13

SUMMARY OF DISCUSSIONS AND CONCLUSIONS

OF THE

THIRTEENTH MEETING OF THE NAT SYSTEMS PLANNING GROUP

(Paris, 12 - 22 September 1977)

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1. Convening and conduct of the Meeting

1.1 The 13th Meeting of the North Atlantic Systems Planning Group (NAT/SPG) was held in the European Office of ICAO from 12 to 23 September 1977. In addition to the usual participation by all Members of the Group, IATA and IFALPA, the Group had also invited Denmark, Iceland, Norway and Portugal, as well as ACCA, IACA, and IAOPA to attend this Meeting because of the need to take into account their views on some of the subjects discussed. With the exception of Norway and IACA, all those States and Organizations were present.

1.2 At the opening of the Meeting the Group was asked by Poland to be permitted to participate in this Meeting of the Group. After careful consideration of this request and, more especially, of the exceptional circumstances caused by the imminent introduction of the MNPS and associated questions, the Members of the Group agreed to admit the attendance of Poland at this Meeting.

1.3 In doing so, the Members wished, however, to stress the importance of their freedom in deciding who should be invited to attend NAT/SPG Meetings and this exclusively for reasons of efficiency in the conduct of its work in relation to the size of attendance of its Meetings.

1.4 The Meeting was chaired by Mr. J. G. ten Velden, the Member from the Netherlands. A list of participants is given on page vi.

1.5 The Meeting of the Group was conducted throughout as an open Meeting with all participants present.

1.6 For some of the Agenda Items, the Group created ad hoc drafting Groups as follows:

a) a drafting group on Item 1 g) with Mr. R. Taylor of Canada as Rapporteur;

b) a drafting group on Item 3 with Mr. L. Lee from IATA as Rapporteur;

c) a drafting group on Item 9 with Mr. R.M. Whitford of Ireland as Rapporteur.

1.7 Mr. P. Berger served as Secretary of the Meeting assisted by Messrs C. Eigl, and E. Cerasi. Messrs F. E. Sperring and W. Arcangeletti also participated part-time in the Meeting and acted as advisers on communication questions. All five are Members of the European Office of ICAO.

A G E N D A

Item 1 : Review of Situation and Measures required regarding the implementation of Minimum Navigation Performance Specifications (MNPS) in specified parts of the NAT Region:

a) navigation capability of aircraft likely to operate in the NAT Region.

b) monitoring of aircraft navigation performance operating in the MNPS airspace by:

   i) States of Registry and Operators ; and

   ii) ATC Units in the NAT Region by means of radar.

c) follow-up action on observed and reported deviations from assigned track by individual aircraft.

d) establishment of special routes and related procedures for:

   i) flights between Iceland and other parts of Europe;and

   ii) high level flights in the NAT Region or flights operating from Iceland via Greenland to points in North Eastern Canada.

e) special temporary arrangements for aircraft unable to comply with the MNPS.

f) completion of Guidance Material regarding the application of MNPS

g) determination of time scale and dates for aeronautical information publications required to implement the MNPS.

Item 2 : Review of the latest situation regarding OMEGA.

Item 3 : Development of a more useful presentation of NAT Air Traffic Forecasts and conduct of a NAT traffic survey to assist in this task.

Item 4 : Extension of the area of use of current composite separation.

Item 5 : Determination of measures required as a pre-requisite to a possible reduction of longitudinal separation in the NAT Region.

Item 6 : Review of measures likely to assist in a reduction of problems created in the NAT Region by air traffic crossing and/or joining the main traffic flow.

Item 7 : Development of uniform procedures for use in establishing required temporary airspace reservations.

Item 8 : Determination of ATS Routes and procedures to be used by IGA light aircraft flights across the North Atlantic.

Item 9 : Review of the HF air-ground communication situation in the NAT Region including applicable Regional SUPPs.

Item 10 : Determination of the Work Programmes of the Group covering at least the next 2 years.

Item 11 : Any other business:

a) proposal to delete para 4.1.3 from the NAT RAC SUPPs;

b) specifications for Mach Number Indicators;

c) exchange of ATS messages between OACs;

d) lower limit of controlled airspace in NAT;

e) position reporting in NAT by SST aircraft;

f) application of lateral separation;

g) application of longitudinal separation based on distance.

LIST OF CONCLUSIONS

LIST OF PARTICIPANTS IN THE THIRTEENTH MEETING OF THE NAT SPG

CANADA

M. D. Broadfoot
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Agenda Item 1: Review of Situation and Measures required regarding the Implementation of Minimum Navigation Performance Specifications (MNPS) in specified parts of the NAT Region.

1.1 Introduction

1.1.1 In accordance with the request expressed by the LIM NAT RAN Meeting 1976 in its Recommendation 1.2/10, regarding the future work programme of the NAT/SPG, the Group agreed to undertake work on Agenda Item 1 under the following points:

a) navigation capability of aircraft likely to operate in the NAT Region.

b) monitoring of navigation performance of aircraft operating in the MNPS airspace by:

   i) Operators and States of Registry; and

   ii) ATC Units in the NAT Region by means of radar.

c) follow-up action on observed and reported deviations from assigned track by individual aircraft.

d) establishment of special routes and related procedures for:

   i) flights between Iceland and other parts of Europe; and

   ii) high level flights in the NAT Region or flights operating from Iceland via Greenland to points in North Eastern Canada.

e) special temporary arrangements for aircraft unable to comply with the MNPS.

f) completion of Guidance Material regarding the application of MNPS.

g) determination of time scale and dates for aeronautical information publications required to implement the MNPS.

1.2 Navigation capability of aircraft likely to operate in the NAT Region

1.2.1 The Group noted that, in accordance with b) of Recommendation 1.2/10 of the LIM NAT RAN Meeting 1976, the European Office of ICAO had requested States, having operators conducting flights in the NAT Region, to provide it with information on the situation expected to exist on 29 December 1977 regarding the capability of such operators to comply with Minimum Navigation Performance Specifications (MNPS). Information presented to the Group by the European Office of ICAO, showed that out of the 50 States contacted, only 16 had replied by the time of the opening of the Meeting of the Group. In addition, it was noted that some 8 States, having operators engaged in NAT operations had not yet informed ICAO of this fact and were therefore not yet included in the list of States having aviation interests in that Region.

1.2.2 In view of this situation, the Group, with the assistance of IATA, conducted a screening of the list of those States not yet having replied to the letter of the European Office mentioned above and eliminated those States where, based on available information it could be assumed with a high probability that their operators would either not be concerned with the introduction of MNPS or where it was anticipated that their operators would not have difficulties of meeting the MNPS by 29 December 1977.

1.2.3 For those States where the Group felt that, while it was likely that their operators would not have any problems but there were certain doubts about this assumption, it was agreed to request the European Office to contact these States and obtain confirmation that their operators would be able to comply. This Group was composed of 11 States and, by the end of the Meeting such confirmation had been received from 3 of them.

1.2.4 For those States where there was insufficient information available as to the situation of their operators in order to come to any assessment at all, the Group requested the European Office of ICAO to contact them and provide the missing information as a matter of urgency. This Group consisted of 9 States and, by the end of the Meeting 3 of them had provided the requested information.

1.2.5 In this context, the Group also noted a statement from the IAOPA observer to the extent that those aircraft of its Members likely to require operation in the MNPS airspace would be capable of meeting the MNPS by 29 December 1977.

1.2.6 Despite the above mentioned shortcomings in the provision of information, the Group, after careful review of all available information, came to the conclusion that, without being able to precisely state any number of non-MNPS aircraft it could safely be expected that by 29 December 1977 the situation with regard to compliance with the MNPS by operators engaged in NAT operations was such that the application of the MNPS as of that date would not create serious difficulties.

1.2.7 Furthermore, the number of flights required to operate outside the MNPS airspace because of their continued inability to comply with the MNPS was expected to be such that the resulting traffic density in that airspace at any given time would permit the continued application of lateral and longitudinal separation between such aircraft as now applied in the NAT Region outside the Organized Track System (OTS).

CONCLUSION 13/1 - APPLICATION OF THE MNPS AS OF 29 DECEMBER 1977 AND SEPARATION TO BE PROVIDED TO AIRCRAFT OUTSIDE THE MNPS AIRSPACE AFTER THAT DATE

That

a) there was no information available which would indicate that the application of the MNPS in specified parts of the NAT Region as of 29 December 1977 will lead to undue difficulties either to users or providers; and

b) lateral and longitudinal separation now applied in the NAT Region between aircraft operating outside the OTS be continued to be applied between aircraft operating outside the MNPS airspace in the NAT Region after 29 December 1977, subject to continuing review.

1.2.8 In this context it was noted that at least one State of Registry was at present engaged in work in order to determine whether, in a specified Northern part of the MNPS airspace North of 50°N the provision of DOPPLER equipment, combined with LORAN-C would meet the MNPS.

1.3 Monitoring of navigation performance of aircraft operating in the MNPS airspace

Monitoring by operators and States of Registry

1.3.1 Throughout the development of the MNPS concept it had been stressed that close monitoring of the navigation performance constituted a major element in the application of this concept. For this reason, the LIM NAT RAN Meeting 1976 had spent considerable effort in impressing this upon operators as well as States of Registry responsible for operators engaged in flight operations in the MNPS airspace. The Group noted with satisfaction that IATA had already undertaken very useful work in this respect by producing a document on navigation practices in the NAT Region which, inter alia, also covered this aspect of the operators' responsibilities.

1.3.2 With regard to monitoring of IGA operations, the Group noted a statement by the representative from IAOPA to the extent that this Organization was fully prepared to assist in the execution of monitoring of these types of operations, in cooperation with States of Registry, to the extent that this was appropriate,

1.3.3 As to monitoring by States of Registry, both the UK and the USA had already prepared Information Circulars on the way in which they intended to discharge themselves of their obligations in this respect and the Group agreed that these circulars should be included in the NAT Guidance Material prepared by the European Office of ICAO. The Member from Canada informed the Group that his Administration requires all operators engaged in NAT operations to maintain for each aircraft an INS log which is regularly reviewed. In all those cases where such a review reveals significant equipment deficiencies, this is subject to an investigation in cooperation with the operator concerned.

1.3.4 The Group agreed that the arrangements made by Canada, the UK and the USA were fully satisfactory. Nevertheless it was believed that, because of the large variety of circumstances existing in the relationship between States of registry and their operators engaged in NAT operations, it could not be expected that all States would be able to make similar or identical arrangements. It was, however, expected that all States concerned would make maximum efforts to comply effectively with their responsibilities resulting from the application of MNPS, while keeping administrative arrangements within reasonable limits.

Monitoring by ATC units

1.3.5 With regard to the monitoring of actual navigation performance by ATC with the aid of radar, the Group noted that, in accordance with Recommendation 1.2/2 of the LIM NAT RAN Meeting 1976, France, Iceland and the USA had already made arrangements to participate in these monitoring activities. In addition, it was noted that the UK, Ireland as well as the USA planned to extend their monitoring activities in the near future by the use of additional radar stations for this purpose. Portugal informed the Group that they intended to start monitoring at the beginning of 1978.

1.3.6 As to monitoring by Canadian ATC units, the Group noted that, while activities in this field had been considerably increased, this was still being done on a random sampling basis because of certain limitations. The Group therefore reiterated a request to the Canadian Member, already made at previous Meetings, that Canada should make every effort to conduct monitoring on a permanent basis, especially during the period between 29 December 1977 when MNPS were starting to be applied in the NAT Region and 5 October 1978 when lateral separation minima within the MNPS airspace were planned to be reduced to 60NM.

1.4 Follow-up action on observed and reported deviations

1.4.1 As to the conduct of monitoring activities, on a proposal by the UK Member, it was agreed that the six-monthly summaries of monitoring data provided by the European Office of ICAO should be based on the calendar year and should be submitted to that Office in January and July covering the six preceding months.

