Bourget	119.1	119.7 125.5	119.5 GCA	3023.5				
Paris/Orly	118.7	121.1	119.9) 123.7) GCA	3023.5	127.9	2868 5626.5 8913.5 13324.5*	2931 5611.5 8947.5 13354.5*	(12)
Reims/Champagne	119.7	119.7						
Tours/St. Symphorien	119.7							
<u>FRENCH ANTILLES</u> <u>ANTILLES FRANCAISES</u> Fort-de-France, Martinique	118.1			3023.5			(8) 2931 5611.5 8947.5	
Pointe-à-Pitre, Guadeloupe	118.1			3023.5				
<u>GERMANY</u> <u>ALLEMAGNE</u> Bremen	118.3	126.7		3023.5				(12)
Düsseldorf	118.3	123.9	121.9 AMG	3023.5				(12)

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1	2	3	4	5	6	7	8	9
<u>PORTUGAL</u> Lajes, Azores	118.1		121.9 AMC 118.1 } GCA 126.18)	3023.5				(12)
Lisboa	118.1	119.1		3023.5	127.9	2868 5626.5 8913.5 13324.5	2931 5611.5 8947.5 13354.5	(12) (2) (4)
Santa Maria	118.1	119.1		3023.5	127.9	2945 5641.5 8862.5 13264.5* 17966.5* 2868 5626.5 8913.5 13324.5 2987 5671.5 8888 13284.5*	2931 5611.5 8947.5 13354.5	(2) (4) (12) (1)
<u>PUERTO RICO</u> San Juan/Isla Verde	118.3		121.9 AMC	3023.5				(12)
<u>SPAIN/ESPAGNE</u> Barcelona	118.1	118.5 119.1		3023.5				(12)
Madrid/Barajas	118.1	118.1		3023.5				(12)
Sevilla/San Pablo	118.1	119.1		3023.5				
<u>SWEDEN/SUEDE</u> Göteborg/ Torslanda	118.7		121.9 AMC	3023.5				(12)

1	2	3	4	5	6	7	8	9
<u>SWEDEN/SUEDE</u> (Cont'd) (Suite) Malmö/Bulltofta	118.7		121.9 AMC	3023.5				(12)
Norrköping/ Kunsängen	118.7			3023.5				(12)
Stockholm/Bromma	118.1		121.9 AMC	3023.5				(12)
Stockholm/ Hälsjö	(13)	(13)	(13)	3023.5*				
<u>SWITZERLAND/SUISSE</u>								
Genève/Cointrin	119.7	121.3	119.9 GCA	3023.5				(12)
Zürich/National Airport	118.1	118.5		3023.5				(12)
<u>UNITED KINGDOM/ ROYAUME-UNI</u> Bournemouth/Hurn	118.7	119.1		3023.5				(12)
London/Bovingdon	118.3	119.7		3023.5				(12)
London/London	118.1	124.9	121.9 AMC 125.5 ORC 119.5 GCA	3023.5				(12)

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1	2	3	4	5	6	7	8	9
<u>UNITED KINGDOM/</u> <u>ROYAUME-UNI</u> (Cont'd) (Suite) Prestwick/London								
					(10)	2945 5641.5 8862.5 13264.5 127.9	2931 5611.5 8947.5 13354.5	(2)
						2868 5626.5 8913.5 13324.5 2987 5671.5 8888 13284.5		(1)
Prestwick	118.1	124.1	119.5 GCA	3023.5				(12)
Reading/ Blackbushe	124.7	124.3		3023.5				(12)
<u>UNITED STATES/</u> <u>ETATS-UNIS</u> Baltimore/ Friendship International	118.7 119.3	118.7 119.3	121.9 AMC	281T 3023.5R	126.7			(12)
	118.1 118.3 120.5 126.5	118.1 126.5	121.7 AMC 121.9 AMC	278T 3023.5R	126.7 126.9			(12)
	120.7	120.7	121.9 AMC	278T 3023.5R	126.7			(12)
	118.1 118.7 119.5 119.9 120.7	118.1 119.5 120.7	121.7 AMC	278T 3023.5R	126.7 126.9			(12)

Part IV.- COM Committee
4ème Partie.- Comité COM

1	2	3	4	5	6	7	8	9
UNITED STATES/ ETATS-UNIS (Cont'd) (Suite)								
Cleveland/Cleveland Hopkins	118.1 118.5 119.9	118.1	121.9 AMC 118.1) 118.5)GCA 119.9)	278T 3023.5R	126.7			(12)
Detroit/Wayne- Major	121.1	121.1	121.7 AMC	245T 3023.5R	126.7 126.9			(12)
Milwaukee/Gen. Mitchell	119.1 124.9	119.1	121.9 AMC	278T 3023.5R	126.7			(12)
New York/Inter- national	118.1 119.1 121.1	118.1	121.9 AMC	239T 3023.5R	126.7 126.9	2868 5626.5 8913.5 13324.5 2945 5641.5 8862.5 13264.5 17966.5 2987 5671.5 8888 13284.5	2931 5611.5 8947.5 13354.5	(12) (2) (5)
New York/La Guardia	118.1 118.7 119.9 120.3 125.5	119.9 125.5	121.9 AMC 118.1) 118.7) 119.9)GCA 120.3) 125.5)	362T 3023.5R	126.7 126.9			(12)
Philadelphia/ International	118.1 118.5	118.1	121.7 AMC 121.9 AMC	278T 3023.5R	126.7			(12)

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1	2	3	4	5	6	7	8	
<u>UNITED STATES</u> <u>ETATS-UNIS</u> (Cont'd) (Suite)								
Pittsburg Greater Pitts- burg	118.7 119.3 121.1	118.7	121.9 AMC	396T 3023.5R	126.7			(12)
Washington/ National	118.1 118.3 119.1 120.7 126.5	118.1 118.3 126.5	121.9 AMC 118.1) 118.3) GCA 119.1) 120.7)	278T 3023.5R	126.7			(12)
Ocean Station Vessels Navires-stations océaniques (A,B,C,D,E,I,J, K,M)					127.9 121.5	3023.5	2931 5611.5 8947.5* 13354.5*	(11)
<u>BRITISH GUIANA</u> <u>GUYANE ANGLAISE</u> Georgetown/ Atkinson Field							2931 5611.5 8947.5	(8)
<u>FRENCH GUIANA</u> <u>GUYANE FRANÇAISE</u> Cayenne/ Rochambeau							2931 5611.5 8947.5	(8)
<u>BRITISH WEST INDIES</u> <u>ANTILLES BRITANNIQUES</u> Port of Spain/ Piarco Trinidad							2931 5611.5	(8)
<u>CUBA</u> Habana/Rancho Royeros							2931 5611.5	(8)
<u>SURINAM</u> Paramaribo/ Zandery							2931 5611.5 8947.5	(8)

SECTION 2Part III. Radio Navigation Aids1. Long distance radionavigation aids1.1 Introduction

1.1.1 The stations listed in paragraph 2 when sited and oriented as indicated therein will, in general, provide a fixing service satisfying the criterion of an accuracy of better than 20 NM for 95% of the time within the whole of the area defined below.

1.1.2 The area is generally defined by a line connecting the following locations in the order shown:

Goose Bay: Labrador
Keflavik: Iceland
Stavanger: Norway
Sevilla: Spain

Portugal: Azores
Nantucket: United States
Goose Bay: Labrador

1.1.3 It is assumed that the radiated power of all stations will be adequate to provide accurate position line information up to distances of 1000 NM from the station of origin. It is important to note, however, that any appreciable increase in radiated power, whilst materially extending the area of position line cover, will also produce a significant improvement in the quality of the fixing service in the most heavily travelled areas.

2. Recommendations on CONSOL and LORAN2.1 Recommendation No. 39

That existing CONSOL and LORAN stations should be continued in operation.

2.2 Recommendation No. 40*

That CONSOL stations be installed in the following areas with the orientation given:

Note 1: Orientation is given in degrees from true north.

Note 2: In general, small changes of orientation will not materially affect the plan. However, this does not apply to the Santa Maria station, the orientation of which is somewhat critical. The orientation chosen, was based upon a desire to provide progress information on the heavily travelled Europe to Newfoundland route north of the Azores whilst providing position line information along the routes from the Azores to Martinique, Curacao, Newfoundland, France and England.

* See Statement of Canadian Delegation at Appendix A

Canada: Labrador

Location: The operational requirement would be adequately met by any coastal location between the north side of Hamilton Inlet and the immediate vicinity of Mount Benedict. It was noted that one of the more important functions of this station will be to serve the important FIR Control Points between and including Capelin and Perch, and for this purpose the most easterly location is desirable.

Orientation: Normal 090° : Base line 180/0°

Canada: Newfoundland

Location: Whilst Cape Spear is the preferred location, the operational requirement would be met by any location on the eastern coast of the Avalon Peninsula, between the limits of Cape St. Francis and Cape Race.

Orientation: Normal 050° : Base line 140/320°

United States of America

Locations: Nantucket and Atlantic City (2 stations)

It was considered within the limits of available information, that the locations and orientation of these stations were such as to permit integration in the plan, but that there was little point in extensive discussion since it was understood that the stations were already planned, and that the planning was based on certain considerations which were outside the terms of reference of the Group. It was noted, however, that whilst Nantucket Island provided a satisfactory location, Atlantic City was not the most favourable since the area of fixing service provided by pairing with Nantucket will be less than with a station at Cape Hatteras.

With reference to Recommendation No. 41 hereunder, the keying characteristics of these stations conform to the recommendations of the Fifth Session of the COM Division. Specifically, a keying cycle of 75 seconds duration will be employed incorporating two 30-second navigational information sequences, one 7-1/2-second identification sequence, and three silent periods of 2-1/2-seconds each.

Orientation: Nantucket: Normal 100° : Base line 010/190°
Atlantic City: Normal 110° : Base line 200/020°

Portugal : AzoresLocation: Santa Maria

The most favourable location appears to be north of the Airport on the Island of Santa Maria.

Orientation: Normal 015° : Base line $105/285^{\circ}$

Iceland

Location: Operationally any coastal location in the area around Eyrarbakki would be acceptable.

Orientation: Normal 180° : Base line $090/270^{\circ}$

Denmark : GreenlandLocation: Nanortalik or Simiutak

From information available it appeared that Nanortalik might offer a feasible location. Prins Christians Sund was considered but it appeared that siting a CONSOL station at this location would be impracticable. Nanortalik offered the advantages of an existing settlement, relatively easy access by regularly available shipping and virtually year round accessibility by ship. If Nanortalik or some area in the vicinity of this location should not prove to be practicable, Simiutak, where an NDB is presently in operation may offer an alternative which would likely meet the operational requirements.

Orientation: Normal 180° : Base line $090/270^{\circ}$

2.3 Recommendation No. 41

That the keying characteristics of the CONSOL installations recommended above shall comply with the recommendations of the 5th Session of the COM Division (Doc 7480-COM/548, Section IV, Page IV-9).

Note. In connection with the Note in paragraph 3.8.3, Part IV of Doc 7480-COM/548, the Committee was of the opinion that in addition to adherence to those keying characteristics prescribed by the recommendations of the 5th Session of the COM Division standardization of the entire cycle (that is the sequence, periodicity, and duration of each element of the cycle) was desirable in order to facilitate the design of automatic counters.

2.4 Recommendation No. 42

That the following improvements be made to the existing CONSOL stations at:

Sevilla: Spain
Lugo : Spain

- (a) That the keying cycle should be made to conform with the recommendations of the Fifth Session of the Communications Division (Doc 7480-COM/548 - Page IV-9).
- (b) That steps should be made to increase the reliability of operation and effective range in order to meet the requirement indicated in paragraph 1, page 57.
- (c) That consideration should be given to a reorientation of the station at Lugo so as to change the present orientation of normal 268.5°: base line 178.5/358.5°: to normal 045/225°: base line 135/315°.

Comment: The present orientation of the station at Lugo is not such as to provide coverage in certain important areas. If the orientation were changed as proposed, Lugo would provide valuable coverage to the north and over the Azores route. Furthermore, the unusable sector would fall in an area to the west of Lugo already adequately covered.

2.5 Consol Technical Advisory Panel

2.5.1 The Committee realized that when detailed siting and installation planning commenced, variations in location and orientation might arise, which would require adjustment to the plans for other installations in order to continue to satisfy fixing coverage requirement. It was considered that readjustment of the overall plan could best be done by a technical coordinating group made up of representatives from the States operating CONSOL installations together with IATA. It was further considered that such a group could also usefully interchange information on CONSOL in accordance with Recommendation No. 16 of the 5th Session of the Communications Division.

2.5.2 Recommendation No. 43

That the Air Navigation Commission consider the formation of a CONSOL Technical Advisory Panel having the terms of reference and constitution shown hereunder.

Constitution

One representative from each State operating or proposing to operate CONSOL stations in the North Atlantic region, together with representation from IATA.

Terms of Reference

To review the North Atlantic CONSOL Plan prepared by the III NAT RAN Meeting, 1954, as required by problems in the location and siting arising during detailed planning of projected installations.

To exchange technical information on the operation, installation and maintenance of CONSOL stations.

Comment: It was envisaged that the Panel would be convened when agreed by a majority of States concerned and by the Council of ICAO, and that normally action to convene the panel would be initiated by the Air Navigation Commission or by a request from States concerned.

3. Dual Station in Newfoundland

3.1 It was agreed that a dual station in the vicinity of Cape Race could not possibly be regarded as a substitute for the pair Cape Race - Goose Bay, for the following reasons:

- 1) Whilst a dual station is actually a pair on one site, such a pair cannot provide fixing service.
- 2) If no station were provided in Labrador, there would be a serious gap in the fixing cover between Greenland and Newfoundland. Furthermore, the value of the system as a means of defining the entry points to the Maritimes would be seriously reduced.

4. Frequencies

4.1 It was considered that no useful statement could be made on frequency allocations for the stations in the plan, other than to point to the desirability of using, so far as practicable, frequencies from the lower part of the band allocated for the purpose. It was considered that appropriate frequencies can be finally determined only after a local study of the frequency position in respect of each location.

4.2 Frequencies should be selected from the bands available under the ITU Radio Regulations (Atlantic City 1947), preferably between 200 and 285 kc/s, in the appropriate ITU Region and coordinated through the application of Article 11 of the ITU Radio Regulations.

5. Frequency Protection

5.1 It was considered that no useful statement could be made in respect to frequency protection; it being known that States are actively working on this matter in the entire field of communications and radio navigation aids. Furthermore, there would appear to be considerable difficulty in reconciling protection requirements based upon equipment considerations with the realities of the existing M/F frequency situation.

6. NDB operation on board Ocean Station Vessels

6.1 The Committee noted that trials run as a result of Recommendation No. 4 of the Fourth NAOS Conference have failed to show that beacon transmission seriously reduces the effectiveness of the Ocean Station Vessel as a communications station. Shielding, bonding and filtering can minimize interference caused by the NDB to other services aboard the ship.

6.2 Recommendation No. 44

That the Ocean Station Vessels should provide a cyclic NDB service consisting of 5 minutes on and 10 minutes off starting 5 minutes after the hour except that at stations K and M the NDB service may be provided only on a request basis. Where a cyclic NDB is provided this service should be supplemented by "on request" operation. The duration of the "on request" period should be specified by the pilot, and this period should be the shortest time that is consistent with the requirements of air navigation.

7. Facilities which can provide service to aircraft navigating on polar routes but which are not included in the NAT Radionavigation Plan

7.1 The following facilities, not included in the North Atlantic Regional Radio Navigation Plan can provide service to aircraft navigating on polar routes.

<u>Location</u>	<u>Aid</u>	<u>Function</u>	<u>Status</u>	<u>Frequency</u>	<u>Remarks</u>
Winnipeg	ILS	AL	E	109.9	
	ILS	AL	E	109.5	
	L	AL	E	201	
	L	AL	E	215	
	RNG	AL/SD	E	248	
Frobisher	RNG	SD/AL	E	263	
	L	AL	E	520	
Churchill	RNG	AL/SD	E	236	

8. NAT Regional Plan for Radionavigation Aids8.1 Recommendation No. 45

That the Council approve the plan set forth in the tabulation in Paragraph 10, which comprises the radionavigational aids plan for the North Atlantic region and which supersedes all earlier plans for radionavigation aids in the region.

8.2 Implementation dates8.2.1 Recommendation No. 46*

That the new radionavigation aids or changes to existing aids proposed in the radionavigation aids plan under Recommendation No. 45 should be implemented as soon as practicable and that States concerned inform ICAO by 1st May 1955 of the implementation program they intend to follow.

9. Aerodrome Surface Movement Radar

9.1 The Committee considered that development of non-visual aids to aerodrome surface movement control was not yet sufficiently mature to permit inclusion of such aids in the radionavigation aid plan, and made the following recommendation in view of the requirement stated by the RAC Committee.

9.1.1 Recommendation No. 47

That States concerned give consideration to the provision of aerodrome surface movement radar at the following aerodromes: Gander, London Airport, New York International and Orly.

10. Details of NAT Radionavigation Plan10.1 Explanation of Abbreviations

SD:	Short Range Aid (250 NM or less)
LD:	Long Range Aid (more than 250 NM)
AL:	Aid to Approach and Landing
NDB:	Non-directional Radiobeacon
VDF:	Very High Frequency D/F
RNG:	Radio Range (LF/MF)
L:	Locator
TAR:	Terminal Area Radar
ASR:	Airport Surveillance Radar
GCA:	Ground Control Approach Radar

* See Statement of Spanish Delegation at Appendix A.

PAR:	Precision Approach Radar
VOR:	VHF Omnidirectional Radio Range
E:	Existing Facility
R:	Required Facility
P:	Facility projected by the State concerned
Z:	Z marker
P1:	First priority
P2:	Second priority

10.2 Notes (see last column of Tables)

- Note 1. Locator beacon to be located on extended centre line of Runway 07 to permit back course letdown.
- Note 2. Installation of an ILS on Runway 14 is technically impracticable. PAR to be installed to serve runways 14 and 32.
- Note 3. Locate with ILS.
- Note 4. The facility to be associated with the PAR on Runway 14 in the position normally associated with an ILS outer marker.
- Note 5. Z marker is required at the site of the NDB.
- Note 6. A locator on the extended centre line of runway to be considered when new runway completed.
- Note 7. In view of the special weather conditions at Keflavik and Santa Maria reliable functioning of the ILS is required.
- Note 8. Three VOR are installed in the area of Paris. The VORs are currently under test.
- Note 9. The VOR site may be shifted from Jeløy to suit the new coverage plan now under consideration.
- Note 10. Portugal stated that the requirement for a long distance aid at Santa Maria may be met by the relocation and conversion of this NDB to CONSOL.
- Note 11. ITU Region 1 plan calls for 265 kc/s; this frequency cannot be used due to harmful interference from Bushmills CONSOL station on 266 kc/s.

- Note 12. Existing long distance NDB. If this facility is relocated and converted to CONSOL (see Note 10), a locator is required at the site of the middle marker.
the Report of the
- Note 13. Reference should be made to para. 1.2.1.2 of Dec 7531 NAT III/RAC/SAR.
Committee (Part V of this document)
- Note 14. Reliable functioning of ILS on Runway 13 is required.
- Note 15. Additional ILS required on Runway 22 or 25 left.
- Note 16. ILS to be brought into conformity with Annex 10.
- Note 17. Goose Bay is a military airport and is available to the civil operators in its existing state. Canada is unable to accept responsibility for the installation of additional facilities.
- Note 18. See the reservation of the Canadian Delegation with respect to this facility.
- Note 19. Can be used for approach and landing.
- Note 20. Facility currently under test.
- Note 21. The LF/MF facilities form part of the European airways system, the United Kingdom section of which is now under review. Consequently the position, frequency and coverage may be changed to conform to any agreed revision.
- Note 22. For details of location and orientation of new CONSOL stations see Recommendation No. 40.
- Note 23. For modification required to these CONSOL stations see Recommendation No. 42.
- Note 24. See the statement of Canadian delegation with respect to this facility.
- Note 25. The coverage specified is the required operational coverage.
- Note 26. Frequencies selected nationally under the provisions of paragraph 88 of the Radio Regulations, ITU, Atlantic City.
- Note 27. Reference should be made to para. 1.2.1.3 of Dec 7531 NAT III/RAC/SAR
-the Report of the Committee (Part V of this doc.)
- 10.3 Tabulation of Radio Navigation Facilities

The following tabulation comprises all radio navigation facilities recommended as comprising the NAT Radio Navigation Aid Plan.

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COUNTRY & STATION PAYS & STATION	AID AIDE	FUNCTION FONCTION	STATUS STATUT	FREQUENCY FRÉQUENCE	NDB COVERAGE COUVERTURE NDB	REMARKS REMARQUES
<u>BELGIUM - BELGIQUE</u>						
Bruxelles	VDF	SD	E	118.1 124.5		
	VDF	SD	E	124.5 121.5		
	L	AL	E	293		
	L	AL	E	308		
	L	AL	E	318-548		
	ILS	AL	E	110.3		
	GCA	AL	E			
	NDB	SD	E	299 393		
	RNG	SD/AL	E	254		
	VOR	SD	E	114.5		
	L	AL	R	-----		Pl: Note 1
Coxysde	NDB	SD	E	326		
Dender	NDB	SD	E	520		
Beauvechain	NDB	SD	E	341.5		
Barvaux	NDB	SD	E	250		
Anvers	NDB	SD	E	355		
Kleine-Brogel	NDB	SD	E	448.5		
Machelen	NDB	SD	E	224		
<u>CANADA</u>						
Gander	ILS	AL	E	109.9		
	ILS	AL	R			Pl: Note 2
	L	AL	E	266		
	L	AL	E	201		
	L	AL	R			Pl: Note 4
	GCA	AL	E			
	TAR	SURV.	R			
	VOR	SD	R			Pl
	RNG	SD/AL	E	236		
	NDB	LD	E	168		
Goose	ILS	AL	R			Note 17
	L	AL	R			Note 17
	L	AL	R			Note 17
	VOR	SD	R			Pl 27
	RNG	SD/AL	E	257		
Montreal	ILS	AL	E	109.9		
	ILS	AL	E	109.5		
	L	AL	E	201		
	L	AL	E	239		
	VOR	SD	R			Pl.
	RNG	SD/AL	E	248		

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COUNTRY & STATION PAYS & STATION	AID AIDE	FUNCTION FONCTION	STATUS STATUT	FREQUENCY FRÉQUENCE	NDB COVERAGE COUVERTURE NDB	REMARKS REMARQUES
<u>CANADA</u> (Cont'd) (suite)						
Sydney	ILS ILS L L VOR RNG	AL AL AL AL SD SD/AL	E E E E R E	109.5 110.3 201 219 269		P2 27
Moncton	ILS L VOR RNG	AL AL SD SD/AL	E E R E	109.5 332 224		P2 27
Ottawa	ILS L VOR RNG	AL AL AL/SD SD	E E R E	109.5 344 		
Belle Isle	VOR	SD	R	236		P1 13
Lake Eon	VOR	SD	R			P2 27
Wesleyville	NDB	SD	P		150	Note 25
Knob Lake	NDB	LD	R	250		Note 18
Yarmouth	RNG VOR	SD/AL SD	E R	206		P2 27
Dartmouth	RNG VOR	SD/AL SD	E R	254		P2 27
Copper Lake	RNG	SD	E	233		
Stephenville	RNG	SD/AL	E	390		
Buchans	RNG	SD	E	209		
Grey River	VOR	SD	R			P2 27
Fredericton	RNG VOR	SD SD	E R	326		P2 27
St. John's	RNG VOR CONSOL	SD SD LD	E R R	260		P1; Note 13 P1; Note 24 & 22
Argentia	RNG	SD	E	323		

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COUNTRY & STATION PAYS & STATION	AID AIDE	FUNCTION FONCTION	STATUS STATUT	FREQUENCY FRÉQUENCE	NDB COVERAGE COUVERTURE NDB	REMARKS REMARQUES
<u>CANADA</u> (Cont'd) (suite)						
Megantic	RNG VOR	SD SD	E R	362		P2 27
St. John	RNG	SD	E	212		
Charlottetown	RNG VOR	SD SD	E R	347		P2 27
St. Andrews	RNG	SD	E	242		
Quebec	RNG	SD	E	230		
Mont Joli	RNG VOR	SD SD	E R	338		P2 27
Seven Islands	RNG VOR	SD SD	E R	251		P2 27
Cape Harrison	RNG CONSOL	SD LD	E R	344		P1: Note 22 & 24
Battle Harbour (LAB)	LORAN	LD	E			IL4(S) IL3(S)
Bonavista (NFL)	LORAN	LD	E			IL3(M)
Port aux Basques (NFL)	LORAN	LD	E			IH1(S)
Deeming (N.S.)	LORAN	LD	E			IHL(M) IH2(M)
Baccaro (N.S.)	LORAN	LD	E			IH2(S) IH3(S)
<u>DENMARK - DANEMARK</u>						
Billum	NDB VOR	SD SD	E R	355		P2
Hanstholm	NDB VOR	SD SD	E R	361.5		P2
København	RNG NDB VOR ILS	SD/AL SD/AL SD AL	E E R E	267.5 383 108.3		P1
(Nordre Røse)	L	AL	E	398		
(Bella)	L ILS L VDF	AL AL AL SD	E E E E	320 109.9 398 119.1 120.3		

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COUNTRY & STATION PAYS & STATION	AID AIDE	FUNCTION FONCTION	STATUS STATUT	FREQUENCY FRÉQUENCE	NDB COVERAGE COUVERTURE NDB	REMARKS REMARQUES
<u>DENMARK</u> (Cont'd) - <u>DANEMARK</u> (suite)						
(Jernen)	NDB	SD	E	369		
(Roskilde)	NDB	SD	E	316		
Rødbyhavn	NDB	SD	E	328		
Aalborg	NDB VDF	SD/AL SD	E E	325 120.7		
Als	NDB	SD	E	323		
Saltholm Flak	NDB	SD	E	391		
Skuvanes	LORAN	LD	E			IL5(M) IL6(M)
<u>(GREENLAND)</u> <u>(GROENLAND)</u>						
Søndrestrøm Fjord	NDB NDB	AL AL	E E	290 382		
Angmagssalik	NDB	SD	P			
Prins Christian- sund	NDB	LD	E	398	250	Note 25
Nanortalik	CONSOL	LD	R			Pl: Note 22
Simiutak	RNG	SD	E	359		
Narssarssuak	NDB Z	SD AL	E E	279		Note 5
Fredericksdahl	LORAN	LD	E			IL4(M)
<u>FRANCE</u>						
Paris/Orly	ILS ILS L L GCA RNG	AL AL AL/SD AL/SD AL SD/AL	E E E E E E	109.5 108.3 328 348 364.5		
Paris/Le Bourget	ILS ILS GCA L L	AL AL AL AL/SD AL/SD	E E E E E	109.9 110.3 356 265		
Paris (area)(région)	VOR	SD	R			Pl: Note 8
Paris - Est	NDB	SD	E	413		
Paris - Nord	NDB	SD	E	377		
Paris - Ouest	NDB	SD	E	396		

COUNTRY & STATION PAYS & STATION	AID AIDE	FUNCTION FONCTION	STATUS STATUT	FREQUENCY FRÉQUENCE	NDB COVERAGE COUVERTURE NDB	REMARKS REMARQUES
FRANCE (Cont'd - suite) Bordeaux	ILS L VOR NDB	AL AL SD SD	E E R E	110.3 361 393		P2
Marseille	ILS RNG	AL SD/AL	E E	110.3 383		
Abbeville	NDB	SD	E	387		
Cherbourg	NDB	SD	E	373		
Amblainville	NDB	SD	E	408.5		
Pope	NDB	SD	E	370		
Bray	RNG	SD	E	277		
Dieppe	NDB	SD	E	351		
Dijon	RNG	SD	E	381		
St. Saulge	NDB	SD	E	417		
Moulins	RNG	SD	E	324		
Lyon	NDB NDB RNG	SD SD SD	E E E	404 388 374		
Nice	VDF L	SD AL	E E	119.9 338		Note 19
Reims	VDF NDB	SD SD/AL	E E	119.7 430		
Tours	VDF	SD	E	119.7		
Ploneis	CONSOL	LD	E	257		
<u>FRENCH ANTILLES</u> <u>ANTILLES FRANCAISES</u>						
Fort de France	NDB NDB	SD SD	E E	281 314		
Pointe à Pitre	NDB	SD	E	302		
<u>GERMANY - ALLEMAGNE</u>						
Bremen	ILS L L NDB	AL AL AL SD	E E E E	109.5 390.5 347 390.5		

