



Republic of the Philippines
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES

MEMORANDUM CIRCULAR NO.: 007-17

TO : ALL CONCERNED

FROM : THE DIRECTOR GENERAL

**SUBJECT : AMENDMENT TO PHILIPPINE CIVIL AVIATION
REGULATIONS - AIR NAVIGATION SERVICES (CAR-ANS)
PART 13 INCORPORATING AMENDMENT 88 TO ICAO
ANNEX 10 VOLUME V**

REFERENCE:

1. Philippine Civil Aviation Regulations- Air Navigation Services Part 13, Aeronautical Telecommunication, Aeronautical Radio Frequency Spectrum Utilization
2. ICAO Annex 10 Volume V; Amendment 88
3. Regulations Amendment Procedures (RAP)
4. Board Resolution No. 2012-054 dated 28 September 2012

Pursuant to the powers vested in me under the Republic Act 9497, otherwise known as the Civil Aviation Authority Act of 2008 and in accordance with the Board Resolution No.: 2012-054 dated 28 September 2012, I hereby approve the incorporation of ICAO Annex 10 Volume V Amendment No. 88 to the Philippine Civil Aviation Regulations – Air Navigation Services (CAR-ANS) Part 13.

ORIGINAL REGULATIONS:

CAR-ANS PART 13

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13.1. DEFINITIONS

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Frequency channel. A continuous portion of the frequency spectrum appropriate for a transmission utilizing a specified class of emission.

Note.- The classification of emissions and information relevant to the portion of the frequency spectrum appropriate for a given type of transmission (bandwidths) are specified in the Radio Regulations, Article S2 and Appendix S1.

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13.2 DISTRESS FREQUENCIES

Introduction

Note. — ITU Radio Regulations Article S30 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 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 that the frequency 2 182 kHz is the international distress frequency for radiotelephony to be used for that purpose 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 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 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 and Appendix S13) 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.

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, 121.5 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 MHz and 235 – 328.6 MHz respectively (RR Appendix S13, Part A2).

13.2.1 Frequencies for emergency locator transmitters (ELTs) for search and rescue

13.2.1.1 Until 1 January 2005 emergency locator transmitters carried in compliance with the Philippine Civil Aviation Regulations (PCAR) Part 8 shall operate either on both 406 MHz and 121.5 MHz or on 121.5 MHz.

13.2.1.2 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 121.5 MHz.

13.2.1.3 From 1 January 2005, emergency locator transmitters carried in compliance with the Philippine Civil Aviation Regulations (PCAR) Part 8 shall operate on both 406 MHz and 121.5 MHz.

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

Note 2.— Specifications for ELTs are found in CAR-ANS Part 8, Section 8.5.

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13.3. 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 55 of the ITU Radio Regulations. The utilization of these bands are in accordance with the relevant provisions of 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 527 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.

13.3.1 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.

13.3.1.2 Assignment of single sideband channels

13.3.1.2.1 Single sideband channels will be assigned in accordance with CAR-ANS Part 8, Section 8.2.4.

13.3.1.2.2 For the operational use of the channels the Civil Aviation Authority of the Philippines (CAAP) will take into account the provisions of S27/19 of Appendix S27 of the ITU Radio Regulations.

13.3.1.2.3 The use of aeronautical mobile (R) frequencies below 30 MHz for international operations shall be coordinated as specified in Appendix S27 of the ITU Radio Regulations as follows:

S27/19 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.

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

S27/20 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 relates to Interference Range Contours, and application of the procedure results in a protection ratio of 15 dB.

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

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

S27/12 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 and S27/74).

S27/14 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 The use of channels derived from the frequencies indicated in S27/18 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.

13.3.1.3 Assignment of frequencies for aeronautical operational control communications

13.3.1.3.1 Worldwide frequencies for aeronautical operational control communications are required to enable aircraft operating agencies to meet the obligations prescribed in the Philippine Civil Aviation Regulations (PCAR) Part 8. Assignment of these frequencies shall be in accordance with the following provisions of Appendix S27:

S27/9 A world-wide 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.*

Note 1.— Tables S27/213 and S27/218 to S27/231 appearing in Appendix S27 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 materials on the assignment of worldwide frequencies is contained in Attachment C.