1.4.2 With regard to follow-up action on observed deviations from track by 25NM or more, the Group, after having noted that there existed slightly different administrative arrangements within the States engaged in monitoring, agreed that:

a) the observing ATC unit should, whenever possible, inform the pilots of aircraft concerned of such errors;

b) in case of commercial operators these should be notified either by the ATC unit directly or by any other agency designated by the State concerned and this with the shortest possible delay. In addition, such notification should also be provided to the State of Registry if the latter has requested this with the monitoring authority;

Note 1: The Members from Canada, France, the UK and the USA, as well as the Representatives from Denmark, Iceland and Portugal stated at this Meeting that their Administrations had such a requirement.

Note 2: For information, the address of the monitoring authorities are listed in Appendix A to this Part of the Summary.

c) in case of non-commercial operators these should be notified in all cases to the operator (if possible) and to the State of Registry of the operator concerned.

1.4.3 Subsequent follow-up action on large errors notified in accordance with the above provisions should initially be conducted between the operator and a designated agency of the State having responsibility for the ATC unit on the understanding that :

a) Monitoring States may, if they so wish, request the assistance of other States engaged in monitoring activities ; and

b) the State of Registry of the operator concerned may conduct further investigation if deemed necessary.

1.4.4 In addition, monitoring States should, prior to each NAT/SPG Meeting, provide the Group with monitoring data, together with any other relevant information in order to permit it to make a continuous assessment whether observed deviations remain within the tolerances on which the MNPS are based. Nevertheless, should data indicate that tolerance limits are approached or exceeded, the Group will propose appropriate corrective measures.

1.4.5 Finally the Group noted a paper presented by the Member from Canada which gave a detailed description of the manner in which Canadian ATC units conducted their monitoring activities. As it was found that this description covered also the manner in which other monitoring States performed this task and since it was felt that such a description may be of interest to users, the Group agreed that this material, together with an appropriate reference, should be included in the NAT Guidance Material issued by the European Office of ICAO.

1.5 Establishment of special routes and related procedures

1.5.1 Before discussing individual routes, the Group noted that Annex 6, Part I, Chapter 7 stated a requirement for aircraft to carry stand-by navigation equipment. In the context of the application of the MNPS, as agreed at the LIM NAT RAN Meeting 1976 this could be interpreted to mean that, while two sets of long-range navigation equipment would have to be carried when operating in the major part of the MNPS airspace, there could be some areas where the requirement to carry stand-by equipment need only apply to that used for short-range navigation.

Routes for flights between Iceland and other parts of Europe

1.5.2 After a careful review of the navigational guidance provided on the route from Bergen (Flesland) via Myggenes and Ingo to Keflavik and on the route from Sumburgh via Akraberg to Myggenes, the Group agreed that aircraft provided with normal short-range navigation equipment (VOR/DME,ADF) operating on these routes within MNPS airspace should be capable of meeting the MNPS. In addition it was agreed that these two routes should be published in the appropriate aeronautical information publications of States concerned and that they should be given the designation G3 and G11 respectively. In this context it was noted that the alignment arrangements for these routes also applied outside the MNPS airspace.

1.5.3 As to flights operating within MNPS airspace between points in Northern UK and points in Iceland, it was agreed that the operation of such flights should be governed by applicable provisions in paras 1.5.5 and 1.5.6.

Operation on routes between North Eastern Canada and Iceland via Greenland

1.5.4 As had been pointed out at the LIM NAT RAN Meeting 1976, it could be expected that there would be a continued requirement for operation on routes extending between North Eastern Canada and Iceland via Greenland which could be used by aircraft on delivery or by aircraft not normally used in NAT operations.

1.5.5 The Group reviewed once more these requirements and, in the light of anticipated demands for the operation on routes between Iceland and North Eastern Canada (Goose, Frobisher) via Greenland, agreed that no specific routes should be established to cater for these operations within MNPS airspace.

1.5.6 Therefore, because of the specific navigational environment, i.e. the presence of a number of short-range navigation aids, the Group agreed that aircraft operating along routes extending between Iceland and North Eastern Canada should be considered capable of meeting the MNPS provided they were equipped with normal short-range navigation equipment (VOR/DME, ADF) and in addition at least one fully operational set of the following:

a) DOPPLER with computer,
b) INS,
c) OMEGA,
d) LORAN C

It was agreed that this latter equipment need not be part of the permanent navigation equipment installed on board the aircraft in question.

CONCLUSION 13/2 - ESTABLISHMENT OF SPECIAL ROUTES BETWEEN ICELAND AND OTHER PARTS OF EUROPE

That

a) States concerned establish and include in their aeronautical information publications :

i) an ATS route from Bergen (Flesland) via Myggenes and Ingo to Keflavik with the designator G3 within and outside MNPS airspace;

ii) an ATS route from Sumburgh via Akraberg to Myggenes with the designator G11 within and outside MNPS airspace; and

b) aircraft provided with normal short-range navigation capability operating along these routes within MNPS airspace be considered capable of meeting the MNPS.

CONCLUSION 13/3 - PROVISIONS FOR OTHER SPECIAL ROUTES

That

a) aircraft operating along routes between points in Northern UK and Ireland and Iceland and points in North-Eastern Canada (Goose, Frobisher) in MNPS airspace which are equipped with normal short-range navigation capability (VOR/DME, ADF) and at least one fully operational set of the following navigation equipment:

i) DOPPLER with computer,
ii) INS,
iii) OMEGA,
iv) LORAN C

be considered capable of meeting the MNPS while operating along these routes; and

b) all flights operating in MNPS airspace on routes other than those mentioned above be required to meet not only the MNPS but also the requirements in Annex 6, Part I, Chapter 7 regarding complete stand-by navigation equipment.

1.5.7 It was noted that Portugal was at present conducting studies, aimed at the application of arrangements similar to those contained in Conclusion 13/3 a) above regarding certain flights between points in Portugal and in the Azores. The Group agreed however that, since work on this matter was not yet concluded, it was unable to endorse such provisions and it therefore expected that Portugal would raise this matter at a later date for decision, once its studies had proven the feasibility of such a step.

1.5.8 With respect to the Conclusions 13/2 and 13/3, the representative of IFALPA stated that, since his Organization had not yet had sufficient time to consider the arrangements made therein, he was obliged to reserve IFALPA's position with respect to them for the time being, on the understanding that the final views of IFALPA on this subject would be notified as soon as this was possible.

Possible routes for aircraft suffering partial loss of their navigation capability prior to entering the MNPS airspace

1.5.9 It was realized that, because of the large variety of circumstances which may exist at the time an aircraft is faced with partial loss of its navigation capability prior to entry into oceanic airspace it would not be possible to establish hard and fast rules for handling such situations by

pilots. Nevertheless, with the application of the MNPS it was felt that some guidance should be provided to pilots for these occasions in order to keep the risk resulting from such incidents within reasonable proportions. This was particularly applicable after 5 October 1978 when lateral separation in the NAT Region was reduced to 60 NM. It should, however, be noted that the following guidance material in no way relieves the pilot from the obligation to take the best possible course of action in the light of circumstances as they prevail at the time of the incident.

1.5.10 With the above proviso, the Group agreed that pilots encountering partial navigation equipment failure should consider using the following routes:

a) STN - 60N 10W - 61 N 1234W - LIMA - KF;

b) EGL - 5830N 15W - 60N 17W - 61N 1820W - OSKAR - KF;

c) G11/G3 - KF

d) KF - UNIFORM - 63N 30W - 61N 40W - OZN;

e) OZN - 60N 50W - 59N 60W - KL;

f) OZN - 59N 50W - CHAR - HOPEDALE;

g) OZN - 58N 50W - CAPELIN - GOOSEBAY.

1.5.11 When required, operation on the above routes should, however, be subject to the following conditions:

a) following failure of navigation system(s) on board the aircraft, sufficient navigation capability remains to meet the MNPS, and the requirements in Annex 6, Part I, Chapter 7 can be met by relying on the use of short-range navigation;

b) a revised flight plan is filed with the appropriate ATC unit; and

c) an appropriate ATC clearance is obtained.

Note 1: A revised oceanic ATC clearance will be issued after coordination between all OACs concerned.

Note 2; Should the Organized Track Structure at the time of the incident extend to the Northern part of the NAT Region, the aircraft concerned may be required to accept a lower than optimum flight level in its revised oceanic clearance, especially during peak traffic periods.

1.5.12 The Group agreed that the above material should be included in the NAT Guidance Material issued by the European Office of ICAO for information and use as appropriate.

1.6 Special temporary arrangements for aircraft unable to comply with MNPS

1.6.1 The Group noted that, at the LIM NAT RAN Meeting 1976, it had been requested to develop arrangements for specific aircraft, initially unable to comply with the MNPS but needing to operate within the MNPS airspace and that such arrangements should not exceed a maximum period of 12 months starting from the time the MNPS became applicable in the NAT Region, i.e. 29 December 1977 (Recommendation 1.2/10 sub para 5) refers).

1.6.2 When considering this subject, the Group agreed that such arrangements could be divided into two distinct phases; i.e. the one covering the period from 29 December 1977 to 5 October 1978 and the time between 5 October 1978 and the end of December 1978.

1.6.3 In developing proposals for the first period mentioned above, account was taken of the fact that during that period a lateral separation of 120NM would continue to be applied between aircraft, and that this had therefore a definite effect on the arrangements proposed. In addition, the information on re-equipment efforts made by operators, required to operate in the MNPS airspace, as recorded in para 1.2 above seemed to indicate that the number of aircraft requiring to make use of such arrangements will have significantly diminished by 5 October 1978.

1.6.4 For the period after 5 October 1978 when a reduced lateral separation of 60 NM will be applied, the Group felt that the arrangements would only have to cater for a very small number of requests for such operations under exceptional circumstances.

1.6.5 In this context, it was noted that due to the use of automated data processing equipment by OACs and particularly OAC Gander, extensive re-programming of such equipment was required prior to the application of reduced lateral separation in the NAT Region with appropriate lead times. It was therefore believed essential that there should be no doubt left in States' and operators' minds about the fact that the date of 5 October 1978 will be retained as that, on which 60 NM lateral separation will become applicable in the MNPS airspace of the NAT Region and will also effectively be used. This was confirmed by all provider States represented at this Meeting.

1.6.6 In view of the above the Group agreed on the following :

a) on the understanding that the requirement to comply with the MNPS in that part of the NAT Region designated as MNPS airspace will become applicable as of 0001 GMT on 29 December 1977, aircraft intending to operate within the MNPS airspace are required to fully meet the MNPS, except when the provisions in b) and e) apply ;

b) aircraft currently equipped with DOPPLER/LORAN C navigation equipment may be authorized to operate within the MNPS airspace during the period from 0001 GMT on 29 December 1977 to 0001 GMT on 5 October 1978 ;

c) after 0001 GMT on 29 December 1977, aircraft equipped with navigation equipment other than that meeting the MNPS, unless using DOPPLER/LORAN C equipment, should not be authorized by their State of Registry to operate within the MNPS airspace, except in accordance with the provisions specified in e) below ;

d) after 0001 GMT on 5 October 1978, aircraft equipped with DOPPLER/LORAN C navigation equipment should not be authorized to operate within the MNPS airspace unless the State of Registry of the operator concerned has, by that time, concluded that this navigation equipment combination and the associated procedures meet the MNPS in a specified part of the MNPS airspace and operations by aircraft so equipped are restricted to within that part only; and

e) after 0001 GMT on 29 December 1977, special arrangements may be made for a limited number of individual and justified cases to permit aircraft not meeting the MNPS to operate within or through MNPS airspace on the understanding that such arrangements require coordination between the operator requesting such operations and the OAC of entry of such flights into the MNPS airspace with adequate advance notice. The ultimate decision on the method of handling such aircraft should be made by the ATC authorities concerned by their operation, taking into account all relevant factors, including the navigation capability of the aircraft concerned. In addition, such arrangements should be made in such a way that they result in the least economic penalties for aircraft complying with the MNPS and being affected by such operations.

1.6.7 With regard to those aircraft referred to in c) above and restricted from operation within the MNPS airspace, the Group agreed that, because of the very low traffic density resulting from their operation outside the MNPS airspace, it will be safe to continue to apply the present value of 120 NM lateral separation between them. Developments in this respect will, however, be kept under close observation by ATC provider States in the Region and, should a significant increase in traffic over the expected number occur, this will be reviewed by the Group with a view to develop appropriate measures.

