



*International Civil Aviation Organization*

**MIDANPIRG Communication Navigation and Surveillance  
Sub-Group (CNS SG)**

**Fifth Meeting**  
*(Cairo, Egypt, 11 – 13 December 2012)*

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**Agenda Item 4:            Developments related to CNS**

**AMENDMENT TO ANNEX 10 VOL III AND V**

*(Presented by the Secretariat)*

**SUMMARY**

This paper provides information on proposals for amendment to Annex 10, and the State letter sent 24 April 2012.

Action by the meeting is in Paragraph 2.

**1.        INTRODUCTION**

1.1            Proposals for the amendment of Annex 10, Volume III, Part I, and Volume V, concerning digital data communication systems and aeronautical radio frequency spectrum utilization was reviewed by the Air navigation Commission (ANC) at the eighth meeting of its 189th Session held on 13 March 2012. The State Letter is at **Appendix A** to this information paper.

**2.        ACTION BY THE MEETING**

2.1            Note the information in this information paper and its Appendix.

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Ref.: AN 7/1.3.99-12/33

24 April 2012

**Subject:** Proposals for the amendment of Annex 10, Volume III, Part I, and Volume V, concerning digital data communication systems and aeronautical radio frequency spectrum utilization

**Action required:** Comments to reach Montréal by 8 August 2012

Sir/Madam,

1. I have the honour to inform you that the Air Navigation Commission, at the eighth meeting of its 189th Session held on 13 March 2012, considered proposals developed by the Secretariat with the assistance of the Aeronautical Communications Panel (ACP) to amend the Standards and Recommended Practices (SARPs) in Annex 10 — *Aeronautical Telecommunications*, Volume III — *Communication Systems*, Part I — *Digital Data Communication Systems* and Volume V — *Aeronautical Radio Frequency Spectrum Utilization* concerning digital data communication systems and aeronautical radio frequency spectrum utilization. The Commission authorized their transmission to Contracting States and appropriate international organizations for comments.

2. Background information on elements of the proposal is included for your convenience in Attachment A. The proposed amendments, as modified by the Air Navigation Commission, are contained in Attachments B and C.

3. To facilitate your review of the proposed amendments, and pending finalization of an improved State letter format (State letter AN 1/1-10/32 refers), please note that for each amended provision described in Attachments B and C of the present State letter, a corresponding rationale has been provided in Attachment D. Hyperlinks in the attachments should make it possible to easily navigate between amended provisions and corresponding rationales.

4. It should be noted that negligible financial impact is anticipated from the proposed amendments to equipage SARPs. The proposed amendments on frequency assignment SARPs are expected to have a beneficial impact through facilitation of more harmonized planning in the regions.

5. In examining the proposed amendments, you should not feel obliged to comment on editorial aspects as such matters will be addressed by the Air Navigation Commission during its final review of the draft amendment.

6. May I request that any comments you may wish to make on the amendment proposals be dispatched to reach me not later than 8 August 2012. The Air Navigation Commission has asked me to specifically indicate that comments received after the due date may not be considered by the Commission and the Council. In this connection, should you anticipate a delay in the receipt of your reply, please let me know in advance of the due date.

7. For your information, the proposed amendments to Annex 10, Volume III, Part I, and Volume V, are envisaged for applicability on 14 November 2013. Any comments you may have thereon would be appreciated.

8. The subsequent work of the Air Navigation Commission and the Council would be greatly facilitated by specific statements on the acceptability or otherwise of the proposals. Please note that for the review of your comments by the Air Navigation Commission and the Council, replies are normally classified as “agreement with or without comments”, “disagreement with or without comments” or “no indication of position”. If in your reply the expressions “no objections” or “no comments” are used, they will be taken to mean “agreement without comment” and “no indication of position”, respectively. In order to facilitate proper classification of your response, a form has been included in Attachment E which may be completed and returned together with your comments, if any, on the proposals in Attachments B and C.

Accept, Sir/Madam, the assurances of my highest consideration.



Raymond Benjamin  
Secretary General

**Enclosures:**

- A — Background
- B — Proposed amendment to Annex 10, Volume III, Part I
- C — Proposed amendment to Annex 10, Volume V
- D — Rationale
- E — Response form

## BACKGROUND

1. The amendment to Annex 10, Volume III, Part I, as detailed in Attachment B, contains minor changes to two chapters. The first consists of a new note to encourage implementation of aeronautical telecommunication network/internet protocol suite (ATN/IPS) while indicating that ATN/OSI (open systems interconnection) remains a supported Standard. The second and third are to bring the Standards and Recommended Practices (SARPs) for very high frequency (VHF) digital link (VDL) Mode 4 in line with updates made to the International Telecommunication Union (ITU) Radio Regulations as a result of the World Radiocommunication Conferences 2007 and 2012 (WRC-07 and WRC-12) and to reflect the capability of VDL Mode 4 to support ATN/IPS.
2. The amendment to Annex 10, Volume V, as detailed in Attachment C, includes the following:
  - a) in Chapters 2, 3 and 4, a number of editorial updates were made, mainly to bring them in line with the current ITU Radio Regulations;
  - b) in Chapters 2 and 4, removal of provisions that have expired;
  - c) in Chapter 4, addition of a general introduction referring to a new Part II of the *Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including Statement of Approved ICAO Policies* (Doc 9718) containing relevant material for spectrum and frequency management;
  - d) in Section 4.1, removal of material supporting 100 kHz and 50 kHz channelling schemes, in line with earlier updates to Annex 10, Volume III. Consequential updates of the 117.975 – 137.000 MHz allotment table, including a reduction of the guard band around the emergency frequency;
  - e) in Section 4.1, new provision for common signalling channels for VDL Mode 4, applicable only in areas where VDL Mode 4 is implemented; and
  - f) in Section 4.1 and green pages, clarification of top level frequency planning criteria, while moving implementation guidance to Doc 9718, Part II which can be viewed at [http://legacy.icao.int/anb/panels/acp/repository/Doc9718\\_DraftPartII\\_Nov2011.zip](http://legacy.icao.int/anb/panels/acp/repository/Doc9718_DraftPartII_Nov2011.zip).
3. This new Part II of Doc 9718 will contain comprehensive frequency planning criteria for aeronautical VHF voice and digital services, developed over a number of years by the Aeronautical Communications Panel (ACP). The material is almost ready and will be finalized by the ACP Working Group F before the end of 2012. It is expected that Part II will be available for publication in a timely manner to support the related update to Annex 10, Volume V, Chapter 4.