13.3.2 NDB frequency management

13.3.2.1 NDB frequency management shall take into account the following:

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- d) the possibility of interference from spurious radiation generated by non-aeronautical sources (e.g. electric power services, power line communication systems, industrial radiation, etc.).

Note 1.— Guidance material to assist in determining the application of the foregoing is given in Attachment B.

Note 2.— Attention is drawn to the fact that some portions of the bands available for aeronautical beacons are shared with other services.

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13.4 UTILIZATION OF FREQUENCIES ABOVE 30 MHz

13.4.1 Utilization in the band 117.975 – 137 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 deals with Standards and Recommended Practices relating to this band and includes matters pertaining to the selection of particular frequencies for various aeronautical purposes. These Standards are introduced by the following preface, which sets out the principles upon which the utilization of VHF on a worldwide basis with due regard to economy has been planned.

Preface

The utilization of VHF on a nationwide 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 framework for the integrated development of Regional Plans;*
- e) *the desirability of incorporating in any group of frequencies to be used those now in use for international air services;*
- f) *the need for keeping the total number of frequencies and their grouping in appropriate relation to the airborne equipment known to be widely used by international air services;*
- g) *a requirement for the provision of a single frequency that may be used for emergency purposes on a worldwide basis and, also, in certain regions, for another frequency that maybe used as a common frequency for special purposes; and*
- h) *the need for providing sufficient flexibility to allow for the differences in application necessitated by regional conditions.*

13.4.1.1 General allotment of frequency band 117.975 – 137 MHz

Note.— The plan includes a general Allotment Table that subdivides the complete band 117.975 – 137 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.

13.4.1.1.1 The block allotment of the frequency band 117.975 – 137 MHz will be as shown in Table 13.4-1.

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

13.4.1.2 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.

13.4.1.2.1 The minimum separation between assignable frequencies in the aeronautical mobile (R) service will 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.

13.4.1.2.2 Until at least 1 January 2005, DSB-AM equipment specifically designed for 25 kHz channel spacing will be safeguarded with respect to its suitability for the aeronautical mobile (R) service (AM(R)S) except in those 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.

13.4.1.2.2.1 Requirements for mandatory carriage of equipment specifically designed for 8.33 kHz channel spacing will 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.

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

13.4.1.2.2.3 Requirements for mandatory carriage of equipment specifically designed for VDL Mode 3 and VDL Mode 4 will 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.

13.4.1.2.2.3.1 The agreement indicated in 13.4.1.2.2.3 will provide at least two years' notice of mandatory carriage of airborne systems.

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

Table 13.4-1. Allotment table

<i>Block allotment of frequencies (MHz)</i>	<i>Worldwide utilization</i>	<i>Remarks</i>
a) 118 – 121.4 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 13.7.1.5.9.
b) 121.5	Emergency frequency	In order to provide a guard band for the protection of the aeronautical emergency frequency, the nearest assignable frequencies on either side of 121.5 MHz are 121.4 MHz and 121.6 MHz, except that by regional agreement it may be decided that the nearest assignable frequencies are 121.3 MHz and 121.7 MHz.
c) 121.6 – 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 – 123.05 inclusive	National Aeronautical Mobile Services	Reserved for national allotments.
e) 123.1 Auxiliary frequency	SAR	See 13.7.1.4.1.
f) 123.15 – 123.6917 inclusive	National Aeronautical Mobile Services	Reserved for national allotments, with the exception of 123.45 MHz which is also used as the worldwide air-to-air communications channel (see g)).
g) 123.45	Air-to-air communications	Designated for use as provided for in 13.7.1.3.2.1.
h) 123.7 – 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 13.7.1.5.9.
i) 129.7 – 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 13.7.1.8.1.3.

j) 130.9 – 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 13.7.1.5.9. (See the Introduction to 13.7.1 regarding the band 132 – 137 MHz.)
k) 136.9 – 136.975 inclusive	International and National Aeronautical Mobile Services	Reserved for VHF air-ground data link communications.

13.4.1.2.3 In the band 117.975 – 137 MHz, the lowest assignable frequency will be 118 MHz and the highest 136.975 MHz.

13.4.1.2.4 In regions where 25 kHz channel spacing (DSBAM 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 will conform to the channel contained in Table 13.4-1 (bis).

Note.— Table 13.4-1 (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.