COUNTRY & STATION PAYS & STATION	AID AIDE	FUNCTION FONCTION	STATUS STATUT	FREQUENCY FRÉQUENCE	NDB COVERAGE COUVERTURE NDB	REMARKS REMARQUES
<u>GERMANY</u> (Cont'd) - <u>ALLEMAGNE</u> (suite)						
Frankfurt	ILS	AL	E	109.5		
	L	AL	E	392		
	VDF	SD	E	118.7		
				121.5		
	GCA	AL	E			
	VOR	SD	E	112.1		
Dusseldorf	RNG	SD	E	349		
	ILS	AL	E	109.9		
	L	AL	E	323		
	VDF	SD	E	118.1		
				121.5		
	VOR	SD	E	113.7		
Hamburg	NDB	SD/AL	E	311		
	ILS	AL	E	109.9		
	L	AL	E	343		
	L	AL	E	343		
	VDF	SD	E	118.1		
				119.7		
München	VOR	SD	E	113.1		
	NDB	SD/AL	E	365		
	ILS	AL	E	109.5		
	L	AL	E	364		
	L	AL	E	331		
Hannover	ILS	AL	E	110.1		
	L	AL	E	395		
	L	AL	E	320		
Bitburg	NDB	SD	E	220		
Bretzenheim	NDB	SD	E	338		
Bruggen	NDB	SD	E	357		
Germinghausen	NDB	SD	E	258		
Michaelsdorf	NDB	SD	E	338		
Oldenburg	NDB	SD	E	207		
Helgoland	NDB	SD	E	397.2		
Metro	NDB	SD	E	289		
Offenbach	NDB	SD	E	297		
Modau	NDB	SD	E	310		
Marxheim	NDB	SD	E	320		
Bochum	NDB	SD	E	366.5		

COUNTRY & STATION PAYS & STATION	AID AIDE	FUNCTION FONCTION	STATUS STATUT	FREQUENCY FRÉQUENCE	NDB COUVERTURE NDB	REMARKS REMARQUES
<u>ICELAND - ISLANDE</u>						
Keflavik	ILS	AL	E	109.5		P1: Note 7
	L	AL	E	339		
	L	AL	E	325		
	VOR	SD	E	114.0		P1: Note 20
	NDB	LR	E	392		
	RNG	SD	E	310.5		
	VDF	SD	E			
				118.1		
				119.1		
				121.5		
Reykjavik	RNG	SD	E	355		
	L	AL/SD	E	303.4		
Eyrarbakki	CONSOL	LD	R			P1: Note 22
Vestmannaeyjar	NDB	SD	E	375		
Saudarkrokur	NDB	SD	E	344		
	NDB	SD/AL	E	379		
	NDB	SD/AL	E	360		
Vik	LORAN	LD	E			IL5(S)
<u>IRELAND - IRLANDE</u>						
Shannon	ILS	AL	E	110.3		
	L	AL	E	339		
	L	AL	E	316		
	GCA	AL	E			
	VOR	SD	R			P1
	NDB	SD	E	387		
	RNG	SD	E	352		
Dublin	ILS	AL	E	110.3		
	L	AL	E	362		
	L	AL	E	343		
	VOR	SD	R			P2
	NDB	SD	E	326		
<u>NETHERLANDS</u> <u>PAYS-BAS</u>						
Amsterdam (Schiphol)	ILS	AL	E	110.3		
	ILS	AL	E	109.5		
(Halfweg)	L	AL	E	364		
	L	AL	E	388.5		
	L	AL	E	395		
(Buiksloot)	L	AL	E	369		
	GCA	AL	E			
	VDF	SD	E	125.5		
				121.5		

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COUNTRY & STATION PAYS & STATION	AID AIDE	FUNCTION FONCTION	STATUS STATUT	FREQUENCY FRÉQUENCE	NDB COVERAGE COUVERTURE NDB	REMARKS REMARQUES
<u>NETHERLANDS (Cont'd)</u> <u>PAYS-BAS (suite)</u>						
Amsterdam (Schiphol)	TAR	SURV	E			
Spijkerboor	NDB	SD	E	381		
	VOR	SD	E	113.3		
Groningen (Eelde)	ILS	AL	P	109.9		
	VOR	SD	E	112.4		
	NDB	SD/AL	E	374		
	L	AL	E	342		
	VDF	SD	P	121.5		
	VDF	SD	P	119.7		
IJmuiden	NDB	SD	E	279		
Enkhuizen	NDB	SD	E	316.5		
Harderwijk	NDB	SD		326		
Winterswijk	NDB	SD		386		
<u>NORWAY - NORVEGE</u>						
Oslo/Fornebu	ILS	AL	E	110.3		
	L	AL	E	279		
	L	AL	E	387		
	VDF	SD	E	119.7		
(Grønnsand)	NDB	SD	E	358		
Oslo/Gardermoen	L	AL	E	259		
(Kjeller)	NDB	SD	E	375		
	RNG	SD	E	352		
Stavanger	ILS	AL	E	110.3		
	L	AL/SD	E	352		
	L	AL/SD	E	375		
	VDF	SD	E	119.7		
	CONSOL	LD	E	319		
Bodø	ILS	AL	E	110.3		
	L	AL	E	352		
(Fleinvær)	NDB	SD	E	374		
Jeløy	VOR	SD	R			P2: Note 9
	NDB	SD	E	381		
Kjevik	VOR	SD	R			P2
(Flekkerøy)	NDB	SD/AL	E	372		
Bardufoss	NDB	SD	E	378		

COUNTRY & STATION PAYS & STATION	AID AIDE	FUNCTION FONCTION	STATUS STATUT	FREQUENCY FRÉQUENCE	NDB COVERAGE COUVERTURE NDB	REMARKS REMARQUES
NORWAY (Cont'd) - NORVEGE (suite)						
Herdla	NDB	SD	E	391		
Maudal	NDB	SD	E	277		
Ulefoss	NDB	SD	E	366		
Kragerø	NDB	SD	E	341		
Lista	NDB	SD	E	385		
Øymark	NDB	SD	E	363.5		
<u>PORTUGAL</u>						
Lisboa	ILS	AL	E	109.5		
	L	AL	E	207		
	L	AL	E	224		
	TAR	SURV.	R			
	VOR	SD	R			Pl
	VDF	SD	E	119.1		
	NDB	SD	E	262		
	RNG	SD/AL	E	382		
	NDB	LD	E	355		
Coruche	NDB	SD	E	389		
Portalegre	NDB	SD	E	364		
Porto	NDB	SD	E	327		
Santa Maria	ILS	AL	E	110.3		Pl: Note 7
	L	AL	E	323		Note 12
	VDF	SD	E	119.1		
	VOR	SD	R			Pl
	NDB	LD	E	323		Note 10
	RNG	SD/AL	E	240		Note 11
	CONSOL	LD	R			Note 22, Note 10
						Pl
Lajes	ILS	AL	E	108.3		
	GCA	AL	E			
	L	AL/SD	E	273		
	VDF	SD	E	118.1 121.5		
	RNG	SD/AL	E	341		
Flores	NDB	SD	E	308		
Santana	NDB	SD	E	376		
<u>SPAIN - ESPAGNE</u>						
Madrid	ILS	AL	E	109.9		Pl: Note 16
	L	AL	E	390		
	L	AL	E	375		

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COUNTRY & STATION PAYS & STATION	AID AIDE	FUNCTION FONCTION	STATUS STATUT	FREQUENCY FRÉQUENCE	NDB COVERAGE COUVERTURE NDB	REMARKS REMARQUES
<u>SPAIN (Cont'd)</u> <u>ESPAGNE (suite)</u>						
Madrid (cont'd)	VDF	SD	E	118.1		
	RNG	SD	E	278		
	VOR	SD	R			P1
Barcelona	ILS	AL	R			P1
	L	AL/SD	E	325		
	VDF	SD	E	119.7		
	VOR	SD	R			
	RNG	SD	E	262		P2
Sevilla	ILS	AL	R			P1
	L	AL	R			Note 3
	CONSOL	LD	E	315		P1: Note 23
Horche	NDB	SD	E	362		
Somosierra	NDB	SD	E	350		
Caceres	NDB	SD	E	380		
Lominchar	NDB	SD	E	385		
Vicalvara	NDB	SD	E	375		
Santiago	NDB	SD	E	270		
Lugo	CONSOL	LD	E	285		P1: Note 23
<u>SWEDEN - SUEDE</u>						
Stockholm (Bromma)	ILS	AL	E	110.3		
	(Flysta)	L	AL	E	375	
	(Ulvunda)	L	AL	E	344	
	(Tanto)	L	AL	E	322	
	(Bro)	NDB	SD	E	385	
	(Skälby)	RNG	AL/SD	E	364	
Göteborg	ILS	AL	E	110.3		
	(Lexby)	L	AL	E	342	
	(Lilleby)	L	AL	E	324	
	(Sandvik)	L	AL	E	369	
	VDF	SD	E	118.7 119.7		
Norrköping	ILS	AL	E	109.5		
	(Könungssund)	L	AL	E	324	
	(Dagsberg)	L	AL	E	377	
Malmö	ILS	AL	E	109.5		
	L	AL	E	351		
	L	AL	E	337		
	L	AL	E	351		

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COUNTRY & STATION PAYS & STATION	AID AIDE	FUNCTION FONCTION	STATUS STATUT	FREQUENCY FRÉQUENCE	NDB COVERAGE COUVERTURE NDB	REMARKS REMARQUES
<u>SWEDEN (Cont'd)</u> <u>SUEDE (suite)</u>						
Höör	NDB	SD	E	375		
Herrakra	NDB	SD	E	367		
Överum	NDB	SD	E	346		
Vagnhärad	NDB	SD	E	358		
Vallentuna	NDB	SD	E	370		
Åker	NDB	SD	E	309.5		
Hallsberg	NDB	SD	E	398		
Karlstad	NDB	SD	E	323		
<u>SWITZERLAND</u> <u>SUISSE</u>						
Zürich	ILS	AL	E	110.3		
(Trasadingen)	L	AL	E	395		
(Rhine)	L	AL	E	293		
(Glatt)	L	AL	E	316		
	L	AL	E	360		
	VDF	SD	E	118.5 119.5		
	VOR	SD	R			P2
Genève	ILS	AL	E	109.9		
	VDF	SD	E	119.7		
	GCA	AL	E	VHF		
	VOR	SD	R			P1
(Passeiry)	NDB	SD	E	341		
(Varsoix)	NDB	SD/AL	E	279		
(Lancy)	NDB	SD	E	316		
(Gland)	NDB	SD	E	253.5		
<u>UNITED KINGDOM</u> <u>ROYAUME-UNI</u>						
London	ILS	AL	E	108.1		
	ILS	AL	E	109.9		
	L	AL	E	334		
	L	AL	E	334		
	VDF	SD	E	124.9		
	GCA	AL	E			
	SURV.	SD	E			
	RAD.					
	VOR	SD	P			P1

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COUNTRY & STATION PAYS & STATION	AID AIDE	FUNCTION FONCTION	STATUS STATUT	FREQUENCY FRÉQUENCE	NDB COUVERTURE NDB	REMARKS REMARQUES
<u>UNITED KINGDOM (Cont'd)</u> <u>ROYAUME-UNI (suite)</u>						
Prestwick	ILS	AL	E	109.5		Pl: Note 14
	L	AL	E	316		
	L	AL	E	316		
	ILS	AL	E	108.1		
	VDF	SD	E	124.1 121.5		
	VOR RNG	SD SD	R R	374		
Bournemouth	RNG	SD	E	394		Pl
	ILS	AL	E	109.9		
	VDF	SD	E	119.1 121.5		
Blackbushe	ILS	AL	E	109.7		
	L	AL/SD	E	379.5		
	VDF	SD	E	124.3 121.5		
Bushmills	CONSOL	LD	E	266		
Stornoway	NDB	SD	E	359		
Lanark	NDB	SD	E	363		
Strumble	NDB	SD	E	249		Note 26
Llanwinio	VOR	SD	E	113.1		
Daventry	NDB	SD	E	669.5		Note 26
Bristol	RNG	SD	E	279		
Ottringham	NDB	SD	E	759.5		Note 26
Woodley	NDB	SD	E	723.5		Note 26
Alderney	NDB	SD	E	383	50	
				360		
Dunsfold	RNG	SD	E	357		
Epsom	RNG	SD	E	316		

COUNTRY & STATION PAYS & STATION	AID AIDE	FUNCTION FONCTION	STATUS STATUT	FREQUENCY FRÉQUENCE	NDB COUVERTURE NDB	REMARKS REMARQUES
<u>UNITED KINGDOM (Cont'd)</u> <u>ROYAUME-UNI (suite)</u>						
Watford	RNG	SD	E	223		Note 26
Bovingdon	NDB	SD	E	214		Note 26
Chatham	RNG	SD	E	367.5		
Brookman's Park	NDB	SD	E	329		
Crowborough	NDB	SD	E	343		
N. Foreland	NDB	SD	E	301.1		
Lichfield	NDB	SD	E	543.5		Note 26
Congleton	NDB	SD	E	361		
Manchester	NDB	SD	E	325		
Burtonwood	RNG	SD	E	383		
New Galloway	NDB	SD	E	325		
Belfast	NDB	SD	E	345		
Mangersta	LORAN	LD	E			IL6(s)
Jersey (Ch. Is.)	NDB	SD	E	340		
<u>UNITED KINGDOM TERRITORIES</u> <u>TERRITOIRES DU ROYAUME-UNI</u>						
Bermuda	NDB RNG VOR	SD SD SD	E E R	528 391		P1
Bahamas Is. Nassau	L	AL	R			Note 6
<u>UNITED STATES</u> <u>ETATS-UNIS</u>						
New York International	VOR RNG ILS L ILS L PAR	SD SD AL AL AL AL AL	E E R R E E E	117.2 379 109.5 248		P1: Note 15 Note 3
New York/ La Guardia	ILS L L L	AL AL AL AL	E E E E	109.9 353 332 233		

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COUNTRY & STATION PAYS & STATION	AID AIDE	FUNCTION FONCTION	STATUS STATUT	FREQUENCY FRÉQUENCE	NDB COVERAGE COUVERTURE NDB	REMARKS REMARQUES
<u>UNITED STATES (Cont'd)</u> <u>ETATS-UNIS (suite)</u>						
New York/ La Guardia (cont'd)	L	AL	E	388		
	GCA	AL	E			
	RNG	SD	E	209		
Washington	ILS	AL	E	109.9		
	L	AL	E	224		
	GCA	AL	E			
	RNG	SD	E	332		
	VOR	SD	E	116.2		
Newark	ILS	AL	E	110.3		
	L	AL	E	400		
	L	AL	E	359		
	RNG	AL	E	341		
	GCA	AL	E			
Philadelphia	ILS	AL	E	108.1		
	L	AL	E	219		
	L	AL	E	201		
	RNG	SD	E	263		
Detroit/Wayne Major	ILS	AL	E	108.1		
	L	AL	E	257		
	L	AL	E	212		
	RNG	SD	E	388		
	VOR	SD	E	114.9		
Columbus	ILS	AL	E	109.5		
	L	AL	E	233		
	L	AL	E	257		
	RNG	SD	E	391		
	VOR	SD	E	116.7		
	ASR	SD	E			
Pittsburg	ILS	AL	E	109.7		
	ILS	AL	E	110.3		
	L	AL	E	323		
	L	AL	E	302		
	L	AL	E	293		
	L	AL	E	201		
	RNG	SD	E	254		
	VOR	SD	E	117.4		
Cleveland	ILS	AL	E	109.9		
	L	AL	E	201		
	RNG	SD	E	344		
	GCA	AL	E			
Buffalo	ILS	AL	E	110.3		
	L	AL	E	219		
	L	AL	E	201		

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Part IV.- COM Committee
4ème Partie.- Comité COM

COUNTRY & STATION PAYS & STATION	AID AIDE	FUNCTION FONCTION	STATUS STATUT	FREQUENCY FRÉQUENCE	NDB COVERAGE COUVERTURE NDB	REMARKS REMARQUES
UNITED STATES (Cont'd) ETATS-UNIS (suite)						
Buffalo (Cont'd)	VOR	AL/SD	E	116.5		
	RNG	AL/SD	E	260		
Milwaukee	ILS	AL	E	110.3		
	L	AL	E	219		
	L	AL	E	201		
	VOR	AL/SD	E	115.1		
	RNG	AL/SD	E	242		
Hempstead	RNG	SD	E	227		
Poughkeepsie	RNG	SD	E	215		
	VOR	SD	E	115.9		
Albany	RNG	SD	E	263		
	VOR	SD	E	116.9		
Newburgh	RNG	SD	E	335		
Burlington	RNG	SD	E	323		
Plattsburg	VOR	SD	E	112.9		
Millinocket	RNG	SD	E	344		
	VOR	SD	P			P2
Presque Isle	RNG	SD	E	388		
	VOR	SD	E	114.7		
Houlton	VOR	SD	P			P2
	RNG	SD	E	272		
Riveshead	VOR	SD	E	113.9		
Montauk Point	VOR	SD	P			P2
Providence	VOR	SD	P			
	RNG	SD	E	347		P2
Nantucket	VOR	SD	E	117.0		
	NDB	SD	E	194		
	CONSOL	LD	P			P1 Note 22
Squantum	RNG	SD	E	233		
Boston	RNG	SD	E	382		
	VOR	SD	E	117.7		
Bangor	RNG	SD	E	239		
	VOR	SD	E	112.7		
Norwich	VOR	SD	E	117.9		

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2.- Rapport et recommandations sur les installations et services

COUNTRY & STATION PAYS & STATION	AID AIDE	FUNCTION FONCTION	STATUS STATUT	FREQUENCY FRÉQUENCE	NDB COVERAGE COUVERTURE NDB	REMARKS REMARQUES
<u>UNITED STATES (Cont'd)</u> <u>ETATS-UNIS (suite)</u>						
Bridgeport	RNG	SD	E	221		
Hartford	RNG	SD	E	329		
Kennebunk	VOR	SD	E	113.7		
Augusta	RNG	SD	E	221		
	VOR	SD	E	113.4		
Quonset Point	RNG	SD	E	356		
Princeton	VOR	SD	E	114.3		
Portland	RNG	SD	E	215		
Atlantic City	CONSOL	LD	P			Pl Note 22
Hobe Sound	LORAN	LD	E			IH7(S)
Folly Is.	LORAN	LD	E			IH7(M) IH6(M)
Cape Hatteras	LORAN	LD	E			IH4(S) IH6(S)
Nantucket Is.	LORAN	LD	E			IH3(M) IH4(M) IHO(S)
Sandy Hook	LORAN	LD	E			IHO(M)

SECTION 2PART IV - AERONAUTICAL BROADCAST SERVICE1. VOLMET Broadcast Plan.

1.1 Considering that radiotelephony should be the primary means of communication in the NAT Region, but recognizing the need for the continued use of radiotelegraphy, it was agreed that there existed a requirement for half-hourly broadcasts of meteorological reports (AERO) and hourly broadcasts of forecasts (TAF) for the main aerodromes to be transmitted on both radiotelephony and radiotelegraphy.*

1.2 It was noted that there was only one family of HF available for the NAT VOLMET plan.

1.3 It was also noted that the approximate time for transmission on radiotelegraphy of one meteorological report (AERO) required 30 seconds and approximately 45 - 55 seconds for a forecast (TAF), depending on the length of the forecast. This would result in a transmission time of approximately 5 minutes for three meteorological reports (AERO) and three forecasts (TAF) with a repetition of the first report in the sequence. The transmission time on radiotelephony was considered to be approximately the same.

1.4 Limiting factors of frequencies and transmission time available made it necessary to reduce the number of reports and forecasts to an absolute minimum. In the development of the plan account was taken of the principles of the First Air Navigation Conference, to the maximum extent possible.

1.5 Although the plan compromises the operational requirements for half-hourly broadcasts of meteorological reports for the exclusive users of radiotelephony, the transition to the primary means of communication will eventually fulfill the half-hourly requirements on radiotelephony by utilizing the radiotelegraphy transmission time for broadcasts on radiotelephony. In the case of New York, this principle should be applied immediately as shown in the plan.

-
- * Definitions - Act - Aerodrome meteorological report in plain language.
Fct - Aerodrome forecast in plain language.
AERO - Aerodrome meteorological report in the international AERO code.
TAF - Aerodrome forecast in the international TAF code (abbreviated Aerodrome forecast code).

1.6 Recommendation No. 48*

That the Plan as contained in paragraph 1.10 of this Report should be the regional plan for meteorological broadcasts to aircraft in flight (VOLMET) and that this plan should be implemented on 1 April 1955 1200 GMT, subject to satisfactory co-ordination of frequencies and time schedules being achieved.

1.7 Recommendation No. 49

That States concerned proceed as rapidly as possible to evaluate technically and operationally the application of ground wave techniques and extension of VHF coverage to the VOLMET broadcasts so as to realize the advantages such systems may provide during periods of poor propagation.

Note.-Any VHF frequency ultimately selected will require co-ordination.

1.8 Recommendation No. 50

That States concerned consider the establishment of procedures wherein the meteorological information to be broadcast is prepared in a manner that will facilitate transmission by radiotelephony.

1.9 Recommendation No. 51

That the existing GANDER meteorological broadcasts on MF in the NAT Region should be retained.

Comment - Such broadcasts serve a useful purpose particularly during periods of poor propagation conditions.

* See Statement of United Kingdom Delegation at Appendix A.

1.10 NAT VOLMET BROADCAST PLAN

First Half Hour						
Mode of Transmission	RADIOTELEPHONY					
Transm. Station	WSY New York	VFG Gander	EIP Shannon	FXO Paris		
H+ Frequencies	00-05	05-10	10-15	15-20	20-25	25-30
3001 kc/s	Act. Idlewild Boston Washington	Act. Gander Goose Bay Stephenville	Act. Moncton Sydney Montreal	Act. Shannon Prestwick London	Act. Amsterdam Brussels (Reserved)	Act. Orly Geneva (Reserved)
5559 kc/s	Fct. Idlewild Boston Washington	Fct. Gander Goose Bay Stephenville	Fct. Moncton Sydney Montreal	Fct. Shannon Prestwick London	Fct. Amsterdam Brussels (Reserved)	Fct. Orly Geneva (Reserved)
8828.5 kc/s	Act. Idlewild	Act. Gander	Act. Moncton	Act. Shannon	Act. Amsterdam	Act. Orly

Second Half Hour						
Mode of Transmission	RADIOTELEPHONY	RADIOTELEGRAPHY				
Transm. Station	WSY New York	VFG Gander	EIP Shannon	FXO Paris		
H+ Frequencies	30-35	35-40	40-45	45-50	50-55	55-60
3001 kc/s	Act. Idlewild Boston Washington	AERO Gander Goose Bay Stephenville	AERO Moncton Sydney Montreal	AERO Shannon Prestwick London	AERO Amsterdam Brussels (Reserved)	AERO Orly Geneva (Reserved)
5559 kc/s	Fct. Idlewild Boston Washington	TAF Gander Goose Bay Stephenville	TAF Moncton Sydney Montreal	TAF Shannon Prestwick London	TAF Amsterdam Brussels (Reserved)	TAF Orly Geneva (Reserved)
8828.5 kc/s	Act. Idlewild	AERO Gander	AERO Moncton	AERO Shannon	AERO Amsterdam	AERO Orly

- Note 1) The transmission order of weather for the locations shown in each block should be strictly observed.
 2) Repetition of the first actual weather report (AERO) should be made if time permits.
 3) The meteorological information regarding particular locations shall be transmitted strictly within the time block specified for its transmission.
 4) The effective period of validity of each forecast should not be less than 6 hours from the time of broadcast.

SECTION 2PART VGENERAL RECOMMENDATIONS1. Integration of Aeronautical Fixed and Mobile Telecommunication Services

1.1 It was considered that in addition to the material contained in the report of the COM Division, Fourth Session, (Doc 7171-COM/544, Part V, Chapter 5, paragraphs 5.14 to 5.15.3) and in the report of the COM Division, Fifth Session, (Doc 7480-COM/548, Part V, Recommendation No. 49) the following action should be recommended:

1.2 Recommendation No. 52

That messages which are received by radio telephone or radio-telegraph, and requiring retransmission, should be recorded in such a manner as to facilitate their retransmission.

Comment - This recommendation is related to the question of re-transmission of material on the aeronautical fixed service which has been received on the aeronautical mobile service and not to the requirements for the maintenance of a communication log.

1.3 Recommendation No. 53

That the existing codes and abbreviations, appearing in Annex 10 and in Doc 6100-COM/504/1, should be utilized to the greatest extent possible in messages passed between the Aeronautical Mobile and Fixed Services, and vice versa.

1.4 Recommendation No. 54

That ICAO should compile a synthesis of the replies received from States in response to Recommendation No. 49 of the COM Division, Fifth Session, and that this synthesis should be used by States as a provisional guide.

2. Use of OSV Communication Facilities*2.1 Recommendation No. 55

a) That the A1 en-route frequencies available aboard Ocean Station Vessels for communications with aircraft-in-flight be also used for the purpose of accomplishing the necessary relay of information to and from aircraft and the aeronautical stations serving the ACC or FIC concerned, when normal communication between aircraft and the aeronautical stations has failed.

b) That the same en-route frequencies be used when necessary for the purpose of passing emergency communications via the ACC or FIC between an Ocean Station Vessel or a Rescue Co-ordination Centre associated with the ACC or FIC concerned.

c) That for prolonged communications for the purpose of coordination between Ocean Station Vessels and Rescue Co-ordination Centres of search and rescue operations States should, with any mutual agreement necessary, use available means of communication other than the en-route communications channels.

d) That the arrangements in a), b), and c) above should be reviewed when there is no longer a requirement for A1 aeronautical mobile communications with Ocean Station Vessels in the Nat Region.

Comment.- As a further means of maintaining communication during poor propagation conditions when the aircraft is unable to communicate with an aeronautical station, it was considered that the aeronautical mobile communication facilities of the Ocean Station Vessel could be used as an alternative means of communication. Under these conditions the A1 family of frequencies available aboard the Ocean Station Vessel could also be used for the relay to Oceanic Area Control Centre of messages received from aircraft on either VHF or HF.

2.2 Recommendation No. 56

That the following procedure be approved and included in the OSV Manual: "In periods of poor propagation when OSV A cannot establish communications with its land station (Washington) for with OSV D, providing D is in communications with Washington, OSV A will relay weather reports, with appropriate transmission relay instructions to Reykjavik for onward transmission via the Reykjavik - United Kingdom AFTN circuit. Messages routed via Reykjavik will be addressed by the OSV to Dunstable, Paris/Orly, Keflavik, and New York/La Guardia meteorological centres."

* Reference is also made to paragraph 3.21, Section 2 Part II

Comment - It was considered that the communication channels between the OSV's and the designated land station necessary for the dissemination of meteorological data are adequate except in respect of OSV A. In this latter case, during certain periods of ionospheric disturbances there has been a demonstrated need for an improvement of this station's ship-to-shore communications.

At such times that contact can neither be established with the designated land station nor with OSV D for further relay an alternative routing should be provided. Since experience has indicated that communications can be maintained with Reykjavik this channel should be utilized for further relay to Europe and North America; additionally the procedure and present informal agreement concerning transmission of meteorological information from OSV A to Reykjavik ~~order~~ ^{should} be continued by bilateral arrangement.

