INTERNATIONAL AIR TRANSPORT ASSOCIATION
EUROPEAN REGIONAL TECHNICAL CONFERENCE
EUROCONTROL, BRUSSELS
24 – 26 October 2000

Agenda Item 12.2.: Voice Communications Beyond 8.33 kHz

Voice Communications Beyond 8.33 kHz

Executive Summary

The spectrum release potential of 8.33 kHz channel spacing as implemented in Europe is expected to be exhausted around 2007, meaning that after that date the frequency needs of ATM can be met only with increasing difficulty or not at all. A solution to this problem is essential.

Europe does not at the moment have an implementation program to address the issue of the next generation communications system, since even a decision on what that system should be is outstanding.

In view of the long pre-notification period needed for a major change in the ATM system, if the frequency problems expected around 2007 are to be solved, there is a need now for a program to facilitate a speedy decision on the system to be implemented and to manage the implementation itself.

In the choice of system to be implemented, regional solutions must be avoided and close co-ordination in respect of technology and time-scales between Europe and the USA is essential.

The management of such a program can best be entrusted to EUROCONTROL and carried out with the early involvement of all stakeholders, including airspace users of all categories, ATS and communications providers, certification authorities, equipment and airframe manufacturers, the European Commission, ICAO, IFATCA and IFALPA.

In view of the global implications, all recommendations from the program must be the subject of review and agreement on the IATA Operations Committee level.

The program must also make use of lessons learnt from earlier programs and operate in accordance with the One European Sky concept to avoid fragmentation.

INTERNATIONAL AIR TRANSPORT ASSOCIATION
EUROPEAN REGIONAL TECHNICAL CONFERENCE
EUROCONTROL, BRUSSELS
24-26 October 2000

Voice Communications Beyond 8.33 kHz

Introduction

1. Communications between the air (the aircraft systems) and ground (the ATS systems) element of ATM is a fundamental capability, which gains ever more importance as these two elements are increasingly integrated. While originally having been based on analogue voice only, digital data communications is making substantial inroads and will replace part of voice communications in the not too distant future.

2. Aviation's communications needs have put increasing demand on the VHF band allocated for this purpose and it is becoming more and more difficult to meet the requirements for new frequencies. In Europe, a short term solution was found in the form of reducing the channel spacing to 8.33 kHz, initially in the core area but with a clear need to extend this to most of the ECAC area by about 2002.

3. Simulations conducted by EUROCONTROL show (RTC6 WP 12.1 refers) that the 8.33 kHz solution will provide sufficient spectrum release to cater for the demand up to about 2007 only. Furthermore, the 8.33 kHz channel spacing constitutes only the continuation of the current analogue voice environment without a transition capability to new, digital technologies.

4. While the extension of 8.33 kHz channel spacing outside the core area of Europe is required as the only feasible short-term solution, there is also a need to explore the options, and to select a solution, to be implemented around 2007 when the benefits provided by 8.33 kHz run out.

5. Both Europe and the USA have a program to implement VDL Mode 2, which will enable the introduction of ATS data link in continental airspace. VDL Mode 2 does not have voice capabilities and while its performance is sufficient to satisfy the short to medium term data communications requirements, in the longer term a more capable system will probably be required to cater for the needs of advanced ATM tools.

Discussion

6. ATM system changes require that airspace users be given sufficient notice so that they can make timely arrangements for procurement and retrofit or forward fit of their aircraft. 7 years advance notice is considered the norm for major changes and the introduction of a, possibly completely new, communications system would most certainly fall into the "major" category.

7. In view of the fact that the 8.33 kHz system offers a solution until only about 2007, it is significant to note that currently there is no comprehensive and co-ordinated

program in Europe to decide on and implement a communications system that will meet aviation's needs beyond that date.

8. EUROCONTROL's "Future VHF System" study explored the options, while the ECAC Communications Strategy lists possible steps towards a future system, but no definitive choice has been made and there is certainly no sign of an implementation program.