13.4.1.3 Frequencies used for particular functions

13.4.1.3.1 Emergency channel

13.4.1.3.1.1 The emergency channel (121.5 MHz) will be used only for genuine emergency purposes, as broadly outlined in the following:

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- 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 121.5 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 Radio Regulations make provisions that the aeronautical emergency frequency 121.5 MHz may also be used by mobile stations of the maritime mobile service, using A3E emission to communicate on this frequency for safety purposes with stations of the aeronautical mobile service (RR S5.200 and Appendix S13, Part A2).

13.4.1.3.1.2 The frequency 121.5 MHz will 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 121.5 MHz at one would meet the requirement.

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.

Note.— *Guidance material relating to the establishment of the minimum separation distance based on the desired to undesired signal protection ratio of 14 dB is contained in Attachment A.*

13.4.1.5.2 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 will 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 1.— *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 2.— *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 3.— *The criterion contained in 13.4.1.5.2 is 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. Guidance material relating to adjacent channel frequency deployment is contained in Section 2 of Attachment A.*

Note 4.— *Guidance material on the interpretation of 13.4.1.5.1 and 13.4.1.5.2 is contained in Attachment A.*

13.4.1.5.3 The geographical separation between facilities working on adjacent channels will be such that points at the protection heights and at the limit of the functional service range 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.*

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

13.4.1.3.1.3 The frequency 121.5 MHz will be available to intercept control units where considered necessary for the purpose specified in 13.4.1.3.1.1 f).

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

13.4.1.3.1.5 The emergency channel will be guarded on a single channel simplex operation basis.

13.4.1.3.1.6 The emergency channel (121.5 MHz) will be available only with the characteristics as contained in CAR-ANS Part 8, Section 8.2.

Table 13.4-1 (bis). Channelling/frequency pairing

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13.4.1.3.2 *Air-to-air communications channel*

13.4.1.3.2.1 An air-to-air VHF communications channel on the frequency of 123.45 MHz will 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.

13.4.1.3.2.2 In remote and oceanic areas out of range of VHF ground stations, the air-to-air VHF communications channel on the frequency 123.45 MHz will be available only with the characteristics as contained in CAR-ANS Part 8, Section 8.2.

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

13.4.1.4 Auxiliary frequencies for search and rescue operations

13.4.1.4.1 Where a requirement is established for the use of a frequency auxiliary to 121.5 MHz, as described in 13.4.1.3.1.1 c), the frequency 123.1 MHz will be used.

13.4.1.4.2 The auxiliary search and rescue channel (123.1 MHz) will be available only with the characteristics as contained in CAR-ANS Part 8, Section 8.2.

13.4.1.5 Provisions concerning the deployment of VHF frequencies and the avoidance of harmful interference

13.4.1.5.1 In the case of those VHF facilities providing service up to the radio horizon, the geographical separation between facilities working on the same frequency will, 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 will be implemented on the basis of a regional

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

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13.4.1.5.6 Where the protection heights determined are less than those operationally desirable, separation between facilities operating on the same frequency shall not be less than that necessary to ensure that an aircraft at the limit of the functional service range and the operationally desirable protection height 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.

13.4.1.5.7 The geographical separation between VHF VOLMET stations will be determined regionally and, generally, will be such that operations free from harmful interference are secured at the highest altitude flown by aircraft in the area concerned.

Note.— Guidance material on the interpretation of 13.3.1.5.7 is contained in Attachment A.

13.4.1.5.8 Frequencies in the aeronautical mobile VHF band used for national services, unless worldwide or regionally allotted to this specific purpose, will be so deployed that minimum interference is caused to facilities for the international air services in this band.

13.4.1.5.9 The problem of inter-State interference on frequencies allotted worldwide or on a regional basis to national services, shall be resolved by consultation between the administrations concerned.

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

13.4.1.5.11 For ground VHF facilities which provide service beyond the radio horizon, any spurious or harmonic radiation outside the band ± 250 kHz from the assigned carrier frequency shall not exceed an effective radiated power of 1 mW in any azimuth.

13.4.1.6 Equipment requirements

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13.4.1.7 Method of operation

13.3.1.7.1 Single channel simplex operation will be used in the VHF band 117.975 – 137 MHz at all stations providing for aircraft engaged in international air navigation.

13.4.1.7.2 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.