CONCLUSION 13/4 - SPECIAL TEMPORARY ARRANGEMENTS FOR AIRCRAFT UNABLE TO COMPLY WITH THE MNPS

That the provisions contained in paras 1.6.6 to 1.6.7 be considered to constitute the special temporary arrangements for aircraft unable to comply with the MNPS and be as such applied by all concerned.

1.6.8 In view of the importance of the material referred to in Conclusion 13/4 above, the Group agreed that this should be included in the NAT Guidance Material issued by the European Office of ICAO.

1.7 Guidance material regarding application of MNPS

1.7.1 The Group reviewed the provisional edition of the "Guidance and Information Material concerning Air Navigation in the NAT Region" as it had been issued by the European Office of ICAO in June 1977. It agreed that the material contained therein, as well as the lay-out and presentation was generally satisfactory.

1.7.2 It noted, however, that, in some respects, this guidance material was not yet complete because relevant material had either not yet been received or had only been developed at this Meeting of the NAT/SPG. It therefore made a review of all relevant documentation placed before that Meeting of the Group and selected from it those parts which, in the Group's view, merited inclusion in the next edition of this Guidance Material.

CONCLUSION 13/5 - COMPLETION OF GUIDANCE AND INFORMATION MATERIAL CONCERNING AIR NAVIGATION IN THE NAT REGION

That

a) the NAT Guidance Material be completed by inclusion, in the appropriate place and in appropriate form of the following:

i) material provided by the US and the UK describing the methods used by these States to ensure compliance with the MNPS;

ii) in regard to specific navigation equipment fits likely to meet the MNPS, the material contained in paras 1.2 : 4.3 to 1.2 : 4.9 of the Report of the LIM NAT RAN Meeting 1976;

Note: Continuing trials are being conducted to evaluate dual OMEGA without DOPPLER as a suitable equipment fit to comply with MNPS and results should be available for the next Meeting of the Group. As additional experience is gained, other equipment, or combinations of equipment, will be considered and appropriate proposals will be made.

iii) special arrangements agreed by the NAT/SPG for aircraft unable to meet the MNPS;

iv) a description of the OMEGA navigation system and its operation provided by the US;

Note: This material will be replaced by the ICAO Circular on this subject as and when this becomes available.

v) a standard form for the reporting by pilots of the performance of INS and OMEGA equipment, as may be required by States of Registry;

Note: As soon as available

vi) guidance material on possible courses of action to be taken by aircraft having experienced partial navigation equipment failure prior to entering MNPS airspace;

vii) material provided by the UK and the US on the way in which these States exercise their monitoring function over operators and relevant extracts from the report of this Meeting.

viii) extracts from the report of this Meeting covering the extension of monitoring by ATC units and a description of the monitoring method used;

b) the European Office of ICAO be invited to make arrangements for the earliest possible issue of the next updated edition of the NAT Guidance Material.

1.8 Time scale and dates for aeronautical information publications required to implement the MNPS

1.8.1 Taking into account the views expressed above regarding the application of the MNPS concept in the NAT Region as of 0001 GMT on 29 December 1977 and also taking account of the need of operators to be provided with maximum advance notice in order to make necessary internal arrangements, the Group agreed that the application of MNPS should be promulgated with an advance notice of two AIRAC cycles, i.e. on 3 November 1977. Furthermore, in order to reduce possible misunderstandings to a minimum, it was agreed that this promulgation should be effected by provider States by means of a commonly agreed text in the form of a NOTAM Class II. The agreed text of that NOTAM, as developed at this Meeting is contained in Appendix B to this Part of the Summary.

CONCLUSION 13/6 - PUBLICATION OF THE NOTAM CLASS II CONCERNING THE APPLICATION OF THE MNPS

That Canada, Denmark, Iceland, Portugal, the United Kingdom and the USA publish, on 3 November 1977 a NOTAM Class II in accordance with the text contained in Appendix B to this Part of the Summary, announcing the application of the MNPS in the NAT Region with effect from 0001 GMT on 29 December 1977.

1.8.2 Since it was evident that the publication of this NOTAM presupposed, that, by that time, the relevant amendments to ICAO document 7030 must be available to States and operators concerned, the Group requested ICAO to make arrangements ensuring this.

CONCLUSION 13/7 - AMENDMENTS TO ICAO DOC 7030 RELEVANT TO THE APPLICATION OF MNPS IN THE NAT REGION

That ICAO ensure that those amendments to ICAO DOC 7030, related to the applications of the MNPS in the NAT Region as of 29 December 1977 be issued by ICAO so that they will be in the hands of all parties concerned not later than 3 November 1977

Appendix A
to Part 1

LIST OF ADDRESSES OF MONITORING AUTHORITIES

(Note 2 to b) of para. 1.4.2 refers)

CANADA

Chief, Airspace and Procedures
ATP
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Appendix B to
Part 1

The following is the commonly agreed text for a NOTAM which should be published on 3 November 1977 by the following States:

Canada, Denmark, Iceland, Portugal,
the United Kingdom and the USA.

(para. 1.8.1 of the Summary refers)

" REQUIREMENT TO MEET MINIMUM NAVIGATION PERFORMANCE SPECIFICATIONS IN THE NORTH ATLANTIC REGION

Introduction

1. At the 9th Air Navigation Conference of ICAO the concept of Minimum Navigation Performance Specifications (MNPS) was adopted on a world-wide basis. This has the objective of ensuring both safe separation of aircraft and at the same time enabling operators to derive maximum economic benefit from the improvement in accuracy of navigation equipment demonstrated in recent years.

2. The concept will be implemented on a Regional basis taking into account particular local operating conditions. At the North Atlantic Regional Air Navigation Meeting held in September 1976, criteria were agreed for MNPS, to be introduced within certain parts of the NAT Region with the withdrawal of Loran A on 29th December 1977. The area concerned will be known as the "NAT MNPS airspace".

3. An implicit condition of the concept of MNPS is that all operators must maintain the specified operating standards and be aware of the inherent obligations of the requirement.

IMPLEMENTATION OF MNPS WITHIN THE NORTH ATLANTIC (NAT) REGION

4. Compliance with the MNPS will be required with effect from 0001 GMT on 29 December 1977 by all aircraft operating on routes within the following defined airspace boundaries:

a) between FL 275 and FL 400;

b) between latitudes 27°N and 67°N;

c) in the East the Eastern boundaries of CTAs Santa Maria Oceanic, Shanwick Oceanic and Reykjavik;

d) in the West the Western boundaries of CTAs Reykjavik and Gander Oceanic and New York Oceanic East of longitude 60°W.

5. Aircraft used to conduct flights within the volume of airspace specified in para 4 shall have navigation performance capability such that:

a) the standard deviation of lateral track errors shall be less than 6.3 NM (11.7 Km);

Note: As a considerable simplification, the above can be interpreted as a need for aircraft to stay within 12.6 NM (23.4 Km) of track for about 95% of the time.

b) the proportion of the total flight time spent by aircraft 30 NM (55.6 Km) or more off the cleared track shall be less than 5.3×10^{-4} (i.e. less than 1 hour in about 2000 flight hours).

c) the proportion of the total flight time spent by aircraft between 50 and 70 NM (92.6 and 129.6 Km) off the cleared track shall be less than 13×10^{-5} (i.e. less than 1 hour in about 8000 flight hours).

Such navigation performance capability shall be verified by the State of registry or the State of the Operator as appropriate.

Note: Guidance material of use to those involved in the initial achievement and continued maintenance of the navigation capability set forth above has been issed by ICAO under the title "Guidance Material related to Air Navigation in the NAT Region" and will be supplemented and updated as required and as new material becomes available.

MONITORING OF NAVIGATION ACCURACIES

6. The data from which MNPS was calculated were derived from previous routine and special data collections involving radar observations and monitoring of equipment performance. In order to ensure that the MNPS are being met it is necessary to monitor the tracking accuracy of aircraft using the ATC radars which cover the exits from the oceanic airspace. The frequency of occurrence of the larger track deviations will be used as a measure of compliance with the second and third parameters of the specification.

In cases of individual large errors, the pilot of the aircraft concerned will normally be notified by the ATC unit observing the error. The subsequent investigation may be carried out by the operator and its State of Registry after notification by the authority providing ATC service. If there is a serious increase in the number of large errors, it may become necessary to increase separation standards until remedial action has been determined. Alternatively if rapid corrective action cannot be achieved, it may be necessary for the State of registry or the State of the Operator to temporarily exclude offending types of aircraft, or operators, from the MNPS airspace."

Agenda Item 2 : Review of the latest situation regarding OMEGA

2.1 Under this item the Member from the USA informed the Group that it had now been decided to maintain the OMEGA ground station at Trinidad in operation up to at least 31 December 1977. The continued operation of the Trinidad station beyond that date was however subject to discussions between the US Administration and Trinidad and Tobago and it was not yet possible to provide any information on their likely results.

2.2 As to the question of certification of OMEGA for use by aircraft the US Member stated that the FAA had just recently issued an operating certificate to two US operators engaged in NAT operations, permitting them to use OMEGA in order to up-date DOPPLER derived navigational guidance.

2.3 On the question when OMEGA navigation equipment as the sole means of navigation would be certified for use in NAT operations, the US Member informed the Group that this matter was under active consideration within his Administration and that a decision to be made will depend on the review of flight data obtained in test flights for this purpose. While he was not in a position to give any indication when such a decision was likely to be taken, he nevertheless stated that this would not take too long.

2.4 With respect to the provision of information by the USA on the operating status of the OMEGA system, the US Member presented to the Group a sample of the weekly status report on OMEGA as it was issued by the FAA to all interested parties. In addition, he informed the Group that measures had been taken within his Administration to ensure that any exceptional performance of the system or of parts thereof could be rapidly disseminated to all the interested parties. The representative of IATA stated that according to its Member airlines this notification system worked satisfactorily.

2.5 With regard to system performance the Group was provided with information which indicated that, under routine operating conditions the accuracy of position information derived from OMEGA was at least equal if not marginally better than that obtained with the use of INS. In addition, due to the fact that airborne OMEGA receiving equipment contained more advance electronics its reliability might be expected to be even better than that of INS.

2.6 On the question of the effects of sun spot activities on the performance of the system, the UK Member stated that this was kept under very close review but that work done so far in this field seemed to indicate that even during the maximum sun spot activity expected around 1981 the performance of the system would remain within the tolerances upon which the MNPS are based.

2.7 The Group therefore concluded that there existed valid reason which made it appear likely that the OMEGA system would meet the requirements upon which the MNPS are based. This assumption also took account of the fact that use of the OMEGA system in the NAT Region had so far shown that, even with the close-down of one OMEGA ground station, the number of stations which could be received, and the quality of their signals was such that continuous provision of valid navigation information on board the aircraft was assured.

2.8 Since it could therefore be expected that OMEGA is going to be used in routine flight operations the representative of IFALPA pointed out that this might raise certain "teething troubles" related to the use of this system by a large number of pilots having had no previous experience with this equipment. It was pointed out that it was exactly for that reason that it had been decided at the LIM NAT RAN Meeting 1976 to provide a nine month period between the introduction of the MNPS and the reduction of lateral separation based on their use. It was, however, stressed that both operators and pilots should make maximum efforts to keep these initial difficulties to a minimum by the use of appropriate techniques and procedures.

2.9 The representative of IAOPA stated that his Organization continued to consider OMEGA as a navigation system which appears to be a required navigation aid by IGA aircraft. However, for the time being this was severely handicapped by the price for OMEGA receiving equipment. He quoted a price in the order of $18.000 as the lowest price for an OMEGA receiver, more sophisticated equipment costing up to $48.000. He informed the Group that he had been repeatedly in contact with manufacturers of OMEGA receivers in order to obtain confirmation of rumours about the development of such equipment in the price class of $5.000 to $6.000 but had been unable to get any precise information. Nevertheless, the IAOPA representative stated that OMEGA apppeared to be a requirement for IGA operations in the NAT Region.

2.10 It was recognized that this was essentially a question of supply and demand and it would therefore have to be awaited whether the potential market of such a low price equipment would develop so as to make it attractive for manufacturers to undertake production of this type of equipment.