9. The shortage of frequencies is not a purely European problem. In the United States, meeting frequency requirements is also increasingly difficult, resulting in long delays in allocating requested frequencies and in some cases even the closing down of elements of certain services (e.g. automated weather service) and giving the frequency thus freed to a service considered more important for the ATM system. With the uniform, and hence far more efficient, frequency management process in the US, the expectation is that it will be possible, even if only with great difficulty, to meet frequency demand until the third quarter of the decade without a frequency spacing split. Hence, currently 8.33 kHz is not considered as an option there.

10. The US NEXCOM program is designed to address a range of issues, including ground equipment renewal and also transitioning the industry to new technology, namely VDL Mode 3. As of August 2000, the US airlines and ATA have given their approval to the NEXCOM program, however they have not as yet endorsed VDL Mode 3.

Proposal

11. The initial implementation of 8.33 kHz channel spacing in Europe has shown what can be achieved with good program management and the timely engagement of all stakeholders. While the program did suffer delays, in the end the transition was extremely smooth without noticeable operational difficulties. It can therefore be said with confidence that there is no reason why EUROCONTROL could not undertake a program similar to NEXCOM, concentrating on choosing and implementing a communications system that will serve the industry from 2007 onwards.

12. It must be stressed that such a European "NEXCOM" must have as its most urgent aim a decision on the system to implement with only the absolutely essential time being spent on deliberating about the possible options. With 8.33 kHz benefits running out in 2007, it is now a time to choose and not to vacillate!

13. It is therefore proposed that EUROCONTROL urgently initiate a program aimed at addressing the issue of the next generation air/ground communications system. In view of the nature of this activity, it can be best envisaged under the leadership of the COM division, with appropriate input and support from other divisions as required. The program should:

    a. Achieve industry consensus based selection of the next generation air/ground communications system. This decision must be arrived at with due speed to

enable implementation starting around 2007, to compensate for the problems expected to arise as the 8.33 kHz potential is exhausted. While the choice must be based on relevant cost-benefit considerations, such considerations must not be allowed to unduly delay making a choice.

b. Involve all stakeholders. Alongside airspace users', ATS and communications providers' representatives, equipment and airframe manufacturers, certification authorities, the European Commission, ICAO, IFATCA and IFALPA must be engaged from the beginning.

c. Address technical as well as operational issues. Human factors considerations, including the airborne and ground Human Machine Interface, as well as radiotelephony procedures must be considered as an integral part of the solution.

d. Aim for a global solution. The kind of regional solution embodied in the 8.33 kHz channel spacing system must be avoided. The minimum aim should be to have identical/compatible systems in continental airspace in Europe and the USA, with the same equipment also operable in Regions of the world still using the earlier generation system.

e. Give preference to a digital system providing a solution for the foreseeable future. A system with a clear transition path to combined digital voice and data is essential. The choice of system must not be governed by national pride or other parochial considerations, but the need for a global solution as described in d. above.

f. Co-operate closely with the FAA NEXCOM program. Cost-effective implementation of a global system is possible only if the choice of system and implementation time frames is co-ordinated between Europe and the USA. This co-operation must work in both directions.

g. Pay special attention to the communications needs of State aircraft. Some of the technologies available for a next generation communications system, e.g. VDL Mode 3, are not compatible with the maintenance of a parallel UHF service for the use of State aircraft. The FAA is already in discussion with the US Dept. of Defense about the possible future withdrawal of UHF service. A cost-effective solution acceptable for operators of State aircraft in Europe must be found.

h. Develop an implementation and transition plan. The engagement of all stakeholders from the earliest possible time must ensure that they all accept and follow this plan. It is essential that this plan consider the airspace of the ICAO EUR Region as a homogenous whole rather then a collection of national airspaces.

i. Ensure publication of relevant and timely information. Information on airborne and ground equipment requirements and implementation dates must be published as soon as possible. A way must be found to do this centrally by EUROCONTROL to avoid a situation where States publish fragmented and diverging information, leading to confusion, as has been the case in the past.

