ATTACHMENT to State letter E 3/5-00/101

ICAO POSITION FOR THE ITU WRC-2003

SUMMARY

This document reviews the agenda for the ITU WRC-2003, discusses points of aeronautical interest and provides the ICAO position for each agenda item.

The ICAO position aims at securing availability of radio frequency spectrum to meet civil aviation requirements for current and future safety-of-flight applications. In particular, it stresses that safety considerations dictate that exclusive frequency bands must be allocated to highly critical aeronautical systems and that adequate protection against harmful interference must be ensured.

Support of the ICAO position by Contracting States is required to ensure that the position is supported by the WRC-2003 and that aviation requirements are met.

CONTENTS

Attachments:

1 — Agenda for ITU WRC-2003
2 — Suggested amendments to the ITU Radio Regulations

1. INTRODUCTION

1.1 This document contains proposals by the Air Navigation Commission for the internationally agreed ICAO Position on issues of interest to international civil aviation to be decided at the next ITU World Radiocommunication Conference (WRC), which is foreseen to be held in 2003. The agenda of the conference is contained in Attachment 1.

1.2 General information and ICAO policy on radio frequency spectrum requirements for civil aviation is contained in the *Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including Statement of Approved ICAO Policies* (Doc 9718, 2nd edition).

2. SPECTRUM REQUIREMENTS FOR INTERNATIONAL CIVIL AVIATION

2.1 The safety of air operations is vitally dependent on the availability of reliable communications and navigation services. Future strategies, based on an increased use of space-based systems, have been agreed as international civil aviation policy through the principles established for the ICAO communications, navigation, and surveillance/air traffic management (CNS/ATM) systems (*Statement of ICAO policy on CNS/ATM systems implementation and operation*, approved by Council (141/13) on 9 March 1994, refers).

2.2 The high integrity and availability requirements associated with aeronautical safety systems demand special conditions to avoid harmful interference to these systems. Accordingly, Article S4.10 of the Radio Regulations states that ITU Member States recognize that the safety aspects of radionavigation and other safety services require special measures to ensure their freedom from harmful interference. This factor needs to be taken into account in the allocation, assignment and use of frequencies. In particular, the sharing of aeronautical radio services with non-aeronautical services or with other aeronautical services must be considered with extreme care where sharing conditions are not thoroughly proven exclusive allocations need to be secured to preserve the integrity of aeronautical services.

2.3 The radio frequency spectrum needs for civil aviation arising from the growth in air transport are stable, and the current allocations appear capable of meeting currently known requirements for the future. Introduction of new aviation technologies, mainly datalink-oriented, may in the future result in a need for additional spectrum for aviation. This is a matter to be addressed by future conferences (post-2003).

3. AERONAUTICAL ASPECTS ON THE AGENDA FOR WRC-2003

Note 1.— The statement of the ICAO position on an agenda item is given in a text box at the end of the section addressing the agenda item, after the introductory background material.

Note 2.— Agenda items marked with an asterisk indicate that suggested amendments to the ITU Radio Regulations are provided in Attachment 2.

Note 3.— No impact on aeronautical services has been identified from the following WRC-2003 agenda items, which are therefore not addressed in the position:

1.2, 1.7, 1.10, 1.12, 1.13, 1.18, 1.19, 1.21, 1.23 to 1.27, 1.29, 1.30, 1.32 to 1.34, 3 to 6, 7.1.

Agenda Item Title: **Requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, in accordance with Resolution 26 (Rev.WRC-97)**

Discussion: Allocations to the aeronautical services are generally made for all world regions and normally on an exclusive basis. These principles reflect the global process of standardization within ICAO for the promotion of safety and to support the global interoperability of radiocommunication and radionavigation equipment used in civil aircraft. In some instances, however, footnotes to the ITU Table of Frequency Allocations allocate spectrum in a country to other radio services in addition to the aeronautical service to which the same spectrum is allocated in the body of the table.

The use of footnote allocations in aeronautical bands is generally not recommended by ICAO on safety grounds, as such use may result in harmful interference to safety services. Furthermore, this practice generally leads to an inefficient use of available frequencies, particularly when the radio systems sharing the band have differing technical characteristics.

A number of footnotes in aeronautical bands that should be deleted for safety and efficiency reasons are discussed below.

a) In the bands used for the **instrument landing system** (**ILS**)[1], footnotes **S5.181, S5.197, S5.259** allow for the introduction of the mobile service when these bands are no longer required for the aeronautical radionavigation service. In 1995, the ICAO Special Communications/Operations Divisional Meeting agreed to the continuation of the use of ILS for the foreseeable future and, as a result, access to these bands by the mobile service is not feasible since no acceptable sharing criteria that secure the protection of ILS can be established. In addition, recently, the need to use the band 108 - 117.975 for global navigation satellite system (GNSS) ground-based augmentation systems (GBAS) has emerged and relevant ICAO Standards and Recommended Practices (SARPs) and frequency planning criteria are under development by the GNSS Panel (WRC-2003 Agenda Item 1.28 refers). These footnotes should now be deleted since they do not represent a realistic expectation for an introduction of the mobile service in these bands.

b) Footnotes **S5.203 and S5.203A** allocate the band 117.975 - 137 MHz, used for **VHF air-ground communications** (voice and data), to the meteorological satellite service (until 1 January 2002) and the to the fixed and mobile service, except aeronautical mobile service (until 1 January 2005), all on a secondary basis. The band 136 - 137 MHz was allocated to the aeronautical mobile (R) service (AM(R)S) on a primary basis by the WARC-79. The actual introduction

[1] The bands used for ILS are: 74.8 - 75.2 MHz (marker beacon); 108 - 111.975 MHz (localizer); 328.6 - 335.4 MHz (glide path).

of the AM(R)S could only take place as from 1 January 1990, to enable other users to vacate this band between 1979 and 1990. However, some of the non-aeronautical services continued to operate well beyond 1990. In Europe, the AM(R)S was introduced in 1990 and in North America in 1995. Introduction of air-ground data link is primarily concentrated in this sub-band. The band is already heavily used in Europe for AM(R)S and use is increasing in North America and other parts of the world, thus restricting seriously the operations of the meteorological satellite service, which is susceptible to interference from the AM(R)S service. There are similar difficulties with footnote S5.203A. The provisions of this footnote, expiring in 2005, should not be extended and the footnote should be deleted at the WRC 2006 (WRC-2003 Agenda Item 7.2 refers).