CONCLUSION 13/8 - DEVELOPMENTS WITH REGARD TO OMEGA

That there were no problems known which appeared to disqualify or restrict the use of current types of certified equipment for navigation purposes in the MNPS airspace, if this is used in accordance with appropriate operating procedures.

Agenda Item 3 : Development of a more useful presentation of NAT Air Traffic Forecasts and conduct of a NAT traffic survey to assist in this task

3.1 It was recalled by the Group that at the LIM NAT RAN Meeting 1976 Recommendation 1.1/1 had made certain proposals regarding NAT traffic forecasting and had made specific reference to the need for the forecast information to be in a format conducive to air navigation system planning in the Region as a whole. In April 1977, a Meeting at Gander had agreed that air traffic data should be collected over specified periods, and that this should be processed by the UK.

3.2 The UK had thus been able to prepare a comprehensive analysis of traffic for April 7, 1977. By means of an elaborate computer programme, stop-the-clock plots had been prepared which showed individual aircraft position, flight level and direction of flight for each aircraft present in the Region (or more exactly, between 05°W and 65°W, and 25°N to 70°N). One of these plots was available for each half hour from 0030Z to 2330Z, thus showing the ebb and flow of traffic in considerable detail. These plots were available in a relatively large scale wall-presentation, and also in a size convenient for incorporation in a Working Paper. In addition, an Appendix to the Working Paper contained, in tabular form, details of the OTS and occupancy on a number of random tracks in various categories (e.g. Europe to/from CAR/SAM).

3.3. The Group was extremely impressed by this work and by the prospects offered by the development of this computer processing. It noted that the initial process of preparing and displaying the data for April 7 had taken several months, but that now that much of the soft-ware had been developed, if further work was carried out by the UK it would be quicker and simpler. Before deciding on the next step, the Group felt this work would relate to that of the NAT Traffic Forecasting Group (NAT/TFG).

3.4 Basically the NAT/SPG was concerned with both tactical and strategic matters. Thus it required to:

a) study short-term problems in order to detect poor airspace management, and effect improvements;

b) study longer-term developments in order to decide what changes to staff and equipment might be necessary five or ten years ahead.

3.5 As far as a) in paragraph 3.4 was concerned, the work so far carried out by the UK appeared to require little cooperation from the NAT/TFG. Some fine changes to the collection and presentation of data would enable that Group to study current problems much more constructively than in the past. A number of possibilities were maintained. For example, it might be possible to collect ATC data over a period, and then decide retrospectively (as with HF studies) which particular day should be the subject of analysis, thus avoiding days affected by industrial disputes or rare wind circulations. Again it might be possible to study the flow of traffic as achieved and compare it with a display of the routes and flight levels which aircraft had actually indicated as requirements in their Flight Plans.

3.6 As regards paragraph 3.4 b), it seemed advisable to seek discussion with the NAT/TFG at an early date. A number of questions needed further consideration, and the NAT/TFG might wish to comment on some of them. For example:

i) would it be possible, by using this more practical presentation of information, to present a more operationally oriented forecast of conflicting traffic flows and related ATC problems in the NAT Region than is possible with the present relation of traffic to 9 traffic flow axes only?

ii) was it desirable to study slack days as well as days of peak flow?

iii) would it be possible to forecast increases in flow on the specific flows being shown up by the new presentation?

iv) would the change to 60NM lateral separation in 1978 result in a very different picture of traffic flow?

v) could more study be carried out on the relative demand for various flight levels (e.g. as more 747 SPs enter service, there will be an increase in demand for higher levels, but more DC10s might perhaps counter-balance this change)?

CONCLUSION 13/9 - CONTINUED WORK ON NAT TRAFFIC FORECASTING

That

a) the NAT/TFG for the present continue their studies using its current techniques ;

b) the UK make the Summary of this Item at once available to the NAT/TFG, drawing the attention to para. 3.6 and that the comments of the NAT/TFG be referred to the NAT/SPG in writing as soon as they become available.

c) the Chiefs of the NAT OACs, at their next Meeting, study the new presentation and comment;

d) that the period November 6-12, 1977 be assigned as the next data collection period, subject to amendment only if traffic conditions dictate otherwise;

e) the UK use the new form of presenting data in connection with this, and the July 1977 data collection;

f) the UK continue studies and other States as appropriate cooperate with the UK in any further development of the new format of data presentation.

3.7 In view of the situation, as described above, the Group also agreed that there would be little use in presenting, for publication, a NAT Traffic Forecast in 1978 covering the period from 1979 to 1983 but that every effort should be made by the NAT/TFG to arrange its work in such a way to be able to produce a NAT Traffic Forecast, for publication in the new format, in 1979, covering the period from 1980 to 1984.

3.8 As to the paper presented to this Meeting by the UK Member and mentioned in para. 3.2, it was noted that this would be published shortly by the UK as a separate document. Copies of it would be made available to the Group and ICAO for information and use as appropriate.

Agenda Item 4 Extension of the area of use of current composite separation

4.1 Under this item the UK Member informed the Group that his Administration, in cooperation with Ireland, was in contact with other Administrations, and more especially France, in order to work out the necessary details required for the introduction of additional "composite tracks" in the Organized Track System, south of those already being provided. No specific date could be given for the conclusion of this work.

4.2 As to the extension of the use of composite tracks to the north of the presently used tracks, this was expected to be possible some time in Spring 1978.

4.3 The Canadian Member informed the Group that Canada intended to extend the use of composite separation along tracks over Labrador and implement this on 1 December 1977. At the same time, the Canadian Member informed the Group that Canada would take the necessary steps to clear this in accordance with existing ICAO provisions.

4.4 A proposal by IATA to modify the use of cruising levels on the outer tracks of the OTS so as to facilitate the joining of the OTS by taking advantage of the possibilities offered by the concept of composite separation, was reviewed by the Group but it was found that this would require further study of all aspects involved before it could be applied. Both, the Members from Canada and the UK agreed to look further into this matter together with interested parties and to report their findings at the next Meeting.

Agenda Item 5 : Determination of measures required as a prerequisite to a possible reduction of longitudinal separation in the NAT Region

5.1 Introduction

5.1.1. The Group noted that at the LIM NAT RAN Meeting the possibility was discussed to reduce longitudinal separation in the MNPS airspace of the NAT Region but, due to the lack of precise data on the risk involved regarding flight safety, it was not possible to come to definite conclusions. In its Recommendation 1.3/4, it therefore requested:

a) States and International Organizations concerned to pursue studies on this subject;

b) Canada, Ireland and the UK to organize a data collection on this subject; and

c) the NAT/SPG to examine the results of this survey and, based on this, prepare appropriate proposals for further action.

5.1.2 In addition, in the period between the LIM NAT RAN Meeting and this Meeting a specific problem related to the application of longitudinal separation, when based on the use of the Mach Number Technique, had come to light, which appeared to require resolution.

5.1.3 In view of this, the Group agreed that discussion of this subject should be based on the following four aspects;

a) data collection required in order to determine station keeping accuracy by aircraft along their cleared flight path;

b) assessment of the effect of wind on longitudinal separation on aircraft using the Mach Number Technique;

c) interpretation of the present provisions in Doc 7030 regarding adherence to the assigned Mach Number; and

d) development of a method for estimating the collision risk related to longitudinal separation.

5.2 Organization of a data collection regarding longitudinal separation

5.2.1 The Group noted that, in accordance with Recommendation 1.3/4 of the LIM NAT RAN Meeting 1976, Canada, Ireland and the UK had organized an initial data collection on longitudinal separation during the period from 1 to 3 July 1977. This exercise was, however, restricted to aircraft entering the NAT Region at the Shanwick Oceanic CTA boundary between 51°N and 61°N and leaving the Gander Oceanic CTA between 45°N and 58°N and vice versa. During this period data on some 800 flights was collected and the following results were obtained:

a) the actual changes in separation between 188 pairs of aircraft were calculated by taking the difference between separation on entry into and separation on exit from the OCA and correcting for Mach Number differences and wind effect. Two pairs of aircraft (1.1%) lost or gained over 8 minutes in longitudinal separation and 9 pairs of aircraft (4.8%) lost or gained over 5 minutes. The mean change of separation was 0.05 minutes with a standard deviation of 2.97 minutes.

b) When comparing the position reports made by pilots over the boundaries of the respective oceanic CTAs (when entering or leavint the oceanic CTA in question) with the actual crossing of the boundary as observed by radar, it was found that the mean time difference for aircraft using INS was 0.24 minutes with a standard deviation of 1.1 minutes. The corresponding figures for LORAN/DOPPLER aircraft was a mean of 0.23 minutes and a standard deviation of 1.07 minutes.

5.2.2 From the above it appears that a reduction in longitudinal separation may be feasible. However, a revision of the allowance for the Mach number difference between pairs of aircraft may be required.

5.2.3 In any case, a larger data sample is, however, required in order to verify the shape and tails of the distribution before any firm conclusions can be reached.

5.2.4 It was therefore agreed that such a data collection should be organized during the Summer of 1978 and the UK Member agreed to make necessary arrangements in cooperation with Canada and Ireland to this extent for review and approval at the next Meeting of the NAT/SPG.

5.2.5 One point which was stressed in this respect was that measures would have to be taken to retain data sufficiently long in order to permit investigation of those cases where excessively large differences between reports from pilots on crossing specific points and the related observation on radar were found to exist because, as had already been found in the 1977 exercise, these could be due to reporting errors, loss of time keeping accuracy or changes in flight level of the aircraft in question with resultant effects on its position keeping accuracy.

5.3 Effect of wind on longitudinal separation

5.3.1 When analysing the results of the data collection in July 1977, the UK had found that there existed one shortcoming of the Mach Number Technique which would require correction. This was caused by the fact that the Mach Number Technique, as at present applied, provides for operation at different Mach numbers by those aircraft constituting a pair between which longitudinal separation is to be provided based on that technique. In fact, in a case where the succeeding aircraft of such a pair is operating at a higher Mach number than the preceding aircraft, the existing provisions may result in an erosion of longitudinal separation if these aircraft are exposed to strong headwinds during a portion of their flight. This is due to the fact that the slower preceding aircraft will be exposed to such a condition for longer periods than the succeeding faster aircraft. It would therefore appear necessary that the effects of wind must be taken into account in applying the Mach Number Technique and also the stage-length during which the aircraft concerned are being longitudinally separated based on that technique.

5.3.2 Due to prevailing meteorological conditions in the NAT Region it was recognized that this was mainly affecting aircraft operating in a westbound direction, while eastbound traffic, normally operating in tailwind conditions, was less often affected.

5.3.3 This problem may be resolved by the use, in OACs, of automated data processing equipment having a conflict prediction capability which takes account of wind effect and aircraft speed. For those OACs using "manual" control methods, the Group agreed on two measures, one to serve as an intermediate solution, the other to resolve this problem in principle.

5.3.4 The intermediate solution for application in the "manual" control mode, as proposed by the UK, was that OACs should be provided with information on the average headwind component for principal routes flown in the NAT Region. This could then be inserted into the less sophisticated data processing equipment or the controllers could be provided with templates on upper wind charts. Based on this information, Gander OAC should then add 3 minutes additional longitudinal separation at entry for a difference of 0.01 in the Mach number between any pair of aircraft whereby the succeeding aircraft is assigned the higher Mach Number. For Shanwick OAC the corresponding factor should be 4 minutes regardless of the headwind component.

5.3.5 For aircraft operating on stage lengths of 3000 NM, such as between the Iberian Peninsula and New York the corresponding values should be:

a) for a tailwind of 25 Kts or more 4 minutes;

b) for a tailwind of less than 25 Kts to a headwind of 25 Kts 5 minutes;

c) for a headwind from 26 to 55 Kts 6 minutes; and

d) for a headwind of 56 to 85 Kts 7 minutes

per difference of 0.01 in the Mach number.

5.3.6 As to the principal resolution of this problem standard values related to specific wind components and stage lengths flown should be developed at the earliest possible time for world-wide application and inclusion in the guidance material regarding the use of the Mach number Technique.

5.3.7 The Group agreed that the above proposals regarding the interim solution should be applied as soon as possible by all OACs concerned and noted that the UK intended to raise this matter formally with ICAO in order to obtain earliest possible updating of the guidance material on the use of the Mach Number Technique as contained in Attachment H of the PANS-RAC.