Recommendation No. 57

That the Special MET AFS circuits given in Part I (Rec. No. 16) be modified or otherwise improved by the States concerned, with view to improving the efficiency of operation sufficient to ensure the fulfillment of the transit time requirement of one hour for meteorological messages emanating from OSV's and destined for MMO's in the NAT Region.

3. Recommendation No. 58*

3.1 That Recommendation No. 1 of the Special North Atlantic Meteorological Telecommunications Meeting, as amended in a) below, and Recommendation No. 3 of the aforementioned meeting and reproduced in b) below, be continued in force.

a) That an exchange of basic meteorological data (including basic synoptic data) between North America and Europe continue to be accomplished by means of duplex radioteletypewriter circuit for exclusive meteorological use between New York and Paris via Santa Maria with New York and Paris acting as the collecting and disseminating centres in North America and Europe respectively and Santa Maria acting as a relay centre.

b) That

1) In addition to the normal diffusion for European use, the Irish meteorological data be routed on the operational circuit from Shannon to Santa Maria for onward relay to North America and that, in consequence thereof, these data should not be included in the Paris Bulletins transmitted by radioteletypewriter to Santa Maria;

* See Statement of United Kingdom Delegation at Appendix A.

2) This procedure should not be taken as a departure from the accepted principle that the exchange of basic meteorological data across the North Atlantic is between one centre in Europe and one centre in North America, and should not be regarded as setting a precedent for other special arrangements.

4. Recommendations of First and Second NAT Regional Air Navigation Meetings

Recommendation No. 59

That the recommendations of the Communications Committee of the III NAT Regional Air Navigation Meeting supersede and cancel all recommendations of the Communication Committees of the First and Second NAT Regional Air Navigation Meetings and also those included in Doc 7012-COM/541.

Comment - The Committee after examination in detail of earlier recommendations considered that they should be regarded as obsolete or superseded by the recommendations made at this meeting. In respect to radio navigation aids the Committee noted that a requirement for HF/DF for SAR purposes was not stated by the RAC/SAR Committee and therefore considered that Recommendation No. 29 of the Second NAT RAN meeting no longer applied. Consideration was also given to the NAT Frequency Assignment Plan given in Doc 7012-COM/541.

SECTION 3REPORT AND RECOMMENDATIONS ON PROCEDURES1. Supplementary Procedures1.1 Recommendation No. 60

That the COM SUPPS currently in force throughout the region continue to be used and that, in addition, the following procedures be approved to supplement the provisions of ICAO Radiotelephony Procedures (Doc 7181-COM/546/1) in the NAT Region:

1.1.1 (Relates to para. 12.6.1 of Doc 7181-COM/546/1)

"As soon as practicable after departure, aircraft entering an en-route network shall report take-off time to the appropriate ground station of that network."

1.1.2 (Relates to paras. 12.8.1 and 12.7.2 of Doc 7181-COM/546/1)

"As soon as practicable after landing, aircraft shall report landing time to the appropriate ground station of the network."

1.1.3 Recommendation No. 61

That the supplementary procedures listed in Recommendation No. 60 be brought into use four months after their approval by Council.

2. Adherence to existing Procedures2.1 Recommendation No. 62

That Council invite the attention of Contracting States to the desirability of ensuring that the ICAO Radiotelephony Procedures for use in the international aeronautical mobile telecommunication service, are applied to the maximum practicable extent by all stations operating in that service under their jurisdiction.

Comment - From detailed examination of proposals submitted to the Meeting for NAT Supplementary Procedures (SUPPS) it is apparent that, in current operations, the ICAO Radiotelephony Procedures prescribed in Annex 10, Part III and Doc 7181-COM/546/1 are not being adhered to inasmuch as the desired operational effect intended by the proposed SUPPS would be achieved if the world-wide procedures approved by the Council of ICAO were to be applied. It was therefore considered essential that the attention of Contracting States be drawn to this matter so that immediate steps can be taken to overcome the problem and thereby facilitate the functioning of an efficient telecommunication

service for international civil aviation. In this connection it was considered that application of the provisions of Annex 10, Part III, paragraph 2.4 should do much towards improving the present situation. Examples of undesirable current practices are as follows:

Radiotelephony Operations

- i) Frequencies (a) NAT experience indicates an inequitable distribution of loading on the frequencies available. Use is not being made of the higher order of HF/RT frequencies in many instances where this would relieve loading on the lower orders.
- (b) In many instances aircraft are establishing communication with the air-ground control radio station on incorrect or unsuitable (in view of propagation conditions or communications traffic loading) frequencies and no apparent effort is made by the air-ground control radio station to have the aircraft changeover to a more appropriate frequency.
- (c) There is a tendency for stations to continue attempts to pass traffic on the primary frequency in conditions where an improvement in communications could be effected by changing over to the secondary or alternate frequencies provided for the route.
- (d) As a result of failure by the air-ground control radio station to designate appropriate frequencies, aircraft stations are sometimes left in doubt as to the current guard frequencies for the area in which they are flying.

Note. Application of the provisions prescribed in paragraph 5 (and also, in R/T Network operations, paragraph 12) of ICAO Doc 7181-COM/546/1 will ensure that maximum use is obtained of frequencies available to international civil aviation.

- ii) R/T Network (a) Experience indicates that some aircraft are exchanging traffic with aeronautical stations of an R/T network when, in fact, these aircraft are flying outside the area for which this network is provided.

Note. The provisions of Doc 7181-COM/546/1, paragraphs 4.1 and 8.7 define the correct operating procedure to be used.

- b) Radiotelephone channels of the network become occupied for lengthy periods of time through the passing of considerable amounts of fixed service communications between aeronautical stations.

Note. Doc 7181-COM/546/1 paragraph 12.4 prescribes that only essential information may be thus exchanged.

- iii) R/T technique - Insufficient attention has been devoted to date to ensure the application of good microphone technique so as to obtain efficient use of radiotelephony. At the present time requests for repetitions are often attributable to transmissions being made at a too fast rate of speech.

Note. Paragraph 16 of ICAO Doc 7181-COM/546/1 prescribes the transmitting technique to be employed. In addition the material contained in green pages (i) and (ii) of Doc 7181-COM/546/1 provides useful guidance on the subject of developing radiotelephony technique.

3. Addressing of Messages

3.1 Recommendation No. 63

That, when preparing recommendations to Council for amendment of Annex 10, Part III, paragraph 5.2.1.1 to 5.2.2.1.1 [radiotelegraph addressing procedures] in the light of the proposal made by the 5th COM Division [Doc 7480-COM/548, Recommendation 7 i], the Air Navigation Commission take into account the following proposal that, insofar as the NAT region is concerned:

- (a) Where it is possible to make prior arrangements for the pre-determined distribution over the aeronautical fixed service of routine (radiotelegraphy) messages from aircraft, such distribution should be made without the necessity of including a specific address;
- (b) The procedure followed by an aircraft station when using radiotelegraphy when originating a message (see Doc 7480-COM/548, Recommendation 7 i), para. 5.2.1.1.1) shall conform with the procedure acceptable for radiotelephony operation (Doc 7480-COM/548, Recommendation 7 v), para. 5.3.5.1, 5.3.5.1.1).

Comment - The Meeting considered that the practice now generally and successfully employed for radiotelephony (Annex 10, Part III, para. 5.3.5.1.2 and Doc 7480-COM/548, Recommendation 7 v), para. 5.3.5.1.4) should also be permitted for radiotelegraphy operation in the NAT region. It was recognized

that the procedures drafted by 5th COM Division in Recommendation 7 i) of its Final Report did not include implementation of abbreviated addressing procedure for radiotelegraphy operations.

However, as will be noted from this Meeting's Recommendation No. 24, the revised NAT Aeronautical Mobile Communications plan is predicated upon a future reduction of from two A1 frequency families to a single family with a corresponding addition of a third A3 frequency family based upon the fact that future operations within the region will result in an increased requirement for A3 operation and a decreasing requirement for A1.

This reduction of A1 frequencies necessitates that further effort be made to simplify message formulation procedure so that traffic volume may be reduced as much as possible on the one A1 frequency family to be available. Such procedures are now in use for radiotelephony operations under the provisions of Annex 10, Part III, para. 5.3.5.2 and, in the opinion of this Meeting, should now be made applicable to radiotelegraphy operations in the NAT region.

4. Acceptance and Delivery of Messages

4.1 Recommendation No. 64

That Contracting States be invited to make an overall evaluation of the aeronautical mobile and aeronautical fixed telecommunication services provided by stations under their jurisdiction in order to determine whether, in some instances unwarranted duplication of service is being provided to addressees.

Comment - In considering methods of improving the aeronautical mobile service and proposals for supplementary procedures, it was found necessary to discuss aspects pertaining to the detailed organization of this service and to take cognizance of differing national procedures relative to delivery of messages to addressees. In the time available at its disposal, the Meeting was unable to go into this matter in great detail partly because precise information as to the different organizational procedures employed was not available. The meeting considered, however, that its initial investigation indicated that the varying message acceptance and delivery practices now being followed by States within the region in respect of mobile service traffic, when viewed from the overall regional aspect, were tending to result in the providing of duplicate service to addressees.

In view of this, it was considered that the attention of States should be drawn to this matter in order that an overall evaluation may be made as soon as practicable.

APPENDIX A - STATEMENTS OF DELEGATIONSSTATEMENT OF THE CANADIAN DELEGATION

The Canadian delegation is unable to support the plan for the installation of CONSOL (Recommendation No. 40) insofar as it duplicates existing long-distance aids (Loran) which now cover the western section of the North Atlantic. It is to us illogical to duplicate an existing aid with an aid which is also of "interim" status.

Furthermore, the Canadian delegation is unable to accept the plan because they are of the opinion that a proposal of this magnitude could not be examined to the extent necessary in the limited time available at this meeting.

STATEMENT OF THE PORTUGUESE DELEGATION

Portugal will make all efforts in order to discontinue A1 operation for NAT en-route Communication in Santa Maria and Lisbon as soon as possible and not later than the 1st January 1956.

STATEMENT OF THE UNITED KINGDOM DELEGATION

(Reference Section 2, Part IV)

The United Kingdom, whilst offering no criticism of the manner in which the radiotelegraphy VOLMET broadcast has been carried out in the past, believes that a reduction in AFTN traffic, a simplification of handling of MET information and a closer integration with the requirements of the EUM region could be achieved without any reduction in the coverage of the system if the H+15/25 and H + 45/55 broadcasts were made from a location in the United Kingdom.

The United Kingdom will keep these aspects under review in the light of changes in the pattern of air traffic in the region and, should it appear that the United Kingdom's misgivings are well founded, reserves the right to re-open the question with the Council with a view to amendment of the plan.

(Reference Section 2, Part II)

Whilst the United Kingdom recognizes the operational advantage of guarding 127.9 Mc/s on Ocean Station Vessels, technical and certain other considerations preclude the immediate introduction of the channel

on ships provided by the United Kingdom. The United Kingdom is examining the question, and will in the meantime maintain available the channel 118.1 Mc/s in addition to the watch to be maintained on 121.5 Mc/s.

The United Kingdom has noted that in the Report of the MET Committee attention has been drawn to the necessity for improving the present exchange of meteorological data between Europe and North America, and considers that the question of alternative routing should be studied.

STATEMENT OF THE UNITED STATES DELEGATION

With reference to Recommendation No. 21, the United States wishes to draw the attention of States to the need for the utilization of VHF channels with 100 kc separation, after 1956, for communication in the New York Terminal Area. This may also be necessary in other congested terminal areas of the Region at an early date.

The COM Division, Fifth Session, recommended changes to the principles for world-wide VHF planning contained in Annex 10 to provide that 39 channels, with 200 kc separation, in the band 118.1 - 132 Mc should be utilized for international civil aviation communication purposes, excluding the emergency and ground control frequencies. The recommended changes to Annex 10 also included the use when agreed regionally, of 100 kc channeling after January 1956, provided alternative means of communication are available on the channels spaced at 200 kc. After January 1, 1958, 100 kc channeling can be used in the VHF communications band for all services provided for international aircraft.

The present situation at New York will necessitate the use of 100 kc channeling for VHF ATC communications by the fall of 1956. Although service will continue to be available to aircraft which may at that time not be equipped for 100 kc/s channeling such aircraft may not be in a position to take full advantage of the improved procedures and services available through use of channel spaced at 100 kc/s.

With reference to Recommendation No. 24, the United States notes the agreement of the meeting that radiotelephony is the primary means of enroute communication in the Region. There has been a steady decrease in the use of radiotelegraph for communication with New York owing to the rapid transition from type A1 to type A3 operation. The U.S. is of the opinion that this trend will continue to the extent that, within a relatively short time there will no longer be a requirement for such service at New York.

The U.S. therefore intends to continue to review the situation and at the earliest reasonable date, to propose an amendment to the aeronautical mobile Plan under which radiotelegraph service at New York would be discontinued. Furthermore, it is anticipated that the U.S. requirement for enroute A1 service at other aeronautical stations within the Region will cease to exist within two years.

STATEMENT OF THE SPANISH DELEGATION

Taking into account Paragraph 2.1.1.1 of Annex 10 and the climatological conditions of Barcelona and Sevilla Aerodromes, as well as their classification as "alternate" aerodromes, thus making small the probability for the need of ILS installation in them, within the International Air Operations of the NAT Region, therefore the Delegation of Spain wishes to point out its reservations as to the intentions of the Spanish Government, relating to its acceptance for the inclusion in first priority of the ILS installation in Barcelona and Sevilla Aerodromes, in the Regional Plan for Radionavigation Aids, due to its cost that is not in proportion to its utility.

The Spanish Delegation also wishes to point out its identical reservation with reference to the requirement of VOR installation in Madrid and Barcelona, due to climatological reasons and its probable traffic density, as mentioned in Paragraph 2.1.1 of Annex 10.

With regard to the CONSOL at Sevilla and Lugo, being the CONSOL a long distance navigational aids system adopted as provisional in a Recommendation of the 5th COM Conference, it is not justified the great expense that it would suppose the change of cycle in them and the change in orientation of the base-line of the CONSOL at Lugo, since the expense of all that would be equal to the cost of a new installation. Only the adoption of the CONSOL as a definite standard aid would justify it.

For those reasons the Delegation of Spain wishes to point out its reservation as to the intentions of the Spanish Government, relating the realization of sub-paragraphs a) and c) of Recommendation No. 42. With reference to sub-paragraph b), at present the necessary works are being conducted and precisely those works are the ones that have caused lately the greatest irregularities in their functioning, but these will cease soon.

APPENDIX B - TECHNICAL DATA SUBMITTED BY THE UNITED KINGDOMNORTH ATLANTIC HF RTT TRIALS

(January - February 1954)

1. PURPOSE OF TRIALS

- 1.1 Trials were conducted at Birdlip during the period Jan. 14th-Feb. 5th 1954, to establish the operational gain which might be expected from the use of a new transmitter (with its recently installed rhombic aerials) and a new receiver on the Birdlip/New York RTTY circuit.

The new rhombic transmitter aerials are as follows:

- (a) 2.25 to 6.75 Mc/s. Side length 600 ft. semi-included angle 60 degrees. 3 wires. Height 150 ft.
- (b) 3 to 9 Mc/s. Side length 450 ft. Semi-included angle 60 degrees. 3 wires. Height 100 ft.

Simultaneous reception is carried out on many circuits each using space diversity reception. Wide band amplifiers are used to serve both New York and Gander receiving circuits.

Receiver aerial factors are as follows:

- (a)
 - (i) 3 to 9 Mc/s. Side length 450 ft. Semi-included angle, 60 degrees. 3 wires. Height 150 ft.
 - (ii) 3 to 9 Mc/s. Side length 450 ft. Semi-included angle, 60 degrees. 3 wires. Height 100 ft.
- (b)
 - (i) 6 to 18 Mc/s. Side length 225 ft. Semi-included angle, 60 degrees. 3 wires. Height 100 ft.
 - (ii) 6 to 18 Mc/s. Side length 225 ft. Semi-included angle, 60 degrees. 3 wires. Height 70 ft.

- 1.2 At the same time it was required to estimate the reliability of a Birdlip/Gander circuit using this new equipment.
- 1.3 Tests were also conducted to establish the comparative availability figures between the new and old equipment, viz:-

The two receivers
The two transmitters (5KW and 45KW respectively)
The two aerial systems
The old and new complete installations.

2. STATISTICAL RESULTS2.1 The Two Receivers

	Old Receiver	New Receiver
Percentage availability	56%	92.5%
Average No. of hrs. available per day	13.6 hours	22.6 hrs
Average length of outage	2.9 hours	1.2 hrs
Peak outage	23.5 hrs	5.5 hrs

2.2 The Two Transmitters

	Old Trans. with old aerial system	New Trans. with new aerial system
Percentage availability	47%	92%
Average No. of hrs. available per day	11.2 hrs	22.2 hrs
Average length of outage	5.3 hrs	1.1 hrs
Peak outage	21 hrs	4.0 hrs

2.3 The Two Aerial Systems

	5Kw into old Aerial System	5Kw into New Aerial System
Percentage Availability	47%	65%
Average No. of hrs. available per day	11.2 hrs	15.6 hrs
Average length of Outage	5.3 hrs	4.5 hrs
Peak Outage	21 hrs	2.0 hrs

2.4 The Old and New Installations

	Old Rec. & Trans. old aeriels	New Rec. & Trans. new aeriels
Percentage availability	45%	90%
Average No. of hrs available	10.8 hrs	21.5 hrs
Average length of outage	5.5 hrs	1.2 hrs
Peak outage	22 hrs	5.5 hrs

NOTE: It should be noted that the figures relate to 18 days within a 3-week period which included the worst propagation days of January 1954. All figures, therefore, show a poorer communications condition than the monthly average for January. In summer months there therefore seems to be every prospect of a circuit availability of 99%.

2.5 Traffic Table showing Rise and Fall of total traffic over New York circuit inversely with rise and fall of diversions

	<u>Messages</u>	<u>Diversions</u>	
January 28	300	3	
29	206	139	old equipment in use only
30	344	10	
31	233	25	old equipment in use only
February 1	411	8	
2	98	154	old equipment in use only
3	309	7	
4	156	139	old equipment in use only

NOTE: Striking though the above figures are, they would have been even more striking if propagation conditions had not been on the improvement during this period.

2.6 Prestwick/Gander and Birdlip Gander Tests

	<u>Receiver at Prestwick</u>	<u>Receiver at Birdlip</u>	<u>Transmitter at Prestwick</u>	<u>Transmitter at Birdlip</u>
Percentage availability	62.5	86.9	50.5	75.5
Average no. of hrs. per day	15	21	12	18
Average length of outage	3.6	1.7	4.3	2.3
Peak outage	15.5	2.5	15.5	13

3. TECHNICAL

- 3.1 One of the objects of the trials was the evaluation of the gain obtained from the new rhombics recently installed for use with the new transmitter.
- 3.2 Two examples can be quoted to illustrate the comparison between the 400 and 600 foot rhombics, and between the new TX operating on 25 and 40kw.
- 3.3 WSY reported that the signals from MVB had average 30db above 1 microvolt during the previous hour. The new TX was then operating at 25kw into the 400 foot rhombic. Power was increased to 40kw, and WSY reported that the signal level had increased by approximately 5db. Power was then reduced to 25kw, but we were informed that the change was hardly perceptible, but this may have been due to the signals changing due to normal fading conditions. The output from the new TX (still on 25kw) was then fed into the 600 foot rhombic, and WSY informed us that the signal strength was now 60db above 1 microvolt. This difference of 30db between one rhombic and the other may have been partly due to the somewhat abnormal conditions prevailing at the time, but on the following evening a further test proved that the 600 foot aerial is considerably more efficient than the old rhombic associated with the old transmitter. At 1730 the circuit was "in" to WSY on 8 Mc/s using

NOTE: TX means Transmitter.

the new TX on 5kw into the 600 foot rhombic. In an interval between messages, the service was transferred to the SWB8 operating on 8 Mc/s into the 400 ft. rhombic at approximately the same power level. As soon as MVB attempted to resume transmission of traffic, WSY reported that signals had almost faded out and requested a test tape. Reversion to the new TX and 600 ft. rhombic restored the circuit, WSY reporting the signals as QRK 5/5.

- 3.4 During Stage 2 of the trials, the new TX transmissions from Birdlip were monitored by Gander. Reference to the Gander table will show that the Birdlip transmitter was "in" to Gander more frequently than the transmitter in use at Prestwick. Bearing in mind that the only aerial available at Gander was a simple dipole, for test purposes, it is considered that the use of a suitable rhombic at VOAC would considerably increase the percentage availability from the 75.5 obtained. It will be seen that the peak outage to Gander was 13 hours, and this occurred on February 1st from 0001 to 1300. During this period, the only outages to WSY were from 0730-0930 and from 1100-1200. There were indications during the trials that 6Mc/s frequency in use on the MYB/VOAC circuit is unsuitable for a MVB/VOAC channel. Numerous instances were observed of Prestwick being QSO with VOAC on 6Mc/s while Birdlip had difficulty in reading Gander although New York was providing a solid signal on 8Mc/s.

During the tests with Gander it was, of course, necessary to use a rhombic beamed on New York, although the difference in line of shoot is comparatively small.

4. NEW DOUBLE DIVERSITY RECEIVER

4.1 DATA SUMMARY

Service CW On/Off, MCW or FSK telegraph reception.

Frequency range 3-27.5 Mc/s (100-10.9 m) in three bands,
Reception on one of 3 spot frequencies or
continuous tuning over each band.

Frequency stability	Crystal Oscillator	LC Oscillator
	Max. Drift	Max. Drift
3-10 Mc/s	: 30 c/s per °C	120 c/s per °C
10-27.5 Mc/s	: 60 c/s per °C	300 c/s per °C

The setting accuracy of the variable first oscillator is within ± 1 kc/s.

Input impedance 75 Ω unbalanced.

Sensitivity	CW on/off - $0.3 \mu V$ at 27.5 Mc/s for 10 db signal/noise ratio.
Noise Factor	6 db maximum for frequencies up to 15 Mc/s. 8 db maximum for frequencies above 15 Mc/s.
Selectivity	
First IF:	Passband 8 kc/s flat to within ± 1 db. Minimum discrimination at 35 kc/s from mid-band, 70 db.
Second IF:	1 kc/s Filter - 1 kc/s passband flat to within ± 2 db. Minimum discrimination at 1 kc/s from mid-band, 80 db. 2 kc/s Filter - 2 kc/s passband flat to within ± 2 db. Minimum discrimination at 1.9 kc/s from mid-band, 80 db.
Image protection:	65 db minimum at any frequency.
Radiation due to first oscillator	Less than $10 \mu V$ at any frequency, measured at the aerial terminal.
AFC	Up to $\pm 3,000$ c/s mistune corrected to 10 c/s max. residual mistune.
AGC	10 db max. change in output for 80 db change in input.
AGC threshold	ON/OFF - 10 db below overload point FSK - 20 db below overload point
Blocking	An adjacent channel, spaced at 2000 c/s from the working frequency for the 1 kc/s pass band, and at 60 db above the wanted signal will not cause blocking in the receiver, provided that the wanted signal does not exceed $100 \mu V$.
Recording threshold	ON/OFF - 30 db below overload point FSK - 50 db below overload point
Receiving speed	200 bauds maximum
FSK shift	300-1,000 c/s
Diversity switching	Operates on minimum signal difference of 1.5 db. Initiating time $500 \mu s$ max. Transit time $50 \mu s$ max.
Outputs	1 Maximum 30-0-30 mA into earth loads of $1,000 \Omega$ max.

	2 Tone output 10mW into 600 Ω when tone sender fitted).			
Power supplies	200-250V, 50-60 c/s single-phase AC mains (other values to special order)			
	Frequency tolerance $\pm 4\%$			
	Voltage regulation $\pm 6\%$			
Power consumption	650W			
Dimensions	<u>Height</u>	<u>Width</u>	<u>Depth</u>	<u>Weight</u>
	7 ft. 1 $\frac{1}{4}$ in.	3 ft. 11 in.	1 ft. 9 in.	12 cwt (approx).
	(216 cm)	(119.4 cm)	(53.3 cm)	(610 kg).

The Gander-London HF RTT Duplex Circuit

1. The United Kingdom radio terminal for the Gander HF RTT duplex circuit was transferred from Prestwick to Birdlip (i.e. alongside the New York-London circuit) on July 1st 1954. Prior to this transfer, the circuit had an average availability of 69%; but the transfer provided the opportunity to introduce changes in the London (Birdlip) terminal equipment similar to those earlier effected at Birdlip on the New York-London circuit. Although these improvements are not yet fully completed it is noted that in July and August 1954 the availability of the circuit averaged 99.7% - some 10% higher than the best summer conditions in previous years. It would therefore seem that the results achieved on the New York - London circuit will probably be at least equalled by those on the Gander-London circuit in the 1954/55 Winter period.

2. The Birdlip radio terminal of the Gander-London circuit is equipped as follows (July 1954).

Transmitter: Approx. 40/45 kw

Receiver: Old receiver shortly to be replaced by new receiver of the same type used on the New York-London circuit.

Transmitter aeriels:-

- a) 2.25 to 6.95 Mc/s. Side length 600 ft. Semi-included angle 60 degrees. 3 wires. Height 150 feet.
- b) 3 to 9 mc/s. Side length 450 ft. Semi-included angle 60 degrees. 3 wires. Height 100 ft.

Receiver aeriels at Birdlip are as for the New York-London circuit.

- END OF PART IV -

PART V
METEOROLOGICAL COMMITTEE

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THIRD NORTH ATLANTIC REGIONAL AIR NAVIGATION MEETINGMONTREAL - OCTOBER 1954METEOROLOGY COMMITTEESECTION 1. - CHAIRMAN'S REPORT1.1 - Historical Statement1.1.1 Meetings

The Meteorology Committee held four Plenary Meetings in open session at the ICAO Headquarters in Montreal from 11 to 26 October 1954, under the Chairmanship of Mr. R. C. Graham, Delegate of Canada.

1.1.2 Representation

A list of the States and International Organizations represented at meetings of the Committee appears at Appendix A of the General Committee Report.

1.1.3 Secretariat

Mr. G. J. W. Oddie, Secretary to the MET Committee, assisted by Dr. J. H. Heierman, served as the technical secretariat of the Committee.

1.1.4 Minutes of the Meetings

A record of the proceedings of the Committee is contained in the minutes of the meetings held. These minutes do not form part of this Report.

1.1.5 Agenda

The agenda of the Meteorology Committee was approved by the General Committee at its first meeting.

1.1.6 Working Groups

Two working groups, A - "Facilities" and B - "Procedures", were established by the Committee at its first meeting.

1.1.7 Election of Officers

Mr. R. C. Graham, Delegate of Canada, was unanimously elected Chairman of the Committee. Mr. P. Leclercq, Delegate of France, was unanimously elected Vice-Chairman. The working groups elected their own chairmen, namely Dr. K. R. Postma (Netherlands) for Working Group A and Mr. W. L. Halnon (United States) for Working Group B.

1.2 - Report on the Agenda

1.2.1

Agenda Item 1.1: Consideration of specific proposals for amendments to the existing ICAO plan with particular reference to observation networks

1.1.1 The surface observation network, in particular in the Polar area.

1.1.2 The upper air network, with particular reference to the reduction in number of observations at some stations, the requirement for upper air information from the Polar area, the upper air observation experiments, Spring 1952, and the reduced ocean station vessel network.

1.2.1.1 The work of the MET Committee under this Agenda item was divided into two parts, namely, consideration of the required networks and consideration of the information to be exchanged between North America and Europe. Closely associated with this work was that carried out under Agenda item 1.3.1 concerning meteorological communications.

1.2.1.2 In an effort to increase the benefit derived from the North Atlantic Ocean Station network the MET Committee made recommendations for an improved service of supplementary observations from ocean station vessels and for the development by WMO of new procedures and codes both for these observations and for radar weather observations (Recommendations Nos. 1, 2 and 3). The MET Committee refrained from recommending a new code and new procedures for the supplementary reports by ocean station vessels, for provisional use pending action by WMO on these matters, as it seemed likely that WMO would be able to complete its action within a few months.