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**ATTACHMENT B** to State letter AN 7/1.3.99-12/33

**PROPOSED AMENDMENT TO ANNEX 10, VOLUME III, PART I**

**NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT**

1. The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

- a) ~~Text to be deleted is shown with a line through it.~~ text to be deleted
- b) **New text to be inserted is highlighted with grey shading.** new text to be inserted
- c) ~~Text to be deleted is shown with a line through it~~ **followed by the replacement text which is highlighted with grey shading.** new text to replace existing text

2. The source of the proposed amendment is the Aeronautical Communications Panel (ACP).

**INTERNATIONAL STANDARDS  
AND RECOMMENDED PRACTICES**

**AERONAUTICAL TELECOMMUNICATIONS**

**ANNEX 10**

**TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

**VOLUME III  
(COMMUNICATION SYSTEMS)**

**PART I — DIGITAL DATA COMMUNICATION SYSTEMS**

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**CHAPTER 3. AERONAUTICAL  
TELECOMMUNICATION NETWORK**

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**3.4 GENERAL REQUIREMENTS**

3.4.1 The ATN shall either use International Organization for Standardization (ISO) communication standards for open systems interconnection (OSI) or use the Internet Society (ISOC) communications standards for the Internet Protocol Suite (IPS).

*Note 1.— ATN/IPS implementation is preferred for ground/ground networks. While ATN/OSI continues to be supported in air/ground networks, particularly when using VDL Mode 2, it is expected that future air/ground implementations will use the ATN/IPS.*

*Note 2.— Interoperability between interconnecting OSI/IPS networks is expected to be arranged prior to implementation.*

*Note 3.— Guidance material on interoperability between ATN/OSI and ATN/IPS is contained in Doc 9896.*

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## CHAPTER 6. VHF AIR-GROUND DIGITAL LINK (VDL)

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### 6.9.2 VDL Mode 4 radio channels

#### 6.9.2.1 VDL MODE 4 STATION FREQUENCY RANGE

6.9.2.1.1 *Transmitter/receiver tuning range.* A VDL Mode 4 transmitter/receiver shall be capable of tuning to any of the 25 kHz channels from ~~117.975–112 MHz through to~~ 137 MHz. ~~The transmitter shall have a means for the tuning range to be restricted to a narrower range.~~

*Note.— Operational conditions or certain applications may require the equipment to be operated in a narrower frequency range.*

~~6.9.2.1.2 **Recommendation.**— A VDL Mode 4 transmitter/receiver should be capable of tuning to any of the 25 kHz channels from 108 to 117.975 MHz.~~

~~*Note.— The band 108–117.975 MHz may be utilized in accordance with the relevant provisions of the ITU Radio Regulations.*~~

6.9.2.1.3~~2~~ *Simultaneous reception.* A VDL Mode 4 station shall be capable of receiving two channels simultaneously.

6.9.2.1.4~~3~~ **Recommendation.**— *A VDL Mode 4 station should be capable of receiving additional channels simultaneously as required by operational services.*

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### 6.9.3 System capabilities

6.9.3.1 *ATN compatibility.* The VDL Mode 4 system shall support ATN/IPS-compliant subnetwork services ~~for surveillance applications.~~

*Note.— VDL Mode 4 provides a seamless transfer of data between ATN/IPS ground networks and ATN/IPS aircraft networks. Interoperability with ATN/OSI networks, where required, is expected to be arranged prior to implementation. VDL Modes 2 and 3 provide ATN/OSI compliant subnetworks.*

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*Delete Table 6-5 in its entirety and renumber the subsequent table accordingly.*

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ATTACHMENT C to State letter AN 7/1.3.99-12/33

PROPOSED AMENDMENT TO ANNEX 10, VOLUME V

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT

1. The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

- a) ~~Text to be deleted is shown with a line through it.~~ text to be deleted
- b) **New text to be inserted is highlighted with grey shading.** new text to be inserted
- c) ~~Text to be deleted is shown with a line through it~~ followed by **the replacement text which is highlighted with grey shading.** new text to replace existing text

2. The source of the proposed amendment is the Aeronautical Communications Panel (ACP).

**INTERNATIONAL STANDARDS  
AND RECOMMENDED PRACTICES**

**AERONAUTICAL TELECOMMUNICATIONS**

**ANNEX 10**

**TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

**VOLUME V**

**(AERONAUTICAL RADIO FREQUENCY SPECTRUM UTILIZATION)**

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**CHAPTER 2. DISTRESS FREQUENCIES**

**Introduction**

*Note.*—The ITU Radio Regulations Article ~~S30~~ 30 provides general conditions for distress and safety communications for all mobile services. ~~Appendix S13 designates the frequencies to be used for these situations.~~ The aeronautical mobile service is also permitted under ~~Appendix S13, Part A1, Section 1~~ Article 30, Section III, No. 30.9 to conform to special arrangements between governments where these have been agreed. ICAO Annexes constitute such agreements.

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The frequency 2 182 kHz also offers possibilities for communication between aircraft and stations of the maritime mobile service. The ITU Radio Regulations specify in ~~Appendix S13, Part A2~~ Article 30, Section III, No. 30.11 that the frequency 2 182 kHz is the international distress frequency for radiotelephony to be used for ~~that purpose~~ emergency communications by ship, aircraft and survival craft stations using frequencies in the authorized bands between 1 605 kHz and 4 000 kHz when requesting assistance from, or communicating with, the maritime service.

With respect to emergency locator transmitters (ELTs) designed to be detected and located by satellite, the Radio Regulations authorize the use of these devices, which are referenced in ITU as satellite emergency position indicating radio beacons (EPIRBs). Radio Regulations ~~Appendix S13, Part A2~~ Article 31, Section 1, No 31.1 specifies that the band 406 – 406.1 MHz is used exclusively by satellite emergency position indicating radio beacons in the earth-to-space direction.

The frequency 4 125 kHz is also authorized by the ITU to enable communications between stations in the maritime mobile service and aircraft stations in distress. The current ITU Radio Regulations (RR ~~S5.130~~ 5.130 and ~~Appendix S13~~ Articles 31 and 32) state that the carrier frequency 4 125 kHz may be used by aircraft stations to communicate with stations of the maritime mobile service for distress and safety purposes. The aeronautical mobile (R) service frequencies 3 023 kHz and 5 680 kHz may be employed for coordinated search and rescue operations with the maritime mobile service under RR ~~S5.115~~ 5.115.

~~Similarly, the frequency 500 kHz (RR S5.83) is the international distress frequency for Morse radiotelegraphy to be used for that purpose by ship, aircraft and survival craft stations using frequencies in the bands between 415 kHz and 535 kHz when requesting assistance from the maritime service (RR Appendix S13, Part A2).~~

With respect to survival craft stations, the Radio Regulations provide for the use of the frequency(ies) ~~500 kHz, 8 364 kHz, 2 182 kHz, 121.500 MHz and 243 MHz~~, if the survival craft is capable of operating in the bands ~~415—535 kHz, 4 000 – 27 500 kHz, 1 605 – 2 850 kHz, 117.975 – 137,000 MHz and 235 – 328.6 MHz~~ respectively (RR Articles 31 and ~~32~~Appendix S13, Part A2).