5.4 Interpretation of Mach Number provisions in Doc 7030

5.4.1 The Group was informed that one operator had interpreted the present provisions in para. 1.2.2 of Part 1 of Doc 7030 regarding adherence to the assigned Mach Number to mean that a pilot could intentionally deviate from the ATC approved Mach number by a difference of ± 0.01 without the need to inform ATC. This had resulted in a situation where the operator concerned advised his pilots to file in their flight plans a Mach number of 0.82 and that they had in fact entered the NAT Region at an indicated Mach number of 0.81, increasing this slowly as fuel was burned off to 0.83 at the time of exit of the NAT Region. This in turn had resulted in a situation where the longitudinal separation between an aircraft using this procedure and preceding or succeeding aircraft had been eroded.

5.4.2 The Group therefore agreed that the relevant provisions in para 1.2.2 of Part 1 of Do 7030 should be amended to eliminate any possible ambiguity and that this should be done by deleting the words "within a tolerance of ± 0.01" in the 10th line of the paragraph and the addition of a note at the end of that paragraph along the following lines:

> "Note: ATC procedures take account of a Machmeter systems error of ± 0.01 in relation to the assigned Mach number. However, no further allowance is made for other variations from the ATC approved Mach number."

5.4.3 As it was felt that the above was not restricted to the NAT Region only, it was believed advisable to make this same amendment also applicable to the supplementary procedures on this subject as applicable in the CAR and PAC Regions.

5.4.4 The UK Member stated the willingness of his Administration to propose this amendment formally to ICAO.

CONCLUSION 13/10 - AMENDMENT TO DOC 7030

That

a) the provisions in para 1.2.2 in Part 1 of Doc 7030 regarding adherence to the ATC approved Mach Number be amended as shown in para 5.4.2; and

b) the Member from the UK initiate necessary action with his Administration to have this amendment formally proposed to ICAO for application in the CAR, NAT and PAC Regions.

5.5 Method for estimating the collision risk related to longitudinal separation

5.5.1 The Group realized that, if any decision on the reduction of longitudinal separation were to be taken, this could only be done if the risk involved in doing so has been properly assessed. It was for this reason that the UK Member presented to the Group a paper describing a possible method of doing this. This method provided a more realistic approach than that developed at NAT/SPG/5. It also made allowance for an increase of the dimensions of modern wide-bodied jet aircraft and took account of the increased precision in navigation now achieved by aircraft. The representative of IATA suggested that any new method for the calculation of collision risks should also make allowance for :

a) improved position reporting by aircraft ;

b) corrective intervention by ATC in case separation minima are estimated to be infringed ; and

c) the fact that, in potential conflicts between aircraft travelling in the same direction, the pilots of succeeding aircraft, at the levels at which they operated were generally able to visually detect the preceding aircraft in case of serious reduction of longitudinal separation.

5.5.2 With respect to c), because of the many factors which would have to be taken into account and the difficulty in expressing these factors in mathematical terms, the representative of IFALPA recommended utmost caution before any allowance could be made for visual avoidance.

5.5.3 As the method presented by the UK constituted only a first approach to the problem, the Group agreed that properly qualified experts from the Netherlands, the UK and the USA should get together as soon as possible in order to continue work in this field with the aim of presenting a commonly acceptable method to the next Meeting of the Group.

Agenda Item 6: Review of measures likely to assist in a reduction of problems created in the NAT Region by air traffic crossing and/or joining the main traffic flow

6.1 Introduction

6.1.1 The Group noted that the longstanding problems, caused by NAT flights crossing or joining the major flow axes across the North Atlantic between Europe and North America had also been reviewed by the LIM NAT RAN Meeting 1976 (para. 1.3:5 of ICAO DOC 9182, LIM NAT (1976) refers). At that time it had been noted that, following a conclusion reached at the 12th Meeting of the NAT/SPG, Canada, Portugal, the UK and the USA had made a data collection on actual traffic in the NAT Region in order to see to what extent the ATC system in the Region was able to meet the intentions of operators.

6.1.2 In pursuance of work on this subject, the US Member presented to the Group a paper which contained their preliminary ideas on a possible solution to the problem posed by crossing and joining traffic in the NAT Region as it had emerged from studies conducted so far and also from initial contacts with other provider States affected by this question, including those located in the CAR and SAM Regions. These latter contacts had been undertaken following Recommendation 6/15 of CAR/SAM RAN Meeting 1976 in which the NAT/SPG had been requested to undertake action in this respect with the participation of Trinidad and Tobago and Venezuela.

6.2 Discussion

6.2.1 In discussing the proposal put before the Meeting by the US Member, the representative of Portugal believed it useful if he were to provide the Group with latest traffic figures so as to recall to the Group the approximate size of the problem with which it was confronted. According to this, less than 11% of the total air reports made at 15°W, 20°W, 30°W and 40°W by turbojet traffic operating through the Santa Maria CTA reported at FL280 and FL290 and no reports were received from aircraft operating below FL280. The distribution of the air reports at FL280 and FL290 by traffic generating areas was as follows

- 52% of the reports were made by traffic operating between the Iberian Peninsula and North America,

  18% by traffic operating between the UK and Bermuda, Nassau and points in Florida,

  11% by traffic operating between the UK and France and the CAR and SAM Regions,

- 15% by traffic operating between the Iberian Peninsula and the CAR and SAM Regions with tracks situated South of the Azores, and

- 4% by traffic operating between the Iberian Peninsula and the CAR Region with tracks situated North of the Azores.

6.2.2 In this context, the representative of IATA felt it necessary to recall to the Group that in the approach to a solution to the general problem, careful account should be taken of the fact that this crossing and joining traffic operated between a considerable number of pairs of aerodromes, especially as far as their spread in the CAR and SAM Regions were concerned and that therefore due account would have to be taken of the economic consequences which may result to individual operators from any rationalization of a proposed route structure. It was, however, also recognized by IATA that more uniform procedures in the flight planning of such operations could assist in the rationalization of requests for routes in flight plans and they indicated their willingness to assist in this respect through their Member airlines concerned by this problem.

6.2.3 As to the time scale for implementing relief measures regarding crossing and joining flights, all provider States concerned and IATA indicated their willingness to work together with the USA in order to develop, at the earliest possible time, proposals for corrective action. It was, however, also realized that, in developing such measures, due account would have to be taken not only of the speed with which necessary preparatory work could be completed by provider States concerned, but also of the overall changes which may result from the application of the MNPS and, as of 5 October 1978, the use of 60 NM in MNPS airspace. This was necessary in order to avoid changes to existing provisions at too short intervals.

6.2.4 This latter consideration was, however, not intended to imply that provider States could not, either unilaterally or in coordination with other ATC provider States concerned, take corrective measures which could contribute towards a solution of the problem in their oceanic transition areas.

6.3 Proposed action

6.3.1 In view of the above, the Group agreed that:

a) the preliminary concept proposed by the USA at this Meeting for the resolution of problems created by crossing and joining traffic in the NAT Region, should be included in this Summary to serve as guidance for any future work done on this subject (Appendix A to this Part of the Summary refers);

b) the USA should continue its work on this subject in coordination with affected CAR and SAM States in order to obtain a common position of affected States situated on the South Western edge of the NAT Region;

c) all other provider States concerned with the problem should be prepared to cooperate with the USA in the resolution of this question, to the extent that they are affected by it;

d) all provider States directly concerned with the problem of crossing and joining traffic in the NAT Region take all necessary coordinated measures to improve the existing situation, especially in the transition areas between their continental and oceanic airspace;

e) the ultimate solution developed should also take into account the question of economic penalties imposed on operators conducting flights on crossing and joining routes and their most equitable distribution, if necessary also on those operators normally operating within the Organized Track System.

CONCLUSION 13/11 CONTINUED WORK ON THE PROBLEM OF CROSSING AND JOINING TRAFFIC IN THE NAT REGION

That work on the problem of crossing and joining traffic be continued by States concerned in accordance with the provisions in paragraph 6.3.1 and that appropriate proposals for further action be presented by them to the next Meeting of the NAT/SPG in April 1978.

6.4 Specific problems regarding traffic joining the OTS from Santiago in Spain

6.4.1 IATA drew to the attention of the Meeting its understanding that whenever the OTS included a westbound link track originating from Santiago, the only level published on that track was 310. IATA believed that this stemmed from an agreement reached at NAT/SPG 7. At that Meeting, when developing the basic guidance for the tracks originating from the Iberian Peninsula, it had been suggested that one of the two levels 310 or 350 should be made available on the track, and that because of poor inter-centre communications this should not be the subject of negotiation but should be fixed. FL 310 was allocated, and had remained as the only level ever since that time.

6.4.2 In the ensuing discussion on the subject, IATA conceded that aircraft filing FL 310 were often able subsequently to obtain a higher level. The fact remained that operators routing via Santiago on a link track found it necessary to uplift fuel for the lower level. Thus, by contrast with those operators normally operating on track using higher flight levels, the operators on the Santiago route felt that they were suffering a penalty. There was no reason why this should be permanent: inter-centre communications have greatly improved, thus facilitating negotiation, or as another suggestion, a periodic alternation of level allocation could be considered. However, a little more study was necessary to ensure that the suggested change was not impractical.

6.4.3 Discussion then digressed to a brief review of the overall situation regarding the provision whereby pilots, when entering the oceanic airspace, should state their preferred flight level in their initial contact with the OAC at entry. It was the understanding of some provider States that this procedure was only used by about half the pilots concerned and it might therefore be useful for operators to recall this procedure to their flight crews.

6.4.4 Finally, the Group agreed that any further problems regarding flight level assignment on the link route from Santiago to the OTS should be directly discussed between IATA and the Shanwick and Santa Maria OACs.

Appendix A
to Part 6

PRELIMINARY PRINCIPLES FOR THE DEVELOPMENT OF MEASURES TO RESOLVE THE PROBLEMS CREATED BY FLIGHTS OPERATING IN THE SOUTHERN PART OF THE NAT REGION AND OUTSIDE THE ORGANIZED TRACK SYSTEM

1. System concept

1.1 Any system catering for the flow of air traffic outside the OTS in the Southern part of the NAT Region should be based on the following considerations:

a) Peak Traffic flow in each direction
b) The different axes of traffic flow
c) Compatibility with the NAT OTS
d) The overall weather situation
e) Individual flights wishing to operate against the peak flow
f) Non-system compatible military requirements

1.2 The traffic situation in that part of the NAT Region South of the OTS is traffic flow-wise identical to that observed within the OTS. Peak westbound flow is between 1100 and 2000 GMT and peak eastbound flow is between 0000 and 0800 GMT. A small number of aircraft operate opposite the general flow during both time periods. This general pattern will most probably continue, but it can be expected that there will be a greater number of aircraft operating against the main flow. The system must take these aircraft into account but the primary aim should be to accommodate the main traffic flow.

1.3 Atmospheric pressure distribution determines the selection of the most desirable routes. This normally creates two major route patterns in the middle of the Atlantic. When there exists a low pressure system in the middle or Northern part of the Atlantic, Westbound aircraft fly more Northerly routes, and Eastbound aircraft the more Southerly routes. Occasionally the situation is reversed depending on the location of the pressure system. When there exists an even pressure distribution throughout the North Atlantic, aircraft fly both East and West on near great circle tracks. Tracks may vary between these two extremes depending on the position and extent of the pressure systems. Aircraft should therefore be permitted to fly as closely as possible to the most advantageous route and any proposed route system should therefore be arranged so that it offers the possibility for aircraft to conduct their flight with optimum economy.

2. Principles for the establishment of a route system

2.1 OACs should determine those routes catering for the major traffic flow during those periods of the day when traffic is highest on these flow axes.

2.2 Such routes should be based on the minimum time tracks (primary reference lines) and should cover the major traffic axes. In addition they should be coordinated between the OACs concerned with due consideration to airspace reservations, the overall weather structure, and the need to ensure that individual operators would not be unduly penalized owing to their direction of flight. These routes should normally extend from the Southwestern part of the UK and Western European landfall points to specified Atlantic/Caribbean locations. They may, however, be extended or reduced in length to allow the integration of the continual and oceanic flight operations in the oceanic transit areas in accordance with applicable separation standards.