1.2.1.3 Recommendations for improvements in observational networks covered a small number of upper air observations additional to those already being made (Recommendations Nos. 7 and 8), improvements in accuracy of upper air observations (Recommendation No. 5) and in the levels regularly attained (Recommendation No. 6), and improvements in the coverage of ships' reports (Recommendation No. 4). The recommendation for radio/radar wind observations at Danmarkshavn did not receive the support of all Delegates.

1.2.1.4 With regard to the surface and upper air networks the Committee felt itself to be seriously handicapped by the lack of objective criteria for the required density of stations. Early study by WMO of network criteria, with special reference to the North Atlantic Region and associated areas in the extreme north, was accordingly recommended (Recommendation No. 10).

1.2.1.5 The Committee dealt specifically with the necessity for reports of hourly observations from Prins Christiansund and South and Southeast Iceland. The main requirement in each case appeared to hinge upon the individual usefulness of hourly reports in the preparation of aerodrome forecasts for the adjacent MMO (Narsarssuak and Keflavik, respectively) together with a supplementary requirement for hourly QNH values. Unanimity of opinion was not reached with regard to hourly meteorological reports (Recommendations Nos. 11 and 12).

1.2.1.6 The requirements for the contents of bulletins exchanged via the New York - Santa Maria - Paris meteorological circuit were reviewed by the Committee, working on the basis of the relevant recommendations of the 2nd NAT RAN Meeting and the existing arrangements (Recommendation No.13).

1.2.1.7 The Committee recommended minor changes in the presentation of fact-finding material, relating to observational networks, for Regional Meetings (Recommendation No.14).

1.2.2

Agenda Item 1.2: Consideration of specific proposals for amendments to the existing ICAO plan with particular reference to operational facilities and services

1.2.1 Operational facilities and services for present and planned requirements; with particular reference to the status of meteorological offices at North Atlantic aerodromes, and to planned trans-polar operations.

1.2.2.1 The Committee derived primary guidance from the following sources in preparing a new plan of meteorological facilities and services for the Region:

- (a) the statement of operational requirements as determined by Subcommittee 1;
- (b) the proposed AGA plan for the Region;
- (c) the tabulations of existing facilities and services as contained in the fact-finding report prepared for the meeting, and the "Combined Meteorological Tables for International Air Navigation" (Doc 7155-MET/522).

1.2.2.2 The new regional plan is set forth in seven tables (Recommendation No.15). A brief summary of action taken in respect of each of these tables follows:

Table 1 - Meteorological offices providing service for international flight operations

The Committee considered that, in the NAT Region, a simpler format than that of Table I of the Combined MET Tables would be adequate for presentation of this portion of the regional plan. It was not deemed necessary to designate the associated MMQ, as is done in column 4 of the Combined MET Tables, inasmuch as this is left to States' determination. Column 6, dealing with languages used, was not deemed appropriate to a regional plan. Column 7, dealing with charts available was not incorporated in the regional plan in view of the adequately developed state of meteorological services in the NAT Region and the fact that the specification of charts available was, in this Region, an unnecessary statement of the tools to be used in meeting the operational requirement.

Table 2 - Special responsibilities of meteorological offices

The Committee decided that this table should consist of a plan for the dissemination of air-reports to designated collecting centres, as well as the subsequent transmission of air-reports collectives by such collecting centres on designated circuitry. It was determined that the issue of selected special aerodrome reports had been adequately catered for in the new PANS-MET. The exchange of such special reports was incorporated in Table 6 of the new regional plan. The dissemination of warnings (other than for storms of tropical or sub-tropical origin) was not tabulated in view of the elimination of area meteorological watch as a procedure for the NAT Region.

Table 4 - Exchange of aerodrome forecasts

Among the receiving offices, all regular North Atlantic aerodromes listed in the AGA report have been included, as well as certain important aerodromes classified as "Alternate Aerodromes" by the AGA Committee. The list of issuing offices has been based mainly on that given for regular and alternate aerodromes in the AGA report.

The indicated exchange of aerodrome forecasts and amendments reflect the general statement of operational requirements and the agreed additional exchanges necessary to meet present and planned operations.

Table 6 - Dissemination of meteorological reports

The list of issuing and receiving offices was compiled on the same basis as that used for Table 4.

The indicated exchanges of hourly and selected special reports have been drawn up primarily on a distance basis, taking into account scheduled and planned flight operations. The distances used for guidance were approximately 750 and 500 miles respectively.

Table 7 - Distribution of warnings of severe storms of tropical or sub-tropical origin

In the development of this section of the regional plan, only minor modifications were made indicating a wider distribution of warnings by certain storm warning centres.

Tables 8 and 9 - VOLMET broadcasts

These tables, prepared by the COM Committee, were reviewed by the MET Committee. With the exception of the Delegate of Canada, ~~the~~ The MET Committee was satisfied that the requirements for providing the meteorological data could be met without difficulty.

1.2.3

Agenda Item 1.3: Consideration of specific proposals for amendments to the existing ICAO plan with particular reference to meteorological telecommunications

1.3.1 Requirements for utilizing operational and special MET channels for ground-to-ground exchange of meteorological messages. (Complementary to the decisions of Sub-committee 1.)

1.2.3.1 Information on deficiencies in the existing exchange of meteorological information was passed to the COM Committee for necessary action and was followed later by an estimate of the increase in traffic to be expected on the main New York - Santa Maria - Paris meteorological circuit.

1.2.3.2 The continuation of traffic-handling checks on various circuits was recommended, but on a request basis only (Recommendation No.17).

1.2.3.3 The special difficulties encountered by Iceland in the collection of meteorological information from North America was considered and a recommendation was made for appropriate action by WMO (Recommendation No.18).

1.2.3.4 Deficiencies in the dissemination of aircraft reports were noted and more strict compliance with the relevant Regional Supplementary Procedures - MET was recommended (Recommendation No.19).

1.2.3.5 It was believed essential to retain the use of the Paris - Santa Maria - New York meteorological circuit (Recommendation No.20) and for procedures to be developed for alternative routing (Recommendation No.21). Continuation of special routing arrangements for Irish data was also recommended (Recommendation No.22).

1.2.3.6 Attention was given to the schedules and priorities applied to the New York - Santa Maria - Paris circuit and proposals were made with the object of meeting more closely the aeronautical requirements for dissemination of data, special attention being given to reports of ocean station vessels (Recommendations Nos. 23, 24 and 25).^{*}

1.2.3.7 The MET Committee also studied matters connected with the application of "dead traffic" procedures to meteorological messages and made Recommendation No.26.

^{*} See also ~~Report of Subcommittee 1 of the General Committee, Doc 7527, 7530~~
NAT III/CC ~~Sub-1~~, Section I, paragraph 1.3.2, and Recommendation No. 19.

1.2.4

Agenda Item 1.3: Consideration of specific proposals for amendments to the existing ICAO plan with particular reference to meteorological telecommunications

1.3.2 Radiotelephony and radiotelegraphy MET broadcast plan.
(Complementary to the decisions of Subcommittee 1.)

In accordance with a directive of Subcommittee 1 of the General Committee, this item was considered as deleted from the Agenda of the MET Committee, all action on it, except that indicated in paragraph 1.2.2.2 above (Tables 8 and 9) and in paragraph 1.2.9.2 below, being taken in the COM Committee.

1.2.5

Agenda Item 2: Consideration of specific problems relating to the collection and exchange of meteorological data from ocean station vessels.
(Associated with Item 2 on the Agenda of the COM Committee.)

The MET Committee studied the question of the dissemination of meteorological reports from ocean station vessels and noted that the transit times of these reports between ships and MMOs were in normal circumstances between 1 and 2 hours and occasionally 2 1/2 to 3 hours but that much longer delays sometimes occurred when radio propagation conditions were poor, especially in the case of reports from Ocean Station Alfa. This information was transmitted to the COM Committee together with an indication of the required transit times for these messages, namely one hour. This transit time was decided upon, bearing in mind the importance of these reports both as basic surface and upper air synoptic data and more directly in connection with flight meteorological watch. The COM Committee was also given information available to the MET Committee concerning the action being taken by the panel of European States, set up by the Fourth North Atlantic Ocean Stations Conference, to improve ship-shore communication and by WMO to improve the further dissemination of reports from ocean stations in the western part of the North Atlantic.

1.2.6

Agenda Item 3: Preparation of any regional procedures necessary to supplement world-wide MET procedures

1.2.6.1 The Committee had available to it the text for the expanded Annex 3, prepared by the 4th Session of the MET Division under its Recommendation 1 and the text, prepared by the Secretariat, for new PANS-MET, resulting from Recommendation 3 of the 4th Session of the MET Division. The Committee was made aware of the approximate date at which it might be expected that the above world-wide provisions will become effective, namely, about 1 January 1956. As its first action on the Agenda item, the Committee, therefore, discussed the need for interim amendment of the present Supplementary Procedures. It found that the changes required in the Supplementary Procedures were substantially not of a major character and that only in incidental cases would there

be a need for the introduction of revised procedures prior to 1 January 1956. The Committee recognized that, simultaneously with the introduction of the new world-wide procedures (Annex 3 and PANS-MET), certain of the present Supplementary Procedures would require substantial change or might be eliminated, as they would be replaced in their entirety by world-wide procedures. The Committee agreed that the best way of proceeding would be to review the present Supplementary Procedures and bring them up to date, bearing in mind the new world-wide provisions to become effective in 1956 and, subsequently, to rearrange the Supplementary Procedures material so as to follow the sequence of related provisions of a world-wide character in the new Annex and the PANS-MET. The Committee kept in mind that the new model for the Supplementary Procedures - NAT might be used as an example for the rearrangement of the corresponding Supplementary Procedures for other regions. Therefore, Recommendation No.27 in Section 3 contains the proposals of the meeting for amendment of the present Part IV of the Supplementary Procedures - MET in the sequence of the related new world-wide provisions. The implementation date for these Supplementary Procedures should coincide with that set for implementation of the new Annex 3 and PANS-MET.

1.2.6.2 Realignment of the MET Supps in accordance with the PANS-MET

The Committee considered that it would be of great convenience if the presentation of the new Supplementary Procedures for all Regions could be aligned so as to follow the sequence of related paragraphs of the proposed PANS-MET. An attempt should be made to allocate identical paragraph numbers to the Supplementary Procedures and their corresponding world-wide controlling paragraphs. Cross-reference between related provisions would thus be considerably facilitated. In its presentation of the proposed Supps, the Committee has, therefore, indicated the corresponding paragraph numbers of the PANS-MET, while recognising that this numbering system might undergo further changes due to editorial improvement of the presentation of the PANS-MET during the review by the Air Navigation Commission. The above opinion of the Committee is underlined in Recommendation No.28.

1.2.6.3 Universally agreed Supplementary Procedures

The Committee noted that most of the paragraphs in the present Supplementary Procedures, controlling the required display of meteorological information, have been agreed universally. As the 4th Session of the MET Division failed to incorporate this material into the draft PANS-MET, the Committee was of the opinion that this material could be incorporated while the final text for the PANS-MET was being established. Accordingly, it formulated Recommendation No.29.

1.2.6.4 Area and flight meteorological watch

The Committee noted that, in recent years, there have been a number of developments affecting air transport in the North Atlantic Region, namely:

- (a) Annex 6 has placed certain clearly defined responsibilities on operators for safe conduct of the flight and for supervision of flight operations, which they are required to discharge in a manner which does not conflict, inter alia, with meteorological procedures;
- (b) The route structure of airlines operating across the North Atlantic has developed and expanded to the point where there is now a multiplicity of air routes and a heavy density of traffic in some parts of the region;
- (c) Longer range types of modern aircraft have been introduced into regular service, leading to a wider selection of routings and tracks;
- (d) The growing number of direct flights to and from aerodromes well within the continental areas of North America and Europe.

The Committee noted that the operator's local representative was in some cases required to carry out in-flight operational planning duties in connection with flights other than those for which the MMO at the same location had responsibility for the supply of meteorological service under present meteorological procedures and, in connection with these duties, had a requirement for meteorological information.

The provision of in-flight planning information raised questions related to possible duplication of work at two offices and the division of responsibility of these two offices. These were matters of some concern to certain Meteorological Authorities, particularly where the meteorological office responsible for the supply of meteorological service for a flight was in a different State from the operator's local representative designated to carry out in-flight planning duties.

Recognising this problem, the Committee replaced the present paragraph concerning flight meteorological watch by a provision which enables the operators to arrange with the Meteorological Authorities the particular type of in-flight meteorological service best adapted to the interests of all concerned. Recommendation No.30 calls upon operators and Meteorological Authorities to co-operate in order to effect the most practicable arrangements.

1.2.6.5 Period of validity of aerodrome forecasts

Comparison of the presentation in the present Supps of the validity periods of aerodrome forecasts disseminated by VOLMET broadcasts and by means of ground-to-ground exchanges, indicates the differences in treatment given to this material in the two cases. It was believed preferable to lay down the validity periods of aerodrome forecasts included in radio broadcasts in a manner similar to that for forecasts for ground exchange purposes. The Committee accordingly proposed the introduction of a separate Supplementary Procedure on this matter.

1.2.6.6 Amendments to aerodrome forecasts

The attention of the Committee was drawn to the fact that, on both sides of the Atlantic, meteorological offices receive aerodrome forecasts for certain aerodromes with varying validity periods. It was considered necessary to draw attention to the fact that an amendment to a forecast in one series does not necessarily apply also to that for the same aerodrome received in another series. This situation could be improved, when amendments would be made available promptly and would clearly indicate that they apply to all series issued by the particular aerodrome. Recommendations Nos. 31 and 32 call the attention of States to the measures referred to above.

1.2.6.7 Utilisation of air-reports

The Committee noted that air-reports provide a valuable source of meteorological information in the NAT Region. It agreed that maximum benefit should be obtained from the air-reports received by meteorological offices under the proposed Supplementary Procedures. The Committee called attention to this need in its Recommendation No.34.

1.2.6.8 Other procedural matters

The Committee briefly discussed the desirability of preparing a procedure for the exchange of upper wind components along routes. The great variety in tracks followed across the North Atlantic appeared to make it difficult to provide a satisfactory procedure, it being recognised that upper wind components without knowledge of the actual track followed could not be put to satisfactory use.

Operational utilisation of supplementary reports, recommended by the Committee to be obtained from ocean station vessels, was briefly discussed. It was believed that such reports would have predominantly synoptic significance. No Supplementary Procedure was, therefore, considered necessary on this matter.

The proposed PANS-MET refer to the possibility of developing Regional agreements regarding the division of responsibility for the preparation of aeronautical descriptive climatological memoranda for sea areas. It was believed that it would be premature to attempt to develop guidance to States regarding the division of responsibility envisaged and that, for the time being, the division of responsibility for this material could be left to arrangement between the interested Meteorological Authorities, as permitted by the PANS-MET.

The functions of meteorological offices, prescribed in detail in the PANS-MET, call for the supply of meteorological information, as required, to appropriate Rescue Co-ordination Centres, in accordance with regional agreements. The RAC/SAR Committee was asked whether a precise indication of the meteorological information, to be readily available in case of emergency, was practicable. The reply received from the RAC/SAR Committee caused the MET Committee to make the necessary provision in paragraphs 9.2 and 9.3 of the proposed Supplementary Procedures.

While considering Recommendation No.57 of the 4th Session of the MET Division, calling for an investigation into the suitability of present Flight Information Regions for purposes of area meteorological watch when the volume of traffic of high speed, high flying aircraft becomes substantial, the Committee concluded that this matter is not at present urgent in the North Atlantic Region. Area watch is provided only in the fringe areas and, thus, the matter seems to be largely a problem of the European Region. Such experience as is available pertains to that area rather than to the North Atlantic Region. The Committee accordingly concluded that no special provisions are required in the NAT Region in the near future.

1.2.6.9 Forms of messages in transmissions to aircraft

The Committee reviewed Appendix A of the Supplementary Procedures, which records the forms of meteorological messages to be used in ground-air transmissions. It agreed that the present stage in the development of radio-telephony for this purpose makes it impracticable to standardise on one or other form of message. The provisions on this matter, contained in the new PANS-MET, were considered adequate. Accordingly, the Committee eliminated Appendix A - NAT.

1.2.6.10 Meteorological data in support of altimeter setting procedures

The Committee also reviewed paragraph 1.4 of Part 1 of the Supplementary Procedures, dealing with meteorological provisions in support of altimeter setting procedures. The recommendation of the Committee in this field was forwarded to Sub-committee 1 for incorporation in its proposals for amendment of Part 1 of the Supplementary Procedures - NAT. The Committee felt that these procedures are adequate for the present, but may require revision in the light of findings, expected to result from the Secretariat's study of the contributions by States in response to EUM III MET Recommendations 31, 32 and 33 and SEA/SOP MET Recommendation 55. The Committee limited its proposals to Sub-committee 1 on the subject, therefore, to a proposal for rewording paragraph 1.4.4.1 so as to bring the phraseology in line with corresponding text in the new PANS-MET.

1.2.7

Agenda Item 4: Recapitulation of previous North Atlantic Regional MET recommendations with a view to eliminating those which are no longer applicable.

1.2.7.1 In its review of MET recommendations of previous North Atlantic regional meetings, the Committee gave special attention to MET Recommendation No.20 of the 2nd NAT RAN Meeting in view of the continued joint financing of certain meteorological facilities and services in Iceland (see Section 4, paragraph 2.2). This recommendation was re-affirmed, as also was Recommendation No.13 of the Special North Atlantic Meteorological Telecommunications Meeting. It was recommended that all others be cancelled (Recommendation No.35).

1.2.8

Agenda Item 5: Preparation for transmission to Sub-committee 1 of a list of MET facilities and services included in the revised regional plan that are considered of critical importance to air operations in the Region, and that for this reason should be given priority in the implementation plans of the State concerned.

1.2.8.1 In its work under this Agenda item the MET Committee was unable to reach unanimous agreement. There was a division of opinion as to whether or not the following item should be listed as a matter of critical importance to air operations in the Region and deserving priority action:

Improvement of the present exchange of meteorological data between Europe and North America.

The Delegates of five States (Canada, Denmark, Netherlands, Sweden and United Kingdom) voted in favour of the inclusion of the item and an equal number of Delegates (Belgium, France, Ireland, Portugal and United States) voted against, one abstaining (Iceland).

No other facility was believed to require priority in implementation.

1.2.9

Agenda Item 6: Recommendation of dates for implementing the recommended facilities and procedures.

1.2.9.1 In proposing dates of implementation of additional meteorological observations under Agenda Item 6, the MET Committee took into account the dates of commencement of new air services for which some of these observations were required (Recommendation No.9).

1.2.9.2 The Committee prepared its plan for operational facilities and services in the light of its earlier conclusions regarding modifications required in the Supplementary Procedures - MET for the Region. Most of the new or modified operational facilities and services recommended should, therefore, be implemented simultaneously with the revised Supplementary Procedures. However, the Committee, noting certain deficiencies in the current exchange of air-reports, considered it desirable that the plan for exchange of air-reports, as set forth in Table 2 of the new regional plan, be implemented at an early date. With regard to the radiotelephony/radiotelegraphy broadcast plan, prepared by the GOM Committee, the MET Committee in general foresaw no difficulty in meeting any date, however early, for the provision of the recommended broadcast centres with the necessary meteorological information (Recommendation No.16).

1.2.9.3 The Committee recommended that the revised Supplementary Procedures - MET be introduced at the same time as the new Annex 3 and PANS-MET (Recommendation No.33).

SECTION 2 - REPORT AND RECOMMENDATIONS ON FACILITIES1. SYNOPTIC OBSERVATIONS AND NETWORKS1.1 General

1.1.1 The MET Committee examined the existing networks of surface synoptic and upper air observations and decided that it was not justified in recommending any substantial changes in the general density and frequency of observations, bearing in mind that, pending the completion of networks studies by WMO, no generally accepted criteria for the density of networks are available. However, taking into account the principles stated in Recommendation No.4 of the 4th Session of the MET Division, reported or expected difficulties in forecasting and the future requirements for high level operations, the Committee felt justified in recommending a small number of additions to the existing observation programme.

1.1.2 No recommendation was made for any change in the number or location of North Atlantic Ocean Stations decided upon at the 4th NAOS Conference (Paris, February 1954), as no new information or views were put forward which might serve as a basis for a reassessment of requirements. However, recommendations were made with the object of increasing to the maximum extent considered practicable and useful the observation programme of the ocean station vessels.

1.2 Surface synoptic observations1.2.1 Ocean station network1.2.1.1 Need for supplementary reports from ocean station vessels

Recommendation No.1.- that the special attention of States operating ocean station vessels be drawn to the need for supplementary observations to be taken on board ocean station vessels between synoptic hours and disseminated (Ocean Station Vessel Manual, Section II, paragraphs 2.1.2 and 2.2).

1.2.1.2 The MET Committee noted that the international meteorological code for selected special weather reports from ships (FM.26A), and also the criteria for the transmission of such reports, are based on the selected special meteorological reports for aerodromes and the corresponding criteria. The Committee believed, however, that a modified code and new criteria would be needed since this type of information originated by ocean station vessels would serve quite a different purpose, namely, the provision of supplementary information for general synoptic purposes rather than up-to-date information on conditions for landing and take-off at aerodromes.

Procedures and code for supply of observations from ocean station vessels

Recommendation No.2.- that WMO be requested

(a) to establish procedures for the issue of supplementary reports by ocean station Vessels, taking into account the following suggestions:

(i) Supplementary reports should be transmitted:

- A. when a marked and sustained change in mean wind speed has occurred (of the order of 20 knots or more);
- B. when a marked and sustained change in mean wind direction has occurred (of the order of 30° or more) the mean wind speed having been 15 knots or more before or after the change;
- C. when precipitation has begun or has ended (excepting individual showers in the case of showery precipitation);
- D. when fog has begun or ended;
- E. when pressure has begun to rise or fall at a rate of two millibars per hour or more;
- F. when one or more of the following phenomena has occurred:
 - Thunderstorm
 - Waterspout
 - Hail
 - Heavy snow
 - Freezing precipitation
 - Squall.

(ii) A supplementary report will not be transmitted in the half hour preceding the regular synoptic observation.

(b) to develop a code for supplementary reports from ocean station vessels, suitable for use with any new criteria developed along the lines indicated in (a)(i) above taking into account the following suggestions:

(i) The report should indicate, without ambiguity, the object of the supplementary report. Thus there should be a clear indication of whether the report became necessary because of an increase or decrease of the wind; it is not sufficient to know that the wind speed changed. Similarly, it should be possible to distinguish between a veering and a backing of wind, and between a rise and a fall of pressure. It should be noted that the interval since the last routine report may be almost 3 hours, whereas the change which gave rise to the report may have taken place within a much smaller period. A comparison of the supplementary report with the last routine report will not, therefore, give the information required.

- (ii) When two or more weather phenomena or changes occur simultaneously the report should indicate, without ambiguity, which one gave rise to the supplementary report.

1.2.2 Radar weather reports from ocean station vessels

Recommendation No.3.- that WMO be requested to develop, as an urgent matter, procedures and code(s) for the reporting of weather phenomena observed on the radar scope of ocean station vessels, bearing in mind the possibility that requirements in both respects may be different for this purpose from those in respect of observations at land stations and particularly aerodromes.

1.2.3 Reports from ships other than ocean station vessels

Recommendation No.4.- that WMO be requested

- (a) to continue efforts to improve the coverage of ships' reports over the North Atlantic, especially in the area north and west of a line from northern Scotland to southern Newfoundland, and the distribution of reports through the 24 hours;
- (b) in particular, to arrange for the meteorological reports from fishing vessels operating north of 60°N to be included in the synoptic exchanges in order that they may be utilised by MMOs providing service for North Atlantic flights.

1.3 Upper air observations

1.3.1 Recognising the need for greater accuracy in radiosonde observations in connection with forecasting for high level operations, and noting the requirement that radiosonde and radio/radar wind observations should be made up to 17,000 metres (55,000 feet) for future operations, the MET Committee made the following recommendations:

Accuracy and comparability of radiosonde observations

Recommendation No.5.- that WMO be requested to accelerate steps that are being taken to improve the accuracy and comparability of radiosonde observations as indicated in Recommendation No.6 of the 4th Session of the MET Division, 1st Session of CAeM, in view of impending high level operations in the North Atlantic Region.

Radiosonde and radio/radar wind observations up to 90 millibars

Recommendation No.6.- that WMO be requested to draw the attention of Members to the need for radiosonde and radio/radar wind observations made in the North Atlantic Region and North America to extend regularly to at least the 90 mb. level.

1.3.2 Additional radiosonde observations

Recommendation No.7.- that WMO be requested to take appropriate action to arrange for the following additional radiosonde observations to be made:

* Madrid	08221	0300 GMT (now made at 1500 GMT)
* La Coruña	08001	0300 and 1500 GMT
* Björnøya	01028	0300 and 1500 GMT

Comment.- The above observations are required for the following reasons:

Madrid and La Coruña - because of the sparse network over the Iberian Peninsula.

Björnøya - to improve network for forecasting for projected route Bodø-Fairbanks.

1.3.3 Additional radio/radar wind observations

Recommendation No.8.- that WMO be requested to take appropriate action to arrange for the following additional radio/radar wind observations to be made:

* Madrid	08221	0300 and 1500 GMT
* La Coruña	08001	0300 and 1500 GMT
* Stavanger	01415	0300 and 1500 GMT
* Jan Mayen	01001	0300 and 1500 GMT
* Björnøya	01028	0300 and 1500 GMT
* Tromsø	01030	0300 and 1500 GMT
* Østersund	02062	0300 and 1500 GMT
Danmarkshavn	04320	0300 and 1500 GMT
Nitchequon	72826	0300 and 1500 GMT
Coral Harbour	72915	0300 and 1500 GMT
Baker Lake	72926	0300 and 1500 GMT

Comment.- The above observations are required for the following reasons:

Madrid and La Coruña - as in comment under paragraph 1.3.2.

Stavanger - for general forecasting purposes because of sparse network in the area.

Jan Mayen, Björnøya, Tromsø and Østersund - to improve the network for forecasting for existing routes and projected "polar" routes, and because of difficulties expected in forecasting for future high level operations.

Nitchequon, Coral Harbour and Baker Lake - to improve the network in central and eastern part of Canada for forecasting for air routes through this area, particularly those to be operated at high levels.

Danmarkshavn - to improve network for forecasting for new and projected routes over Greenland.

* Recommended by 3rd EUM RAN Meeting (Rec.15-MET)

1.3.4 Implementation dates for additional upper air observations

Recommendation No.9.- that the additional meteorological observations referred to in Recommendations Nos.7 and 8 be implemented as soon as practicable, taking into account the fact that the following are required in connection with new air services commencing on the dates indicated:

- (a) Jan Mayen radio/radar wind observations - required for flights on the København-Spøndre Strømfjord route, commencing November 1954.
- (b) Bjørnøya radiosonde observations and Bjørnøya, Tromsø and Danmarkshavn radio/radar wind observations - required for "polar" flights commencing mid-1956.

1.4 Studies of networks requirements

Bearing in mind the difficulty and expense of establishing and maintaining ocean weather stations and observing stations in the extreme north, the MET Committee believed it to be important to have a sound basis for the further consideration of surface and upper air networks in those areas. Further, in view of the expected development of "polar" and high altitude flying, the Committee considered that suitable guidance regarding networks was urgently needed.

Study of requirements for observational networks

Recommendation No.10.- that WMO be requested in its studies of requirements for observational networks (Resolution No.8, CSM-I), especially for the upper air, to give early and special attention to the North Atlantic Region and polar regions, in particular the area north of 60°N, from northern Europe to Alaska.

2. HOURLY METEOROLOGICAL REPORTS

2.1 The MET Committee agreed that there was no requirement for a general exchange of hourly meteorological reports over long distances, e.g., on the New York - Paris meteorological RTT circuit.