IATA Involvement

14. Defining and agreeing upon the next generation air/ground communications system to be applicable as a minimum in the continental airspace of Europe and the USA is probably one of the most important forthcoming activities our industry will be facing in the near future. Considering that the concept of integrating the air and ground elements of the ATM system has now been accepted as a basis of the future operational concept, the importance of the air/ground communications system, forming the essential link between those elements, cannot be overstated.

15. The close and continuous involvement of IATA in the proposed program, as the leading industry organisation representing a substantial segment of airspace users, is essential. While the co-operation with such a European program would primarily be concentrated at the IATA European Operations and Infrastructure Office, important contributions would be expected from the other IATA Regions as well as IATA in Montreal.

16. In view of the global implications of such a program, all recommendations emanating from it must be the subject of review and agreement on the IATA Operations Committee level.

17. It is estimated that the effort involved will be between 10-15 % of the time of one person acting as the primary focus of the activity, with around 2 % of the time of a second person dealing with frequency management aspects, throughout the program lifetime. Therefore, no additional resource would be required.

Program risks

18. The need to address the frequency shortage problems expected from 2007 onwards and the required long pre-notification period (essential in the case of such a major change in the ATM system) leaves a very narrow window of opportunity to decide on starting the program. This must happen before the end of 2000.

19. For the same reasons, the decision on the next generation system to be implemented must also be arrived at with due speed. If the decision is delayed beyond the end of 2001, the implementation curve of the new system will inevitably lag behind the problem curve in 2007.

20. If system choice is influenced by National and/or parochial interests, Europe may well end up with yet another costly regional solution. Such interests may also unduly delay the decision.

21. If information promulgation is not handled properly, confusion will once again be a very real possibility with the consequent adverse effects on airline implementation plans.

22. Lack of clear and agreed requirements or the concurrent availability of divergent requirement has an adverse impact also on equipment manufacturers, which can result in shortages during the run-up to the implementation deadline.

23. If the provisions and dates in the Implementation and Transition Plan are not considered mandatory by airlines and ATS service providers, program delays will be inevitable. All stakeholders in the industry have to accept that the agreed plan must be carried out in order to keep costs down and realise benefits on a timely basis.

24. In the past, the peculiar needs of State aircraft have been accommodated in the face of new developments by various options available in the existing system (e.g. use of UHF in the 8.33 kHz area). Extensive transition of the industry to a digital environment means that the options may be very limited or non-existent if State aircraft are not upgraded also. While all efforts must be made to accommodate the needs of State aircraft, the inertia or unwillingness to face costs of their operators should not be allowed to prevent the implementation of the next generation system by the industry.

Conclusions

25. The RTC is invited to:

1. Note that the spectrum release potential of 8.33 kHz channel spacing is expected to be exhausted by around 2007 and that after this date the frequency needs of ATM can be met only with increasing difficulty or not at all;

2. Agree that there is an urgent need for the industry to agree upon the next generation communication system to be implemented;

3. Note that Europe currently has no implementation program to address the above need;

4. Agree that such a program can best be set up under the management of EUROCONTROL, with the active involvement of all stakeholders;

5. Request EUROCONTROL to initiate such an implementation program along the lines described in this working paper and taking due account of the urgency of the matter;

6. Urge EUROCONTROL to ensure that the program to be set up be co-ordinated with the FAA NEXCOM program to ensure compatibility of technology and timescales;

7. Urge the FAA to also ensure appropriate co-ordination with the relevant European program to ensure compatibility of technology and timescales;

8. Urge all stakeholders to support such a program with a view to achieving a future-proof, cost-effective communications solution in the required time frame and to make use of the lessons learned from earlier programs to ensure a problem-free transition.

9. Agree that all recommendations emanating from such a program be the subject of review and agreement on the IATA Operations Committee level.