2.3 Alternative routes, parallel to the main route may be established to the North and to the South of the main route. These routes should be reserved for use by traffic during periods of major traffic density and flight levels on these routes should be grouped in relation to the direction of flight.

2.4 If required, additional routes may be established in accordance with the material described above, if traffic demand so requires, In addition, the route structure so established should be up-dated as required by circumstances.

2.5 The route structure established in accordance with the above should be promulgated to all operators concerned with as much advance notice as possible.

2.6 During the periods when such a route system is applied, operators should be required to plan flights entirely along those routes or to plan joining, as early as possible, the route which is most appropriate with respect to their ultimate destination.

Agenda Item 7 : Development of uniform procedures for use in establishing required temporary airspace reservations

7.1 Recent incidents in the NAT Region had brought to light a problem which, while it had existed for some time, seemed now to have assumed proportions which made a common approach to it by all provider States desirable. This concerned the establishment of temporary airspace reservations in the NAT Region and the criteria used in their establishment.

7.2 In general, such temporary stationary airspace reservations can be subdivided into two categories:

a) those established to accommodate unique flight operations in specified parts of the NAT Region, and

b) those established to cover other than aviation activities which may, however, affect oceanic en-route operations.

7.3 It was noted that, while some provider States made no difference in the provision of a buffer zone around such areas and therefore provided a uniform buffer of 60NM between the closest edge of such areas and the planned flight path of aircraft, others used two different values, namely 120 NM in the case of airspace reservations for unique flight operations and 60 NM in the other cases. It was this difference which caused difficulties especially in those cases where such an area covered airspace under the responsibility of States applying different criteria with regard to the required buffer zone.

7.4 In the ensuing discussion on this subject it was found that there existed a number of other factors which tended to complicate the situation. These were:

a) certain activities such as rocket firing for MET data collection purposes were apparently made at the instigation of other International Organizations such as WMO, without prior consultation as to the likely effects such activities could have on the safety and economy of NAT flights;

b) little or no information could be obtained from the originators of certain airspace reservations as to the activities intended to be conducted within these reserved airspaces. This was creating particular difficulties in those cases where aircraft engaged in NAT operations could be forced to penetrate such reservations due to inflight contingencies affecting the safety of the flight otherwise. In those cases no information could be provided to the pilot permitting him to assess the comparative risk involved in penetrating such areas when compared with the impaired abilities of his aircraft;

c) in some cases the lateral boundaries of announced airspace reservations were modified at such short notice that OACs could re-clear aircraft only with considerable economic penalties to the flights concerned ; and

d) there was reason to suspect that in some cases the ships being at the origin of airspace reservations were not maintaining their announced positions.

7.5 After discussion of all relevant factors and especially taking account of the very extensive experience which had been accumulated by some States in this respect, the Group agreed the following:

a) that the European Office of ICAO should write to States originating such temporary airspace reservations, namely

Canada, Cuba, Denmark, France, Iceland, Italy, Norway, Portugal, Spain, UK, USA and USSR as well as to NATO (for information)

requesting them to confirm that necessary internal arrangements were made by these States to ensure that, whenever temporary airspace reservations were established by them in the NAT Region, these met the following requirements:

i) the extent of the area was kept to the minimum compatible with the type of the activities intended to be conducted;

ii) it was ensured that activities were strictly confined within the specified area;

iii) the location of the area and the duration of the activities took maximum account of the major traffic flow axes in the NAT Region and periods of peak traffic movements on such axes;

iv) confirmation that a lateral buffer between the closest edge of the area and the intended flight path past that area was adequate; and

v) confirmation that a vertical buffer corresponding to the minimum vertical separation was adequate between the vertical limits of the reserved aispace and aircraft flying under or above that airspace;

b) that the replies by States concerned to the above be made available to provider States in the NAT Region as and when they become available;

c) that ICAO should draw the attention of other International Organizations to the need to coordinate any activities likely to affect NAT flights with the provider States concerned, possibly with the assistance of ICAO;

d) that, as long as affirmative blanket replies from the States mentioned in a) above had not yet been received, provider States should try to obtain confirmation of the requirements listed in i) to v) of a) above, from the originators of airspace reservations at the time these were put forward and, if so, apply a buffer of 60NM; and

e) in case such confirmation can not be obtained, provider States should continue their present practices regarding the application of lateral and vertical buffers.

CONCLUSION 13/12- COORDINATION OF UNIFORM PROVISIONS REGARDING TEMPORARY AIRSPACE RESERVATIONS IN THE NAT REGION

That the European Office of ICAO take action in accordance with para 7.5 a) and c) and inform NAT provider States of results achieved in accordance with para 7.5 b).

Agenda Item 8 : Determination of ATS routes and procedures to be used by IGA light aircraft flights across the North Atlantic

8.1 At the LIM NAT RAN Meeting 1976, the Group had been requested in Recommendation 1.1/8 to undertake studies on the problems of general aviation flights in the NAT Region in order to develop appropriate measures for their resolution on the understanding that this did not apply to those IGA flights conducted in a manner similar to commercial air transport operations. Information provided by the Members from Canada, Iceland, Ireland and the UK indicated that IGA flights by light aircraft in the NAT Region continued to constitute an appreciable amount of traffic in the lower airspace, even though data provided by these States did not allow for the determination of a precise number of such flights. It could, however, be assumed that their total per year was about 2000 to 2200.

8.2 The UK Member reported that the difficulties encountered with some of these flights, i.e. lack of air/ground communication and thus increased workload for ATC and, in many cases unnecessary alerting of the search and rescue services, continued. For example, in July 1977 some 40% of such flights were conducted in apparent contravention of international regulatory requirements with no evident enforcement action.

8.3 In the discussion, the Group returned to previous suggestions, namely to restrict such flights to routings via Greenland and Iceland to Europe and also to a proposal made by the UK at the LIM NAT RAN Meeting and re-iterated at this Meeting by IATA, to raise the lower limit of the controlled airspace in the NAT Region from the present FL 55 to FL 135 or thereabouts.

8.4 With regard to the suggestion for routing the traffic through the Northern part of the NAT Region, the representative from IAOPA pointed out that this would most likely increase the hazards to such flights considerably because of the notoriously bad meteorological conditions, and more especially the dangers caused by icing which sometimes prevailed in that part of the NAT Region around Greenland at the lower levels. The Group, however, also recognized that, provided adequate precautions were taken, flights along such a routing did not present more than the usual risks involved in IGA flights directly across the North Atlantic in adverse conditions, quite apart from the fact that, because of prevailing wind conditions on westbound flights, the Northern routing was the only possible route.

8.5 As to the proposal to raise the lower limit of the controlled airspace, which would ease the requirement for position reporting for IGA aircraft, this would involve a somewhat greater risk in case search operations had to be conducted, because of the uncertainty regarding the search area. The representative of IAOPA stated that, after consultation of a representative group of pilots frequently engaged in IGA operations and in an effort to reduce present difficulties, this risk was quite acceptable and the proposal could therefore be supported. However, it was found that there were other users, also engaged in low level NAT operations, who were not prepared to accept the loss of provision of air traffic control including the provision of separation, which would be incurred by this measure (see also para. 11.5 of this Summary).

8.6 In view of this situation, the Group felt that practical measures applicable to all parties concerned by this problem would therefore have to concentrate on the following three aspects :

a) better information on the requirements to be met by IGA pilots intending to undertake such operations ;

b) more effective measures by those States in whose territory departure points of such flights are located to ensure compliance with existing regulations ; and

c) preventive action in those cases where pilots do not comply with applicable regulations and provisions.

8.7 With respect to the information of IGA pilots, the Group noted that the US had already issued an advisory circular on flight operations in oceanic airspace but that this covered only airspace wherein the US provided air traffic services. It was therefore felt best, if such a document were to be prepared covering the entire NAT Region and which would be endorsed by all provider States concerned with these operations. It was therefore agreed to establish a drafting group composed of representatives from

Canada, Denmark, Iceland,
United Kingdom, USA and IAOPA

which should be convened as soon as feasible to develop such a document and that, after completion it should be included in the NAT Guidance Material issued by the European Office of ICAO. In addition, it was noted that IAOPA was prepared to give such a document widest possible distribution amongst its interested Members.

8.8 As to the content of such a document, it was felt that, inter alia, this should cover the following main subjects :

a) essential pilot qualifications, including flying experience;

b) aircraft performance requirements;

c) essential requirements for navigation and communication equipment;

d) rules and regulations applicable to such flights;

e) essential flight preparation including necessary AIS and MET briefings; and

f) description of likely flight conditions and appropriate action by pilots (icing, thunderstorms, and other in-flight contingencies).

CONCLUSION 13/13 - INFORMATION FOR IGA PILOTS ON NAT OPERATIONS BELOW FL 275

That, as soon as feasible, the USA convene a Meeting of representatives from Canada, Denmark, Iceland, UK, USA and IAOPA to prepare an information document for IGA pilots on NAT operations below FL 275 for publication as appropriate covering the subjects listed in para. 8.8.

8.9 With respect to the more effective measures regarding compliance with existing regulations, the Group noted that some States were already engaged in work on that subject and it hoped that in view of the seriousness of the matter this would be continued or started by all concerned with due urgency. In this context, it was also believed useful if States would refrain from "over-regulation" and ensure that optimum freedom of action, consistent with flight safety, were left to IGA operations.

8.10 On the question of preventive measures mentioned in c) of para 8.6 above, it was suggested that one way of achieving this, especially in those cases where it was suspected that aircraft were not properly equipped in order to maintain air/ground communications on such flights, could be to request such flights to obtain their oceanic clearance via HF air/ground communication channels at or shortly after departure and to authorize ATC units concerned to refuse such a clearance if the aircraft was unable to comply with this request. Some of the provider States concerned felt that this required further study within their Administrations, covering all possible implications and it was therefore agreed that this matter should once more be reviewed at the next Meeting of the NAT/SPG.

Agenda Item 9 : Review of the HF air-ground communication situation in the NAT Region including applicable Regional SUPPs

Consideration of the results of the 1976 annual NAT HF data collection

9.1. The Group reviewed the analysis, presented by the United Kingdom, of the data collected in the course of the 1976 exercise. Because data had not been available for all stations relating to the 1976 Summer peak period, the date selected was 8 October 1976. It was noted that, during the 24 hours in question, the track structure was in a Southerly position. This had the result of reducing the number of contacts made on VHF. Even so, some 591 reports were passed on VHF compared with 1844 on HF.

9.2. It was observed that, although 8 October fell outside a peak traffic period, the HF traffic figures were only some 3-7% lower than those for August 1975.

9.3 The loading on the four families was, in general, similar to that of 1975. Family C carried the heaviest load, whilst the load on the other three families was broadly comparable. As in 1975, the night load fell on the 3 and 5.6 MHz frequency bands, and the day load on the 5.6 and 8.8 MHz frequency orders.

9.4 As is customary, Shannon Aeradio had the highest peak hour loading (73 reports). Message delays were somewhat lower than in earlier years, being 3.78 minutes in the mean. As a point of interest it was noted that, between January and July 1977, the average number of HF messages per aircraft crossing was $4\frac{1}{2}$, being slightly higher in Winter than in Summer.

9.5 The proportion of SSB equipped aircraft increased from about 76% in 1975 to some 79%. However this value resulted from Shannon and Gander estimates, and the Group felt that, in connexion with the future transfer to SSB operation on Families A and D, it would be desirable to establish the proportion more accurately, preferably both in Summer and in Winter.

9.6 The Group concluded that, for the time being, there was no need to amend the arrangements (SUPPs) for the assignment of traffic to the four families. Moreover, since no overloading had been experienced, it was agreed that introduction of a fifth family would not be required during the next two years. The Group felt, however, that, due to the number of variables involved, it would be necessary to keep the HF situation under continued close review. It therefore agreed that a further exercise would be necessary based on 1977 data. States would need to retain message data relating to all July and August 1977 flights until the collection dates had been agreed.

9.7 As in previous years Ireland kindly offered to coordinate the exercise, whilst the United Kingdom agreed to collate and analyze the results.

9.8 It was agreed that, as Søndre Strømfjord HF station continued to form part of the overall NAT HF system, its data should be included.