13.4.1.8 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 13.4.1.8.1.2 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 13.4.1.8.1.2 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 13.4.1.8.1.2 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 13.4.1.8.1 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 13.4.1). 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 13.4.1.8.1.2 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 shall be used in accordance with 13.4.1.8.1.1.1 and 13.4.1.8.1.2. It shall 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 13.4-1 (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 for particular functions as, for instance, aerodrome or approach control. The plan does not make such assignments (except in respect to the emergency channel and ground service frequencies), such action being taken regionally if considered desirable.

13.4.1.8.1 The frequencies in the band 117.975 – 137 MHz for use in the aeronautical mobile (R) service will be selected from the list in 13.4.1.8.1.2.

13.4.1.8.1.1 When the number of frequencies required does not exceed the number of frequencies contained in Group A of 13.4.1.8.1.2, the frequencies to be used will be selected in sequence, in so far as practicable, from those in Group A of 13.4.1.8.1.2.

13.4.1.8.1.1.1 When the number of frequencies required exceeds those available in Groups A to E of 13.4.1.8.1.2, parts of the band will be designated as containing 8.33 kHz width channels (voice) or as containing VDL Mode 3. Appropriate frequencies will be selected from Group F of 13.4.1.8.1.2 for 8.33 kHz channel assignments or from Groups A to E in accordance with the time-slot assignments in accordance with Table 13.4-1 (bis) for VDL Mode 3. The remainder of the band will 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.

13.4.1.8.1.2 List of assignable frequencies

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

13.4.1.8.1.3 Frequencies for operational control communications may be required to enable aircraft operating agencies to meet the obligations prescribed in the Philippine Civil Aviation Regulations (PCAR) Part 8, in which case they shall be selected from the bands 128.825 – 132.025 MHz. These frequencies shall 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.

13.4.1.8.2 The frequencies that may be allotted for use in the aeronautical mobile (R) service will 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.

...

APPENDIX TO CHAPTER 13.4 LIST OF ASSIGNABLE FREQUENCIES

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ATTACHMENT 13A. CONSIDERATIONS AFFECTING THE DEPLOYMENT OF VHF COMMUNICATION FREQUENCIES

...

ATTACHMENT 13B. CONSIDERATIONS AFFECTING THE DEPLOYMENT OF LF/MF FREQUENCIES AND THE AVOIDANCE OF HARMFUL INTERFERENCE

...

ATTACHMENT 13C. GUIDING PRINCIPLES FOR LONG DISTANCE OPERATIONAL CONTROL COMMUNICATIONS

...

4. The licences should be issued on a one time basis and regular inspection/evaluation and, pursuant to RR S4.11 and in accordance with RR S43.4, should prohibit “public correspondence”, or point-to-point type traffic, or other communications traffic not meeting the definition of operational control communications.

5. VHF (general purpose or AOC channels) and not HF should be used when an aircraft is within the coverage of an appropriate VHF aeronautical station.

Note.— The specific categories of messages that may be handled on aeronautical mobile (R) service channels are prescribed in Administrative Order governing Communications Procedures including those with Provisions of Air Navigation Service (PANS) status Chapter 5, 5.1.8. The same chapter defines the standard communications procedures for the service including the requirements for maintaining watch in Administrative Order governing Communications Procedures including those with Provisions of Air Navigation Service (PANS) status Chapter 5, 5.2.2. In accordance with RR S18.6 of the ITU Radio Regulations, licences should define the purpose of the station for aeronautical operational control and should specify the general characteristics in accordance with Appendix S27 of the Radio Regulations.

AMENDED REGULATIONS:

CAR-ANS PART 13

...

13.1. DEFINITIONS

...

Frequency channel. A continuous portion of the frequency spectrum appropriate for a transmission utilizing a specified class of emission.

Note. —The classification of emissions and information relevant to the portion of the frequency spectrum appropriate for a given type of transmission (bandwidths) are specified in the Radio Regulations, Article 2 and Appendix 1.

...

13.2 DISTRESS FREQUENCIES

Introduction

The ITU Radio Regulations Article 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 Article 30, Section III, No. 30.9 to conform to special arrangements between governments where these have been agreed. ICAO Annexes constitute such agreements.

...

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 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 Article 31, Section I, 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 5.130 and 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 5.115.

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 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).

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

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

...