c) In the band 1 559 - 1 610 MHz, which is used for elements of the ICAO **Global Navigation Satellite System (GNSS),** footnotes **S5.355A** and **S5.359A** allow the operation of the fixed service on a primary basis until 1 January 2005 (1 January 2010 in some countries) and on a secondary basis until 1 January 2015. This band is allocated, on a world-wide primary basis, to the aeronautical radionavigation service and to the radionavigation satellite service (RNSS). The band already supports operation of two prime elements of GNSS, i.e. GLONASS and GPS, which are in the process of being defined in ICAO SARPs. Other new RNSS systems, such as the European Galileo system, are under consideration. Studies undertaken in preparation for WRC-2000 indicate that a geographical separation distance exceeding line of sight (in the order of 400 km) between aircraft using GNSS and stations of the fixed service is required to ensure safe operation of GNSS. This is a very severe restriction, which can prohibit the safe use of GNSS over wide areas around any fixed service installation. To compensate for these restrictions, retention of current terrestrial radionavigation systems by aviation may be needed, leading to inefficient use of available spectrum. More importantly, harmful interference situations can arise leading to disruption to GNSS, affecting the safety of aircraft in flight. Thus, the WRC-2000 agreement to terminate use of this band on a primary basis in 2005 (2010) and all use in 2015 still constitutes a severe and unacceptable constraint on the safe and effective use of GNSS in some areas of the world. It is therefore recommended that deletion of these footnotes will be effective as from 2005 at the latest.

d) In the band 4 200 - 4 400 MHz, which is reserved for use by **airborne radio altimeters,** footnote **S5.439** allows the operation of the fixed service on a secondary basis. Radio altimeters are a critical element in the precision landing of aircraft under automatic guidance conditions. Interference from fixed service has the potential to affect the safety of such operations. Deletion of this footnote is recommended.

ICAO Position:

a)	To support deletion of footnotes S5.181, S5.197, S5.259, as access to these bands by the mobile service is not feasible and could create the potential for interference to important radionavigation systems used by aircraft at final approach and landing.
b)	To support deletion of S5.203 at WRC-2003 and no change to S5.203A (to be deleted at WRC-2006) to enable full use of the band 136 - 137 MHz for AM(R)S communications.
c)	To support the cessation of all fixed services in the band 1 559 - 1 610 MHz as of 2005 in order to remove the interference caused by the fixed service to essential aeronautical radionavigation functions and to permit the full utilization of GNSS services to aircraft on a global basis.
d)	To support deletion of footnote and S5.439 as a measure to protect safety-critical operation of radio altimeters in the band 4 200 - 4 400 MHz.

WRC-2003 — Agenda Item 1.3

Agenda Item Title: **To consider identification of globally/regionally harmonized bands, to the extent practicable, for the implementation of future advanced solutions to meet the needs of public protection agencies, including those dealing with emergency situations and disaster relief, and to make regulatory provisions, as necessary, taking into account Resolution 645/[GT PLEN-2/5] (WRC-2000)**

Discussion: Harmonized world-wide aeronautical frequencies have been identified in Article S5 and Appendix S13 for use in emergency and in search and rescue situations, and for communications between aircraft and other mobile units. Detailed operational procedures for these emergency and search and rescue situations have been established both in ITU and ICAO.

Certain frequencies or frequency bands may be identified for use by public protection agencies in support for major emergency situations and disaster relief, under conditions yet to be established. Collaboration with aviation authorities is essential to ensure the most appropriate application of certain aeronautical frequencies that will be identified in the context of this requirement, and to evaluate any repercussions on their prime use for safety of flight.

ICAO Position: Assist in the identification of frequencies and bands for use in the situations envisaged, provided that the use is in accordance with the provisions in the Radio Regulations, and does not cause interference to operational aeronautical radio services. In particular, current ICAO Search And Rescue (SAR) procedures should not be affected.

Agenda Item Title: **To consider the results of studies related to Resolution 114 (WRC-95), dealing with the use of the band 5 091-5 150 MHz by the fixed-satellite service (Earth-to-space) (limited to non-GSO MSS feeder links), and review the allocations to the aeronautical radionavigation service and the fixed-satellite service in the band 5 091 - 5 150 MHz**

Discussion: Resolution 114 (WRC-95) calls, *inter alia*, for a review of allocations to both the aeronautical radionavigation service and the fixed-satellite service (FSS) in this band. ICAO is specifically invited to further review the detailed spectrum requirements and planning for international standard aeronautical radionavigation systems in the band. This band is reserved to meet requirements for MLS assignments which can not be satisfied in the band 5 030 - 5 091 MHz. In accordance with S5.444, MLS has precedence over other uses in the band 5 030 - 5 150 MHz.

Footnote S5.444A permits use of the band 5 091 - 5 150 MHz by the fixed-satellite service on a primary basis until 1 January 2010, subject to the requirements of S5.444 to protect MLS assignments and to not causing interference to the aeronautical radionavigation service. After 1 January 2010, the fixed satellite service is expected to revert to a secondary status. Sharing between the two services in this band is not feasible. ITU-R Recommendation S.1342 specifies the separation distance required to protect MLS services in the band 5 030 - 5 090 MHz from FSS use in this band.

In accordance with *resolves 1* of Res.114, ICAO has developed a procedure to establish the spectrum requirements for MLS and other potential aeronautical applications, in order to support the future allocation requirement for the band 5 091 - 5 150 MHz. The results should be available around end 2001. This procedure includes:

— update of the MLS requirements by States;

— review of the operational requirements of MLS (Ref. Annex 10, Volume I – Radio Navigation Aids);

— replanning of MLS assignments to establish spectrum requirements;

— identification of future spectrum requirements for other aeronautical systems;

— presentation and discussion of results in ICAO; and

— presentation of results to ITU.