2.2 The MET Committee agreed that there was no requirement for hourly meteorological reports from Prins Christianssund and south or south-east Iceland from the synoptic point of view, i.e., for the analysis of synoptic charts and the preparation of prognostic charts. However, in considering the usefulness of hourly reports for terminal forecasting and in providing QNH values, the following decisions were reached:

2.2.1 Prins Christianssund

- (a) Sub-committee 1 had reached the conclusion that "QNH values from Prins Christianssund, or a location within 60 or 70 nautical miles, would contribute materially to the efficiency of air navigation in that part of the Region". The MET

Committee agreed that Prins Christianssund would be as suitable a site for QNH reports as any in this neighbourhood.

Hourly QNH values at Prins Christianssund

Recommendation No.11:- that hourly QNH values be made available at Prins Christianssund.

- (b) The utility of hourly reports from nearby locations for aerodrome forecasting was recognised. However, owing to the difficulty of assessing this value in precise terms, no firm conclusion could be reached. The Committee felt, however, that if hourly QNH observations were made, the provision of full hourly reports might involve so little additional effort as to be capable of justification.

2.2.2 South and south-east Iceland

- (a) In a study on the benefits of hourly observations from Hólar or Höfn, the Government of Iceland had indicated that such reports would have a rather limited value for general forecasting purposes. The same report further indicated that, to be of maximum use in forecasting for Keflavik, the hourly reporting station should not be located east of 18°W longitude. The MET Committee was in agreement with these principles and did not, therefore, recommend the establishment of an hourly reporting station at Hólar or Höfn. The Committee felt, however, that the possibility of improving Keflavik terminal forecasts by the establishment of such a station on the south coast in the area of 18°W should be investigated.

Hourly reports from station on south coast of Iceland

Recommendation No.12.- that the Government of Iceland be invited to make a detailed study of the need for hourly meteorological reports from a location on the south coast of Iceland as an aid to forecasting for Keflavik Airport and to forward this study to ICAO to serve as a basis for consideration of an appropriate amendment of the regional plan.

- (b) Sub-committee 1 was informed of the approximate saving in flight space which might result from the use of hourly QNH values from Hólar or Höfn instead of the existing 3-hourly values and ruled that provision for these observations should not be made in the plan.

3. REQUIREMENTS FOR EXCHANGE OF SYNOPTIC DATA

3.1 Contents of bulletins

- 3.1.1 The MET Committee found that the contents of the bulletins of synoptic data being exchanged between North America and Europe were broadly satisfactory

except that no hourly reports were believed necessary. It therefore made the following recommendation, which was intended to supersede MET Recommendations Nos.1, 2, 3, 4, 5, 6, 8, 9, 10 and 11 of the 2nd NAT RAN Meeting.

Exchange of basic meteorological data between Europe and North America

Recommendation No.13.- that WMO be requested to take account of the following aeronautical requirements for the exchanges of basic synoptic data, in each direction between North America and Europe, and to take any further action which may be necessary to satisfy these requirements:

- (a) approximately 250 reports of surface observations for 00, 06, 12 and 18 GMT;
- (b) approximately 125 reports of surface observations for 03, 09, 15 and 21 GMT;
- (c) approximately 50 upper wind reports for 03, 09, 15 and 21 GMT, including all available reports of radio/radar wind observations, it being understood that the existing number of radio/radar wind observations will not be decreased;
- (d) approximately 25 individual reports of radiosonde observations for 03 and 15 GMT, the reports of station 72909 (Frobisher) being added to the current list;
- (e) summaries of upper air data (temperature, humidity, pressure and wind) based upon all available reports, for 03 and 15 GMT;
- (f) all merchant ships' reports, excluding those from ships within 150 nautical miles of the shore unless in coastal waters of Greenland, Iceland, Spitzbergen and Canada north of Newfoundland;
- (g) reports of observations made on all meteorological reconnaissance flights;
- (h) hourly consolidated bulletins of aircraft weather reports;
- (i) reports from sferics networks.

3.2 Fact-finding reports

3.2.1 The MET Committee believed that it would be helpful to have available, well in advance of future meetings, information concerning synoptic network and information already being disseminated. It therefore made the following recommendation, which supersedes MET Recommendation No.34 of the 2nd NAT RAN Meeting.

Meteorological data in fact-finding reports for RAN Meetings

Recommendation No.14.- that, at least two months prior to the convening of a regional meeting, a fact-finding report, in the form of charts showing surface and upper air meteorological observations made in the area which is likely to require attention by the meeting, and indicating those disseminated, be issued as part of the preliminary documentation of the meeting.

4. OPERATIONAL METEOROLOGICAL FACILITIES AND SERVICES

4.1 Requirements for operational meteorological facilities and services

Recommendation No.15.- that the following tables replace the corresponding parts of the present plan, covering the requirements for operational meteorological facilities and services in the Region:

TABLES MET 1 and 2 - METEOROLOGICAL OFFICES AND THEIR RESPONSIBILITIES
TABLEAUX MET 1 et 2 - CENTRES METEOROLOGIQUES ET RESPONSABILITESEXPLANATION OF TABLEColumn

- 1 Name of Meteorological Office.
- 2 Class of Meteorological Office, i.e. Main (MM), Dependent (DM), or Supplementary (SM).
- 3 Normal hours of service of the Meteorological Office.
- 4 Name of the Area Control Centre (ACC) and/or Rescue Co-ordination Centre (RCC), served.
- 5 Name of the collecting centre to which air reports should be sent by the Meteorological Office listed in Column 1.

Column

- 6 Dissemination of collectives of air reports by collecting centre.
- 7 Relay of collectives of air reports on basic circuitry.

Legend

DU = Dunstable.
 GN = Gander.
 NY = New York.
 PS = Paris.
 X = West European teleprinter network.
 Y = Paris-Santa Maria-New York MET RTT circuit.
 Z = North American MET teleprinter circuits.

EXPLICATION DES TABLEAUXColonne

- 1 Nom du centre météorologique.
- 2 Catégorie du centre météorologique, c'est-à-dire: Principal (MM), secondaire (DM), ou supplémentaire (SM).
- 3 Heures normales de vacation du centre météorologique.
- 4 Nom du centre de contrôle régional (ACC) et (ou) du centre de coordination de sauvetage desservis (RCC).
- 5 Nom du centre collecteur auquel doivent être envoyés les comptes rendus en vol par le centre météorologique indiqué dans la colonne 1.

Colonne

- 6 Diffusion par les centres collecteurs des messages collectifs de comptes rendus en vol.
- 7 Retransmission des messages collectifs de comptes rendus en vol sur les circuits de base.

Légende

DU = Dunstable.
 GN = Gander.
 NY = New York.
 PS = Paris.
 X = Réseau téléimprimeur d'Europe occidentale.
 Y = Réseau RTT MET Paris-Santa Maria-New York.
 Z = Circuits téléimprimeurs MET d'Amérique du Nord.

2.- Facilities 2.- Installations et services

MET-21

TABLE - TABLEAU
MET 1

TABLE - TABLEAU
MET 2

MET OFFICE CENTRE MET	CLASS CATEG.	HOURS HEURES	ACC AND RCC SERVED ACC ET RCC DESSERVIS	DISSEMINATION OF AIR REPORTS DIFFUSION DES COMPTES RENDUS EN VOL	DISSEMINATION OF COLLECTIVES DIFFUSION DE MESSAGES COLLECTIFS	RELAY OF COLLECTIVES RETRANSMISSION DE MESSAGES COLLECTIFS
1	2	3	4	5	6	7
BELGIUM / BELGIQUE						
Bruxelles/National	M40	H24	Bruxelles ACC & RCC			
BERMUDA / BERMUDES						
Kindley Field	M40	H24	Kindley ACC	San Juan		
BRITISH WEST INDIES ANTILLES BRITANNIQUES						
Port-of-Spain	M40	H24	Piarco ACC & Port-of-Spain RCC			
CANADA						
Gander	M40	H24	Gander ACC & Torbay RCC		Z, Keflavik, Prestwick, Shannon	X(PS);Y(NY)
Goose	M40	H24		Gander		
Moncton	DMO	H24	Moncton ACC	Gander		
Montreal	M40	H24	Montreal ACC	Gander		
Ottawa	SMO	HO		Gander		
Stephenville	DMO	H24		Gander		
Sydney	SMO	H24		Gander		
DENMARK / DANEMARK						
Aalborg	DMO	H24		Shannon		
København	M40	H24	København ACC & RCC	Shannon		
FRANCE						
Aix-en-Provence	-	H24	Marseille ACC & Aix-en-Provence RCC			
Marseille/Marignane	DMO	H24		Shannon		
Bordeaux/Mérignac	DMO	H24	Bordeaux ACC & RCC	Shannon		
Nice	DMO	HO		Shannon		
Paris/Le Bourget	DMO	H24		Shannon		
Paris/Orly	M40	H24	Paris ACC & RCC	Shannon		
Reims	DMO	HO		Shannon		
Tours	DMO	HO		Shannon		
FRENCH ANTILLES ANTILLES FRANÇAISES						
Fort-de-France or Pointe-à-Pitre	M40	H24	Piarco ACC			
GERMANY / ALLEMAGNE						
Bad Eilsen	-	H24	Bad Eilsen ACC & RCC			
Bremen	DMO	H24		Shannon		
Düsseldorf	M40	H24		Shannon		
Frankfurt/Main	M40	H24	Frankfurt ACC	Shannon		
Hamburg	M40	H24		Shannon		
Hannover	M40	H24		Shannon		
München	M40	H24	München ACC	Shannon		
GREENLAND / GROENLAND						
Narsarsuaq	M40	HO	Narsarsuaq ACC & RCC	Gander		
Søndrestrøm*	M40	HO	Thule ACC & RCC	Gander		
Thule				Gander		
ICELAND / ISLANDE						
Keflavik	M40	H24	Reykjavik ACC & RCC		Gander, London, Paris, Prestwick, Shannon	X(PS);Y(PS); Z(QN)
Reykjavik	SMO	HO		Keflavik		
IRELAND / IRLANDE						
Dublin	DMO	H24		Shannon		
Shannon	M40	H24	Shannon ACC & RCC		Y, Dumettable, Gander, Keflavik, Zürich	X(DU);Z(NY)
NETHERLANDS / PAYS-BAS						
Amsterdam/Schiphol	M40	H24	Amsterdam ACC & Valkenburg RCC	Shannon		
Groningen/Keelde	SMO	H24		Shannon		

*For polar flights only - Pour les vols transarctiques seulement.

Part V.- MET Committee
5ème Partie.- Comité de météorologie

TABLE - TABLEAU
MET 1TABLE - TABLEAU
MET 2

MET OFFICE	CLASS	HOURS	ACC AND RCC SERVED	DISSEMINATION OF AIR REPORTS	DISSEMINATION OF COLLECTIVES	RELAY OF COLLECTIVES
1	2	3	4	5	6	7
NORWAY / NORVEGE						
Bardufoss	SMO	HO	Oslo ACC & RCC Stavanger ACC & RCC Tromsø ACC & RCC	Shannon		
Bodo	MMO	HO				
Oslo/Fornebu	MMO	H24				
Stavanger/Sola	MMO	H24		Shannon		
Tromsø	-					
PORTUGAL						
Lajes	DMO	H24	Lisboa ACC & RCC Santa Maria ACC & Lajes RCC	Santa Maria		
Lisboa	MMO	H24		Santa Maria		
Santa Maria	MMO	H24			Y	X(FB);Z(NY)
PUERTO RICO / PORTO RICO						
San Juan/Isla Verde	MMO	H24	San Juan ACC & RCC		Z	Y(NY)
SPAIN / ESPAGNE						
Barcelona	SMO	HO	Barcelona ACC Madrid ACC & RCC Sevilla ACC	Santa Maria		
Madrid/Barajas	MMO	H24		Santa Maria		
Sevilla/San Pablo	SMO	HO		Santa Maria		
SWEDEN / SUEDE						
Göteborg/Torslanda	MMO	H24	Göteborg ACC Malmö ACC Stockholm ACC & RCC	Shannon		
Malmö/Bulltofta	MMO	H24		Shannon		
Norrköping/Kungsängen	SMO	HO		Shannon		
Stockholm/Bromma	MMO	H24		Shannon		
Stockholm/Halmstad	DMO	HO				
SWITZERLAND / SUISSE						
Genève/Cointrin	DMO	H24	Genève ACC & Berne RCC Zürich ACC & Berne	Shannon		
Zürich/Kloten	MMO	H24		Shannon		
UNITED KINGDOM/ROYAUME-UNI						
Aldergrove	-		Aldergrove RCC			
Bournemouth/Hurn	DMO	HO		Shannon		
London/Bovingdon	SMO	HO		Shannon		
London/London	MMO	H24		Shannon		
Pitreavie	-		Rosyth RCC Plymouth RCC Prestwick ACC & RCC			
Plymouth	-					
Prestwick	MMO	H24		Shannon		
Reading/Blackbushe	SMO	HO		Shannon		
UNITED STATES / ETATS-UNIS OF AMERICA						
Baltimore/Friendship	DMO	H24	Boston ACC & New York RCC	New York		
Boston/Logan	DMO	H24		New York		
Buffalo	DMO	HO		New York		
Burlington	DMO	HO		New York		
Chicago/Midway	MMO	H24		New York		
Cleveland	DMO	HO		New York		
Detroit/Wayne Major	DMO	HO		New York		
Milwaukee/Gen. Mitchell	DMO	HO		New York		
Newark	DMO	HO		New York		
New York/La Guardia	MMO	H24	New York ACC & RCC		Y, Z	X(FB)
New York/International	MMO	H24				
Philadelphia/International	DMO	H24		New York		
Pittsburgh/						
Greater Pittsburgh	DMO	HO		New York		
Washington/National	DMO	H24	Washington ACC & New York RCC	New York		

TABLEAU - TABLE
MET 4
ÉCHANGE DES PRÉVISIONS D'AÉRODROME - EXCHANGE OF AERODROME FORECASTS

COUNTRY PAYS	FORECASTS AND AMENDMENTS FROM: PRÉVISIONS ET AMENDEMENTS DE: To be received at: Destinées à:																																				
		AMSTERDAM	ANTWERP	BAGDAD	BANGKOK	BATAVIA	BOMBAY	BORDAUX	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG	BREITENBURG
BAHAMA'S	NASSAU (OAKS)																																				
BELGIUM / BELGIQUE	BRUXELLES	X																																			
BERMUDA / BERMUDES	KINDLEY FIELD		X																																		
CANADA	GANDER	X	X																																		
	GOOSE	X	X																																		
	MONTREAL	X	X																																		
	STEPHENVILLE																																				
DENMARK / DANEMARK	KØBENHAVN																																				
FRANCE	PARIS/Orly	X																																			
FRENCH ANTILLES ANTILLES FRANÇAISES	POINTE-À-PITRE																																				
GERMANY / ALLEMAGNE	FRANKFURT	X	X																																		
	HAMBURG	X	X																																		
GREENLAND / GROENLAND	NARSARSSUAK																																				
	SONDRESTROM	X																																			
ICELAND / ISLANDE	KEFLAVIK	X	X																																		
	REYKJAVIK	X	X																																		
IRELAND / IRLANDE	SHANNON	X																																			
NETHERLANDS / PAYS-BAS	AMSTERDAM/SCHIPHOL	X																																			
NORWAY / NORVEGE	Bodo																																				
	OSLO																																				
	STAVANGER																																				
PORTUGAL	LISBOA	X	X																																		
	SANTA MARIA	X	X																																		
PUERTO RICO / PORTO-RICO	SAN JUAN		X																																		
SPAIN / ESPAGNE	MADRID	X	X																																		
SWEDEN / SUEDE	GÖTEBORG																																				
	STOCKHOLM/BROMMA																																				
	STOCKHOLM/HÄLSJÖN																																				
SWITZERLAND / SUISSE	GENÈVE																																				
UNITED KINGDOM / ROYAUME-UNI	LONDON/LONDON	X	X																																		
	PRESTWICK	X	X																																		
UNITED STATES OF AMERICA ETATS-UNIS	BOSTON		X																																		
	CHICAGO																																				
	DETROIT																																				
	NEW YORK	X	X																																		
	PHILADELPHIA		X																																		
	WASHINGTON		X																																		

TABLEAU - TABLE
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DIFFUSION DES MESSAGES MÉTÉOROLOGIQUES - DISSEMINATION OF METEOROLOGICAL REPORTS

COUNTRY PAYS	REPORTS FROM: MESSAGES PROVENANT DE: TO BE RECEIVED AT: DESTINÉS À:																																																																																								
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Yokohama	ALCOBES AMSTERDAM BALTIMORE BARCELONA BOMBAY BUENOS AIRES CANTON CHONGKING COPENHAGEN DUBLIN GUANGZHOU HANKOW HONGKONG Kobe LONDON LYONS MANILA MOSCOW NEW YORK Peking Rangoon San Francisco Shanghai Singapore Sourabaya Tientsin Yokohama	ALCOBES AMSTERDAM BALTIMORE BARCELONA BOMBAY BUENOS AIRES CANTON CHONGKING COPENHAGEN DUBLIN GUANGZHOU HANKOW HONGKONG Kobe LONDON LYONS MANILA MOSCOW NEW YORK Peking Rangoon San Francisco Shanghai Singapore Sourabaya Tientsin Yokohama	ALCOBES AMSTERDAM BALTIMORE BARCELONA BOMBAY BUENOS AIRES CANTON CHONGKING COPENHAGEN DUBLIN GUANGZHOU HANKOW HONGKONG Kobe LONDON LYONS MANILA MOSCOW NEW YORK Peking Rangoon San Francisco Shanghai Singapore Sourabaya Tientsin Yokohama	ALCOBES AMSTERDAM BALTIMORE BARCELONA BOMBAY BUENOS AIRES CANTON CHONGKING COPENHAGEN DUBLIN GUANGZHOU HANKOW HONGKONG Kobe LONDON LYONS MANILA MOSCOW NEW YORK Peking Rangoon San Francisco Shanghai Singapore Sourabaya Tientsin Yokohama	ALCOBES AMSTERDAM BALTIMORE BARCELONA BOMBAY 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LEGEND - LÉGENDE

H - HOURLY REPORTS - OBSERVATIONS HORAIRES
S - HOURLY AND SELECTED SPECIAL REPORTS - MESSAGES HORAIRES ET MESSAGES D'OBSERVATIONS SPÉCIALES SÉLECTIONNÉES

MET-24

Part V.- MET Committee
5ème Partie.- Comité de météorologie

TABLE - TABLEAU
MET 7

DISTRIBUTION OF WARNINGS OF SEVERE STORMS OF TROPICAL OR SUB-TROPICAL ORIGIN
DIFFUSION DES AVERTISSEMENTS RELATIFS AUX FORTES TEMPÊTES D'ORIGINE
TROPICALE OU SUBTROPICALE

STORM WARNING CENTRES CENTRES D'AVERTISSEMENT DE TEMPETE	AREA SERVED RÉGION DESSERVIE	BASIC DISTRIBUTION TO MET OFFICES DIFFUSION FONDAMENTALE AUX CENTRES METEOROLOGIQUES
1	2	3
BOSTON	ATLANTIC: COAST AND COASTAL WATERS NORTH OF BLOCK ISLAND (41°10'N) ATLANTIQUE: ZONE CÔTIÈRE AU NORD DE BLOCK ISLAND (41°10'N)	GANDER, KINDLEY FIELD, LONDON/LONDON, MONCTON, MONTREAL, NEW YORK/LA GUARDIA, PARIS/ORLY, PRESTWICK, SANTA MARIA, SHANNON.
MIAMI	ATLANTIC SOUTH OF 35°N AND AREAS IN GULF OF MEXICO AND CARIBBEAN SEA NOT ASSIGNED TO SAN JUAN AND NEW ORLEANS ATLANTIQUE AU SUD DE 35°N ET RÉGIONS DU GOLFE DU MEXIQUE ET DE LA MER DES CARAÏBES QUI N'ONT PAS ÉTÉ ATTRIBUÉES À SAN JUAN OU À NEW ORLEANS	GANDER, KINDLEY FIELD, LONDON/LONDON, MONCTON, MONTREAL, PRESTWICK, SANTA MARIA, SHANNON.
SAN JUAN	CARIBBEAN SEA AND ISLANDS EAST OF 75°W AND SOUTH OF 20°N MER DES CARAÏBES ET ÎLES À L'EST DE 75°W ET AU SUD DE 20°N	BOSTON, KINDLEY FIELD, MIAMI, NEW YORK, SANTA MARIA, WASHINGTON.
WASHINGTON	ATLANTIC: NORTH OF 35°N AND WEST OF 35°W, NOT TO INCLU- DE AREA ASSIGNED TO BOSTON ATLANTIQUE: AU NORD DE 35°N ET À L'OUEST 35°W, NON COMPRIS LA ZONE ATTRIBUÉE À BOSTON	GANDER, KINDLEY FIELD, LONDON/LONDON, MONCTON, MONTREAL, NEW YORK/LA GUARDIA, PARIS/ORLY, PRESTWICK, SANTA MARIA, SHANNON.

FIRST HALF HOUR				PREMIÈRE DEMI-HEURE		
MODE OF/DE TRANSMISSION	RADIOTELEPHONY			RADIOTÉLÉPHONIE		
STATION	WSY NEW YORK	VFG GANDER		EIP SHANNON		FXO PARIS
H + FREQUENCIES FRÉQUENCES	00-05	05-10	10-15	15-20	20-25	25-30
3001 kc/s	REP NEW YORK/INT BOSTON WASHINGTON	REP GANDER GOOSE STEPHENVILLE	REP MONCTON SYDNEY MONTREAL	REP SHANNON PRESTWICK LONDON	REP AMSTERDAM BRUXELLES (RESERVED)	REP PARIS/ORLY GENÈVA (RESERVED)
5559 kc/s	FCT NEW YORK/INT BOSTON WASHINGTON	FCT GANDER GOOSE STEPHENVILLE	FCT MONCTON SYDNEY MONTREAL	FCT SHANNON PRESTWICK LONDON	FCT AMSTERDAM BRUXELLES (RESERVED)	FCT PARIS/ORLY GENÈVA (RESERVED)
8828.5 kc/s	REP NEW YORK/INT	REP GANDER	REP MONCTON	REP SHANNON	REP AMSTERDAM	REP PARIS/ORLY
SECOND HALF HOUR				DEUXIÈME DEMI-HEURE		
MODE OF/DE TRANSMISSION	RADIOTELEPHONY RADIOTÉLÉPHONIE	RADIOTELEGRAPHY		RADIOTÉLÉGRAPHIE		
STATION	WSY NEW YORK	VFG GANDER		EIP SHANNON		FXO PARIS
H + FREQUENCIES FRÉQUENCES	30-35	35-40	40-45	45-50	50-55	55-60
3001 kc/s	REP NEW YORK/INT BOSTON WASHINGTON	AERO GANDER GOOSE STEPHENVILLE	AERO MONCTON SYDNEY MONTREAL	AERO SHANNON PRESTWICK LONDON	AERO AMSTERDAM BRUXELLES (RESERVED)	AERO PARIS/ORLY GENÈVA (RESERVED)
5559 kc/s	FCT NEW YORK/INT BOSTON WASHINGTON	TAF GANDER GOOSE STEPHENVILLE	TAF MONCTON SYDNEY MONTREAL	TAF SHANNON PRESTWICK LONDON	TAF AMSTERDAM BRUXELLES (RESERVED)	TAF PARIS/ORLY GENÈVA (RESERVED)
8828.5 kc/s	REP NEW YORK/INT	AERO GANDER	AERO MONCTON	AERO SHANNON	AERO AMSTERDAM	AERO PARIS/ORLY

- NOTE 1- THE TRANSMISSION ORDER OF WEATHER FOR THE LOCATIONS SHOWN IN EACH BLOCK SHOULD BE STRICTLY OBSERVED.
L'ORDRE DES LOCALITÉS INDIQUÉES DANS CHAQUE CASE SERA STRICTEMENT OBSERVÉ LORS DE LA TRANSMISSION.
- 2- REPETITION OF THE FIRST ACTUAL WEATHER REPORT AERO SHOULD BE MADE IF TIME PERMITS.
LE PREMIER MESSAGE MÉTÉOROLOGIQUE AERO SERA RÉPÉTÉ, SI LES DÉLAIS LE PERMETTENT.
- 3- THE METEOROLOGICAL INFORMATION REGARDING PARTICULAR LOCATIONS SHALL BE TRANSMITTED STRICTLY WITHIN THE TIME BLOCK SPECIFIED FOR ITS TRANSMISSION.
LES VACATIONS PRESCRITES BERONT STRICTEMENT OBSERVÉS POUR LA TRANSMISSION DES RENSEIGNEMENTS MÉTÉOROLOGIQUES INTÉRESSANT CHAQUE LOCALITÉ.
- 4- THE EFFECTIVE PERIOD OF VALIDITY OF EACH FORECAST SHOULD NOT BE LESS THAN 6 HOURS FROM THE TIME OF BROADCAST.
LA PÉRIODE DE VALIDITÉ EFFECTIVE DE CHAQUE PRÉVISION NE SERA PAS INFÉRIEURE À 6 HEURES À PARTIR DE L'HEURE D'ÉMISSION.

TABLE - TABLEAU
MET 8/9

4.2 Implementation dates for Tables, operational facilities and services

Recommendation No.16.- that Tables 1, 2, 4, 6, 7, 8 and 9 in Recommendation No.15, be implemented as follows:

- (a) Tables 1, 4, 6, 7 and 2 (except exchange plan for air-reports):
on the date set for implementation of the proposed new Supplementary Procedures - MET;
- (b) Table 2, in so far as it shows the exchange plan for air-reports:
not later than four months after approval by Council of this part of the plan;
- (c) Tables 8 and 9:
on the date recommended by the COM Committee.

5. METEOROLOGICAL TELECOMMUNICATIONS

5.1 Deficiencies in exchanges of meteorological information

5.1.1 The MET Committee considered the efficiency of the existing telecommunications arrangements for the exchange of surface and upper air synoptic information and operational meteorological information. A list of deficiencies was transmitted to the COM Committee for consideration of possible remedial measures. It included the following important deficiencies:

- (a) Delays in the receipt in Europe of basic data from Greenland, only during periods of poor propagation;
- (b) Delays in the receipt in Canada of basic data from Greenland;
- (c) Interruptions of the New York - Santa Maria - Paris meteorological circuit, especially when conditions of radio propagation are poor.

5.1.2 The MET Committee was anxious to continue arrangements for traffic handling checks and made the following recommendation, which supersedes MET Recommendation No.14 of the 2nd NAT RAN Meeting.

Traffic handling checks

Recommendation No.17.- that

- (a) in order to assess the efficiency of the communications channels, traffic handling checks should be undertaken at the following points:
 - (i) Goose Bay and Montreal, with respect to the data received from Greenland;
 - (ii) København with respect to the data received from Angmagssalik;

-
- (iii) New York, with respect to the data transmitted on the radioteletype circuit to Santa Maria and Paris;
 - (iv) Santa Maria, on the handling of meteorological data on the radio-teletype circuits to New York and Paris;
 - (v) Paris, with respect to the meteorological data transmitted on the radioteletype circuit to Santa Maria and New York;

Note: Checks should be made on the traffic handled between 0001 and 2359 GMT on a day determined by co-ordination between States concerned at the request of any interested State and should not be made on more than one day per month.

- (b) reports be prepared in the form shown in the annex to this recommendation;
- (c) reports of checks carried out as in paragraph (a) above be sent to all North Atlantic States as soon as possible and not later than two weeks after the check has been made.