13.4.1.4.6 Where protected service volume is less than those operationally desirable, separation between facilities operating on the same frequency shall not be less than that necessary to ensure that an aircraft at the upper edge of the operational service volume of one facility does not come above the radio horizon with respect to emissions belonging to the service of adjacent facilities.

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

13.4.1.4.7 The geographical separation between VHF VOLMET stations shall be determined regionally and, generally, will be such that operations free from harmful interference are secured at the highest altitude flown by aircraft in the area concerned.

Note.— Guidance material on the interpretation of 4.14.7 is contained in the ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including Statement of Approved ICAO Policies (Doc 9718).

13.4.1.4.8 In the frequency band 117.975–137.000 MHz, the frequencies used for National Aeronautical Mobile Services, unless worldwide or regionally allotted to this specific purpose, shall be so deployed that no harmful interference is caused to facilities in the International Aeronautical Mobile Services.

13.4.1.4.9 The problem of inter-State interference shall be resolved by consultation between the States concerned.

13.4.1.4.10 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.

13.4.1.5.11 For ground VHF facilities which provide service beyond the radio horizon, any spurious or harmonic radiation outside the band ± 250 kHz from the assigned carrier frequency shall not exceed an effective radiated power of 1 mW in any azimuth.

13.4.1.5 Method of operation

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

13.4.1.5.2 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.

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

13.2.1 Frequencies for emergency locator transmitters (ELTs) for search and rescue

13.2.1.1 All emergency locator transmitters carried in compliance with PCAR Part 7 and CAR-ANS Part 8 shall operate on both 406 MHz and 121.500 MHz.

Note 1.— ITU Radio Regulations (5.256) provide for the use of 243 MHz in addition to the above frequencies.

Note 2.— Specifications for ELTs are found in CAR-ANS Part 8, Section 8.5.

...

13.3. 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 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. 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.

13.3.1 Method of operations

13.3.1.1 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.

13.3.1.2 Assignment of single sideband channels

13.3.1.2.1 Single sideband channels will be assigned in accordance with CAR-ANS Part 8, Section 8.2.4.

13.3.1.2.2 For the operational use of the channels the Civil Aviation Authority of the Philippines (CAAP) will take into account the provisions of 27/19 of Appendix 27 of the ITU Radio Regulations.

13.3.1.2.3 The use of aeronautical mobile (R) frequencies below 30 MHz for international operations shall be coordinated as specified in Appendix 27 of the ITU Radio Regulations as follows:

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 shall be consulted in all appropriate cases in the operational use of the frequencies in the Plan.

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

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 27 relates to Interference Range Contours, and application of the procedure results in a protection ratio of 15 dB.

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.

27/22 The co-ordination described in No.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.27/21 are unsatisfactory.

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

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. 27/73 and 27/74).

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

27/15 The use of channels derived from the frequencies indicated in 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.

13.3.1.3 Assignment of frequencies for aeronautical operational control communications

13.3.1.3.1 Worldwide frequencies for aeronautical operational control communications are required to enable aircraft operating agencies to meet the obligations prescribed in the Philippine Civil Aviation Regulations (PCAR) Part 8. Assignment of these frequencies shall be in accordance with the following provisions of Appendix 27:

27/9 A world-wide 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.*

27/217 The worldwide frequency allotments appearing in the tables at No.27/213 and Nos. 27/218 to 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.

Note 1.— Tables 27/213 and 27/218 to 27/231 appearing in Appendix 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 B.

** "The type of communications referred to in 27/9 may be regulated by administrations"*

13.3.2 NDB frequency management

13.3.2.1 NDB frequency management shall take into account the following:

...

- d) the possibility of interference from spurious radiation generated by non-aeronautical sources (e.g. electric power services, power line communication systems, industrial radiation, etc.).

Note 1.— Guidance material to assist in determining the application of the foregoing is given in Attachment A.

Note 2.— Attention is drawn to the fact that some portions of the bands available for aeronautical beacons are shared with other services.

...

13.4 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).

13.4.1 Utilization in the band 117.975 – 137 MHz

Introduction

Section 13.4.1 deals with Standards and Recommended Practices (SARPs) relating to the use of the frequency band 117.975 – 137.000 MHz and includes matters pertaining to the selection of particular frequencies for various aeronautical purposes. These SARPs are introduced by the following preface, which sets out the principles upon which the utilization of this frequency band on a worldwide basis with due regard to economy is being planned.