ICAO Position:	No change to footnote S5.444 and S5.444A. (Further material to be presented when results of studies are available)

WRC-2003 — Agenda Item 1.5*

Agenda Item Title: **To consider, in accordance with Resolution 736/[GT PLEN-2/1] (WRC-2000), regulatory provisions and spectrum requirements for new and additional allocations to the mobile, fixed, Earth exploration-satellite and space research services, and to review the status of the radiolocation service in the frequency range 5 150 - 5 725 MHz, with a view to upgrading it, taking into account the results of ITU-R studies**

Discussion: The aeronautical radionavigation service (ARNS) band at 5 350 - 5 470 MHz supports the operation of airborne radar systems in accordance with S5.449. This includes airborne radar systems for the detection of adverse weather conditions which provide important information for the safe flight of aircraft. Many aeronautical administrations mandate the carriage of this equipment.

The ongoing protection of the ARNS needs to be assured. The operation of radiolocation systems in the same band must be on a non-interference basis and conform to the conditions recommended by the relevant ITU-R studies. The radiolocation service must also accept interference from the ARNS service without any possibility of protection.

ICAO Position:

Accept the upgrading of the radiolocation service to primary status in the band 5 350 - 5 470 MHz only on the express condition that no interference be caused to the ARNS service operating in accordance with S5.449, and that no protection be required from the ARNS to the radiolocation service, as agreed between administrations taking account of relevant ITU-R Recommendations.

No further changes to the allocations to the bands 5 350 - 5 470 MHz.

Agenda Item Title: **To consider regulatory measures to protect feeder links (Earth-to-space) for the mobile-satellite service which operate in the band 5 150 - 5 250 MHz, taking into account the latest ITU-R Recommendations (for example, Recommendations ITU-R S.1426, ITU-R S.427 and ITU-R M.1454)**

Discussion: The band 5 150 - 5 250 MHz was originally allocated to the aeronautical radionavigation service (ARNS) on a primary exclusive basis. The allocation was made (in 1945-1947) to meet the spectrum requirements foreseen at that time for the microwave landing system (MLS).

As a consequence of the later addition of other services to the band, notably the fixed-satellite service (Earth-to-space) and the mobile service, there is now very little scope for safe and interference-free use of the band by any ARNS systems.

Moreover, retention of the ARNS allocation creates the erroneous impression that the band is still available for use by ARNS. Since international civil aviation no longer has a requirement for this band, deletion of the ARNS allocation in the band 5 150 - 5 250 MHz is not opposed.

ICAO Position: Not to oppose the deletion of the allocation to the aeronautical radionavigation service in the band 5 150 - 5 250 MHz on the grounds that, due to use by a number of other radio services, it can no longer support the safe and interference-free operation of navigation systems for civil aviation.

Agenda Item Title: **To consider issues related to unwanted emissions:**

1.8.1 consideration of the results of studies regarding the boundary between spurious and out-of-band emissions, with a view to including the boundary in Appendix S3;

1.8.2 consideration of the results of studies, and proposal of any regulatory measures regarding the protection of passive services from unwanted emissions, in particular from space service transmissions, in response to recommends 5 and 6 of Recommendation 66 (Rev.WRC-2000)

Discussion: Progress of the work on this matter in ITU R Study Group 1 is being monitored. Any amendments to the limits for unwanted emissions contained in Appendix S3 should not invalidate those in ICAO documents required for conformity with international civil aviation requirements.

In particular attention should be paid to *recommends* 5 and *recommends* 6 of ITU Recommendation 66 (Rev. WRC-2000), stipulating that ITU-R should:

*" 5 study those frequency bands and instances where, for technical or operational reasons, more stringent spurious emission limits than the general limits in Appendix **S3** may be required to protect safety services and passive services such as radio astronomy, and the impact on all concerned services of implementing or not implementing such limits;*

6 study those frequency bands and instances where, for technical or operational reasons, out-of-band limits may be required to protect safety services and passive services such as radio astronomy, and the impact on all concerned services of implementing or not implementing such limits;"

ICAO Position:

Any revisions to the values contained in Appendix S3 to the Radio Regulations, or other regulatory provisions on unwanted emissions, should not invalidate the values for aeronautical radio systems, as expressed in ICAO Annex 10, and other relevant aeronautical documents.

Agenda Item Title: **To consider Appendix S13 and Resolution 331 (Rev.WRC-97) with a view to their deletion and, if appropriate, to consider related changes to Chapter SVII and other provisions of the Radio Regulations, as necessary, taking into account the continued transition to and introduction of the Global Maritime Distress and Safety System (GMDSS)**

Discussion: Appendix S13 to the Radio Regulations addresses non-GMDSS distress and safety communications, and contains important provisions for aeronautical radio services, which are applicable to the aeronautical mobile (R) and aeronautical mobile-satellite (R) services. These provisions have been carefully harmonized with those applying to aircraft emergencies as contained in ICAO Annexes.

Before any changes are made to this appropriate arrangement, it must be ensured that provisions affecting the safety of aircraft, including aircraft emergency situations, are not affected. In this regard it should be noted that the GMDSS has essentially been set up for maritime purposes, and is applicable primarily in the maritime segment of mobile operations.

ICAO Position: Any proposed changes to Appendix S13 and related changes to Chapter SVII must be considered carefully against the requirements of the aeronautical mobile (R) service, and applicable ICAO Annexes.

WRC-2003 — Agenda Item 1.11*

Agenda Item Title: **To consider possible extension of the allocation to the mobile-satellite service (Earth-to-space) on a secondary basis in the band 14-14.5 GHz to permit operation of the aeronautical mobile-satellite service as stipulated in Resolution 216 (Rev.WRC-2000)**

Discussion: This extension of the present secondary allocation to include the aeronautical mobile satellite service, as considered in Res. 216 (Rev. WRC-2000), addresses non-safety communications with aircraft, and will not form part of the aeronautical mobile satellite (R) service since a secondary allocation is not acceptable for any aeronautical safety-of-life service. The latter is governed by Article S43.1 of the Radio Regulations[2], which defines the conditions for communications relating to safety and regularity of flight between aircraft and ground.

The modification under consideration can be supported on the basis that the service has the potential to promote the general efficiency of aircraft operations.

ICAO Position: Provide support where applicable to the extension of this allocation to include the aeronautical mobile satellite service.

[2] Art. S43.1 stipulates that "Frequencies in any band allocated to the aeronautical mobile (R) service and the aeronautical mobile-satellite (R) service are reserved for communications relating to safety and regularity of flight between any aircraft and those aeronautical stations and aeronautical earth stations primarily concerned with flight along national or international civil air routes."