(Annex to Recommendation No.17)

METEOROLOGICAL TRAFFIC HANDLING CHECK

1	2	3	4	5	6	7
Message Collective or Bulletin Heading	Time of obser- vation or origination of data GMT	Filing time (originating station) or time message received (relay stn.) GMT	Time of transmission GMT	Group count	Handling and Transmission Time (Column 4 minus Column 3) in minutes	Remarks (if handling time greater than 30 minutes)
(Example of information to be entered on this form given below)						
PBUS KLGA	0300	0610	0622	300	12	Unable to transmit earlier be- cause of equipment failure (transmitter inoperative).
MTUS KLGA	0630	0655	0702	275	7	
etc.						
etc.						
etc.						
MTEF FFMN	0600	0640	0649	250	9	
PBEF FFMN	0800	1130	1145	165	15	
MTEU FFMN	0600	1132	1150	225	18	
etc.						
etc.						
etc.						
SLSU GAIA	0600	1201	1245	985	44	
SLNH DDFM	1500	1800	1805	90	5	
etc.						
etc.						
etc.						

5.1.3 The Committee believed that some improvement in the exchanges with Iceland was needed. It also noted that there was a likelihood of the WSY radiotelegraph broadcast being discontinued. The following Recommendation was accordingly made and was intended to supersede MET Recommendation No.12 of the 2nd NAT RAN Meeting.

Exchange of basic meteorological data with IcelandRecommendation No.18.- that WMO

- (a) be informed of the necessity for improved facilities for the expeditious transmission (whether by broadcast or point-to-point) of North American and European meteorological data to Iceland and for the transmission of Icelandic data to North America and Europe;
- (b) be requested to continue action towards an improvement of existing facilities and, in particular, to take all possible measures to avoid the adverse effects which would otherwise result if the WSY radiotelegraph broadcasts were discontinued;
- (c) be requested to treat this as an urgent matter, and to keep ICAO informed of progress.

5.1.4 It was noted that existing exchanges of aircraft meteorological reports were not satisfactory.

Collection and dissemination of aircraft meteorological reports

Recommendation No.19.- that Contracting States be urged to comply fully with the Regional Supplementary Procedures for the North Atlantic Region which relate to the collection and dissemination of aircraft meteorological reports.

5.2 New York - Santa Maria - Paris meteorological circuit

5.2.1 It was estimated that, as a result of the exchange of greater numbers of aircraft meteorological reports and of upper air data for greater altitudes, traffic on the New York - Santa Maria - Paris meteorological circuit would increase by about 2,000 groups daily in the west-east direction and by about 500 groups daily in the east-west direction. This information was transmitted to the COM Committee.

5.2.2 The MET Committee was anxious to retain exclusive use of the New York - Santa Maria - Paris circuit for the exchange of meteorological data between North America and Europe and made the following recommendation, which was intended to supersede Recommendation No.1 of the Special North Atlantic Meteorological Telecommunications Meeting.

Exchange of meteorological data between North America and Europe by RTT New York - Santa Maria - Paris circuit

Recommendation No.20.- that an exchange of meteorological data (including basic synoptic data) between North America and Europe continue to be

accomplished by means of a duplex radioteletypewriter circuit for exclusive meteorological use between New York and Paris via Santa Maria with New York and Paris acting as the collecting and disseminating centres in North America and Europe respectively and Santa Maria acting as a relay centre.

5.2.3 The provision of alternative routing procedures was believed to be essential and the following recommendation, which was intended to supersede Recommendation No.4 of the Special North Atlantic Meteorological Telecommunications Meeting, was accordingly made.

Alternative routing procedures for New York - Santa Maria - Paris RTT circuit

Recommendation No.21.- that to ensure the continuation of a supply of at least a skeleton amount of data when the flow of data on the New York - Santa Maria - Paris radioteletypewriter circuit is interrupted, alternative routing procedures should be developed as a matter of urgency and that these procedures should ensure that Santa Maria will continue to receive the basic information from North America and Europe.

5.2.4 It was also believed necessary to continue the special arrangements for the routing of Irish meteorological data to North America and the following recommendation, which was intended to supersede Recommendation No.3 of the Special North Atlantic Meteorological Telecommunications Meeting, was made.

Routing of meteorological data from Ireland

Recommendation No.22.- that

- (a) in addition to the normal diffusion for European use, the Irish meteorological data be routed on the operational circuit from Shannon to Santa Maria for onward relay to North America and that, in consequence thereof, these data should not be included in the Paris Bulletins transmitted by radioteletypewriter to Santa Maria;
- (b) this procedure should not be taken as a departure from the accepted principle that the exchange of basic meteorological data across the North Atlantic is between one centre in Europe and one centre in North America, and should not be regarded as setting a precedent for other special arrangements.

5.2.5 The MET Committee recognised the importance of early dissemination of upper air data and noted the views which the MET Division expressed on this subject at its 4th Session (Recommendation No.48). The Committee believed that a significant improvement could be achieved by having data for standard levels disseminated first, followed by the remaining data in subsequent messages.

Filing time for reports of upper air observations

Recommendation No.23.- that WMO be requested to

- (a) explore, as an urgent matter, the possibility, at stations in North America, western Europe and the North Atlantic, of transmitting radiosonde and radio/radar wind data for the standard pressure surfaces (levels) of 1,000, 850, 700, 500, 400, 300, 200 and 100 mb within 30 minutes after the time at which the balloon would normally reach 100 mb, and of transmitting the remainder of the report as early as practicable thereafter;
- (b) re-arrange accordingly the schedules of the intercontinental exchanges between Europe and North America and the continental exchanges in Europe so that the maximum benefit may be derived from the advanced filing time of these reports, especially those from North Atlantic Ocean Stations.

5.2.6 The MET Committee also recognised the special value of reports from the North Atlantic Ocean Station network and the considerable loss of benefit which results from delayed dissemination. The following recommendation, which was intended to supersede MET Recommendation No.7 of the 2nd NAT RAN Meeting, was therefore made.

Delivery time of reports from ocean station vessels

Recommendation No.24.- that WMO be requested to take appropriate action to arrange that reports of surface and upper air observations from North Atlantic Ocean Stations be included in synoptic exchanges between North America and Europe in time to permit of their being delivered at MMOs providing service for North Atlantic and "polar" flights within one hour of filing time on board ocean station vessels.

5.2.7 The priorities applied to traffic which accumulates during periods of interrupted communications were studied. The MET Committee noted that the matter was under discussion within WMO and made no recommendation, on the assumption that the views of ICAO would later be taken fully into account in the normal course of follow-up action on Recommendation No.35 of the 1st Session of Regional Association VI of WMO.

5.3 Direct interception of reports of ocean station vessels

5.3.1 In order to assist States wishing to arrange direct interception of reports of ocean station vessels the Committee made the following recommendation, which was intended to supersede Recommendation No.30 of the 2nd NAT RAN Meeting.

Schedules and frequencies used by ocean station vesselsRecommendation No.25.- that

- (a) ICAO assemble information on the existing schedules and frequencies used by ocean station vessels in communicating their meteorological reports to shore and publish this information in an appropriate ICAO publication;
- (b) WMO also publish this information in an appropriate WMO publication.

5.4 "Dead traffic"

5.4.1 In accordance with the directive of the Air Navigation Commission, the MET Committee considered the guidance for the application of the "dead traffic" procedures prepared by the MET Division at its 4th Session and agreed that this was appropriate for use in the NAT Region without modification.

Guidance material for application of "dead traffic" procedures

Recommendation No.26.- that the guidance material referred to in Recommendation No.35 of the 4th Session of the MET Division (Doc.7520-MET/525, Part V, Appendix B) be used by originators of meteorological messages in the application of the "dead traffic" procedures referred to in Recommendation No.37 of the 5th Session of the COM Division.

5.4.2 The MET Committee also discussed the use of these procedures on the New York - Santa Maria - Paris meteorological circuit but, noting that the bulk of the traffic on this circuit was scheduled and not addressed to the eventual individual recipients, was of the opinion that the same procedures were not entirely appropriate. The MET Committee accordingly made no recommendation, leaving it to the authorities concerned with the operation of the circuit to arrange special procedures as necessary.

SECTION 3 - REPORT AND RECOMMENDATIONS ON PROCEDURES3.1 Supplementary Procedures

Recommendation No.27.- that the Supplementary Procedures - MET presented hereunder replace the present Supplementary Procedures - MET, simultaneously with the coming into force of the expanded Annex 3 and the PANS-MET, proposed by the 4th Session, MET Division:

(Note: Figures in parenthesis in the text of paragraphs refer to the corresponding tables of operational meteorological facilities and services contained in Recommendation No.15.)

ReferencePANS-MET1.- METEOROLOGICAL OFFICES AND THEIR SERVICES FOR INTERNATIONAL FLIGHT OPERATIONS2.1 1.1 Meteorological Offices" 1.1.1

Meteorological service for international flight operations shall be provided by designated (1) meteorological offices.

2.3.8 1.3 Flight Meteorological Watch" 1.3.1.1(5)

In-flight meteorological service for the pilot-in-command shall be provided by means of Flight Meteorological Watch and/or In-flight Operational Planning information as agreed between the Meteorological Authorities concerned and the operator.

2.3.4.4 1.4 Advance Operational Planning" 1.4.1(1)

Advance operational planning service shall be provided locally by main meteorological offices by agreement between the operating agencies and the Meteorological Authorities concerned.

2.- AERODROME FORECASTS AND AMENDMENTS2.4.5 2.1 Dissemination" 2.1.1

Designated (4) meteorological offices shall arrange to obtain specified aerodrome forecasts as agreed (4) and amendments thereto.

" 2.1.2

Aerodrome forecasts shall be obtained

1) on AFS channels

2) on meteorological teleprinter channels.

Reference
PANS-MET

- 2.4.5 (Cont'd) 2.1.3 Aeronautical fixed services channels shall be used when necessary to ensure rapid distribution.
- " 2.1.4 Aeronautical fixed services channels shall be used for the dissemination of amendments to aerodrome forecasts.
- " 2.1.5 Forecasts shall be filed for transmission
- 2) at least one hour before the commencement of the period of validity.
- " 2.3 Period of validity
- " 2.3.1 Aerodrome forecasts disseminated by radio broadcast
- " 2.3.1(1) The period of validity of aerodrome forecasts disseminated by radio broadcast shall normally extend to six hours from the hour following the broadcast time.
- " 2.3.2 The period of validity of routine aerodrome forecasts disseminated for operational planning purposes, by means other than radio broadcasts, shall be 24 hours.
- " 2.3.2.3.1(2) The validity period shall begin at one of the main synoptic hours (00, 06, 12 or 18 GMT).
- 3.- STATION METEOROLOGICAL OBSERVATIONS AND NETWORKS*
- 2.2.1 3.1 Routine observations and reports at international aerodromes
- " 3.1.2 Frequency
- " 3.1.2.1 Routine meteorological observations shall be made at intervals of one hour.

* Details of basic synoptic exchanges are shown in IMO Publication No. 9 (Fasc. III)

ReferencePANS-MET

- 2.2.1 (Cont'd) 3.1.2.1.1(3)
Where broadcasts are made at half-hourly intervals, routine meteorological observations included in such broadcasts shall be the latest available observations.
- " 3.1.5 Additional information included with AERO reports
- " 3.1.5.1(2)
QNH data shall be included as required.
- " 3.1.5.2(1)
The group OTTTdTd shall be included at hourly intervals for VOLMET broadcasts if required for operational purposes and if the duration of the broadcast permits its regular inclusion.
- " 3.2 Routine observations and reports at selected stations not at international aerodromes
- " 3.2.1 Location
- " 3.2.1.1(1)
Routine meteorological observations and reports shall be made at designated (6) stations.
- " 3.2.2 Frequency
- " 3.2.2.1(1)
Routine meteorological observations shall be made at intervals of one hour.
- " 3.2.3 Period of day
- " 3.2.3.1(1)
Routine meteorological observations shall be made as indicated (6).
- " 3.2.4 Dissemination
- " 3.2.4.1(1)
Reports of routine meteorological observations shall be disseminated as agreed (6).
- 2.4.1 3.2.5 Code forms of reports and additional information included
- " 3.2.5.1
As an alternative to the AERO form, reports of routine meteorological observations may be coded in the SYNOP form, if desired by the Meteorological Authority responsible for their preparation.

ReferencePANS-MET

2.2.2

3.3 Special Observations and Reports3.3.2 Special observations selected for transmission beyond the aerodrome3.3.2.1.2 Supplemental

Criteria which States decide are necessary to supplement the regional criteria.

2.2.3

3.3.2.3 Dissemination

3.3.2.3.1

Reports of special observations selected in accordance with 3.3.2.1 and 3.3.2.2 including half-hourly observations intermediate to the routine hourly observations which satisfy the criteria for selected special observations shall be:

3.3.2.3.1.1(1)

transmitted to designated (6) meteorological offices.

4.- AIRCRAFT METEOROLOGICAL OBSERVATIONS AND REPORTS

2.2.6

4.1 Frequency and/or location of routine observations

4.1.1.1(1)

Aircraft meteorological observations shall be made on all routes.

4.1.4 Observations from high speed aircraft

4.1.4.1

In the event of routine observations being made in an aircraft with a true air speed exceeding 325 knots, and the distance between the observations specified in 2.2.7 and 2.2.8 of the PANS-MET exceeding 325 nautical miles, special arrangements shall be made by the interested meteorological offices and operators so that the distance between two successive observations does not exceed approximately 325 nautical miles.

2.2.11.1(c)

4.3 In-flight reporting4.3.1 Reports of observations to be transmitted

ReferencePANS-MET

2.2.11.1(c)
(Cont'd)

4.3.1.1(3)

Reports of observations made in accordance with para. 4.1 shall be transmitted at the same time as the position reports on all flights except:

- 1) where traffic density makes it necessary to exempt certain aircraft from transmitting routine weather reports. Such exemption may be made only on the authority of the meteorological office at the departure aerodrome and shall be made according to the following rule:

Where two aircraft

- a) depart from the same aerodrome on the same track, and
- b) will be vertically separated from each other during cruising flight by 2,000 feet or less over the major portion of that track, and
- c) will be within one hour's flight of each other en route,

one aircraft may be exempted from transmitting all meteorological elements except upper wind information.

- 2) in areas where in-flight observation procedures of adjacent continental regions apply. In such areas reports shall be transmitted in accordance with the procedures in force in those regions.

2.2.11

4.3.2 Contents of reports

"

4.3.2.1(3)

Reports transmitted in flight shall contain all the elements which have been recorded, except as provided for in para. 4.3.1.1(3).

2.2.13

4.4 Transmission of in-flight and post-flight reports between ground stations

"

4.4.2 In-flight reports received by meteorological offices from ATS units and post-flights reports

"

4.4.2.1(1)

Meteorological offices receiving in-flight and/or post-flight reports shall transmit them to the designated (2) collecting centre.

"

4.4.2.3.1(1)

The designated (2) collecting centres shall prepare hourly collectives for dissemination as indicated (2).

ReferencePANS-MET5.- METEOROLOGICAL WARNINGS2.2.3 5.1 Distribution of warnings, other than warnings of severe storms of tropical or subtropical origin

"

5.1.1(6)

Selected aircraft reports, transmitted by aircraft in accordance with the criteria contained in para. 2.2.9 of PANS-MET, and received in the meteorological office associated with an FIC (or ACC), shall be disseminated without delay to other meteorological offices in the FIR, as required, and shall be distributed in the collectives of routine aircraft reports, as indicated (2).

2.4.15

5.2.1

Warnings of severe storms of tropical or subtropical origin shall be issued and disseminated as agreed (7).

2.1.1(d)

6.- DISPLAY OF METEOROLOGICAL INFORMATION

2.1.2(b)

2.1.3(b)

"

6.1

The meteorological office at each aerodrome used for international air operations shall display, or have readily available for reference by pilots-in-command and operators' local representatives, the following information:

"

6.1.1

Routine and selected special meteorological reports received;

"

6.1.2

Reports from meteorological stations on air routes received in accordance with the provisions of paragraph 3.2;

"

6.1.3

Aerodrome forecasts and amendments thereto received;

"

6.1.4(1)

Air-reports in the form in which they are received;

"

6.1.5

Aircraft flight cross-sections received;

"

6.1.6

Meteorological warnings received;

"

6.1.7

Synoptic and prognostic charts.

Reference
PANS-MET7.- BROADCAST SCHEME FOR TRANSMISSION OF METEOROLOGICAL INFORMATION TO AIRCRAFT IN FLIGHT

2.3.4.18

7.1 Broadcast schemes

"

7.1.1 Radiotelegraphy

"

7.1.1.1(1)

Current meteorological reports and aerodrome forecasts shall be broadcast to aircraft in flight as indicated (8).

"

7.1.2 Radiotelephony

"

7.1.2.1

Current meteorological reports and aerodrome forecasts shall be broadcast to aircraft in flight as indicated (9).

8.- METEOROLOGICAL OFFICES PROVIDING SERVICE FOR FLIGHT INFORMATION CENTRES

2.3.10.5

8.1

Meteorological services for Flight Information Centres shall be provided by designated (2) meteorological offices.

"

8.2

The meteorological office providing service for a flight information centre shall ensure that hourly reports and aerodrome forecasts, exchanged in accordance with (6) and (4) respectively, are readily available to the flight information centre.

9.- METEOROLOGICAL OFFICES PROVIDING SERVICE FOR RESCUE CO-ORDINATION CENTRES

2.3.12

9.1

Meteorological services for Rescue Co-ordination Centres shall be provided by designated (2) meteorological offices.

"

9.2

The types of meteorological information which may be required by Rescue Co-ordination Centres for specific search and rescue operations are:

ReferencePANS-MET

2.3.12
(Cont'd)

a) Past weather

Conditions that existed in the last known position of a missing aircraft, with particular reference to:

- i) Hazardous flying conditions, such as icing, turbulence etc.;
- ii) Complete description of cloud conditions;
- iii) Surface visibility and obstructions to vision;
- iv) Precipitation;
- v) Wind information, both surface and aloft;
- vi) State of the sea, including whenever possible direction, height and velocity of local wind driven sea, and the direction, height, length and velocity of the swell system;
- vii) State of the ground, i.e., snow cover, etc.

b) Present and forecast weather

- i) Complete and detailed information as to the current and forecast meteorological conditions, including the elements in a) above, in the search area and current and forecast conditions en route from and returning to the base from which the search is being conducted;

9.3

The designated meteorological offices (2) shall maintain liaison throughout the search and rescue mission between the meteorological office and the Rescue Co-ordination Centre.

3.2 Re-alignment of Supplementary Procedures - MET

Recommendation No.28. - that the future MET Supps be rearranged in the sequence of controlling paragraphs in the PANS-MET. To this end, paragraph numbering, identical with that of the PANS-MET, should, so far as is practicable, be used in the future presentation of the MET Supps.

3.3 Transfer of universally applicable Supplementary Procedures to PANS-MET

Recommendation No.29.- that paragraphs 6.1.1, 6.1.2, 6.1.3, 6.1.6 and 6.1.7 of the present Supplementary Procedures - MET which have obtained universal application, be incorporated into the 1st edition of the PANS-MET.

3.4 Arrangements for the provision of meteorological information for in-flight planning purposes

Recommendation No.30.- that operators and Meteorological Authorities co-operate to effect the most practicable arrangements in order to ease present particular difficulties in the provision of meteorological information for in-flight planning purposes.

3.5 Amendment procedures for aerodrome forecasts

Recommendation No.31.- that ICAO draw the attention of States to:

(a) the importance of maintaining an adequate amendment procedure for aerodrome forecasts whereby necessary amendments or new forecasts are issued without delay and disseminated with the highest permissible priority to all recipients of the original forecasts;

(b) the fact that whilst an amendment or new forecast replaces, as appropriate, part or all of the previous forecast of the same type or series, it does not automatically apply to forecasts of a different type or series, each of which calls for independent amendment or replacement, as necessary.

3.6 Criteria for amendments to aerodrome forecasts

Recommendation No.32.- that in the selection of the criteria for amendments to aerodrome forecasts referred to in Appendix 2, note 2, of the PANS-MET, the criteria for selected special reports should be used for guidance.

3.7 Implementation date for new Supplementary Procedures - MET

Recommendation No.33.- that the proposed new Supplementary Procedures - MET be implemented on the date on which the expanded Annex 3 and the new PANS-MET become effective.

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SECTION 4 - ADDITIONAL RECOMMENDATIONS1. Utilisation of aircraft weather reports

Recommendation No. 34.- that WMO be requested to bring to the attention of all concerned, the need for making the fullest use of in-flight and post-flight air-reports during briefing of flight crews, in order to maintain a high standard in both the preparation and utilisation of these reports and, also, to emphasize the need for full utilisation of aircraft weather reports in the WMO "Manual on Aerodrome Meteorological Practices", now in preparation.

2. MET recommendations of previous North Atlantic regional meetings

2.1 The Committee reviewed the recommendations of the MET Committees of the two previous NAT RAN meetings and also those of the special North Atlantic MET Telecommunications meeting and the special MET meeting for the NAT Region. Those which the Committee wished to re-affirm without change are repeated for convenience in Appendix A to this report. In the same appendix are given cross-references for those cases in which a substantial part of the content of a recommendation of a previous meeting has been retained in a recommendation of the present meeting.

2.2 Recommendation No. 20 of the MET Committee of the 2nd NAT RAN meeting (See Appendix A), which specifies the meteorological services required in Iceland for international aviation, was considered carefully. It was found that the synoptic station at Bolungarvík had been replaced by one at Galtarviti, approximately 10 km away. This change, and some minor differences between current terminology and that used in the statement of requirements, were not considered to affect the adequacy of the statement and the recommendation was accordingly re-affirmed.

2.3 The Committee believed that all MET recommendations of previous North Atlantic regional meetings, apart from the two contained in Appendix A to this report, were obsolete or had been replaced by recommendations of the present meeting or other ICAO meetings and should be cancelled.

Cancellation of MET recommendations of previous North Atlantic regional meetings

Recommendation No. 35.- that the following recommendations of previous meetings be cancelled:

Recommendations of the MET Committee of the North Atlantic Route Service Conference (Dublin, 1946.- Doc D 364, MET/D86) -- all.

Recommendations of the MET Committee of the Second North Atlantic Regional Air Navigation Meeting (Paris, 1948.- Doc NA/203, MET-NA/23) -- all except Recommendation No. 20.

Recommendations of the Special North Atlantic Meteorological Telecommunications Meeting (London, 1949.- Doc 6815) -- all except Recommendation No. 13.

Recommendations of the Special MET Meeting, North Atlantic Region (Paris, 1950.- Doc 7092 - MET/520) -- all.

APPENDIX "A"Action taken on Recommendations of previous meetings
not recommended for cancellation1. RECOMMENDATIONS CONFIRMED1.1 MET Committee, 2nd NAT RAN Meeting

Recommendation No. 20.- It is recommended that the schedule given in Appendix B to the Final Report of the Meteorological Committee of the North Atlantic RAN Meeting, Paris 1948, be regarded as the minimum specification of the meteorological facilities and services required in Iceland for the provision of meteorological service to international aeronautics.

Appendix "B" to the Final Report of the MET Committee, 2nd NAT RAN MeetingSPECIFICATION OF MET SERVICES IN ICELAND REQUIRED FOR
INTERNATIONAL AERONAUTICS

The following meteorological services and facilities shall be provided by Iceland for international aeronautics:

1. A main meteorological office, located at Keflavik aerodrome, providing meteorological services in accordance with the ICAO procedures in force in the North Atlantic Region, including:

1.1 The preparation and display of:

1.1.1 Surface synoptic charts embracing the North Atlantic Region for the main synoptic hours of 00, 06, 12 and 18 GMT.

1.1.2 Surface synoptic charts embracing the Eastern North Atlantic for the intermediate synoptic hours of 03, 09, 15 and 21 GMT.

1.1.3 Pronostic surface charts embracing the North Atlantic Region based on the synoptic charts prescribed in 1.1.1.

1.1.4 Contour charts embracing the North Atlantic Region for the 700 and 500 millibar surfaces, at least twice daily.

1.1.5 Thermodynamic diagram of upper air soundings made at selected stations in the North Atlantic Region, including Scandinavia and the Eastern Seaboard of North America.

1.1.6 Route, flight, area and terminal forecasts and amendments thereto, as required for international operations to and from Keflavik and Reykjavik Aerodromes and for operational planning.

- 1.1.7 Routine terminal forecasts and any necessary amendments thereto for Keflavik and Reykjavik Aerodromes.
- 1.1.8 Warnings of hazardous weather.
2. Meteorological briefing for all international flights departing from Keflavik and Reykjavik Aerodromes.
3. Hourly observations for aircraft to be made at Keflavik and Reykjavik Aerodromes, and special observations on request and whenever rapid deterioration or improvements in weather conditions occurs.
4. Synoptic surface observations at the stations listed below at the hours 00, 03, 06, 09, 12, 15, 18, 21 GMT:

Reykjavik
Keflavik
Stykkishólmur
Bölungarvík^{*}
Akureyri
Raufarhöfn
Dälátangi
Hólar
Vestmannaeyjar
5. Upper air soundings of temperature humidity and pressure at 03 and 15 hours GMT and upper air wind observations at 03, 09, 15 and 21 hours GMT, by radioelectric means.
6. The collection and dissemination of meteorological information as required by operational centres and meteorological offices in the North Atlantic Region.
7. Broadcast of meteorological reports for aircraft in conformity with the supplementary procedures for the North Atlantic Region.
- 1.2 Special North Atlantic MET Telecommunications Meeting

Recommendation No. 13.— It is recommended that, to avoid duplication, centres responsible for the preparation of hourly collectives of aircraft weather reports include in their collectives only those reports received direct from aircraft in flight or through their respective satellite stations and not include those received from other collecting centres.

^{*} Since replaced by Galtarviti, approximately 10 km from Bolungarvik

2. Cross-references between recommendations of the present meeting and earlier recommendations the substance of which they contain in part.

2nd NAT RAN Meeting

Superseded by 3rd NAT RAN Meeting

MET Recommendation No.

MET Recommendation No.

1 to 6	13
7	24
8 to 11	13
12	18
14	17
30	25
34	14

Special NAT MET Telecommunication Meeting

Recommendation No.

1	20
3	22
4	21

PART VI
RULES OF THE AIR
AND AIR TRAFFIC SERVICES COMMITTEE

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* As transmitted to the COM Committee.

LIST OF RECOMMENDATIONS

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1	Flight Information Regions	RAC/SAR-11
2	Goose and Winnipeg FIRs	RAC/SAR-11
3	Control Areas	RAC/SAR-11
4	Linking Domestic Control Areas	RAC/SAR-11
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6	Search and Rescue Areas	RAC/SAR-11
7	Miami and San Juan Search and Rescue Areas	RAC/SAR-12
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12	Date of Implementation of Facilities	RAC/SAR-12
13	Supplementary Procedures	RAC/SAR-13
14	Date of Implementation of Regional Supplementary Procedures	RAC/SAR-14
15	Criteria for the Establishment of Control Areas and Control Zones	RAC/SAR-15
16	Co-ordination between the Shannon and Prestwick Area Control Centres	RAC/SAR-15
17	Ships' Positions	RAC/SAR-15
18	Position Reports - AIREP Form	RAC/SAR-15
19	Code for Reporting Position - AIREP Form	RAC/SAR-15
20	Maintaining Flight Plan Track	RAC/SAR-16
21	Vertical Separation Standards	RAC/SAR-16
22	Type and Frequencies of Emergency Portable Radio Equipment	RAC/SAR-16
23	Local Procedures for Accidents shortly after Take-Off	RAC/SAR-16
24	Liaison of Air Traffic Services and Rescue Co-ordination Centres Personnel	RAC/SAR-16
25	Search and Rescue Training	RAC/SAR-17

THIRD NORTH ATLANTIC REGIONAL AIR NAVIGATION MEETINGMONTREAL - OCTOBER 1954RULES OF THE AIR AND AIR TRAFFIC SERVICES AND SEARCH AND RESCUE COMMITTEESECTION 1.- CHAIRMAN'S REPORT1.1 - Historical Statement1.1.1 Meetings

The Rules of the Air and Air Traffic Services and Search and Rescue Committee held six Plenary Meetings in open session at the ICAO Headquarters in Montreal from 11 October to 23 October 1954, under the Chairmanship of Captain J. P. Saul, Delegate of Ireland.