## 2.1 Frequencies for emergency locator transmitters (ELTs) for search and rescue

~~2.1.1 Until 1 January 2005 emergency locator transmitters carried in compliance with Standards of Annex 6, Parts I, II and III shall operate either on both 406 MHz and 121.5 MHz or on 121.5 MHz.~~

~~2.1.2<sup>1</sup> All emergency locator transmitters installed on or after 1 January 2002 and carried in compliance with Standards of Annex 6, Parts I, II and III shall operate on both 406 MHz and 121.500 MHz.~~

~~2.1.3 From 1 January 2005, emergency locator transmitters carried in compliance with Standards of Annex 6, Parts I, II and III shall operate on both 406 MHz and 121.5 MHz.~~

*Note 1.— ITU Radio Regulations (S5.256 ~~5.256~~ and Appendix S13) provide for the use of 243 MHz in addition to the above frequencies.*

*Note 2.— Specifications for ELTs are found in Annex 10, Volume III, Part II, Chapter 5 and the ITU Radio Regulations, Art. 34, Section I, No. 34.1.*

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## CHAPTER 3. UTILIZATION OF FREQUENCIES BELOW 30 MHz

### Introduction

High frequency bands allocated to the  
aeronautical mobile (R) service

*The frequency bands between 2.8 MHz and 22 MHz allocated to the aeronautical mobile (R) service are given in Article S5 ~~5~~ of the ITU Radio Regulations. The utilization of these bands must be in accordance with the relevant provisions of the Radio Regulations and in particular Appendix 27 to the Radio Regulations. Prior to 1 September 1979, the provisions are contained in the Final Acts of the ITU Extraordinary Administrative Radio Conference (Geneva 1966). On 1 September 1979, revised provisions came into force, details of which are contained in the Final Acts of the World Administrative Radio Conference for the Aeronautical Mobile (R) Service (Geneva 1978) and Appendix 27 Aer2 to the Radio Regulations, except the Frequency Allotment Plan which entered into force at 0001 hours UTC, 1 February 1983. In the Radio Regulations, 1998 version, based on the World Administrative Radio Conference for the Mobile Services (1987), Appendix S27 now incorporates editorial amendments to Appendix 27 Aer2. In the utilization of these bands, States' attention is drawn to the possibility of harmful*

*radio interference from non-aeronautical sources of radio frequency energy and the need to take appropriate measures to minimize its effects.*

### 3.1 Method of operations

3.1.1 In the aeronautical mobile service, single channel simplex shall be used in radiotelephone communications utilizing radio frequencies below 30 MHz in the bands allocated exclusively to the aeronautical mobile (R) service.

#### 3.1.2 Assignment of single sideband channels

3.1.2.1 Single sideband channels shall be assigned in accordance with Volume III, Part II, Chapter 2, 2.4.

3.1.2.2 For the operational use of the channels concerned administrations shall take into account the provisions of ~~S27/19~~ 27/19 of Appendix ~~S27~~ 27 of the ITU Radio Regulations.

3.1.2.3 **Recommendation.**— *The use of aeronautical mobile (R) frequencies below 30 MHz for international operations should be coordinated as specified in Appendix ~~S27~~ 27 of the ITU Radio Regulations as follows:*

~~S27/19~~ 27/19 The International Civil Aviation Organization (ICAO) co-ordinates radio-communications of the aeronautical mobile (R) service with international aeronautical operations and this Organization should be consulted in all appropriate cases in the operational use of the frequencies in the Plan.

3.1.2.4 **Recommendation.**— *Where international operating requirements for HF communications cannot be satisfied by the Frequency Allotment Plan at Part 2 of Appendix ~~S27~~ 27 to the Radio Regulations, an appropriate frequency may be assigned as specified in Appendix ~~S27~~ 27 by the application of the following provisions:*

~~S27/20~~ 27/20 It is recognized that not all the sharing possibilities have been exhausted in the Allotment Plan contained in this Appendix. Therefore, in order to satisfy particular operational requirements which are not otherwise met by this Allotment Plan, administrations may assign frequencies from the aeronautical mobile (R) bands in areas other than those to which they are allotted in this Plan. However, the use of the frequencies so assigned must not reduce the protection to the same frequencies in the areas where they are allotted by the Plan below that determined by the application of the procedure defined in Part I, Section II B of this Appendix.

*Note.*— *Part I, Section II B of Appendix ~~S27~~ 27 relates to Interference Range Contours, and application of the procedure results in a protection ratio of 15 dB.*

~~S27/21~~ 27/21 When necessary to satisfy the needs of international air operations administrations may adapt the allotment procedure for the assignment of aeronautical mobile (R) frequencies, which assignments shall then be the subject of prior agreement between administrations affected.

~~S27/22~~ 27/22 The co-ordination described in No. ~~S27/21~~ 27/19 shall be effected where appropriate and desirable for the efficient utilization of the frequencies in question, and especially when the procedures of No. ~~S27/19-27/21~~ are unsatisfactory.

3.1.2.5 The use of classes of emission J7B and J9B shall be subject to the following provisions of Appendix ~~S27~~ 27:

~~S27/12~~ 27/12 For radiotelephone emissions the audio frequencies will be limited to between 300 and 2 700 Hz and the occupied bandwidth of other authorized emissions will not exceed the upper limit of J3E emissions. In specifying these limits, however, no restriction in their extension is implied in so far as emissions other than J3E are concerned, provided that the limits of unwanted emissions are met (see Nos. ~~S27/73~~ 27/73 and ~~S27/74~~ 27/74).

~~S27/14~~ 27/14 On account of the possibility of interference, a given channel should not be used in the same allotment area for radiotelephony and data transmissions.

~~S27/15~~ 27/15 The use of channels derived from the frequencies indicated in ~~S27/18~~ 27/18 for the various classes of emissions other than J3E and H2B will be subject to special arrangements by the administrations concerned and affected in order to avoid harmful interference which may result from the simultaneous use of the same channel for several classes of emission.

### 3.1.3 Assignment of frequencies for aeronautical operational control communications

3.1.3.1 Worldwide frequencies for aeronautical operational control communications are required to enable aircraft operating agencies to meet the obligations prescribed in Annex 6, Part I. Assignment of these frequencies shall be in accordance with the following provisions of Appendix ~~S27~~ 27:

~~S27/9~~ 27/9 A worldwide allotment area is one in which frequencies are allotted to provide long distance communications between an aeronautical station within that allotment area and aircraft operating anywhere in the world.\*

~~S27/217~~ 27/217 The worldwide frequency allotments appearing in the tables at No. ~~S27/213~~ 27/213 and Nos. ~~S27/218~~ 27/218 to ~~S27/231~~ 27/231, except for carrier (reference) frequencies 3 023 kHz and 5 680 kHz, are reserved for assignment by administrations to stations operating under authority granted by the administration concerned for the purpose of serving one or more aircraft operating agencies. Such assignments are to provide communications between an appropriate aeronautical station and an aircraft station anywhere in the world for exercising control over regularity of flight and for safety of aircraft. Worldwide frequencies are not to be assigned by administrations for MWARA, RDARA and VOLMET purposes. Where the operational area of an aircraft lies wholly within a RDARA or sub-RDARA boundary, frequencies allotted to those RDARAs and sub-RDARAs shall be used.

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\* The type of communications referred to in ~~S27/9~~ 27/9 may be regulated by administrations.