Preface

The utilization of 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:

...

- d) *the need for providing a global framework for the 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;*
- f) *the desirability of incorporating in any group of frequencies to be used those now in use for international air services;*
- g) *the need for keeping the total number of frequencies and their grouping in appropriate relation to the airborne equipment known to be widely used by international air services;*
- h) *a requirement for the provision of a single frequency that may be used for emergency purposes on a worldwide basis and, also, in certain regions, for another frequency that maybe used as a common frequency for special purposes; and*
- i) *the need for providing sufficient flexibility to allow for the differences in application necessitated by regional conditions.*

13.4.1.1 General allotment of frequency band 117.975 – 137 MHz

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

13.4.1.1.1 The block allotment of the frequency band 117.975 – 137 MHz will be as shown in Table 13.4-1.

13.4.1.2 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.

13.4.1.2.1 In the frequency band 117.975 – 137.000 MHz, the lowest assignable frequency shall be 118.000 MHz and the highest 136.975 MHz.

13.4.1.2.2 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, 25 kHz channel spacing provides an adequate number of frequencies suitably related to international and national air services and that equipment designed specifically for 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.

13.4.1.2.3 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.

Table 13.4-1. 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 13.4.1.4.8 and 13.4.1.4.9.
b) 121.500	Emergency frequency	See 13.4.1.3.1. 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 121.550 MHz.
c) 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 13.4.1.4.8 and 13.4.1.4.9.
e) 123.100	Auxiliary frequency SAR	See 13.4.1.3.4. 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 an air-to-air communications channel (see g)). National assignments are covered by the provisions of 13.4.1.4.8 and 13.4.1.4.9.
g) 123.450	Air-to-air communications	Designated for use as provided for in 13.4.1.3.2.
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 13.4.1.4.8 and 13.4.1.4.9.
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 13.4.1.6.1.2.
j) 130.900 – 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 13.4.1.4.8 and 13.4.1.4.9.
k) 136.900 – 136.975 inclusive	International and National Aeronautical Mobile Services	Reserved for VHF air-ground data link communications.

13.4.1.2.4 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.

13.4.1.2.4.1 The agreement indicated in 13.4.1.2.4 shall provide at least two years' notice of mandatory carriage of airborne systems.

13.4.1.2.5 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 13.4-1 (bis).

Note.— Table 13.4-1 (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.

13.4.1.3 Frequencies used for particular functions

13.4.1.3.1 Emergency channel

13.4.1.3.1.1 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 ITU Radio Regulations (RR 5.200) permit the use of the aeronautical emergency frequency 121.500 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.

13.4.1.3.1.2 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 13.4.1.3.1.1.

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

13.4.1.3.1.3 The frequency 121.5 MHz will be available to intercept control units where considered necessary for the purpose specified in 13.4.1.3.1.1 f).

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

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

13.4.1.3.1.6 The emergency channel (121.500 MHz) will be available only with the characteristics as contained in CAR-ANS Part 8, Section 8.2. (25 kHz).

Table 13.4-1 (bis). Channelling/frequency pairing

...

13.4.1.3.2 *Air-to-air communications channel*

13.4.1.3.2.1 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.

13.4.1.3.2.2 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).

13.4.1.3.3 Common signalling channels for VDL

13.4.1.3.3.1 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).

13.4.1.3.3.2 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.

13.4.1.3.4 Auxiliary frequencies for search and rescue operations

13.4.1.3.4.1 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.

13.4.1.4.2 The auxiliary search and rescue channel (123.100 MHz) will be available only with the characteristics as contained in CAR-ANS Part 8, Section 8.2.(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.

13.4.1.4 Provisions concerning the deployment of VHF frequencies and the avoidance of harmful interference

Note.— Protection of facilities' service volumes in this section is meant in the sense of avoidance of harmful interference.

13.4.1.4.1 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 protected service volume of each facility is separated from the 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.

13.4.1.4.2 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 protected service volume of each facility is separated from the 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 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 protected service volume of each facility.

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 4.— 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 5.— The criteria contained in 4.1.4.1 and 4.4.1.2 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 the ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including Statement of Approved ICAO Policies (Doc 9718).

13.4.1.4.3 The geographical separation between facilities operating on adjacent channels shall be such that points at the edge of the 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 the ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including Statement of Approved ICAO Policies (Doc 9718).