Agenda Item Title: **To consider measures to address harmful interference in the bands allocated to the maritime mobile and aeronautical mobile (R) services, taking into account Resolutions 207 (Rev.WRC-2000) and 350/[COM5/12] (WRC-2000), and to review the frequency and channel arrangements in the maritime MF and HF bands concerning the use of new digital technology, also taking into account Resolution 347 (WRC-97)**

Discussion: Resolution 207 (Rev.WRC-2000), and Resolution 350/[COM5/12] (WRC-2000) contain provisions and measures to combat the growing concern of aviation and maritime authorities over the increased interference to operational distress and safety communications caused by unauthorized (illegal) transmissions. Interference to safety communications with aircraft in these bands in some areas of the world, notably in the South Pacific, is now a matter of very serious concern to civil aviation authorities, and to aircraft operating in those areas.

International civil aviation fully supports the development of measures to strengthen the Radio Regulations, as feasible, and their application by administrations to avoid the occurrence of safety infringing events and to lead to the eventual cessation of these unauthorized transmissions. Increased use of HF data link (HFDL), in particular for ATC communications, as standardized in ICAO Annex 10, would provide technical means to overcome interference caused by these transmissions. HFDL is currently extensively available and mainly used for AOC communications.

Solutions effecting technical characteristics of currently used equipment and solely aimed at mitigating the effects of interference must however be carefully assessed by civil aviation as to their effect on internationally agreed standards, and to their practical effectiveness in both the short and the long term. The prime focus for action has to remain in the area of the regulatory control exercised by radio administrations. Technical means should primarily promote and make this more effective. In particular in the case of aircraft equipment, careful attention must be given to avoid unnecessary or ineffective changes to equipment which would place an economic burden on airline operators.

ICAO Position: To support regulatory provisions, actions by administrations, and the implementation of recommended measures and techniques, aimed at reducing this threat to the safety of air operations.

Agenda Item Title: **To review the results of studies concerning the radionavigation-satellite service in accordance with Resolutions 604/[COM5/16] (WRC-2000), 605/[COM5/19] (WRC-2000) and 606/[COM5/20] (WRC-2000)**

Discussion: The radionavigation-satellite service (RNSS) is the ITU generic designation that includes, but is not limited to, the ICAO-defined GNSS. The allocation of new frequencies to the RNSS was an item of major aviation concern at WRC-2000. Two aeronautical radionavigation bands were selected for the introduction of the RNSS (space-to-Earth): the band at 1 164 - 1 215 MHz used by the DME and the radar band at 1 260 - 1 300 MHz. Two RNSS systems were concerned: the GPS system, with the new L5 frequency in the DME band, and the Galileo system, with components both in DME band and the radar band.

Resolution 605 (WRC-2000) relates to the introduction of the RNSS (space - Earth) in the band 1 164 - 1 215 MHz (S5.328A refers). The band is allocated world-wide on a primary basis to the aeronautical radionavigation service (ARNS) and is currently intensively used by DME[3].

Resolution 606 (WRC-2000) relates, inter alia, to the introduction of the RNSS (space-Earth) in the band 1 215 - 1 300 MHz. The band is allocated world-wide on a primary basis to the radiolocation service and in several countries, to the aeronautical radionavigation service or the radionavigation service. It is currently used by long-range primary radars for en-route surveillance.

Both Resolutions call for ITU-R studies on the technical, operational, and regulatory aspects of the new allocations. ICAO has been specifically invited to participate in these studies, because of the great importance of these bands to international civil aviation.

Within this agenda item, the main civil aviation interest is to assure the protection and expansion, as required, of the present systems in the bands (DME and primary radars), which are a vital part of the air traffic infrastructure and will remain so for many years ahead, while at the same time supporting the implementation of RNSS that can offer civil aviation future benefits. WRC-2000 gave RNSS operators the desired allocation of frequencies, but only under the condition that existing aeronautical radionavigation services be fully protected from interference that could be caused by the RNSS (which itself could not claim any protection from ARNS services). Accordingly, the focus of aviation interest is now on achieving the desired protection through the definition of appropriate design constraints on future RNSS systems.

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[3] DME services in the band 960 - 1 215 MHz are expected to be required for the foreseeable future, with the current intensive usage increasing even further in some areas. This, together with Tacan operation in the same band and a frequency paired arrangement with VOR, ILS and MLS, creates a situation of extreme inflexibility, which leaves little or no room for changing or removing frequencies. Preservation of the available spectrum is therefore a vital concern for ongoing aviation operations and to avoid disruptive and costly changes to present facilities.

In the **band 1 164 - 1 215 MHz,** addressed by Resolution 605, the ICAO GNSS and AMC Panels are currently studying the appropriate value of power flux density (pfd)[4] limit and other relevant aspects of the protection of DME, with a view to presenting contributions to the ITU-R studies which are requested under Res. 605. The Resolution highlights the ICAO finding indicating that a provisional pfd value should be in the range of -115 - to - 119 dB(W/m^2) in any 1 MHz in the band for the aggregate of all RNSS systems. The finding will be refined further by the ICAO work.

In the **band 1 215 - 1 300 MHz,** addressed by Resolution 606, similar considerations apply. Aviation is seeking the incorporation of an agreed pfd limit in the Radio Regulation. However, the principle of such incorporation has been disputed by some countries at WRC-2000. Resolution 606 calls for studies on the need for, and the value of, an appropriate pfd limit. It is a firmly held view in international civil aviation that a pfd limit is necessary to give protection to radionavigation systems employed to establish and maintain separation between aircraft. ICAO will therefore support work to develop appropriate pfd limits in this band.

ICAO Position:

To support an appropriate value for a pfd limit for the aggregated interference of all RNSS systems in the band 1 164 - 1 215 MHz, as a necessary protection for aeronautical DME systems currently in operation, and to support the incorporation of the agreed pfd limit within an adequate regulatory framework having full mandatory force.

To support the need for a pfd limit for RNSS in the band 1 215 - 1 300 MHz as a necessary protection for important radionavigation systems providing safe separation to aircraft in flight, and to support the incorporation of the agreed pfd limit within an adequate regulatory framework having full mandatory force.