9.9 It was further agreed that, in selecting the dates for the exercise, those dates affected by industrial action should be avoided if possible.

9.10 During the discussion, the Portuguese Observer informed the Group of plans to provide extended range VHF coverage from islands in the Azores. He further stated that improvements in the Santa Maria centre would have the effect of reducing delays between the aeronautical station and the OAC there.

9.11 It was reported that Westbound aircraft continued to enter the New York Oceanic airspace using the wrong HF family, but it was agreed that the elimination of this problem was essentially an educational exercise.

Operation of SELCAL and SELCAL watch

9.12 Although there is a clear requirement for aircraft stations to maintain continuous watch, it was reported that calls on HF by voice and/or by SELCAL often went unanswered. It was agreed that this was a serious matter and needed action. Discussion showed that the problem arose due to the following main causes:

a) aircraft remained on VHF after having left VHF coverage or when passing though gaps in VHF coverage;

b) aircraft failed to transfer SELCAL from VHF to HF or to switch it on when using HF;

c) airborne SELCAL equipment apparently not being activated by ground equipment.

With reference to a) and b) it was noted that Recommendations 4/5 of the LIM NAT RAN Meeting 1976 had not had the desired effect.

9.13 It was proposed that ground stations, when giving oceanic clearances or designating HF channels, should instruct aircraft to ensure proper connexion of SELCAL equipment when changing to HF. However it was agreed that the use of aeromobile channels to draw the attention of pilots to the need to comply with particular established procedures was undesirable. It was agreed that broadcast of such material, for example in VOLMET broadcasts, was also undesirable.

9.14 The Group considered proposing a NAT SUPP for consideration. For example, a NAT COM SUPP associated with Annex 10 Volume II paragraph 5.2.2.1.1 might read:

> "In NAT oceanic airspace outside VHF coverage, permanent HF watch shall be maintained by aircraft on the appropriate HF channel either by SELCAL or by conventional listening watch".

The Group noted, however, that this aspect of permanent watch, including use of SELCAL, was covered by numerous paragraphs e.g. Annex 2 paragraph 3.6.5.1, so that a special NAT SUPP appeared not to be required. It was agreed, however, that this was an ongoing problem in which both States and aircraft operators would need to play an educational role as in the proper use of certain navigational systems. It appeared to be desirable that, when technically possible, aircraft should maintain SELCAL watch on both VHF (GP) and HF simultaneously.

Conversion of Family D to A3H/A3J operation

9.15 It was recalled that the LIM NAT RAN Meeting (1976), in its Recommendation 4/1 b), had called upon the States concerned to propose arrangements for the conversion of Family D to compatible SSB operation at an early date. The Group was informed that Canada, Denmark and Norway were ready. Iceland was expected to be ready by the end of 1977. Ireland would have receive capability by early 1978, and transmit capability at Shannon would follow in due course.

9.16 It was agreed that the States concerned, and particularly Ireland, would need to study the possible mixed-mode effects at Shannon before such a mode of operation could be recommended even for use North of 61 degrees North prior to provision of full capability at Shannon. Following an in-depth discussion it was agreed that Ireland should be invited to investigate the earliest date by which equipment to provide full A3H/A3J capability at Shannon could be installed, and to estimate by what date the conversion of Family D could be effected. Ireland would then, after consulting the other NAT States affected, and in the scope of LIM NAT RAN Meeting (1976) Recommendation 4/1 b), propose appropriate changes to the NAT COM SUPPs, with the intent that these should be approved by the time all necessary equipment changes had been completed.

Future requirement for NAT HF Families

9.17 The Group gave some consideration to the future requirement for NAT HF Families in connexion with the formulation of requirements at forthcoming ITU Meetings. As mentioned above in para.9.6, the Group foresaw no need for a fifth Family in the next two years. It was noted, however, that the LIM NAT RAN Meeting (1976) had estimated such a requirement for 1981/82.

9.18 It was evident that future NAT air traffic would be influenced by world economic and social issues, as well as by such factors as the availability of fuel. Peak NAT air traffic had tended to stagnate since 1973. However planning could not be based on pessimistic assumptions. It was quite likely that the annual growth rates achieved prior to 1973 would resume. It could by no means be assumed that growing NAT passenger movements would be absorbed by aircraft of greater and greater capacity. An increasing proportion of NAT traffic was coming from "crossing" traffic, originating in Africa or in the Caribbean. Its future growth could well be considerable. The AEROSAT programme might or might not have reached a stage by the year 2000 when the HF load would be markedly reduced thereby. The Group reached the conclusion that, based on past operational experience, and a reasonably optimistic probability of NAT air traffic growth by that time, it would be prudent to plan for an availability of not less than seven NAT HF families up to the end of the century.

NAT enroute VHF coverage charts

9.19 The Group noted that the AIPs published by NAT States included a map showing the NAT enroute VHF GP coverage at 30,000 feet. It was agreed that this presentation might be misleading to aircraft such as IGA flights operating at lower flight levels. The Group decided to recommend that this chart should be supplemented by a second chart showing the coverage at 15,000 feet.

CONCLUSION 13/ 14 - ACTION ON NAT HF AIR-GROUND COMMUNICATION MATTERS

That:

a) a three day data collection exercise should be conducted in 1977 with the same arrangements as agreed for 1975 and 1976, noting that:

1) Ireland will coordinate the exercise and select the dates;

2) The United Kingdom will collate and analyze the results;

3) States should retain message data for July and August 1977 until the dates have been selected;

4) Søndrestrøm data should be included;

5) Completed data forms should be addressed to:

Civil Aviation Authority (CG2),
Room T 1113,
Space House,
43-59 Kingsway
London WC2B 6TE

b) Shannon and Gander, in coordination, should make as accurate a check as possible of the NAT SSB/DSB fit, preferably by a Winter check in January and a Summer check in July 1978.

c) NAT provider States should continue to note and analyze cases where aircraft fail to maintain proper HF watch, with a view to recommending appropriate measures in due course; IATA should draw the matter to the attention of its Member airlines.

d) Ireland should establish a firm date for the full implementation of A3H/A3J capability at Shannon on Family D and should subsequently propose a coordinated change to NAT COM SUPPs as explained in paragraph 9.16 above.

e) NAT States concerned should fully support the need for the availability of not less than seven NAT HF Families to meet requirements up to the end of the century.

f) NAT States' AIPs should include an enroute VHF GP coverage chart showing the coverage at 15,000 feet. To this end, the States concerned should communicate to the ICAO Paris Office their 15,000 foot GP VHF coverage diagrams so that a consolidated chart may be produced.

Agenda Item 10 : Determination of the work programme of the Group covering at least the next two years

10.1 Introduction

10.1.1 Because of the decisions taken at the LIM NAT RAN Meeting 1976 regarding the application of the MNPS in the NAT Region and consequential modifications of the lateral separation minima in the MNPS airspace as of 5 October 1978, it was evident that the Group, in establishing its Work, Programme, could not restrict itself at this time to merely determining what it intended to do at its next Meeting and how Members and other interested parties should prepare for that Meeting.

10.1.2 In fact, the decisions of the LIM NAT RAN Meeting 1976 to charge the NAT/SPG with further work on the possible reduction of longitudinal separation in the NAT Region and the pending decision regarding the application of composite separation in the MNPS airspace, made it appear desirable to extend forward planning of the Group's activities to at least four years ahead as far as major tasks of the Group were concerned.

10.1.3 In this context, the Group was also advised of certain administrative constraints which may affect the activities of the Group and which were caused by, inter alia, the workload imposed on the European Office of ICAO by the activities of the European Air Navigation Planning Group (EANPG) and the preparatory work required to be done in preparation of a full-scale EUR RAN Meeting some time during the latter part of the period under consideration.

10.1.4 Therefore, in developing its work programme over the next four years, the Group agreed that this should take account of the following aspects:

a) improvements in operating methods of specific user Groups in the Region (e.g. IGA flights);

b) changes to the ATC and navigation environment;

c) a realistic assessment of progress of work achievable by the Group; and

d) the capacity of contributing and supporting bodies (e.g. the European Office of ICAO).

10.2 Tentative Work Programme covering the period from 1978 to 1981

10.2.1 On the assumption that a lateral separation minimum of 60 NM will be introduced for use in the MNPS airspace of the NAT Region as of 5 October 1978 (which corresponds to present planning), the 14th Meeting of the NAT/SPG should then be held from 17 to 28 April 1978. Major subjects for consideration at that Meeting are:

1) Development of measures to permit the application of 60NM lateral separation in the MNPS airspace of the NAT Region as of 5 October 1978 in the light of data on aircraft performance obtained since 29 December 1977.

2) Review of work undertaken up to that Meeting on the question of crossing and joining traffic in the NAT Region (Summary on Agenda Item 6 refers).

3) Determination of the new format of the NAT Traffic Forecast prepared by the NAT/TFG.

4) Conclusion of final arrangements for a large scale data collection in Summer 1978 on longitudinal separation in the NAT Region (Summary on Agenda Item 5 refers).

5) Initial discussion of future trends in navigation and ATS in the NAT Region as they present themselves after the introduction of the MNPS and determination of future detailed work required on this subject.

Note: Apart from covering navigation and ATC operational questions, consideration of this subject may also need review of the airspace organization, effects of the use of data processing equipment by ATC on the time scales required for the introduction of changes, the ATS route structure in the Region, cost-effectiveness considerations, etc.

6) Review of the situation regarding the navigation and communication capability of IGA flights in the Region.

7) Review of the separation applied between SST aircraft while in supersonic flight.

10.2.2 The 15th Meeting of the NAT/SPG should be planned for some time in Spring 1979 with the following major subjects to the extent that these can now be forecast:

1) Review of results obtained with the use of 60NM lateral separation in the MNPS airspace and development of necessary up-dating measures.

2) Review of the lateral separation situation outside the MNPS airspace in the light of traffic developments within that airspace after 5 October 1978.

3) Review of special arrangements for aircraft unable to meet the MNPS in the light of experience gained since 5 October 1978.

4) Determination of priorities in the work on future reductions of separation in the NAT Region based on the results of the data collection made in Summer 1978 (para 10.2.1 3) refers).

Note: Under this Item a decision in principle should be taken whether, in the light of circumstances, the Group should concentrate on work permitting the reduction of longitudinal separation in the MNPS airspace or whether the introduction of composite separation is more advantageous from an overall cost-effectiveness point of view.

5) Continuation of work regarding future trends (para 10.2.1 4) refers).

10.2.3 The 16th Meeting of the NAT/SPG should be planned for some time in Autumn 1979 with the following major subjects, to the extent that these can now be forecast;

1) Definite decision by the Group whether to propose, as the next measure, to reduce longitudinal separation in the MNPS airspace or to introduce the use of composite separation in that airspace, and determination of the date when this should be done (Autumn 1980 or later) in the light of results of routine data collections on aircraft navigation performance in the MNPS airspace obtained through ATC monitoring.

2) Continuation of work regarding future trends (para 10.2.1 4) refers).

10.2.4 The 17th Meeting of the NAT/SPG should be planned for some time in Spring 1980 with the following major subjects, to the extent that these can now be forecast:

1) Development of Measures to permit the application of either reduced longitudinal separation or composite separation in the MNPS airspace in accordance with the decision taken at NAT/SPG/16 (10.2.3 1) refers).

2) Continuation of work regarding future trends (para 10.2.1 4) refers).

10.2.5 The 18th Meeting of the NAT/SPG should be planned for some time in Spring 1981 with the following major subjects, to the extent that these can now be forecast:

1) Preparation of necessary supporting documentation for a Limited NAT (RAC/COM) RAN Meeting in 1981.

10.2.6 The above work programme has been established on the understanding that, as usual, the Group would continue to react flexibly to developments in the NAT Region and will review, in the course of its Meetings, any items requiring action by the Group as and when they occur. The arrangements specified in para 10.2.5 for its 18th Meeting have been made on the assumption that a Limited NAT RAN Meeting will be held in 1981. In this context, the Group expressed its views that, for the time being, while recognizing the need for a Limited NAT RAN Meeting by about that time, it did not see any need to make arrangements for an full-scale NAT RAN Meeting in the foreseeable future i.e. up to 1983. Finally, in assessing ATC operational developments in the NAT Region, the Group expressed the view that, within the period up to 1981, no need existed to make provisions for a possible reduction of vertical separation.