1.1.2 Representation

meeting of the A list of the States and International Organizations represented at the Committee appears at Appendix B. *of the report of the General Committee* Messrs L. G. Fowler and H. G. Clusy served as the technical secretariat of the Committee.

1.1.3 Minutes of the Meetings

A record of the proceedings of the Committee is contained in the minutes of the meetings held. These minutes do not form part of this Report.

1.1.4 Agenda

The agenda of the Rules of the Air and Air Traffic Services and Search and Rescue Committee was approved by the General Committee at its first meeting.

1.1.5 Working Groups

At the first meeting of the Committee it was agreed that it should function as a working group of the whole, due to the fact that representation of some States was limited and in order to expedite the business of the Committee. However, the full working group was found to be unwieldy in dealing with several contentious issues which arose and special ad hoc working groups were formed to examine and report on these. A rapporteur was appointed in each case.

1.1.6 Election of Officers

Captain J.P. Saul, Delegate of Ireland, was unanimously elected Chairman of the Committee. Mr. B. Jonsson, Delegate of Iceland was unanimously elected Vice-Chairman. It was agreed that Captain Saul should also act as Chairman of the working group of the whole Committee.

1.1.7 Coordination with other Committees of the Meeting

Coordination was maintained with Subcommittee 1 and other technical committees throughout the Meeting, particularly on the following matters:

1.1.7.1 Information on the boundaries of flight information regions and search and rescue areas was passed to all Committees;

1.1.7.2 The meteorological Committee was informed of the specific meteorological information which should be readily available at the designated meteorological offices for immediate use in case of need by rescue coordination centres;

1.1.7.3 The requirements for communications were passed to the Communications Committee;

1.1.7.4 The Committee, at the request of Subcommittee 1 and the MET Committee, considered the necessity for hourly QNH reports in south east Iceland and agreed there was no requirement for international aviation.

1.1.7.5 The question of expediting communications between ocean station vessels on the one hand and area control centres and rescue coordination centres on the other was referred to the COM Committee.

1.2 - Report on the Agenda

1.2.1

Agenda Item 1: Consideration of specific proposals for amendments to the existing ICAO plan, with particular reference to:

1.2.1.1 In accordance with the directives of Subcommittee 1, the Committee established the ATS requirements for navigation aids.

1.2.1.2 The current difficulties encountered by overflying aircraft in obtaining desired flight levels in the vicinity of Gander, owing to traffic density in the Gander terminal control area, were recognized and it was anticipated that these would increase. In view of the desirability of facilitating the diversion of flights around Gander, the Committee invited Canada to consider, in developing its VOR programme, the installation of VORs at Belle Isle and St. Johns.

1.2.1.3 Further, in view of the desirability both of achieving compatibility in aids and of obtaining static-free aids, the Committee invited Canada to consider, in expanding its VOR programme, the installation of VORs on the Canadian portions of the routes between New York and Gander, New York and Goose, and Montreal and Gander.

1.2.1.4 The Committee considered, in the absence of ATS requirements, that VORs at North Berwick and Ottringham in the United Kingdom were not necessary. It was made aware that the navigation coverage in the vicinities of these locations was under consideration.

1.2.1.5 A list of ATS requirements for navigation aids transmitted to the COM Committee is reproduced at Appendix **H**

1.1 The present scheme of flight information regions and control areas in relation to current and planned routes

1.2.1.6 As instructed by Subcommittee 1, the RAC/SAR Committee established flight information regions to cover the North Atlantic Region to the North Pole. It was nevertheless agreed that some of these flight information regions (Nord and Tromsø) need not be implemented before scheduled traffic is about to be operated in them. This was reflected in the recommendations concerning the implementation of facilities. (Recommendations Nos. 1 and 12)

1.2.1.7 In view of the fact that there are flights now operating north of the Goose and Winnipeg flight information regions it was recognized that there was a need to provide flight information service up to parallel 70° N. It was also recognized that there would be a need to provide flight information service north of parallel 70° N when flights are operated north of this parallel. The Committee, therefore, made a recommendation accordingly. (Recommendation No. 2)

1.2.1.8 As instructed by Subcommittee 1, the RAC/SAR Committee also designated control areas to cover those international air routes where it was considered that existing or planned traffic densities and/or operational conditions warranted such a course or would warrant it in the near future. (Recommendation No. 3)

1.2 Control areas to link the North Atlantic control areas with the domestic control areas

1.2.1.9 The Committee found difficulty in deciding the strength of the requirement for control areas to link the North Atlantic control areas with domestic control areas. With respect to the creation of new control areas, paragraph 2 of Attachment A to Annex 11 did not, in the Committee's opinion, provide adequate guidance and for this reason the Committee made a recommendation to enable the matter to be considered at the next appropriate Air Navigation Conference. (Recommendation No. 15)

1.2.1.10 The Committee was of the opinion that there was a requirement for continuity in area control service from the eastern boundary of the Shannon/Prestwick oceanic control area to terminals in the United Kingdom for flights along the following routes: Gander-Prestwick, Goose-Prestwick, Keflavik-Prestwick and Gander-London via Fastnet Rock and Strumble. (Recommendation No.4)

1.2.1.10.1 Proposals that it would be desirable at a later date:

- a) for an airway to be established along the route Belle Isle to the boundary of the Gander Oceanic control area, and
- b) for a control area within the Goose flight information region to be established,

were not approved.

1.2.1.11 Although not specifically included in the agenda, the Committee found it necessary, in order to have a complete RAC/SAR NAT regional plan, to discuss aerodromes within the NAT Region at which approach control service should be provided and where, therefore, control zones should be established and made a recommendation accordingly. (Recommendation No. 5)

1.3 Requirements for inter-centre communications

1.2.1.12 The air traffic density on the preferred routes in the NAT Region has reached a point where adequate air traffic control requires the most efficient pilot-controller coordination obtainable. In this connection the Committee wished to indicate that a basic problem in the exercise of air traffic control in the NAT Region was the lack of continuously dependable air-ground and point-to-point communications. It was essential that the aeronautical communications system be improved to a point where the rapid exchange of clearances and flight safety messages between the pilot and controller and control information between area control centres and/or flight information centres could be assured on a continuously reliable basis. The AFTN, even if operated in accordance with the highest existing ICAO standards of operation and planning, could not be expected to meet the requirements set forth in paragraph 6.2 of Annex 11. Aircraft were not always able to maintain direct contact with the communications station serving the FIR or CTA in which the aircraft was flying. Consequently, the point-to-point service must be such that it would approximate direct contact when relaying air-ground messages. This was a critical problem in developing improved air traffic services standards and became vital in connection with emergency or distress actions.

1.2.1.13 Functionally, the requirement was not too different from that of coordinating the various aeronautical activities at one airport, i.e. area control, approach control, aerodrome control, etc., which was generally accomplished by inter-phone where those offices were physically separated.

It would be laborious if those offices were required to file large numbers of addressed and composed messages via teletype or manual telegraph circuits to a communications centre, then re-transmit the message to the addressee concerned at the same aërodrôme. It was entirely reasonable that adjacent air traffic control centres and/or flight information centres and en-route radio stations should be inter-connected by means of inter-phone.

1.2.1.14 Whether landlines or radio circuits were employed as the transmission medium was irrelevant; these are merely the techniques employed to carry out the function. Such inter-connection might be effected by the use of cables, low frequency voice circuits, extremely high power VHF point-to-point circuits, or HF radiotelephone ground wave systems where auroral effects are severe. Experience to date in the NAT Region indicates that ground wave systems show the greatest promise of fulfilling the objective in the most economical manner, during the time when direct contact between required locations is not possible on higher frequencies. Further, this system is capable of early implementation at existing locations where aeronautical services are now being provided, without undue technical difficulties or large installations and operating expenditures.

1.2.1.15 The requirements approved by the Committee provide for interphone type communications to link directly together NAT area control centres and/or flight information centres at Gander, Lisboa, Narsarssuak, New York, Nord, Paris, Prestwick, Reykjavik, Santa Maria, Shannon, Thule, Tromsø. These circuits should be provided with automatic switching devices that will permit direct communications between the stations. In addition, the area control centres and/or flight information centres at each of these locations should be tied directly to the air-ground station.

1.2.1.16 ATS requirements for communications, as transmitted to the COM Committee, are reproduced at Appendix N.6.

1.4 The search and rescue plan

1.2.1.17 The Committee considered as a first step in the establishment of the search and rescue plan, the establishment of search and rescue areas. In accordance with Standards and Recommended Practices in Annex 12 and with amplifications of these in the Search and Rescue Manual (Doc 7333-AN/859), it established search and rescue areas, all coincident with the flight information regions, with the exception that the Nord and Thule flight information regions have been combined in a single search and rescue area. (Recommendation No. 6)

1.2.1.18 Although not within the NAT Region, the Committee was of the opinion that the Miami Oceanic and San Juan search and rescue areas should be coincident with the corresponding flight information regions and made a recommendation accordingly. (Recommendation No. 7)

1.2.1.19 The Committee made a realistic appraisal of the problems and reached the unanimous conclusion that there are certain requirements for search and rescue facilities in the NAT Region. It recognized, however, that the existing facilities appeared to meet the basic needs of search and rescue. It found some difficulty in specifying particular facilities to be provided at specific localities since it was felt that, generally speaking, reliance would have to be placed on military installations and shipping to fulfill these needs. No firm commitment was likely to be accepted by any State for search and rescue facilities in addition to those presently existing. On this basis the facilities listed in Appendix G were recommended. (Recommendations Nos. 8, 9 and 10)

1.2.1.20 At the request of the Committee, the views of the RAC/SAR Committee were made known on the meteorological information which should be available to rescue coordination centres for immediate use in case of need.

1.2.1.21 The Committee examined the extensive documentation submitted by IRASA in connection, amongst other items, with the use of 500 kc/s for communications between aircraft and ships. It also heard from the Representative of IFALPA that his Organization endorsed the remarks contained in the IRASA submission in this respect. The Committee took no action on the documentation beyond noting it. Documentation submitted by France on the same subject under Agenda Item 2.5 was similarly noted by the Committee.

1.2.1.22 The Committee reviewed a statement by Canada pointing out that according to the provisions of Annex 10, Part II, paragraph 2.1, radio frequencies to be provided in radio equipment used in aircraft survival craft shall be selected from 8364, 500 and 4182 kc/s. Canada considered that it was important in ensuring efficient search and rescue operations, particularly in so far as homing was concerned, that rescue coordination centres were aware of the frequencies on which survival radio equipment being carried by particular aircraft operated. This was agreed and a recommendation was made accordingly. (Recommendation No. 22)

1.2.2 Agenda Item 2: Consideration of specific proposals for amendments to the regional procedures for Rules of the Air, Air Traffic Services and Search and Rescue, with particular reference to:

2.1 Separation procedures and flight level clearances (Complementary to the decisions of Sub-committee 1)

1.2.2.1 It was considered that, as a temporary expedient, until navigation aids and communication services were sufficiently reliable to permit less separation, North Atlantic Oceanic area control centres should, in general, provide a minimum of thirty (30) minutes longitudinal separation between aircraft on the same or on converging tracks and a recommendation for a supplementary procedure to this effect was made. (Recommendation No. 13)

1.2.2.2 As regards lateral separation, it was agreed that a criterion of 120 nautical miles should be established. (Recommendation No. 13)

1.2.2.3 Since both longitudinal and lateral criteria were predicated on the assumption that pilots would maintain the flight plan track as far as possible, a recommendation to this effect was formulated. (Recommendation No. 20)

1.2.2.4 During the Committee's deliberations on this item it became evident that since the formulation of "minimum separation criteria" is essentially dependent upon the degree of accuracy of position reporting, an indication of how the position was determined, similar to the methods applicable to the ICAO POMAR Form, should be included in the ICAO AIREP Form, e.g. dead reckoning, celestial fix, etc. A recommendation to this effect was accordingly passed. (Recommendation No. 18)

1.2.2.5 It was also recommended that ICAO should develop a suitable code for reporting the method used to determine position. (Recommendation No. 19)

1.2.2.6 In studying the procedures in force for the allocation of cruising levels in the Region, it was agreed that attention should be drawn to the fact that it was permissible, in attaining maximum utilization of airspace, to assign flight levels irrespective of the direction of flight provided that this action was first coordinated with other concerned centres. A note to this effect was recommended for addition following paragraph 2.1 b) of the Regional Supplementary Procedures (Doc 7030). (Recommendation No. 13)

1.2.2.7 The attention of the Committee was drawn to the fact that vertical separation based on intervals of 1,000 feet was not sufficient at high altitudes and would not provide adequate safety. This point had already been made at the Third EUM Regional Air Navigation Meeting in 1952. A recommendation drawing the attention of ICAO to the need for urgent action in this respect was passed. (Recommendation No. 21)

2.2 Approach procedures

1.2.2.8 Although not a specific item of the agenda, it was found necessary, in order to have a complete RAC/SAR NAT Regional plan, to discuss aerodromes within the NAT Region at which approach control should be provided and where therefore control zones should be established. A recommendation was made accordingly. (Recommendation No. 5)

2.3 Coordination between centres

1.2.2.9 A discussion of paragraph 9.5, Part 2 of the Regional Supplementary Procedures (Doc 7030), concerning the coordination between Shannon and Prestwick control centres, took place and it was agreed that the existing wording of the paragraph was open to differing interpretations and that it required amendment. It was agreed that since the matter was the concern of two States only - Ireland and the United Kingdom - it could best be resolved by study by these two States who should present to ICAO an agreed revised text for the paragraph. A recommendation to this end was accordingly passed. (Recommendation No. 16)

1.2.2.10 The MET Committee was informed that in view of the above action, a proposed amendment to paragraph 9.5.3 of the Regional Supplementary Procedures would be inappropriate at this time.

2.4 Examination of means to ensure the fullest use is made of the facilities available on ocean station vessels to improve air traffic control services and search and rescue

1.2.2.11 An examination was made of Recommendations 4 and 5 of the Technical Committee of the Fourth ICAO Conference on North Atlantic Ocean Stations - Paris, February 1954, to the effect that:

- a) the Third North Atlantic Regional Air Navigation Meeting should develop procedures for aircraft to ensure the minimum use of the MF beacons aboard ocean station vessels, and
- b) the Meeting should adopt paragraph 4.3.6, Section IV of the Ocean Station Vessel Manual as a Supplementary Procedure to be introduced into the NAT Region and that the fullest possible use should be made of the ocean station vessels to improve air traffic control in the Region.

1.2.2.12 The Committee noted that the COM Committee had taken action on paragraph 1.2.2.1 a) above, which it endorsed, and it recommended the inclusion of paragraphs 4.3.6 and 4.3.6.1, Section IV of the Ocean Station Vessel Manual as Regional Supplementary Procedures. (Recommendation No. 13)

2.5 Alerting services procedures

1.2.2.13 The Committee examined existing procedures laid down in Annex 11 and the PANS-RAC (Doc 4444-RAC/501/5) to ensure that any accident to an aircraft taking off is made known to ATS with the minimum of delay.

1.2.2.13.1 The Committee decided that in the case when an aircraft does not report after take-off as required, guidance on the length of time before search and rescue and/or local crash facilities are alerted is lacking and the Committee accordingly recommended that States consider the introduction of suitable local procedures. (Recommendation No. 23)

1.2.2.14 The Committee examined a proposal presented by France, advocating the adoption of procedures 7.1 (with the exception of para. 7.1.1) to 7.4 and 8.1 of Part 2 of the Regional Supplementary Procedures (Doc 7030) to the North Atlantic Region. It was considered that the provisions of para. 7.1.1 required amendment because practically the entire Region was represented by controlled airspace and accordingly, the responsibility for initiating search and rescue action belonged to the rescue co-ordination centre which was first alerted, subject to subsequent transfer of its responsibility if necessary as indicated in para. 7.1.4 of the Regional Supplementary Procedures.

1.2.2.14.1 The action advocated by France was agreed by the Committee. (Recommendation No. 13)

1.2.2.15 A further paragraph of the same paper, pointing out the value of 500 kc/s as a distress frequency, was noted by the Committee, together with submissions on the same subject by IRASA.

1.2.3 Agenda Item 3: Consideration of the problem of obtaining the positions of merchant ships

1.2.3.1 In its consideration of this problem, the Committee was made aware that several States in the Region maintain records of the positions of merchant ships. Since one of the main sources of information for this purpose is the routine weather reports transmitted by "selected ships" as classified by WMO, the records are usually kept in respect of major ships.

1.2.3.2 The Committee considered that if the information held by the States maintaining ships' positions records were pooled, it might be of

material assistance to rescue co-ordination centres during the conduct of search and rescue operations and could be made available to pilots wishing to know the positions of ships near to their route.

1.2.3.3 Accordingly, it was recommended that those States maintaining records of ships' positions in the North Atlantic make such information available on request. (Recommendation No. 17)

1.2.4 Agenda Item 4: Recapitulation of previous North Atlantic Regional RAC and SAR recommendations with a view to eliminating those which are no longer applicable

1.2.4.1 The Committee carefully examined the RAC and SAR Reports of the First North Atlantic Regional Air Navigation Meeting (Doc D/362, ATC-D/60; Doc D/359, SAR-D/76) and also the RAC and SAR Reports of the Second North Atlantic Regional Air Navigation Meeting. (Doc NA/205, ATC-NA/25; Doc NA/204, SAR-NA/20). Only a few recommendations in the SAR Report of the Second RAN Meeting were considered as still valid. They have been re-worded and re-inserted in the present report so that now all recommendations of the RAC and SAR Committees of the First and Second NAT Regional Air Navigation Meetings should be considered as obsolete. (See recommendations 11, 24 and 25)

1.2.5 Agenda Item 5: Preparation for transmission to Sub-committee 1 of a list of RAC and SAR facilities and services included in the revised regional plan that are considered of critical importance to air operations in the Region, and that for this reason should be given priority in the implementation plans of the State concerned

1.2.5.1 In considering the revised regional plan for RAC/SAR facilities, Sub-committee 1 was informed that at this date there were no RAC/SAR facilities that were of such a critical nature that States would be required to give priority for that reason to their implementation.

1.2.5.2 It was further agreed that, in view of the importance and growth of North Atlantic traffic and the temporary expedient of increased separation between aircraft on trans-Atlantic routes, the facilities needed to permit accurate fixing of position and adequate ATS communications should be considered a matter of urgency.

1.2.6 Agenda Item 6: Recommendation of dates for implementing the recommended facilities and procedures

1.2.6.1 The Committee passed Recommendations No. 12 in respect of facilities and No. 14 in respect of procedures.

SECTION 2 - REPORT AND RECOMMENDATIONS ON FACILITIES2.1 Flight Information Service

2.1.1 Recommendation No 1: - that flight information service be provided, either by an area control centre (ACC) or by a flight information centre (FIC) specially established for this purpose, for each flight information region (FIR) delineated on Chart ATS-1 at Appendix ~~S~~ B.

2.1.2 Recommendation No 2: - that Canada consider extending the northern boundaries of the Goose and Winnipeg flight information regions up to 70° N, so as to provide flight information service to flights presently operated north of these flight information regions.

US Further, that Canada and the United States study the possibility of providing flight information service in the area north of parallel 70° N.

2.2 Area Control Service

2.2.1 Recommendation No 3: - that area control service be provided on a 24-hour basis, by area control centres (ACC) specially established for this purpose for each control area (CTA) listed in Table ATS-1 at Appendix ~~D~~ C.

2.2.2 Recommendation No 4: - that the Shannon control area be extended and the necessary portion of airway Green 1 be enlarged to provide continuity of area control service along the direct route Gander-Fastnet Rock-Strumble.

Further, that an airway or a control area be established within the Prestwick FIR to link the domestic control area with the oceanic control areas on the great circle routes from Gander or Goose or Keflavik to Prestwick.

2.3 Approach Control Service

2.3.1 Recommendation No 5: - that approach control service be provided by a designated air traffic control unit and a control zone established at those aerodromes listed in Table ATS-2 at Appendix ~~S~~ D

2.4 Search and Rescue Service

2.4.1 Recommendation No 6: - that search and rescue service be provided, by search and rescue co-ordination centres (RCC) and by air and marine search and rescue facilities available to them, for each search and rescue area (SRR) delineated on Chart SAR-1 at Appendix ~~S~~ E

2.4.2 Recommendation N° 7 :- that the Miami Oceanic and San Juan search and rescue areas be coincident with the Miami Oceanic and San Juan flight information regions.

2.4.3 Recommendation N° 8 :- that the facilities tabulated in Table SAR-1 at Appendix ~~8~~ be approved as the minimum search and rescue facilities requirement for the Region.

2.4.4 Recommendation N° 9 :- that States be requested to maintain, as far as practicable, the minimum facilities tabulated in Table SAR-1 at Appendix ~~9~~.

2.4.5 Recommendation N° 10 :- that land search and rescue units be organized in all countries bordering the NAT Region, so as to ensure prompt action in case of emergency.

2.5 Publication of Information on Search and Rescue Facilities

2.5.1 Recommendation N° 11 :- that ICAO disseminate to States once a year a tabulation of search and rescue facilities within the North Atlantic Region.

2.6 Date of Implementation of Facilities

2.6.1 Recommendation N° 12 :- that those RAC/SAR facilities which are not yet implemented be implemented as soon as practicable, with the exception of those referring to or within the Nord and Tromsø Oceanic flight information regions and the Tromsø Oceanic search and rescue area and that portion of the Thule search and rescue area represented by the Nord flight information region which do not need to be implemented before scheduled operations are started within these areas.

SECTION 3 - REPORT AND RECOMMENDATIONS ON PROCEDURES3.1 RAC and SAR Regional Supplementary Procedures

- 3.1.1 Recommendation No 13 - that the following amendments be made to the Regional Supplementary Procedures (Doc 7030), Part 2 - Rules of the Air, Air Traffic Services and Search and Rescue - 1/9/54:

*See Annex
11.1.1.2
supp 13*

Page 2-1-1 - Following para. 2.1 b), add:

"Note.- In the interests of expediting the flow of air traffic and of attaining the maximum utilization of airspace, area controllers may assign flight levels, irrespective of the direction of flight, subject, in the case of their own control areas, to any necessary coordination with other appropriate centres and, in the case of adjacent control areas, to having received the prior approval of the appropriate adjacent centre or centres (see Annex 11, paragraphs 3.4.2 and 3.5.2)."

Page 2-1-2 - Insert the following additional procedures:

"3.2 - The minimum longitudinal separation required under Reg. the circumstances to which paragraphs 11.1.1 c), 11.1.2 b) and NAT 11.2.1 c) of the PANS-RAC (Doc 4444-RAC/501/5) apply shall be increased to thirty (30) minutes for flights transiting the New York, Gander, Reykjavik, Narsarssuak, Shannon/Prestwick and Santa Maria oceanic control areas, except when the States concerned agree that by virtue of the navigation and communications aids available, the reduced requirements of the PANS-RAC may apply."

3.2.1 - When the existence of navigational aids, good communications and other conditions permit the reduction of the separation standards set out in paragraph 3.2, operators shall be informed in advance by written communication of this intention."

Page 2-1-5 - Insert:

"6.1.8 - When air-to-ground communications through the normal channels have been lost by the aircraft and communications can be established with an ocean station vessel, the aircraft commander shall send [a position report] to the vessel for relay to the appropriate control centre." Reg. NAT

any DNS messages

1197

6.1.8.1 - Such messages shall be preceded by instructions to ensure proper relay by the vessel, and, in addition, shall be assigned the priority prefix DD."

Page 2-1-5 - Insert:

"NAT" opposite paragraph 7.1, with the note that for this Region the material in paragraph 7.1.1 should be supplanted by the following:

"The first rescue coordination centre which is alerted shall be responsible for initiating rescue action, subject to its transferring responsibility in such cases as is provided by paragraph 7.1.4."

Page 2-1-6 - Paragraphs 7.2, 7.3.1, 7.3.2, 7.4 and 8.1: Insert:

"NAT" opposite each paragraph.

Page 2-1-11 - Insert the following additional procedure:

NAT

"12.- LATERAL SEPARATION (P-Part III-9)

12.1 - Oceanic area control centres shall provide a minimum of 120 nautical miles lateral separation between aircraft operating along parallel tracks when the provisions of the PANS-RAC (Doc 4444-RAC/501/5), Part III, paragraph 9, do not apply. Aircraft flying on converging tracks at the same flight level shall, before the lateral separation has been reduced to less than 120 nautical miles, be separated by the application of longitudinal or vertical separation."

3.2 Date of implementation of Regional Supplementary Procedures

3.2.1 Recommendation N° 14.

That the RAC/SAR Regional Supplementary Procedures be implemented four months after their publication in Part 2 of the Regional Supplementary Procedures - Doc 7030.

SECTION 4 - ADDITIONAL RECOMMENDATIONS4.1 Criteria for the establishment of control areas and control zones

- 4.1.1 Recommendation N° 15 - that the next appropriate Air Navigation Conference be asked to revise paragraph 2 of Appendix A to Annex 11 to provide more precise criteria in relation to the establishment of control areas and control zones.

4.2 Coordination between the Shannon and Prestwick area control centres

- 4.2.1 Recommendation N° 16 - that discussions between Ireland and the United Kingdom should take place in the near future in order to agree on a suitable formula for resolving the differing interpretations to which paragraph 9.5, Part 2, of the Regional Supplementary Procedures (Doc 7030) is open. Further that the agreed revised text be forwarded to ICAO.

4.3 Ships' positions

- 4.3.1 Recommendation N° 17 - that those States in the Region recording information on the position of selected merchant or other ships at sea in the North Atlantic Ocean disseminate, on a regular basis, insofar as practicable, such information to other States of the Region requesting it.

Further, that States make arrangements for the appropriate internal distribution of such information.

4.4 Position reports - AIREP form

- 4.4.1 Recommendation N° 18 - that, when reporting position in accordance with the ICAO AIREP Form, an indication of how the position was determined, similar to the methods listed in the Notes and General Instruction on the ICAO POMAR Form, be transmitted by a code reference immediately after the position.

4.5 Code for reporting position - AIREP form

- 4.5.1 Recommendation N° 19 - that ICAO develop a suitable code for reporting the method used to determine the position transmitted in accordance with the ICAO AIREP Form and instructions for the use of the code be included in the PANS-RAC (Doc 4444-RAC/501/5) - Attachment A, Model ICAO AIREP Form Recording and Reporting Instructions.

4.6 Maintaining flight plan track

4.6.1 Recommendation N° 20 - that States take appropriate action to draw the attention of pilots to the need:

- (a) of maintaining tracks as defined in the flight plan with the highest degree of accuracy in order to maintain the separation set out in paragraphs 3.2 and 12.1, Part 2, of the Regional Supplementary Procedures;
- (b) of informing ATS units if operational conditions will require deviations from flight plan tracks so that new clearances may be issued.

4.7 Vertical separation standards

4.7.1 Recommendation N° 21 - that the attention of ICAO be drawn to the need for urgent action in respect of vertical separation standards at high altitudes.

4.8 Type and frequencies of emergency portable radio equipment

4.8.1 Recommendation N° 22 - that States of the Region draw the attention of operators to the provisions of Annex 6, Chapter 11, para. 11.5, and request that, with a view to ensuring efficient search and rescue operations, should these become necessary, information on the type and frequencies of emergency portable radio equipment carried be forwarded immediately to rescue coordination centres and that subsequent changes be notified similarly.

4.9 Local procedures for accidents shortly after take-off

4.9.1 Recommendation N° 23 - that States develop local procedures to ensure that air traffic services will know whether or not an aircraft has suffered an accident shortly after take-off and before the first en-route position report normally would be received.

4.10 Liaison of Air Traffic Services and Rescue Coordination Centres Personnel

4.10.1 Recommendation N° 24 - that States of the Region, in coordinating their search and rescue organizations with

those of neighbouring Contracting States, as provided in Annex 12, paragraph 2.1.5, and in the preparation of the detailed plan for the conduct of search and rescue (Annex 12, paragraphs 4.1.1 and 4.1.2), encourage the exchange of visits of rescue coordination centre personnel of different States.

Further, to promote efficiency in the coordination of air traffic control, personnel of air traffic services units be similarly encouraged to exchange visits.