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[4] An outstanding issue after WRC-2000 is that of the maximum level of power flux density (pfd) at the Earth's surface that the RNSS can be allowed to generate while still protecting DME in the 1 164 - 1 215 MHz band. The pfd value would firstly have to be determined by theoretical and technical analysis and agreed in ITU-R Study Group 8, and then incorporated in regulatory form in the Radio Regulations at WRC-2003. This would provide a maximum pfd to be observed by the RNSS operators. It should be noted that WRC-2000 did agree on the principle of this incorporation and established a provisional pfd value (- 115 dB/W/m^2/MHz), but did not agree on a final pfd value.

WRC-2003 — Agenda Item 1.16*

Agenda Item Title: **To consider allocations on a world-wide basis for feeder links in bands around 1.4 GHz to the non-GSO MSS with service links operating below 1 GHz, taking into account the results of ITU-R studies conducted in response to Resolution 127 (Rev.WRC-2000), provided that due recognition is given to the passive services, taking into account No. S5.340**

Discussion: The bands identified in the *considerings* of Resolution 127 (Rev. WRC-2000) are used by aeronautical radio services. Studies on sharing between MSS feeder links and the aeronautical radionavigation service in other band have resulted in constraints on the development of both services.

Any suggestions that the search for spectrum for these links should include aeronautical bands must be substantiated by technical studies which take into account present and future aeronautical requirements. Such studies should be undertaken jointly by the services concerned and agreed as acceptable by civil aviation.

ICAO Position: Any suggestions for the sharing of aeronautical bands with NGSO feeder links under this Agenda Item can only be considered on the basis of agreed studies, which take into account the present and expected future use of the band by aviation, and the constraints applied to this use.

WRC-2003 — Agenda Item 1.17*

Agenda Item Title: **To consider upgrading the allocation to the radiolocation service in the frequency range 2 900 - 3 100 MHz to primary**

Discussion: This band is heavily utilized by civil aviation radionavigation for ground based primary surveillance radar. The upgrading of radiolocation services to a primary status should only be made on the basis of no protection from, and no interference to, current and future aeronautical radionavigation systems, operating in accordance with the regulations.

ICAO Position: Any upgrading of the radiolocation service to primary status in bands allocated to aeronautical services must ensure the provision of adequate measures to continued protection of aeronautical services, present and future. In particular, the allocation should be made on the conditions of non-interference to, and no protection from, the radionavigation service.

Agenda Item Title: **To consider additional allocations on a world-wide basis for the non-GSO MSS with service links operating below 1 GHz, in accordance with Resolution 214 (Rev.WRC-2000)**

Discussion: The spectrum below 1 GHz contains a number of important aeronautical and radionavigation bands, where the main aeronautical terrestrial radio services for communication and navigation which support air operations are located. All of these bands are under considerable pressure to provide for the future growth of air traffic in the years ahead.

The main aeronautical VHF communications band at 117.975 - 137 MHz supports all of the short- and medium-range safety communications between aircraft and ground over continental airspace, and at airports, and will continue for the foreseeable future to provide this function. Essential aeronautical radionavigation systems operate at 75 MHz, 108 - 117.975 MHz, 328.6 - 335.4 MHz, 406 - 406.1 MHz and 960 - 1 215 MHz. All of these bands are forecast to be required for the foreseeable future.

ICAO Position: Maintain all aeronautical allocations below 1 GHz without change and taking account of the ICAO position on Agenda Item 1.1 in regard to S5.181, S5.197 and S5.259.

Agenda Item Title: **To consider progress of ITU-R studies concerning future development of IMT-2000 and systems beyond IMT-2000, in accordance with Resolution 228/[GT PLEN-2/3] (WRC-2000)**

Discussion: Under this agenda item, proposals may be developed aimed at accommodating the mobile service providing the terrestrial elements of IMT-2000 in bands currently allocated to the aeronautical radionavigation and radiolocation service between 2 700 MHz and 3 400 MHz. These bands are heavily used for air traffic control radar surveillance[5] functions and to meet other important national requirements. Some operational functions carried out with these systems cannot be replaced with any other present or expected future system.

Existing studies have indicated that there is no possibility for practical sharing arrangements between these aeronautical radar stations and the mobile service. Therefore, any proposal for introducing the mobile service in these bands is not acceptable. Any further studies on sharing must take into account the full technical and operational envelope of the use of radar at airports and be accepted and endorsed by the civil aviation authorities responsible for their operation[6].

A full study on the present use of this band by radar stations and on future requirements is necessary to determine whether a removal of these to higher frequency bands is possible and practicable. The requirement for airport and TMA primary radar coverage is foreseen to remain. Removal of radar stations from the band 2 700 - 2 900 MHz into the band 2 900 - 3 400 MHz would be extremely difficult if not impossible due to the requirements for large bandwidth for modern radar stations[7]. It would also require major redesign and reconstruction effort to make the required frequency changes to many radar systems, leading to extensive disruption to services required 24 hours a day at busy airports.

Congestion is increasing at many major airports around the world, and many will reach saturation levels within this decade. The preservation of safety demands reliable and interference-free radar systems to provide surveillance and to ensure separation between aircraft in the landing phase of their operation. Hence, the requirement for primary radar coverage exepcted to continue for the foreseeable future at all major airports where a high traffic density situation applies. Thus, the

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[5] The band 2 700 - 2 900 MHz is heavily used for air traffic control (airport, terminal area, and other short range surveillance needs) by primary radar systems on a global basis. Typically, these radar stations are installed at busy airports, which are normally situated in areas of high population density. The operational range extends to 60-100 nautical miles In addition, this band is used for meteorological radar, providing meteorological information for aeronautical and other services

[6] Technical requirements for radar stations are normally determined on a national basis and it is difficult and speculative to agree on a model of a typical radar station which, when applied in interference assessment activities, can be used to develop a typical sharing scenario.

[7] Most of today's radars utilize two separate frequencies to provide for frequency diversity in order to improve the performance of the system. Normally, radar stations are equipped with dual systems and each system is tuned to one of these frequencies. Furthermore, in order to satisfy requirements for adequate near and far detection of aircraft, many of these radar systems provide for more than one set of frequencies, thus increasing the bandwidth required for one single radar system accordingly.

aeronautical use of the band 2 700 - 2 900 MHz is expected to increase significantly over the next ten years and to continue well beyond 2010. It is of paramount importance to aviation that the currently available spectrum for radar stations be maintained and that no additional restrictions be placed on future frequency assignments for radar stations.