Note 1.— Tables ~~S27/213~~ 27/213 and ~~S27/218~~ 27/218 to ~~S27/231~~ 27/231 appearing in Appendix ~~S27~~ 27 to the ITU Radio Regulations refer to, respectively, the Frequency Allotment Plan, listing frequencies by areas, and the Frequency Allotment Plan, listing frequencies in numerical order.

Note 2.— Guidance material on the assignment of worldwide frequencies is contained in Attachment C.

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## CHAPTER 4. UTILIZATION OF FREQUENCIES ABOVE 30 MHz

*Details pertaining to the allocation of spectrum to aeronautical services, including footnoted allocations and restrictions, are contained in both the ITU Radio Regulations of the International Telecommunication Union and the ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including Statement of Approved ICAO Policies (Doc 9718).*

### 4.1 Utilization in the band 117.975 – 137.000 MHz

#### Introduction

*The band 118—132 MHz was allocated in 1947 by the Atlantic City ITU Radio Conference, and again in 1959 by the Geneva Conference, but with extension downwards to 117.975 MHz, for the exclusive use by the aeronautical mobile (R) service.*

*ITU Radio Conferences subsequent to 1947 also made provisions for the use of the band 132—136 MHz for the aeronautical mobile (R) service under conditions which vary for the different ITU Regions, countries or combination of countries. The utilization of this band has been included in the Allotment Table in this chapter. The ITU World Administrative Radio Conference (1979) made provisions for the use of the band 136—137 MHz by the aeronautical mobile (R) service, subject to conditions of Nos. S5.203, S5.203A and S5.203B of the Radio Regulations. The use of frequencies in the 136—137 MHz part of the band must take account of the conditions contained in these notes. In the utilization of these bands, States' attention is drawn to the possibility of harmful radio interference from non-aeronautical sources of radio frequency energy and the need to take appropriate measures to minimize its effects.*

*This chapter Section 4.1 deals with Standards and Recommended Practices (SARPs) relating to ~~this~~ the use of the band 117.975 – 137.000 MHz and includes matters pertaining to the selection of particular frequencies for various aeronautical purposes. These ~~Standards~~ SARPs are introduced by the following preface, which sets out the principles upon which the utilization of ~~VHF~~ this frequency band on a worldwide basis with due regard to economy ~~has been~~ is being planned.*

#### Preface

*The utilization of ~~VHF~~ the frequency band 117.975 – 137.000 MHz on a worldwide basis with due regard to economy and practicability requires a plan that will take into account:*

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- d) the need for providing a global framework for the ~~integrated~~ coordinated development of Regional Plans;
- e) the need, in certain regions, to have more detailed plans and planning criteria in addition to the provisions in this section;

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Renumber remaining subparagraphs accordingly

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#### 4.1.1 General allotment of frequency band 117.975 – 137.000 MHz

*Note.— The plan includes a general Allotment Table that subdivides the complete band 117.975 – 137.000 MHz, the chief subdivisions being the bands of frequencies allocated to both national and international services, and the bands allocated to national services. Observance of this general subdivision should keep to a minimum the problem of coordinating national and international application.*

4.1.1.1 The block allotment of the frequency band 117.975 – 137.000 MHz shall be as shown in Table 4-1.

4.1.1.2 ~~**Recommendation.**— In the case of the band 136 – 137 MHz, international applications have not yet been agreed, and these frequencies should be brought into use on a regional basis where and in the manner required.~~

#### 4.1.2 Frequency separation and limits of assignable frequencies

*Note.— In the following text the channel spacing for 8.33 kHz channel assignments is defined as 25 kHz divided by 3 which is 8.333 ... kHz.*

4.1.2.3~~1~~ In the band 117.975 – 137.000 MHz, the lowest assignable frequency shall be 118.000 MHz and the highest 136.975 MHz. [Editorial comment: This paragraph, now modified, was originally paragraph 4.1.2.3.]

4.1.2.4~~2~~ The minimum separation between assignable frequencies in the aeronautical mobile (R) service shall be 8.33 kHz.

*Note.— It is recognized that in some regions or areas, ~~100 kHz, 50 kHz or~~ 25 kHz channel spacing provides an adequate number of frequencies suitably related to international and national air services and that equipment designed specifically for ~~100 kHz, 50 kHz or~~ 25 kHz channel spacing will remain adequate for services operating within such regions or areas. It is further recognized that assignments based on 25 kHz channel spacing as well as 8.33 kHz channel spacing may continue to co-exist within one region or area.*



4.1.2.2 ~~Until at least 1 January 2005, DSB AM equipment specifically designed for 25 kHz channel spacing shall be safeguarded with respect to its suitability for the aeronautical mobile (R) service (AM(R)S) except in those regions or areas where regional agreement permits the use of equipment specifically designed for 8.33 kHz channel spacing or for VDL Mode 3 when used for air ground voice communications.~~

**Table 4-1. Allotment table**

<i>Block allotment of Frequencies (MHz)</i>	<i>Worldwide utilization</i>	<i>Remarks</i>
a) 118.000 – 121.450 inclusive	International and National Aeronautical Mobile Services	Specific international allotments will be determined in the light of regional agreement. National assignments are covered by the provisions in 4.1.4.8 and 4.1.54.9.
b) 121.500	Emergency frequency	See 4.1.3.1. In order to provide a guard band for the protection of the aeronautical emergency frequency, the nearest assignable frequencies on either side of 121.500 MHz are 121.450 MHz and <del>121.6</del> 121.550 MHz, <del>except that by regional agreement it may be decided that the nearest assignable frequencies are 121.3 MHz and 121.7 MHz.</del>
c) <del>121.6</del> 121.550 – 121.9917 inclusive	International and National Aerodrome Surface Communications	Reserved for ground movement, pre-flight checking, air traffic services clearances, and associated operations.
d) 122.000 – 123.050 inclusive	National Aeronautical Mobile Services	Reserved for national allotments. National assignments are covered by the provisions of 4.1.4.8 and 4.1.4.9.
e) 123.100	Auxiliary frequency SAR	See 4.1.3.4.4. In order to provide a guard band for the protection of the aeronautical auxiliary frequency, the nearest assignable frequencies on either side of 123.100 MHz are 123.050 MHz and 123.150 MHz.
f) 123.150 – 123.6917 inclusive	National Aeronautical Mobile Services	Reserved for national allotments, with the exception of 123.450 MHz which is also used as <del>the worldwide</del> an air-to-air communications channel (see g). National assignments are covered by the provisions of 4.1.4.8 and 4.1.4.9.
g) 123.450	Air-to-air communications	Designated for use as provided for in 4.1.3.2.4.
h) 123.700 – 129.6917 inclusive	International and National Aeronautical Mobile Services	Specific international allotments will be determined in light of regional agreement. National assignments are covered by the provisions in 4.1.4.8 and 4.1.54.9.