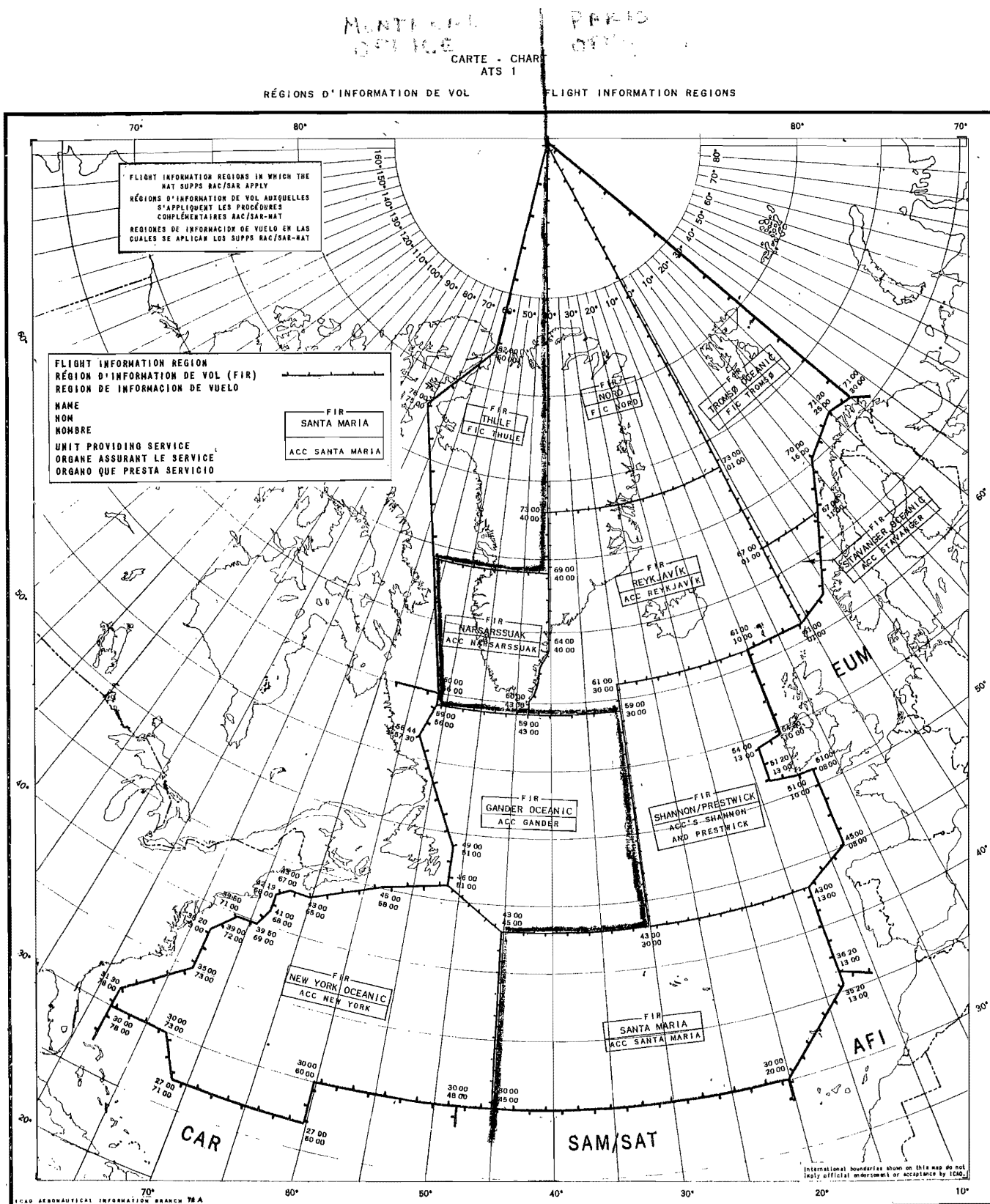
4.11 Search and rescue training

4.11.1 Recommendation N° 25

That ICAO circulate training films on search and rescue to States of the NAT Region.

APPENDIX A - STATEMENTS BY DELEGATIONS

No Statements were recommended
from Delegations for inclusion
in the Report of the RAC/SAR
Committee.



APPENDIX A - STATEMENTS BY DELEGATIONS

No Statements were recommended
from Delegations for inclusion
in the Report of the RAC/SAR
Committee.

PARIS
OFFICE

FLIGHT INFORMATION REGIONS



TABLE ATS 1 - AREA CONTROL SERVICE
TABLEAU ATS 1 - REGIONS DE CONTROLE

EXPLANATION OF TABLE

Column

- 1 Name of the Control Area (CTA).
- 2 Lateral limits of the CTA. If the area is a circle, coordinates are given for the centre with the radius in nautical miles (NM).

Column

- 3 Upper and lower limit of the CTA with an indication of the units used, i.e. m (metres) or ft (feet) and the reference, i.e. MER (relative to mean sea level) or GND (relative to ground).
- 4 Name of the ATS unit providing area control service.

EXPLICATION DU TABLEAU

Colonne

- 1 Désignation de la région de contrôle (CTA).
- 2 Limites latérales de la région de contrôle (CTA). Si la région est un cercle, les coordonnées du centre sont indiquées et le rayon est exprimé en milles marins (NM).

Colonne

- 3 Limites supérieure et inférieure de la région de contrôle, avec indication des unités utilisées: m (mètres) ou ft (pieds), et indication du niveau de référence: MER (par rapport au niveau moyen de la mer) ou GND (par rapport au sol).
- 4 Nom de l'organe ATS assurant le contrôle régional.

TABLE - TABLEAU
ATS 1

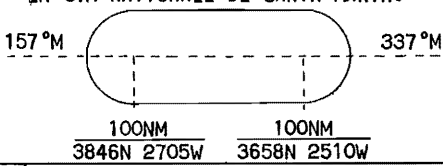
NAME	LATERAL LIMITS OR SIGNIFICANT POINTS	UPPER LIMIT LOWER LIMIT	ATS UNIT
NOM	LIMITES LATÉRALES ou POINTS SIGNIFICATIFS	LIMITE SUP. LIMITE INF.	ORGANE ATS
1	2	3	4
BERMUDA - BERMUDES	150 NM 3221N 6439W	NIL 2000ft MER	KINDLEY FIELD ACC
BERMUDA CTA			
CANADA	GANDER OCEANIC FIR	NIL 2000ft MER	GANDER ACC
GANDER OCEANIC CTA			
GREENLAND - GROENLAND	NARSARSSUAK FIR	NIL 2000ft GND	NARSARSSUAK ACC
NARSARSSUAK CTA			
THULE CTA			
	100 NM 7634N 6849W	NIL 2000ft GND	THULE ACC
ICELAND - ISLANDE	REYKJAVÍK FIR	NIL 2000ft MER OVER WATER- AU-DESSUS DE L'EAU 700ft GND OVER LAND- AU-DESSUS DES TERRES	REYKJAVÍK ACC
REYKJAVÍK CTA			
IRELAND - IRLANDE	SHANNON-PRESTWICK FIR	NIL 2000ft MER	SHANNON ACC & PRESTWICK ACC
SHANNON-PRESTWICK CTA cf. UNITED KINGDOM			
PORTUGAL	SANTA MARIA FIR EXCLUDING SANTA MARIA DOMESTIC CTA. FIR DE SANTA MARIA À L'EXCLUSION DE LA CTA NATIONALE DE SANTA MARIA.	NIL 600m MER	SANTA MARIA ACC
SANTA MARIA OCEANIC CTA			
SANTA MARIA DOMESTIC CTA			
	157°M  337°M 100NM 100NM 3846N 2705W 3658N 2510W	NIL 200m MER	SANTA MARIA ACC
UNITED KINGDOM - ROYAUME-UNI	SHANNON-PRESTWICK FIR	NIL 2000ft MER	SHANNON ACC & PRESTWICK ACC
SHANNON-PRESTWICK CTA cf. IRELAND			
UNITED STATES - ETATS-UNIS	NEW YORK OCEANIC FIR EXCLUDING BERMUDA CTA- À L'EXCEPTION DE LA CTA DE BERMUDA	NIL 2000ft MER	NEW YORK ACC
NEW YORK OCEANIC CTA			

TABLE ATS 2 - APPROACH CONTROL SERVICE
TABLEAU ATS 2 - ZONES DE CONTROLE

EXPLANATION OF TABLE

Column

- 1 Name of the city followed by the name of the aerodrome.
- 2 Lateral limits of the control zone; if the control zone is a circle, coordinates are given for the centre with the radius in nautical miles.

Column

- 3 Upper limit of the control zone with an indication of the units used, i.e. m (metres) or ft (feet) and the reference, i.e. MER (relative to mean sea level) or GND (relative to ground)
- 4 Name of the ATS unit providing approach control service.

EXPLICATION DU TABLEAU

Colonne

- 1 Nom de la localité suivi du nom de l'aérodrome.
- 2 Limites latérales de la zone de contrôle; si la zone de contrôle est un cercle, les coordonnées du centre sont indiquées et le rayon est exprimé en milles marins.

Colonne

- 3 Limite supérieure de la zone de contrôle, avec indication des unités utilisées; m (mètres) ou ft (pieds), et indication du niveau de référence: MER (par rapport au niveau moyen de la mer) ou GND (par rapport au sol).
- 4 Nom de l'organe ATS assurant le contrôle d'approche.

TABLE - TABLEAU
ATS 2

CITY/AERODROME	CONTROL ZONE		ATS UNIT
	LATERAL LIMITS	UPPER LIMIT	
VILLE/AÉRODROME	ZONE DE CONTRÔLE		ORGANE ATS
1	LIMITES LATÉRALES	LIMITE SUPÉRIEURE	4
BERMUDA - BERMUDES	<u>25NM</u> 3212N 6439W	NIL	KINDLEY TWR
KINDLEY FIELD			
GREENLAND - GROENLAND	<u>25NM</u> 6109N 4525W <u>25NM</u> 6701N 5042W <u>25NM</u> 7632N 6845W	NIL NIL NIL	NARSARSSUAK TWR SØNDRESTROM TWR THULE TWR
NARSARSSUAK			
SØNDRESTROM			
THULE			
ICELAND - ISLANDE	<u>6.5NM</u> 6359N 2237W <u>6.5NM</u> 6408N 2156W	1500ft GND 1500ft GND	KEFLAVÍK TWR REYKJAVÍK TWR
KEFLAVÍK/KEFLAVÍK			
REYKJAVÍK/REYKJAVÍK			
PORTUGAL	<u>5NM</u> 3846N 2705W <u>5NM</u> 3658N 2501W	200m GND 200m GND	LAJES TWR SANTA MARIA, TWR
LAJES/LAJES, AZORES			
SANTA MARIA/SANTA MARIA, AZORES			

Appendix E
Appendice E

RÉGIONS DE RECHERCHES ET SAUVETAGE

SEARCH AND RESCUE AREAS

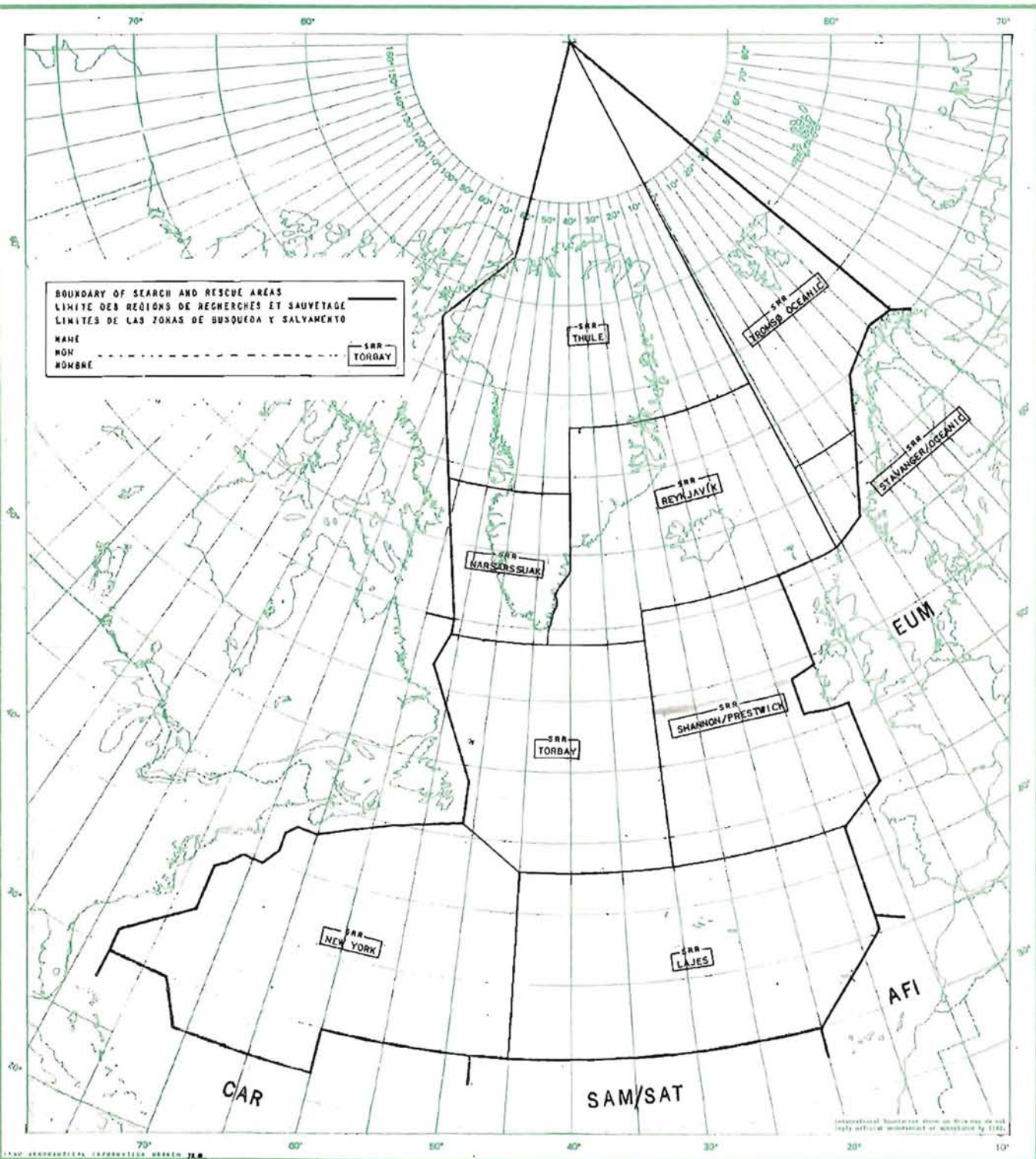


TABLE SAR 1 - SEARCH AND RESCUE FACILITIESTABLEAU SAR 1 - INSTALLATIONS ET SERVICES DE RECHERCHES ET SAUVETAGEEXPLANATION OF TABLEColumn

- 1 Name of the Rescue Coordination Centre (RCC).
- 2 Location of each rescue unit.
- 3 Number and category of search and rescue aircraft, the category being indicated as follows:
- Very long range - VLR
 - Long range - LRG
 - Medium range - MRG
 - Short range - SRG
 - Helicopter - HEL

Column

- 4 Number and category of search and rescue marine craft, the category being indicated as follows:
- Rescue vessel - RV
 - Rescue boat - RB
- 5 Any information supplementary to the above including references to local search and rescue centres serving the rescue coordination centre.

EXPLICATION DU TABLEAUColonne

- 1 Nom du centre de coordination de sauvetage (RCC).
- 2 Emplacement de chaque équipe de sauvetage.
- 3 Nombre et catégorie des aéronefs de recherches et sauvetage; la catégorie est indiquée comme suit:
- Très long rayon d'action - VLR
 - Long rayon d'action - LRG
 - Moyen rayon d'action - MRG
 - Court rayon d'action - SRG
 - Hélicoptère - HEL

Colonne

- 4 Nombre et catégorie des bâtiments de surface destinés aux recherches et sauvetage; la catégorie est indiquée comme suit:
- Navire de sauvetage - RV
 - Vedette de sauvetage - RB
- 5 Renseignements complémentaires, notamment indication des centres locaux de recherches et sauvetage desservant le centre de coordination de sauvetage.

PART VI.- RAC/SAR Committee
6ème Partie.- Comité RAC/SAR

RAC/SAR-26

TABLE - TABLEAU
SAR 1

RESCUE COORDINATION CENTRE	RESCUE UNIT			REMARKS
	NAME	AIRCRAFT	MARINE CRAFT	
CENTRE DE COORDINATION DE SAUVETAGE	EQUIPE DE SAUVETAGE			REMARQUES
1	NOM	AÉRONEFS	BÂTIMENTS DE SURF	5
BERMUDA - BERMUDES	KINDLEY FIELD	1 VLR 1 LRG	1 RB	FACILITIES WILL BE AVAILABLE SO LONG AS PROVIDED BY THE UNITED STATES. LES MOYENS SAR SERONT DISPONIBLES TANT QU'ILS SERONT FOURNIS PAR LES ETATS-UNIS.
NEW YORK RCC				
CANADA	DARTMOUTH GOOSE TORBAY	1 MRG 2 LRG	OSV B OSV C OSV D	
TORBAY RCC			1 RV 1 RB	
GREENLAND - GROENLAND	NARSARSSUAK * THULE	1 LRG 1 MRG 1 HEL 1 LRG 1 MRG 1 HEL	2 RB	*LOCATION TO BE DETER- MINED BY DENMARK. EMPLACEMENT À DÉTERMI- NER PAR LE DANEMARK.
NARSARSSUAK RCC				
THULE RCC				
ICELAND - ISLANDE	KEFLAVÍK REYKJAVÍK	1 VLR 1 LRG 1 HEL 2 SRG	OSV A	
REYKJAVÍK RCC			1 RV 1 RB	
IRELAND - IRLANDE	SHANNON		OSV I OSV J OSV K	
SHANNON RCC			1 RB	
CF. UNITED KINGDOM				
NORWAY - NORVEGE	BERGEN STAVANGER/SOLA	1 LRG 1 SRG 1 HEL	OSV M	
STAVANGER RCC			1 RV 1 RV 1 RB	

TABLE - TABLEAU
SAR 1

RESCUE COORDINATION CENTRE	RESCUE UNIT			REMARKS
	NAME	AIRCRAFT	MARINE CRAFT	
1	2	3	4	5
NORWAY - NORVEGE (CONT'D. - SUITE)				
TROMSØ RCC	BARDUFOSSE BODØ TROMSØ/SKATØRA	1 SRG 1 LRG	 1 RB 1 RV 1 RB	
PORTUGAL				
LAJES RCC	LAJES PONTA DELGADA	1 VLR 1 SRG	 1 RV	
UNITED KINGDOM - ROYAUME-UNI				
PRESTWICK RCC CF. IRELAND	ALDERGROVE ST. EVAL	1 LRG 1 LRG	OSV I OSV J OSV K	
UNITED STATES - ETATS-UNIS				
NEW YORK RCC CF. BERMUDA	BROOKLYN ELIZABETH CITY NEW YORK SALEM	1 LRG 1 HEL 1 LRG 1 HEL 1 LRG 1 HEL	OSV E 1 RB 1 RB	
<p>NOTE: OCEAN STATION VESSELS (OSV) ARE PROVIDED IN ACCORDANCE WITH THE "AGREEMENT ON NORTH ATLANTIC OCEAN STATIONS" SIGNED IN PARIS ON 25 FEBRUARY 1954.</p> <p>LES VAISSEAUX STATIONS OCÉANIQUES (OSV) SONT MIS EN PLACE CONFORMÉMENT À L'ACCORD SUR LES STATIONS OCÉANIQUES DE L'ATLANTIQUE-NORD, SIGNÉ À PARIS LE 25 FÉVRIER 1954.</p>				

APPENDIX G - ATS REQUIREMENTS
FOR COMMUNICATIONS*

(Note: All these requirements are considered urgent by the RAC/SAR Committee.)

1. Air-Ground Communications

1.1 In accordance with the directives from Sub-committee 1, the RAC/SAR Committee considered the ATS requirements for air-ground communications.

1.2 The RAC/SAR Committee requests the COM Committee to consider every possible means of improving air-ground communications in the NAT Region with the immediate objective of providing the most rapid exchange of communications between aircraft and area control centres and the ultimate objective of providing direct communication between aircraft and air traffic control.

1.3 The RAC/SAR Committee is of the opinion that the words "aircraft" and "air traffic control" in para. 1.2 of the directive should be interpreted as meaning "pilots-in-command" and "air traffic controllers".

2. Aeronautical Fixed Service Communications

2.1 In accordance with the directives of Sub-committee 1, the RAC/SAR Committee considered the ATS requirements for inter-area communications.

2.2 The RAC/SAR Committee requests the COM Committee to establish, as part of the NAT Regional Plan, an interphone type network which will directly link together area control centres and/or flight information centres and air-ground communication stations serving area control centres and flight information centres in the NAT Region. These circuits are required to facilitate closer inter-centre coordination and it is suggested that they be used only for this purpose and for high priority ATS and SAR messages. These circuits should be equipped with automatic switching through intermediate stations to permit direct communications between air traffic controllers.

2.3 The RAC/SAR Committee further requests the COM Committee to provide in the NAT Region interphone connections between each rescue coordination centre (RCC) and its associated area control centre (ACC) or flight information centre (FIC).

* As transmitted to the COM Committee.

2.4 The minimum ATS requirements for inter-area communications are presented in the table which follows:

TABLE OF ATS INTER-AREA REQUIREMENTS FOR COMMUNICATIONS

Centres to be connected		Requirements as established by the RAC/SAR Committee*
1	2	3
Gander	✓Goose A
	✓Narsarssuak A
	✓New York A
	✓Prestwick A
	✓Reykjavik A
	✓Santa Maria A
	✓Shannon A
Kindley Field	New York A
Narsarssuak	✓Goose A
	Reykjavik A
	Thule A
New York	Boston A
	Jacksonville A
	Miami A
	Moncton A
	Sal B 30
	San Juan A
	Santa Maria A
Nord	Reykjavik A
	Thule A
	Tromsø A

* A: Direct speech communications as from para. 6.2.2.1.1 b) of Annex 11.

B --: Printed communications as from para. 6.2.2.1.1 a) of Annex 11 with a transit time of the number of minutes indicated or less.

Centres to be connected		Requirements as established by RAC/SAR Committee*
1	2	3
Prestwick	Bordeaux B 30
	Madrid B 30
	Paris A
	Preston A
	Reykjavik A
	Santa Maria A
	Shannon A
	Uxbridge A
Reykjavik	Shannon A
	Stavanger A
	Thule A
	Tromsø B 30
Santa Maria	Casablanca B 15
	Lages A
	Lisboa A
	Sal A
	Shannon A
Shannon	Bordeaux B 30
	Dublin A
	Madrid B 30
	Paris A
	Uxbridge A
Stavanger	Trondheim B 30
	Tromsø A
Tromsø	Trondheim B 30

* A: Direct speech communications as from para. 6.2.2.1.1 b) of Annex 11.

B --: Printed communications as from para 6.2.2.1.1 a) of Annex 11 with a transit time of the number of minutes indicated or less.

APPENDIX H - ATS REQUIREMENTS
FOR NAVIGATION AIDS*

1. Long-range navigation aids

The RAC/SAR Committee considers that there is an urgent need to amend the navigation aids plan, to permit a closer coordination between air traffic control centres, a more accurate position determination, a more uniform application of separation criteria and a reduction in separation minima in use for long range navigation aids serving the NAT Region so as to ensure an accuracy of 20 nautical miles or better.

2. ILS's, GCA's and Radars

2.1 ILS's - The RAC/SAR Committee is satisfied with the plan for ILS (including new locators) as it now appears in the COM Committee report.

2.2 GCA's - The RAC/SAR Committee considers that there is no immediate new requirement for GCA's provided that those now installed are kept in operation.

2.3 Surveillance radars - The RAC/SAR Committee considers that there are immediate requirements for surveillance radar at Gander and Lisboa. The RAC/SAR Committee further requests the COM Committee to establish specifications for surveillance radars serving the NAT Region to ensure:

- a) a useful range of at least 100 nautical miles;
- b) the provision of moving target indicators.

2.4 Aerodrome surface detectors - The RAC/SAR Committee considers that there are requirements for aerodrome surface detector equipment at Gander, London Airport, New York International Airport and Orly.

3. VOR's - The RAC/SAR Committee considers that there are requirements for VOR's (additional to those already installed) at the following new locations:

* As transmitted to the COM Committee.

3.1 Priority 1

<u>Country</u>	<u>Location</u>	<u>Status</u>
Canada	Belle Isle*	Required
Canada	St. Johns*	Required

3.2 Priority 2

<u>Country</u>	<u>Location</u>	<u>Status</u>
Denmark	Billum**	Required
Denmark	Hanstholm**	Required
Norway	Jeløy** ***	Required
Norway	Kjevik**	Required

Canada)	<u>Route New York-Gander via****</u>	Required
U.S.A.)		

Canada)	<u>Route New York-Goose Bay via*</u>	Required
U.S.A.)		

Canada	<u>Route Montreal-Gander via*</u>	Required
	Montreal	
	Millinocket	
	Moncton	
	Sydney	
	Gander	

* See paragraph 1.2.1.2 of the Chairman's Report.

** Location included in the EUM Plan.

*** This VOR site may be shifted from Jeløy to suit the new airway plan now under consideration.

**** See paragraph 1.2.1.3 of the Chairman's Report.

ICAO TECHNICAL PUBLICATIONS

The following summary gives the status, and also describes in general terms the contents of the various series of technical publications issued by the International Civil Aviation Organization. It does not include specialized publications that do not fall specifically within one of the series, such as the ICAO Aeronautical Chart Catalogue or the Combined Meteorological Tables for International Air Navigation.

INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES are adopted by the Council in accordance with Articles 54, 37 and 90 of the Convention on International Civil Aviation and are designated, for convenience, as Annexes to the Convention. The uniform application by Contracting States of the specifications comprised in the International Standards is recognized as necessary for the safety or regularity of international air navigation while the uniform application of the specifications in the Recommended Practices is regarded as desirable in the interest of safety, regularity or efficiency of international air navigation. Knowledge of any differences between the national regulations or practices of a State and those established by an International Standard is essential to the safety or regularity of international air navigation. In the event of non-compliance with an International Standard, a State has, in fact, an obligation, under Article 38 of the Convention, to notify the Council of any differences. Knowledge of differences from Recommended Practices may also be important for the safety of air navigation and, although the Convention does not impose any obligation with regard thereto, the Council has invited Contracting States to notify such differences in addition to those relating to International Standards.

PROCEDURES FOR AIR NAVIGATION SERVICES (PANS) are approved by the Council for worldwide application. They comprise, for the most part, operating procedures regarded as not yet having attained a sufficient degree of maturity for adoption as Inter-

national Standards and Recommended Practices, as material of a more permanent character which is considered too detailed for incorporation in an Annex susceptible to frequent amendment, for which the processes of the Convention would be too cumbersome. In the case of Recommended Practices, the Council has invited Contracting States to notify any differences between their national practices and the PANS when knowledge of such differences is important for the safety of air navigation.

REGIONAL SUPPLEMENTARY PROCEDURES (SUPPS) have a status similar to that of PANS in that they are approved by the Council, but only for application in the respective regions. They are prepared in consolidated form, since certain of the procedures apply to overlapping regions or are common to two or more regions.

The following publications are prepared by authority of the Secretary General in accordance with the principles and policies approved by the Council.

ICAO FIELD MANUALS have no status in themselves but derive their status from the International Standards, Recommended Practices and PANS from which they are compiled. They are prepared primarily for the use of personnel engaged in operations in the field, as a service to those Contracting States who do not find it practicable, for various reasons, to prepare them for their own use.

TECHNICAL MANUALS provide guidance and information in amplification of the International Standards, Recommended Practices and PANS, the implementation of which they are designed to facilitate.

ICAO CIRCULARS make available specialized information of interest to Contracting States.