ICAO Position:

To oppose any proposed new allocation to the mobile service or other services, in bands between 2 700 and 3 400 MHz which are allocated or used by aeronautical radionavigation services, as no rigorous and comprehensive compatibility studies have yet been accepted by international civil aviation. Such studies must take account of all the technical and operational aspects related to the use of these systems at major airports throughout the world for vital separation and monitoring of aircraft preparing to land. The case for sharing on any basis must also be supported by an analysis which is satisfying the ICAO safety requirements.

Agenda Item Title: **To permit the use of the band 108 - 117.975 MHz for the transmission of radionavigation satellite differential correction signals by ICAO standard ground-based systems**

Discussion: A new aviation requirement has emerged for the transmission of augmentation data for GNSS, to be used by aircraft receivers to satisfy the stringent accuracy and integrity requirements for GNSS applications. Following ICAO GNSS Panel studies, the new ground-based augmentation systems (GBAS) are planned to operate in the present VOR/ILS band at 108 - 117.975 MHz (initially, 112 - 117.975 MHz).

The selected band is currently allocated to the aeronautical radionavigation service. It has been argued that GBAS does not fall within the definition of a radionavigation service (i.e. using the property of the propagation characteristics of radio waves) and that an amendment to the allocation of this band is required. An appropriate additional allocation would therefore need to be made to allow for the transmission of GNSS augmentation data.

Compatibility and frequency planning criteria for the VOR/ILS and the new service are being developed by ICAO. Compatibility with FM broadcast services in the band 87.5 - 108 MHz would be assured through conformity with ITU-R Recommendation IS.1009.

ICAO Position:

Support an allocation permitting the use of the band 108 - 117.975 MHz for the transmission of ICAO standard GNSS augmentation systems Ensure conformity with ITU-R Recommendation IS.1009 regarding compatibility with the FM broadcast services in the band 87.5 - 108 MHz

Agenda Item Title: **To consider the additional allocations to the mobile-satellite service in the 1-3 GHz band, in accordance with Resolutions 226/[COM5/29] (WRC-2000) and 227/[COM5/30] (WRC-2000)**

Discussion: Resolutions 226 (WRC-2000) and 227 (WRC-2000) address the need for studies on sharing between MSS and other specified services in order to identify spectrum for future MSS expansions. The demand stated in these Resolutions is for 2 times 123 MHz by 2005, and 2 times 145 MHz by 2010 (including existing MSS allocations).

The Resolutions identify two specific bands (1 518 - 1 525 MHz and 1 683 - 1 690 MHz) as potential candidates for a new allocation. It is noted that the band between 1 429 and 1 535 MHz in some countries in Region 1 and 1 435 - 1 535 in Region 2 is used by the Aeronautical Mobile Service for aeronautical radiotelemetry purposes[8].

However, any other bands in the 1-3GHz spectrum (with the exception of the band 1 559 - 1 610 MHz) may be examined if the results of the sharing studies on the identified bands are not satisfactory.

The band 1 559 - 1 610 MHz, allocated to the RNSS service and planned to be used extensively for GNSS services by civil aviation, has been specifically excluded from the sharing examination in both Resolutions. This exclusion is fully supported by international civil aviation.

Other bands of aeronautical interest in the 1-3 GHz band include the aeronautical radio navigation service bands at 960 - 1 215 MHz, 1 559 - 1 610 MHz, and 2 700 - 2 900 MHz, and the mobile satellite service bands at 1.5/1.6 GHz. The process of global standardization through ICAO Standards applies in these bands, which are extensively used and are planned for even greater use as air traffic expands in the future. Civil aviation sees little scope for sharing with other services in any of these bands without prejudicing the short, and longer, term safety and viability of air transport services around the world.

ICAO Position:

Oppose proposals for an allocation to the mobile satellite service in any of the ARNS bands between 1 and 3 GHz until a full consideration of the aviation use, and sharing studies where appropriate, have been completed and satisfy ICAO requirements.

Support the protection of aeronautical telemetry applications and their continued use in the band 1 425 - 1 535 MHz.

[8] In France, the use of the band 2 310 - 2 360 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service (ref. footnote S5.395).

Agenda Item Title: **To examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution 28 (Rev.WRC-2000), and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with principles contained in the Annex to Resolution 27 (Rev.WRC-2000)**

Discussion: At this point, no ITU-R recommendations referring exclusively to aeronautical radio services and incorporated by reference in the ITU Radio Regulations have been identified.

Provision RR S34.1 of the ITU Radio Regulations specifies that ELT signals on 406.0 MHz or in the band 1 645.5 - 1 646.5 MHz shall be in accordance with relevant ITU-R Recommendations (see Resolution 27 (WRC-95)).

ICAO Position: To support the policy of linked reference in respect of RR S34.1 for ELTs.

WRC-2003 — Agenda Item 7.2

Agenda Item Title: **To recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, taking into account Resolution 801/[GT PLEN-2/6] (WRC-2000)**

Discussion: This agenda item addresses the preliminary agenda for WRC-2006, which will be developed by WRC-2003. Items of aeronautical interest that should appear in the WRC-2006 include:

a) Deletion of footnote S5.203A

This footnote enables the operation of the fixed and mobile, except aeronautical mobile, service in the aeronautical VHF band 136 - 137 MHz in some countries. As pointed out above (WRC-2003 Agenda Item 1.1 refers), the expiry date of the footnote is 2005. The date should not be extended and the footnote should be deleted by WRC-2006.

b) Review of results of studies conducted in accordance with Resolution 222/[COM 5/22] (WRC-2000)

Resolution 222, *inter alia*, calls for ITU-R studies to ensure spectrum availability and protection for the aeronautical mobile-satellite (R) service in the 1.5 - 1.6 GHz band. The result of such studies should be reviewed by WRC-2006 with a view to assessing the need of changes to the Radio Regulation to satisfy AMS(R)S spectrum requirements in the band. Participation by aviation experts to the relevant ITU-R studies is required.

ICAO Position:

To support the deletion of footnote of footnote S5.203A by WRC-2006.

To support the inclusion in the agenda of WRC-2006 of an item addressing the review of results of studies conducted in accordance with Resolution 222 (WRC-2000).