<i>Block allotment of Frequencies (MHz)</i>	<i>Worldwide utilization</i>	<i>Remarks</i>
i) 129.700 – 130.8917 inclusive	National Aeronautical Mobile Services	Reserved for national allotments but may be used in whole or in part, subject to regional agreement, to meet the requirements mentioned in 4.1.86.1.3.
j) 30.900 – 136.875 inclusive	International and National Aeronautical Mobile Services	Specific international allotments will be determined in light of regional agreement. National assignments are covered by the provisions in 4.1.4.8 and 4.1.54.9. (See the Introduction to 4.1 regarding the band 132 – 137 MHz.)
k) 136.900 – 136.975 inclusive	International and National Aeronautical Mobile Services	Reserved for VHF air-ground data link communications.

4.1.2.2.13 Requirements for mandatory carriage of equipment specifically designed for 8.33 kHz channel spacing shall be made on the basis of regional air navigation agreements which specify the airspace of operation and the implementation timescales for the carriage of equipment, including the appropriate lead time.

*Note.— No changes will be required to aircraft systems or ground systems operating solely in regions not using 8.33 kHz channel spacing.*

~~4.1.2.2.2 Until at least 1 January 2005, equipment specifically designed for 8.33 kHz channel spacing shall be safeguarded with respect to its suitability for the AM(R)S.~~

4.1.2.2.34 Requirements for mandatory carriage of equipment specifically designed for VDL Mode 2, VDL Mode 3 and VDL Mode 4 shall be made on the basis of regional air navigation agreements which specify the airspace of operation and the implementation timescales for the carriage of equipment, including the appropriate lead time.

4.1.2.2.34.1 The agreement indicated in 4.1.2.2.34 shall provide at least two years' notice of mandatory carriage of airborne systems.

~~4.1.2.2.4 Until at least 1 January 2010, equipment specifically designed to the VDL Mode 3 and VDL Mode 4 SARPs shall be safeguarded with respect to its suitability for the AM(R)S.~~

~~4.1.2.3 In the band 117.975 – 137 MHz, the lowest assignable frequency shall be 118 MHz and the highest 136.975 MHz. [Editorial comment: This paragraph has been moved to 4.1.2.1.]~~

4.1.2.4.5 In regions where 25 kHz channel spacing (DSB-AM) and VHF digital link (VDL) and 8.33 kHz DSB-AM channel spacing are in operation, the publication of the assigned frequency or channel of operation shall conform to the channel contained in Table 4-1 (*bis*).

*Note.— Table 4-1 (bis) provides the frequency channel pairing plan which retains the numerical designator of the 25 kHz DSB-AM environment and allows unique identification of a 25 kHz VDL and 8.33 kHz channel.*

## 4.1.3 Frequencies used for particular functions

4.1.3.1 *Emergency channel*

4.1.3.1.1 The emergency channel (121.500 MHz) shall be used only for genuine emergency purposes, as broadly outlined in the following:

...

- f) to provide a common VHF channel for communication between civil aircraft and intercepting aircraft or intercept control units and between civil or intercepting aircraft and air traffic services units in the event of interception of the civil aircraft.

*Note 1.— The use of the frequency 121.500 MHz for the purpose outlined in c) is to be avoided if it interferes in any way with the efficient handling of distress traffic.*

*Note 2.— The current ITU Radio Regulations make provisions that (RR 5.200) permit the use of the aeronautical emergency frequency 121.500 MHz may also be used by mobile stations of the maritime mobile service, using A3E emission to communicate on this frequency under the conditions laid down in Article 31 of the Radio Regulations for distress and safety purposes with stations of the aeronautical mobile service (RR S5.200 and Appendix S13, Part A2).*

4.1.3.1.2 The frequency 121.500 MHz shall be provided at:

- a) all area control centres and flight information centres;
- b) aerodrome control towers and approach control offices serving international aerodromes and international alternate aerodromes; and
- c) any additional location designated by the appropriate ATS authority.

where the provision of that frequency is considered necessary to ensure immediate reception of distress calls or to serve the purposes specified in 4.1.3.1.1.

*Note.— Where two or more of the above facilities are collocated, provision of 121.500 MHz at one would meet the requirement.*

4.1.3.1.3 The frequency 121.500 MHz shall be available to intercept control units where considered necessary for the purpose specified in 4.1.3.1.1 f).

4.1.3.1.4 The emergency channel shall be guarded continuously during the hours of service of the units at which it is installed.

4.1.3.1.5 The emergency channel shall be guarded on a single channel simplex operation basis.

4.1.3.1.6 The emergency channel (121.500 MHz) shall be available only with the characteristics as contained in Annex 10, Volume III, Part II, Chapter 2 (25 kHz).

#### 4.1.3.2 *Air-to-air communications channel*

4.1.3.2.1 An air-to-air VHF communications channel on the frequency of 123.450 MHz shall be designated to enable aircraft engaged in flights over remote and oceanic areas out of range of VHF ground stations to exchange necessary operational information and to facilitate the resolution of operational problems.

*Note.— Use of the air-to-air channel can cause interference to and from aircraft using the same frequency for air-ground communications.*

4.1.3.2.2 In remote and oceanic areas out of range of VHF ground stations, the air-to-air VHF communications channel on the frequency 123.450 MHz shall be available only with the characteristics as contained in Annex 10, Volume III, Part II, Chapter 2 (25 kHz).

#### 4.1.3.3 *Common signalling channels for VDL*

4.1.3.3.1 *Common signalling channel VDL Mode 2.* The frequency 136.975 MHz is reserved on a worldwide basis to provide a common signalling channel (CSC) to the VHF digital link Mode 2 (VDL Mode 2). This CSC uses the Mode 2 VDL modulation scheme and carrier sense multiple access (CSMA).

4.1.3.3.2 *Common Signalling Channels VDL Mode 4.* In areas where VDL Mode 4 is implemented, the frequencies 136.925 MHz and 113.250 MHz shall be provided as common signalling channels (CSC) to the VHF Digital Link Mode 4 (VDL Mode 4). These CSCs use the VDL Mode 4 modulation scheme.

#### 4.1.3.4 *Auxiliary frequencies for search and rescue operations*

4.1.3.4.1 Where a requirement is established for the use of a frequency auxiliary to 121.500 MHz, as described in 4.1.3.1.1 c), the frequency 123.100 MHz shall be used.

4.1.3.4.2 The auxiliary search and rescue channel (123.100 MHz) shall be available only with the characteristics as contained in Annex 10, Volume III, Part II, Chapter 2 (25 kHz).