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

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

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

...

13.4.1.4.6 Where protected service volume is less than those operationally desirable, separation between facilities operating on the same frequency shall not be less than that necessary to ensure that an aircraft at the upper edge of the operational service volume of one facility does not come above the radio horizon with respect to emissions belonging to the service of adjacent facilities.

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

13.4.1.4.7 The geographical separation between VHF VOLMET stations shall be determined regionally and, generally, will be such that operations free from harmful interference are secured at the highest altitude flown by aircraft in the area concerned.

Note.— Guidance material on the interpretation of 4.14.7 is contained in the ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including Statement of Approved ICAO Policies (Doc 9718).

13.4.1.4.8 In the frequency band 117.975–137.000 MHz, the frequencies used for National Aeronautical Mobile Services, unless worldwide or regionally allotted to this specific purpose, shall be so deployed that no harmful interference is caused to facilities in the International Aeronautical Mobile Services.

13.4.1.4.9 The problem of inter-State interference shall be resolved by consultation between the States concerned.

13.4.1.4.10 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.

13.4.1.5.11 For ground VHF facilities which provide service beyond the radio horizon, any spurious or harmonic radiation outside the band ± 250 kHz from the assigned carrier frequency shall not exceed an effective radiated power of 1 mW in any azimuth.

13.4.1.5 Method of operation

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

13.4.1.5.2 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.

13.4.1.6 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. The plan provides that the total number of frequencies required in any region would be determined regionally.

The plan provides that the total number of frequencies required in any region would be determined regionally.

In many regions particular frequencies have already been allotted for particular functions as, for instance, aerodrome or approach control. The plan does not make such allotments (except in as provided for in 4.1.1.1), such action being taken regionally if considered desirable.

13.4.1.6.1 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 13.4.1.6.1.1.

Note 1.— The frequencies 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.

13.4.1.6.1.1 List of assignable frequencies

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

13.4.1.6.1.2 Frequencies for operational control communications may be required to enable aircraft operating agencies to meet the obligations prescribed in the Philippine Civil Aviation Regulations (PCAR) Part 8 in which case they shall be selected from a dedicated band which is determined regionally.

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.

13.4.1.6.2 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.

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(Note: APPENDIX TO CHAPTER 13.4, LIST OF ASSIGNABLE FREQUENCIES and ATTACHMENT 13A, CONSIDERATIONS AFFECTING THE DEPLOYMENT OF VHF COMMUNICATION FREQUENCIES have been deleted in toto.)

ATTACHMENT 13A. CONSIDERATIONS AFFECTING THE DEPLOYMENT OF LF/MF FREQUENCIES AND THE AVOIDANCE OF HARMFUL INTERFERENCE

...

ATTACHMENT 13B. GUIDING PRINCIPLES FOR LONG DISTANCE OPERATIONAL CONTROL COMMUNICATIONS

...

4. The licences should be issued on a regular renewal basis and, pursuant to RR 4.11 and in accordance with RR 43.4, should prohibit “public correspondence”, or point-to-point type traffic, or other communications traffic not meeting the definition of operational control communications.

5. VHF (general purpose or AOC channels) and not HF should be used when an aircraft is within the coverage of an appropriate VHF aeronautical station.

Note.— The specific categories of messages that may be handled on aeronautical mobile (R) service channels are prescribed in CAR-ANS Part 2, 2.8.1.8. The same chapter defines the standard communications procedures for the service including the requirements for maintaining watch in CAR-ANS Part 2, 2.8.2.2. In accordance with RR 18.6 of the ITU Radio Regulations, licences should define the purpose of the station for aeronautical operational control (as defined in Annex 6, Part I) and should specify the general characteristics in accordance with Appendix 27 of the Radio Regulations.

(— END of CAR-ANS Part 13—)

EFFECTIVITY CLAUSE:

This amendment shall be added to the Philippine CAR-ANS Part 13 and shall take effect immediately and shall supersede any other memoranda, regulations, and directives in conflict with this provision after compliance with the requisite single newspaper publication and a copy was filed with the U.P. Law Center – Office of the National Administrative register.

So ordered. Signed this 10th day of April 2017, CAAP, Pasay City.


CAPTAIN JIM C. SYDIONGCO