Attachment 1

ITU COUNCIL RESOLUTION 1156

Agenda for the World Radiocommunication Conference (WRC-03)

The Council,

noting

that Resolution 800 of the World Radiocommunication Conference (Istanbul, 2000):

a) resolved to recommend to the Council that a world radiocommunication conference be held in 2003 for a period of four weeks;

b) recommended its agenda, and invited the Council to finalize the agenda and arrange for the convening of WRC-03 and to initiate as soon as possible the necessary consultation with Member States,

resolves

to convene a World Radiocommunication Conference (WRC-03) in Geneva* (Switzerland) from 9 June to 4 July 2003 with the following agenda:

1. on the basis of proposals from administrations and the Report of the Conference Preparatory Meeting, taking account of the results of WRC-2000, and with due regard to the requirements of existing and future services in the bands under consideration, to consider and take appropriate action with respect to the following items:

1.1 requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, in accordance with Resolution **26 (Rev.WRC-97)**;

1.2 to review and take action, as required, on No. **S5.134** and related Resolutions **517 (Rev.WRC-97)** and **537 (WRC-97)** and Recommendations **515 (Rev.WRC-97)**, **517 (HFBC-87)**, **519 (WARC-92)** and Appendix **S11**, in the light of the studies and actions set out therein, having particular regard to the advancement of new modulation techniques, including digital techniques, capable of providing an optimum balance between sound quality, bandwidth and circuit reliability in the use of the HF bands allocated to the broadcasting service;

1.3 to consider identification of globally/regionally harmonized bands, to the extent practicable, for the implementation of future advanced solutions to meet the needs of public protection agencies, including those dealing with emergency situations and disaster relief, and to make regulatory provisions, as necessary, taking into account Resolution **645/[GT PLEN-2/5] (WRC-2000)**;

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* Note by the Secretariat: Taking into account the possible invitation by Venezuela, as provisionally indicated during the Council session, the final decision on the venue will be taken by Council 2001.

1.4 to consider the results of studies related to Resolution **114 (WRC-95)**, dealing with the use of the band 5 091 - 5 150 MHz by the fixed-satellite service (Earth-to-space) (limited to non-GSO MSS feeder links), and review the allocations to the aeronautical radionavigation service and the fixed-satellite service in the band 5 091 - 5 150 MHz;

1.5 to consider, in accordance with Resolution **736/[GT PLEN-2/1] (WRC-2000)**, regulatory provisions and spectrum requirements for new and additional allocations to the mobile, fixed, Earth exploration-satellite and space research services, and to review the status of the radiolocation service in the frequency range 5 150 - 5 725 MHz, with a view to upgrading it, taking into account the results of ITU-R studies;

1.6 to consider regulatory measures to protect feeder links (Earth-to-space) for the mobile-satellite service which operate in the band 5 150 - 5 250 MHz, taking into account the latest ITU-R Recommendations (for example, Recommendations ITU-R S.1426, ITU-R S.1427 and ITU-R M.1454);

1.7 to consider issues concerning the amateur and amateur-satellite services:

1.7.1 possible revision of Article **S25**;

1.7.2 review of the provisions of Article **S19** concerning the formation of call signs in the amateur services in order to provide flexibility for administrations;

1.7.3 review of the terms and definitions of Article **S1** to the extent required as a consequence of changes made in Article **S25**;

1.8 to consider issues related to unwanted emissions:

1.8.1 consideration of the results of studies regarding the boundary between spurious and out-of-band emissions, with a view to including the boundary in Appendix **S3**;

1.8.2 consideration of the results of studies, and proposal of any regulatory measures regarding the protection of passive services from unwanted emissions, in particular from space service transmissions, in response to recommends 5 and 6 of Recommendation **66 (Rev.WRC-2000)**;

1.9 to consider Appendix **S13** and Resolution **331 (Rev.WRC-97)** with a view to their deletion and, if appropriate, to consider related changes to Chapter SVII and other provisions of the Radio Regulations, as necessary, taking into account the continued transition to and introduction of the Global Maritime Distress and Safety System (GMDSS);

1.10 to consider the results of studies, and take necessary actions, relating to:

1.10.1 exhaustion of the maritime mobile service identity numbering resource (Resolution **344 (WRC-97)**);

1.10.2 shore-to-ship distress communication priorities (Resolution **348 (WRC-97)**);

1.11 to consider possible extension of the allocation to the mobile-satellite service (Earth-to-space) on a secondary basis in the band 14-14.5 GHz to permit operation of the aeronautical mobile-satellite service as stipulated in Resolution **216 (Rev.WRC-2000)**;

1.12 to consider allocations and regulatory issues related to the space science services in accordance with Resolution **723 (Rev.WRC-2000)** and to review all Earth exploration-satellite service and space research service allocations between 35 and 38 GHz, taking into account Resolution **730/[COM5/1] (WRC-2000)**;

1.13 to consider regulatory provisions and possible identification of existing frequency allocations for services which may be used by high altitude platform stations, taking into account No. **S5.543A/S5.5RRR** and the results of the ITU-R studies conducted in accordance with Resolutions **122 (Rev.WRC-2000)** and **734/[COM5/14] (WRC-2000)**;

1.14 to consider measures to address harmful interference in the bands allocated to the maritime mobile and aeronautical mobile (R) services, taking into account Resolutions **207 (Rev.WRC-2000)** and **350/[COM5/12] (WRC-2000)**, and to review the frequency and channel arrangements in the maritime MF and HF bands concerning the use of new digital technology, also taking into account Resolution **347 (WRC-97)**;

1.15 to review the results of studies concerning the radionavigation-satellite service in accordance with Resolutions **604/[COM5/16] (WRC-2000)**, **605/[COM5/19] (WRC-2000)** and **606/[COM5/20] (WRC-2000)**;

1.16 to consider allocations on a worldwide basis for feeder links in bands around 1.4 GHz to the non-GSO MSS with service links operating below 1 GHz, taking into account the results of ITU-R studies conducted in response to Resolution **127 (Rev.WRC-2000)**, provided that due recognition is given to the passive services, taking into account No. **S5.340**;

1.17 to consider upgrading the allocation to the radiolocation service in the frequency range 2 900 - 3 100 MHz to primary;