*Note — The ITU Radio Regulations (RR 5.200) permit the use of the aeronautical auxiliary frequency 123.100 MHz by mobile stations of the maritime mobile service under the conditions laid down in Article 31 of the Radio Regulations for distress and safety purposes with stations of the aeronautical mobile service.*

#### 4.1.5.4 Provisions concerning the deployment of VHF frequencies and the avoidance of harmful interference

4.1.5.4.1 ~~In the case of those VHF facilities providing service up to the radio horizon, the geographical separation between facilities working on the same frequency shall, except where there is an operational requirement for the use of common frequencies for groups of facilities, be such that points at the protection heights and at the limit of the functional service range of each facility are separated by distances not less than that required to provide a desired to undesired signal ratio of 14 dB. This provision shall be implemented on the basis of a regional air navigation agreement. For areas where frequency assignment congestion is not severe or is not anticipated to become severe, a 20 dB (10 to 1 distance ratio) separation criteria or radio line of sight (RLOS) separation criteria (whichever is smaller) may be~~

~~used.~~ The geographical separation between facilities operating on the same frequency shall, except where there is an operational requirement for the use of common frequencies for groups of facilities, be such that the frequency protected service volume coverage of each facility is separated from the frequency protected service volume of the other facility by a distance not less than that required to provide a desired to undesired signal ratio of 20 dB or by a separation distance not less than the sum of the distances to associated radio horizon of each service volume, whichever is smaller.

4.1.4.2 For areas where frequency assignment congestion is severe or is anticipated to become severe, the geographical separation between facilities operating on the same frequency shall, except where there is an operational requirement for the use of common frequencies for groups of facilities, be such that the frequency protected service volume of each facility is separated from the frequency protected service volume of the other facility by a distance not less than that required to provide a desired to undesired signal ratio of 14 dB or by a separation distance not less than the sum of the distances to the associated radio horizon of each service volume, whichever is smaller. This provision shall be implemented on the basis of a regional air navigation agreement.

*Note 1.— Guidance material relating to the establishment of the minimum separation distance based on the desired to undesired signal protection ratio of 20 dB or 14 dB and radio line-of-sight is contained in ~~Attachment A~~ Part II of the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including Statement of Approved ICAO Policies (Doc 9718).*

*Note 2.— The application of the minimum separation distance based on the sum of the radio horizon distance of each facility assumes that it is highly unlikely that two aircraft will be at the closest points between and at the maximum altitude of the frequency protected service volume of each facility.*

~~4.1.5.2 In the case of those VHF facilities providing service beyond the radio horizon, except where there is an operational requirement for the use of common frequencies for groups of facilities, planning for co-channel operations shall be such that points at the protection heights and at the limits of the functional service area of each facility are separated by distances not less than the sum of distances from each point to its associated radio horizon.~~

*Note 3.— The distance to the radio horizon from a station in an aircraft is normally given by the formula:*

$$D = K \sqrt{h}$$

where D = distance in nautical miles;  
 h = height of the aircraft station above earth;  
 K = (corresponding to an effective earth's radius of 4/3 of the actual radius);  
 = 2.22 when h is expressed in metres; and  
 = 1.23 when h is expressed in feet.

*Note 24.— In calculating the radio line-of-sight distance between a ground station and an aircraft station, the distance from the radio horizon of the aircraft station computed from Note 1 must be added to the distance from the radio horizon of the ground station. In calculating the latter the same formula is employed, taking for h the height of the ground station transmitting antenna.*

*Note 35.— The ~~riterion~~ criteria contained in ~~4.1.5.2~~ 4.1.4.1 and 4.4.1.2 is ~~are~~ applicable in establishing minimum geographical separation between VHF facilities, with the object of avoiding*

*co-channel air-to-air interference. Guidance material relating to the establishment of separation distances between ground stations and between aircraft and ground stations for co-channel operations is contained in Section 3 of Attachment A—the ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including Statement of Approved ICAO Policies (Doc 9718). Guidance material relating to adjacent channel frequency deployment is contained in Section 2 of Attachment A.*

*Note 4.— Guidance material on the interpretation of 4.1.5.1 and 4.1.5.2 is contained in Attachment A.*

4.1.5.4.3 The geographical separation between facilities ~~working~~ operating on adjacent channels shall be such that points at the ~~protection heights and at the limit of the functional service range~~ edge of the frequency protected service volume of each facility are separated by a distance sufficient to ensure operations free from harmful interference.

*Note.— Guidance material covering separation distances and related system characteristics is contained in Attachment A—the ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including Statement of Approved ICAO Policies (Doc 9718).*

4.1.5.4.4 The protection height shall be a height above a specified datum associated with a particular facility, such that below it harmful interference is improbable.

4.1.5.4.5 The protection height to be applied to functions or to specific facilities shall be determined regionally, taking into consideration the following factors:

...

4.1.5.4.6 **Recommendation.**— *Where the ~~protection heights determined at~~ frequency protected service volume is less than those operationally desirable, separation between facilities operating on the same frequency should not be less than that necessary to ensure that an aircraft at the ~~limit~~ upper edge of the functional service range and the operationally desirable protection height frequency protected service volume of one facility does not come above the radio horizon with respect to adjacent facilities.*

*Note.— The effect of this recommendation is to establish a geographical separation distance below which harmful interference is probable.*

4.1.5.4.7 The geographical separation between VHF VOLMET stations shall be determined regionally and, ~~generally~~, shall be such that operations free from harmful interference are secured at the highest altitude flown by aircraft in the area concerned throughout the frequency protected service volume of each VOLMET station.

*Note.— Guidance material on the interpretation of 4.1.5.4.7 is contained in Attachment A—the ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including Statement of Approved ICAO Policies (Doc 9718).*

4.1.5.4.8 Frequencies in the aeronautical mobile VHF band 117.975 – 137.000 MHz used for national services, unless worldwide or regionally allotted to this specific purpose, shall be so deployed that ~~minimum~~ no harmful interference is caused to facilities for the international air services in this band.

~~4.1.5.4.9 **Recommendation.**— The problem of inter-State interference on frequencies allotted worldwide or on a regional basis to national services, should be resolved by consultation between the administrations States concerned.~~

~~4.1.5.4.10~~ The communication coverage provided by a VHF ground transmitter shall, in order to avoid harmful interference to other stations, be kept to the minimum consistent with the operational requirement for the function.

~~4.1.5.11 **Recommendation.**— For ground VHF facilities which provide service beyond the radio horizon, any spurious or harmonic radiation outside the band  $\pm 250$  kHz from the assigned carrier frequency should not exceed an effective radiated power of 1 mW in any azimuth.~~

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*Delete Section 4.1.6 in its entirety*

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#### 4.1.7.5 Method of operation

4.1.7.5.1 Single channel simplex operation shall be used in the VHF frequency band 117.975 – 137.000 MHz at all stations providing service for aircraft engaged in international air navigation.

4.1.7.5.2 In addition to the above, the ground-to-air voice channel associated with an ICAO standard radio navigational aid may be used, subject to regional agreement, for broadcast or communication purposes or both.