Agenda Item 11 - Any other business

11.1 Introduction

11.1.1 Under this Item the Group dealt with the following subjects:

a) proposal to delete para 4.1.3 from the NAT RAC SUPPs;

b) specification for Mach Number Indicators;

c) exchange of ATS messages between OACs;

d) lower limit of controlled airspace in NAT;

e) position reporting in NAT by SST aircraft;

f) application of lateral separation;

g) application of longitudinal separation based on distance.

11.2 Proposal to amend document 7030

11.2.1 The Group was informed that Part 1 of Document 7030 still contained a provision in its para. 4.1.3 requesting aircraft in the NAT Region to make position reports to ocean station vessels in those cases when aircraft concerned were unable to establish contact with the appropriate air/ground communication station. In view of developments regarding ocean station vessels in the NAT Region, the Group felt that this provision had been superceded by events and should therefore be deleted from Document 7030. The Member from the Netherlands agreed to ensure that his Administrations would take necessary formal action with ICAO.

CONCLUSION 13/15 - AMENDMENT OF DOCUMENT 7030

That paragraph 4.1.3 in Part 1 of Document 7030, applicable in the NAT Region, be deleted and that the Member from the Netherlands ensure that his Government will take necessary formal action with ICAO to this effect.

11.3 Specifications for Mach Number Indicators

11.3.1 With reference to Recommendation 1.3/5 of the LIM NAT RAN Meeting 1976, dealing with the need for development of specifications for Mach Number Indicators and the points related to the use of the Mach Number Technique recorded in the Summary on Agenda Item 5 (paras 5.3 and 5.4 refer) the representative of IFALPA stated that, in the views of his Organization, this matter deserved urgent consideration because of the considerable variety of operating procedures used in the application of the Mach Number Technique and the resultant risks.

11.3.2 He proposed that States should draw the attention of operators to certain shortcomings of the Mach Number Indicators and to certain operating practices which could be applied to overcome these and that these should be used until such time as work on this subject by ICAO has been completed.

11.3.3 The representative of IATA stated that they were prepared to draw the attention of operators to this question in order to ensure continued safe separation between aircraft whose longitudinal separation was based on the use of the Mach Number Technique.

CONCLUSION 13/16 - SPECIFICATIONS FOR MACH NUMBER INDICATORS AND INTERMEDIATE CORRECTIVE MEASURES

That:

a) ICAO pursue its work on Recommendation 1.3/5 of the LIM NAT RAN Meeting 1976 with all due urgency; and

b) until the ICAO specifications for Mach Number Indicators have been developed, States, not already having done so, advise operators of certain shortcoming of this instrument and the need to use other means available to verify or determine the correct Mach Numbe .

c) operators continue in their endeavour to ensure that pilots adhere to their ATC approved Mach Number.

11.4 Exchange of ATS messages between OACs

11.4.1 Further to Recommendation 2/2 of the LIM NAT RAN Meeting 1976, and especially its sub para b), the UK Member presented to the Group a paper containing a proposal for additional ATS messages and amendments to AIREP procedures, the implementation of which would allow maximum benefit to be derived from the new automatic data processing equipment planned for Gander and Prestwick OACs. The proposal was supported by the Members from Canada and Ireland who confirmed the urgency of the requirement.

11.4.2 The Group was informed that, following the 9th Air Navigation Conference, the Air Navigation Commission had agreed to maintain the ADAPT Panel in operation. The subject raised by the UK should therefore be brought to the attention of that Panel so that it could take it into account in its further work. However due to the urgency of the requirements of OACs in the NAT Region this should not preclude further work such as operational trials of formats and procedures mutually agreed between the States directly concerned and preliminary discussions with NAT operators on fixed format messages.

11.4.3 It was therefore agreed that Canada, Ireland, the UK and the USA should continue work in this field implementing mutually agreed message formats on a trial basis when operationally required (during 1978/79) until such time that these had either been included in world-wide provisions or were superceded by them.

11.4.4 The Group agreed that, as a basis for further work mentioned above, the UK proposal should be included as an Appendix to this part of the Summary.

11.5 Lower limit of controlled airspace

11.5.1 Even though the question of the raising of the lower limit of controlled airspace in the NAT Region had been raised as a separate subject by IATA, discussion of IGA flights under Item 8 showed that this matter was closely related to that Agenda Item. It was therefore dealt with under this Item and the findings of the Group are recorded in para 8.5.

11.6 Position reporting by SST aircraft

11.6.1 Prior to this Meeting, France had requested the European Office of ICAO to bring to the attention of the Group a proposal aimed at the reduction of position reporting by SST aircraft in the NAT Region by requiring these aircraft to report position only every 20° of longitude. France had indicated that operating experience by its operator using SST aircraft in the NAT Region had shown that the present procedure of reporting position at every 10° of longitude, i.e. every 20 minutes, imposed an unnecessary workload on pilots and hinder them in the execution of other important tasks.

11.6.2 In the discussions on this subject it was found that this view not shared by IFALPA. The background leading to the establishment of the present reporting procedures was explained and the provider States were still not able to agree which, if any, of the position reports now required could be dispensed with.

11.6.3 It also appeared that full advantage had not yet been taken of the provisions in paras 4.3.4.3 and 4.3.4.4 in Part 1 of Document 7030 permitting SST aircraft to make abbreviated position reports, if so agreed with the appropriate ATC authorities.

11.6.4 In view of this situation, the Group agreed that no action should be proposed at this time on the proposal by France on the understanding that the two operators concerned would be free to pursue both the full application of the abbreviated position reporting procedure as now contained in Doc 7030 in coordination with the appropriate ATC authorities, and at a future date, the possibility of reducing the position reporting requirements.

11.7 Application of lateral separation

11.7.1 The Canadian Member, in a paper, recalled to the Group that, at the LIM NAT RAN Meeting 1976, specific procedures for the application of lateral separation had been developed for insertion in document 7030 with an application date of 5 October 1978. These are reflected in para z) on page 1.2-29 of ICAO Doc 9182, LIM NAT (1976).

11.7.2 In these provisions a difference is made between the manner of application of lateral separation South of 56° N and North thereof. Studies conducted by Canada had however shown that, when relating these provisions to the usual situation of the OTS in the NAT Region, this limit was causing considerable inconvenience and additional workload to ATC. He therefore proposed that this limit be changed from 56°N to 58° and he indicated that his Administration was prepared to make a formal proposal to this effect to ICAO.

11.7.3 The only opposing view to this proposal was raised by the representative of IFALPA because, without being able to quantify the increase in risk, he felt that this might result in diminished safety regarding the future application of lateral separation. All other parties present at the Meeting agreed to the proposal and requested the Canadian Member to have his Administration take necessary action with ICAO as intended.

11.7.4 In order to allay the fears of IFALPA, the UK Member offered to provide to IFALPA necessary data and calculations permitting them to precisely assess the consequences of this proposed change so that IFALPA could react appropriately once it was formally approached by ICAO on the Canadian proposal.

CONCLUSION 13/17- AMENDMENT TO FUTURE PROVISIONS IN DOC 7030

That the Member from Canada ensure that his Administration propose formally to ICAO an amendment to those future provisions concerning the application of lateral separation to the effect that the present limit of 56°N between two methods of application be moved to 58°N.

11.8 Application of longitudinal separation based on distance

11.8.1 The representative of Portugal recalled to the Group that, at the 9th AN Conference provisions had been developed for insertion in the PANS-RAC which permitted the application of longitudinal separation based on distance rather than time, provided overlap of the protection areas established around each of the aircraft involved did not occur. He pointed out that the use of these provisions in the NAT Region, after they have become applicable (expected on 15 June 1978), would be of considerable assistance to the resolution of separation problems in that part of the Santa Maria Oceanic CTA South of 45°N where a lot of crossing traffic occurred.

11.8.2 It was recognized that, in order to apply these new provisions, once they were applicable, it would be necessary to establish firm values for the determination of the protection areas, most probably based on the separation values applied in the NAT Region but there was general agreement that this matter required further study before definite proposals could be made in this respect.

11.8.3 The UK Member pointed out that the data collection expected to be made during the summer of 1978 (the Summary on Agenda Item 5 refers) could yield valuable information for further work on this subject and the Group therefore agreed to study this matter once that data had become available.

Appendix to Part 11

PROPOSED ADDITIONAL ATS MESSAGES FOR USE IN THE NAT REGION AND AMENDMENTS TO AIREP PROCEDURES

Note: Message examples show the text of the message transmitted by the ATS unit

Message type	Type Designator	Message Description, Format and Data Content
AIREP (ie position report & operational and/or met information)	ARP or ARS	As prescribed in Appendix 1 of Doc 4444 except Section 1 to conform with format of POS (Position Report) message and ATS field 18 is added at the end of the last section transmitted. In particular: (a) Sections 1 (excluding aircraft identification), 2 & 3 to each form a field, each separated by a hyphen (b) time always to be expressed in hours and minuted of an hour. (c) oblique stroke (/) to be used to separate the position and time element. The air/ground station will insert a message serial number in Field 2 when relaying it to its parent OACC. Example: (ARPBS098 - JL441 - 50N020W/0830 F350 51N030W/1026 - FUEL 0900 - MS 53 310/60 MEAN 50N020W - 0).
Oceanic Clearance	CLR	Message transmitted between Gander and Shanwick for the purpose of transferring flight clearance details between the two centres. The message is comprised of ICAO Fields 3, 6, 9, 11, a non-standard field and 16. The non-standard field is a North Atlantic route field for use of both organised track and random track aircraft and also includes the longitudinal separation time used. Example: (a) Organised Track Aircraft (CLRSG100 - BA500 - B707 - EGPK - M082F340 54N020W/1413 NATB T15 - KJFK) (b) Random Track Aircraft (CLRSG101 - BA500A - B747 - EGLL - M084F350 54N020W/1000 54N030W/1056 55N040W/1130 56N050W/1215 SCAD/1240 CYCA/1250 T15-CYUE).

Message Type	Type Designator	Message Description, Format and Data Content
Position Report	POS	Message used by aircraft to transmit position reports when weather or company operational information is not required. The air/ground station will insert a message serial number in Field 2 when relaying it to its parent OACC. The message is comprised of ICAO Fields 2, 6 and a non-standard field giving current position and time and flight level followed by an estimated time for the next reporting point, and Field 18. Example: (POSBS099-KL 345 - 54N020W/1420 F350 54N030W/1515 - 0).
Request Clearance	RCL	Message used by aircraft to obtain a clearance or reclearance in Oceanic airspace. The air/ground station will insert a message serial number in Field 3 when relaying it to its parent OACC. The message is comprised of ICAO Fields 3, 6, a non-standard field and 18. The non-standard field contains position, time and current flight level, next position (or entry point or track letter) and time, requested speed (optional) and flight level. This message will not be used to request route changes within OCA (see MIS). Example: RCLBS100-BA500 - OTR/1000 F260 NATC/1000 M082F350 - 0).
Revised Estimate	RPE	Used by aircraft when they wish to revise their estimate for the next reporting point. The air/ground station will insert a message serial number in Field 2 when relaying it to its parent OACC. The message is comprised of ICAO Fields 2, 6, a non-standard field and 18. The non-standard field comprises next position and time and flight level (optional). Example: (RPEBS101 - BA500 - 54N030W/1000 F350 - 0).

Message Type	Type Designator	Message Description, Format and Data Content
Repeat Request	RPT	Used by ATS units to obtain a repeat of a previously received message to assist in handling out of sequence message serial numbers. The message is comprised of ICAO Fields 1 and 4. Example: (RPT-SG100)
Miscellaneous	MIS	This message, as its name implies is intended for use by aircraft and ATS units to convey plain language information which does not conform with an established message format. It is comprised of ICAO Fields 2, 6 and a non-standard plain language field. Example: (MISBS102 - PA100 - REQUEST DOMESTIC ROUTEING AFTER 10°W).

LIST OF NAMES AND ADDRESSES OF THE MEMBERS OF THE NORTH ATLANTIC SYSTEMS PLANNING GROUP/

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