#### 4.1.8.6 Plan of assignable VHF radio frequencies for use in the international aeronautical mobile service

##### *Introduction*

*This plan designates the list of frequencies available for assignment, together with provision for the use by the aeronautical mobile (R) service of all frequencies with a channel spacing of 25 kHz, and of all frequencies with a channel width and spacing of 8.33 kHz, with the frequencies in Group A continuing to be used wherever they provide a sufficient number to meet the operational requirements.*

*The plan provides that the total number of frequencies required in any region would be determined regionally. The effect of this will be that frequencies assignable in any particular region may be restricted to a limited number of the frequencies in the list, the actual number being selected as outlined herein.*

*In order that the assignable frequencies may be coordinated between regions as far as practicable, the plan requires that, whenever the number of frequencies contained in Group A of 4.1.8.1.2 is sufficient to meet the requirements of a region, the frequencies of this Group be used in a sequence commencing with 118 MHz. This ensures that all regions will have in common the frequencies used in the region requiring the least number of frequencies and, in respect to any two regions, the region with the greater number will have in use all the frequencies used by the other.*

*Group A provides for frequency planning based on 100 kHz channel spacing.*

*Group B of the list at 4.1.8.1.2 contains the frequencies in the band 117.975—132 MHz ending in 50 kHz. Together with the frequencies in Group A, they provide for frequency planning based on 50 kHz channel spacing. In Group C are listed the frequency channels in the band 132—137 MHz based upon 50 kHz channel spacing. Group D contains the frequency channels in the band 132—137 MHz ending in 25 kHz, and Group E similarly lists the frequency channels in the band 117.975—132 MHz. The utilization of channels in Groups B, C, D and E is explained below.*

*Group F of the list at 4.1.8.1.2 contains the frequencies in the band 117.975—137 MHz when 8.33 kHz channel width is used. The utilization of the channels in this Group is explained below.*

*Whenever the number of frequencies required in a particular region exceeds the number in Group A, frequencies may be selected from the other Groups taking into account the provisions of 4.1.8.1 with respect to the use of channels based on 25 kHz channel spacing and, with regard to the band 132—137 MHz, the provisions of the Radio Regulations (see Introduction to 4.1). Although for Groups B, C, D and E a preferred order of selection is not indicated, regional planning may require a particular selection of frequencies from these Groups in order to cater for specific regional circumstances. This may apply particularly to the utilization of frequencies from the band 132—137 MHz for reasons of available airborne equipment and/or availability of particular frequency channels for the aeronautical mobile (R) service. It may also be found that, in a particular region, it is desirable to select frequencies from Group B first, before selecting frequencies from Groups C, D or E.*

*Where all the channels of Groups A, B, C, D and E of the list at 4.1.8.1.2 are insufficient to meet the requirements of a region, a part or parts of the band may be designated as containing 8.33 kHz width channels or designated as supporting VDL Mode 3. For parts of the band containing 8.33 kHz width channels, the appropriate frequencies from Group F should be used in accordance with 4.1.8.1.1.1 and 4.1.8.1.2. It should be noted that the designation of frequencies in Group F differs from that of the corresponding frequencies in Groups A to E to emphasize the difference in channel width. For part of the bands supporting VDL Mode 3, frequencies from Groups A, B, C, D and E are utilized on a time division basis. A single frequency supports multiple channels, each utilizing the frequency in periodic time frames or time slots. Specific time slots for VDL Mode 3 are identified using the numeric designators of Table 4-1 (bis).*

*Although for Group F a preferred order of selection is not indicated, regional planning may require a particular selection of frequencies from this group in order to cater for specific regional circumstances.*

*In many regions particular frequencies have already been assigned~~allotted~~ for particular functions as, for instance, aerodrome or approach control. The plan does not make such assignments~~allotments~~ (except in respect to the emergency channel and ground service frequencies as provided for in 4.1.1.1), such action being taken regionally if considered desirable.*

4.1.8.6.1 The frequencies in the frequency band 117.975 – 137.000 MHz for use in the aeronautical mobile (R) service shall be selected from the list lists in 4.1.8.6.1.2.

4.1.8.1.1—When the number of frequencies required in a particular region does not exceed the number of frequencies contained in Group A of 4.1.8.1.2, the frequencies to be used shall be selected in sequence, in so far as practicable, from those in Group A of 4.1.8.1.2.

4.1.8.1.1.1—When the number of frequencies required in a particular region exceeds those available in Groups A to E of 4.1.8.1.2, parts of the band shall be designated as containing 8.33 kHz width channels



~~(voice) or as containing VDL Mode 3. Appropriate frequencies shall be selected from Group F of 4.1.8.1.2 for 8.33 kHz channel assignments or from Groups A to E in accordance with the time slot assignments in accordance with Table 4-1 (bis) for VDL Mode 3. The remainder of the band shall continue to be used for 25 kHz width channels selected from the appropriate parts of Groups A to E.~~

*Note 1.— The frequencies ~~121.425—121.575 MHz inclusive, 123.075—123.125 MHz inclusive and 136.500 – 136.975 MHz inclusive~~ are not available for assignment to channels of less than 25 kHz width.*

*Note 2.— Services that continue operation using 25 kHz assignments will be protected in regions implementing 8.33 kHz channel spacing.*

#### 4.1-8.6.1.2 List of assignable frequencies

The list of assignable frequencies is shown in the Appendix to this chapter.

##### List A – assignable frequencies in regions or areas where 25 kHz frequency assignments are deployed

118.000 – 121.450 MHz in 25 kHz steps  
 121.550 – 123.050 MHz in 25 kHz steps  
 123.150 – 136.975 MHz in 25 kHz steps

##### List B – assignable frequencies in regions or areas where 8.33 kHz frequency assignments are deployed

118.000 – 121.450 MHz in 8.33 kHz steps  
 121.550 – 123.050 MHz in 8.33 kHz steps  
 123.150 – 136.475 MHz in 8.33 kHz steps

4.1-8.6.1.3 **Recommendation.**— *Frequencies for operational control communications may be required to enable aircraft operating agencies to meet the obligations prescribed in Annex 6, Part I, in which case they should be selected from ~~the a dedicated band~~ bands ~~128.825—132.025 MHz~~ which is determined regionally. These frequencies should be chosen, in so far as practicable, from the upper end of the band and in sequential order.*

*Note.— It is recognized that the assignment of such frequencies and the licensing of the operation of the related facilities are matters for national determination. However, in regions where a problem exists with respect to the provision of frequencies for operational control purposes, it may be advantageous if States endeavour to coordinate the requirements of aircraft operating agencies for such channels prior to regional meetings.*

4.1-8.6.2 The frequencies that may be allotted for use in the aeronautical mobile (R) service in a particular region shall be limited to the number determined as being necessary for operational needs in the region.

*Note.— The number of frequencies required in a particular region is normally determined by the Council on the recommendations of Regional Air Navigation Meetings. ~~The capabilities of VHF airborne equipment known to be widely used in the region will be taken into account in this determination.~~*

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*Delete the Appendix to Chapter 4 and Attachment A in their entirety.*

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**ATTACHMENT D** to State letter AN 7/1.3.99-12/33

**RATIONALE FOR THE PROPOSED AMENDMENT TO ANNEX 10,  
VOLUME III, PART I**

<b>Reference</b>	<b>Rationale</b>
Chapter 3, 3.4.1, Note 1.	Encourage implementation of ATN/IPS while indicating that ATN/OSI remains a supported standard. OSI is being superseded by IPS. IPS is expected to remain the accepted industry standard for digital interconnectivity for years to come.
Chapter 6, 6.9.2.1.2, Note and Table 6-5	Bring SARPs for VDL Mode 4 in line with updates made to the ITU Radio Regulations during the ITU World Radiocommunication Conferences 2007 and 2012 (WRC-07 and WRC-12).
Chapter 6, 6.9.3.1 and Note	Reflect the current capability of the VDL Mode 4 data link subnetwork supporting ATN/IPS.

**RATIONALE FOR THE PROPOSED AMENDMENT TO ANNEX 10, VOLUME V**

<b>Reference</b>	<b>Rationale</b>
Chapter 2, Introduction; Chapter 3, Introduction	Editorial amendments and amendments to reflect the current status of the ITU Radio Regulations.
Chapter 2, 2.1	The amendments are a result of provisions that have expired. Additional comment: References to ELT use at 121.5 MHz have been deleted from the ITU Radio Regulations (RR).
Chapter 4, 4.1	<p>General introduction added to the section referring to the new Part II of Doc 9718 which contains all relevant material for spectrum and frequency management.</p> <p>Historical references deleted as they do not add anything that may be relevant to the SARPs contained in Section 4.1.</p> <p>New proposed subparagraph e) caters to requirements in certain regions to develop a methodology different from the one contained in Doc 9718. Doc ICAO EUR 011 is such an example.</p>
Chapter 4, 4.1.1, 4.1.1.1, 4.1.1.2 and Table 4-1	<p>The allotment table is proposed to be updated, reflecting reduced guard band around 121.500 MHz; editorial corrections have been added.</p> <p>As for the band 136 – 137 MHz, 4.1.1.2 is outdated and incorrect.</p>
Chapter 4, 4.1.2	<p>Paragraph 4.1.2.3 has been moved to the front of section: Provides the frequency limits and belongs to the top level of this section.</p> <p>Note under 4.1.2.4.2: There is no longer a requirement to support equipment</p>

Reference	Rationale
	<p>capable only of channel spacing greater than 25kHz.</p> <p>Provisions in 4.1.2.2, 4.1.2.2.2 and 4.1.2.2.4 have time expired. Inclusion in SARPs should be sufficient evidence that a system is approved by ICAO and is available for use either on a global or a regional basis.</p> <p>4.1.2.2.3.4: VDL Mode 2 should also be mentioned in this context.</p>
Chapter 4, 4.1.3	<p>Note 2: The ITU Radio Regulations (RR) Appendix 13 has been suppressed.</p> <p>Paragraph 4.1.3.3: 136.975 MHz is applicable to VDL Mode 2 only.</p> <p>New 4.1.3.3.2 provides for specific frequencies to be used as common signalling channels (CSC) for VDL Mode 4, only in those areas within which VDL Mode 4 is implemented. These CSC's are essential for the functioning of the VDL Mode 4 network. Two CSC's (one in the band 136 – 137 MHz and one in the band 112 – 117.975 MHz) are required to provide redundancy in case one frequency is interfered.</p> <p>A new proposed Note under 4.1.3.4.2 makes reference to a specific function of the frequency 123.100 MHz, as defined in the ITU RR and corresponds to a similar Note under 4.1.3.1.1.</p>
Chapter 4, 4.1.5	<p>Consequential to the proposed deletion of Attachment A, all references to Attachment A in notes are proposed to be deleted.</p> <p>Updates to 4.1.5.1 and the new 4.1.5.2 are editorial and provide clear and precise language to describe the relevant separation criteria.</p> <p>A new proposed Note 2 following 4.1.4.2 provides further clarification of the assumed worst case scenario.</p> <p>Previous 4.1.5.2 and 4.1.5.11 are assumed to refer to extended range facilities using troposcatter propagation. Currently extended range facilities are implemented using either landline or very small aperture terminal (VSAT) links to connect to the remote transmitter/receiver. Hence these provisions can be deleted.</p> <p>4.1.5.3, 4.1.5.6, 4.1.5.7 and 4.1.5.8, editorial clarification.</p> <p>4.1.5.9, all interference to be resolved by consultation between the States concerned. The word “administrations” in ITU terminology refers to radio regulatory authorities within States only. The proposed modification brings coordination in a wider context and may include both radio regulatory and civil aviation authorities.</p>

Reference	Rationale
Chapter 4, 4.1.6, 4.1.7 <del>5</del>	<p>Equipment requirements, including frequency stability and unwanted or spurious emission levels for air/ground communication systems (voice and data) are contained in Annex 10, Volume III. Section 4.1.6 can be deleted.</p> <p>Section 4.1.7 has been renumbered as 4.1.5. Editorial updates have been made to Section 4.1.7<del>5</del>.</p>
Chapter 4, 4.1.8 <del>6</del> and Appendix A	<p>Section 4.1.8 has been renumbered as 4.1.6.</p> <p>There is no longer any requirement to support equipment only capable of 100 kHz or 50 kHz channels spacing, hence these channel groups can be eliminated. As a result, simplified lists for 25 kHz channels and 8.33 kHz channels are proposed as a replacement for the list previously contained in the Appendix to Chapter 4. Other amendments are editorial. Since the lists with assignable frequencies have been incorporated in 4.1.8<del>6</del>.1.2, Appendix A can be deleted.</p>
Attachment A	<p>According to current guidelines for SARPs, the guidance material contained in Attachment A may be moved to a separate manual. This material is already contained in the draft new Part II of Doc 9718, available here:</p> <p><a href="http://legacy.icao.int/anb/panels/acp/repository/Doc9718_DraftPartII_Nov2011.zip">http://legacy.icao.int/anb/panels/acp/repository/Doc9718_DraftPartII_Nov2011.zip</a></p>

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ATTACHMENT E to State letter AN 7/1.3.99-12/33

**RESPONSE FORM TO BE COMPLETED AND RETURNED TO ICAO  
TOGETHER WITH ANY COMMENTS YOU MAY HAVE ON THE  
PROPOSED AMENDMENTS**

To: The Secretary General  
International Civil Aviation Organization  
999 University Street  
Montréal, Quebec  
Canada, H3C 5H7

(State) \_\_\_\_\_

Please make a checkmark (✓) against one option for each amendment. If you choose options “agreement with comments” or “disagreement with comments”, **please provide your comments on separate sheets.**

	<i>Agreement without comments</i>	<i>Agreement with comments*</i>	<i>Disagreement without comments</i>	<i>Disagreement with comments</i>	<i>No position</i>
Amendment Annex 10 — <i>Aeronautical Telecommunications</i> , Volume III — <i>Communication Systems</i> , Part I — <i>Digital Data Communication Systems</i> (Attachment B refers)					
Amendment Annex 10 — <i>Aeronautical Telecommunications</i> , Volume V — <i>Aeronautical Radio Frequency Spectrum Utilization</i> . (Attachment C refers)					

\* “Agreement with comments” indicates that your State or organization agrees with the intent and overall thrust of the amendment proposal; the comments themselves may include, as necessary, your reservations concerning certain parts of the proposal and/or offer an alternative proposal in this regard.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

— END —