1.18 to consider a primary allocation to the fixed service in the band 17.3 - 17.7 GHz for Region 1, taking into account the primary allocations to various services in all three Regions;

1.19 to consider regulatory provisions to avoid misapplication of the non-GSO FSS single-entry limits in Article **S22** based on the results of ITU-R studies carried out in accordance with Resolution **135/[COM5/2] (WRC-2000)**;

1.20 to consider additional allocations on a worldwide basis for the non-GSO MSS with service links operating below 1 GHz, in accordance with Resolution **214 (Rev.WRC-2000)**;

1.21 to consider progress of the ITU-R studies concerning the technical and regulatory requirements of terrestrial wireless interactive multimedia applications, in accordance with Resolution **737/[GT PLEN-2/2] (WRC-2000)**, with a view to facilitating global harmonization;

1.22 to consider progress of ITU-R studies concerning future development of IMT-2000 and systems beyond IMT-2000, in accordance with Resolution **228/[GT PLEN-2/3] (WRC-2000)**;

1.23 to consider realignment of the allocations to the amateur, amateur-satellite and broadcasting services around 7 MHz on a worldwide basis, taking into account Recommendation **718 (WARC-92)**;

1.24 to review the usage of the band 13.75 - 14 GHz, in accordance with Resolution **733/[COM5/10] (WRC-2000)**, with a view to addressing sharing conditions;

1.25 to consider, with a view to global harmonization to the greatest extent possible, having due regard to not constraining the development of other services, and in particular of the fixed service and the broadcasting-satellite service, regulatory provisions and possible identification of spectrum for high-density systems in the fixed-satellite service above 17.3 GHz, focusing particularly on frequency bands above 19.7 GHz;

1.26 to consider the provisions under which earth stations located on board vessels could operate in fixed-satellite service networks, taking into account the ITU-R studies in response to Resolution **82/[COM4/3] (WRC-2000)**;

1.27 to review, in accordance with Resolutions **540/[GT PLEN-1/1] (WRC-2000)** and **735/[GT PLEN-1/3 (WRC-2000)]**, the ITU-R studies requested in those resolutions, and modify, as appropriate, the relevant regulatory procedures and associated sharing criteria contained in Appendices **S30** and **S30A** and in the associated provisions;

1.28 to permit the use of the band 108 - 117.975 MHz for the transmission of radionavigation satellite differential correction signals by ICAO standard ground-based systems;

1.29 to consider the results of studies related to Resolutions **138/[COM5/3] (WRC-2000)** and **78/[COM5/23] (WRC-2000)** dealing with sharing between non-GSO and GSO systems;

1.30 to consider possible changes to the procedures for the advance publication, coordination and notification of satellite networks in response to Resolution **86** (Minneapolis, 1998);

1.31 to consider the additional allocations to the mobile-satellite service in the 1-3 GHz band, in accordance with Resolutions **226/[COM5/29] (WRC-2000)** and **227/[COM5/30] (WRC-2000)**;

1.32 to consider technical and regulatory provisions concerning the band 37.5 - 43.5 GHz, in accordance with Resolutions **128 (Rev.WRC-2000)** and **84/[COM5/28] (WRC-2000)**;

1.33 to review and revise technical, operational and regulatory provisions, including provisional limits in relation to the operation of high altitude platform stations within IMT-2000 in the bands referred to in No. **S5.388A/S5.BBB**, in response to Resolution **221/[COM5/13] (WRC-2000)**;

1.34 to review the results of studies in response to Resolution **539/[COM4/6] (WRC-2000)** concerning threshold values for non-GSO BSS (sound) in the band 2 630 - 2 655 MHz, and to take actions as required;

1.35 to consider the report of the Director of the Radiocommunication Bureau on the results of the analysis in accordance with Resolution **53 (Rev.WRC-2000)** and take appropriate action;

1.36 to examine the adequacy of the frequency allocations for HF broadcasting from about 4 MHz to 10 MHz, taking into account the seasonal planning procedures adopted by WRC-97;

1.37 to consider the regulatory and technical provisions for satellite networks using highly elliptical orbits;

1.38 to consider provision of up to 6 MHz of frequency spectrum to the Earth exploration-satellite service (active) in the frequency band 420 - 470 MHz, in accordance with Resolution **727 (Rev.WRC-2000)**;

1.39 to examine the spectrum requirements in the fixed-satellite service bands below 17 GHz for telemetry, tracking and telecommand of fixed-satellite service networks operating with service links in the frequency bands above 17 GHz;

2. to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution **28 (Rev.WRC-2000)**, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with principles contained in the Annex to Resolution **27 (Rev.WRC-2000)**;

3. to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the conference;

4. in accordance with Resolution **95 (Rev.WRC-2000)**, to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation;

5. to review, and take appropriate action on, the report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention;

6. to identify those items requiring urgent action by the radiocommunication study groups in preparation for the next world radiocommunication conference;

7. in accordance with Article 7 of the Convention:

7.1 to consider and approve the Report of the Director of the Radiocommunication Bureau on the activities of the Radiocommunication Sector since WRC-2000, including on any difficulties or inconsistencies encountered in the application of the Radio Regulations, and action in response to Resolution **80 (Rev.WRC-2000)**;

7.2 to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, taking into account Resolution **801/[GT PLEN-2/6] (WRC-2000)**,

instructs the Director of the Radiocommunication Bureau

to make the necessary arrangements to convene the Conference Preparatory Meeting and to prepare a report to WRC-03,

instructs the Secretary-General

1. to make all the necessary arrangements, in agreement with the Director of the Radiocommunication Bureau, for the convening of the Conference;

2. to communicate this resolution to international and regional organizations concerned.

Attachment 2

Suggested amendments to the ITU Radio Regulations

Suggested amendments to the ITU Radio Regulations based on the ICAO position on action items 1.1, 1.3, 1.4, 1.5, 1.6, 1.17 and 1.28 are shown below. Further amendments may be added based on the results of future ICAO and ITU studies.

Notes on the presentation

1. ~~Text to be deleted is shown with a line through it.~~	text to be deleted
2. <u>New text is underlined</u>	new text to be inserted
3. ***<u>NOC</u>***	precedes existing text that is copied without changes

WRC-2003 — Agenda Item 1.1

a. Footnotes in bands used for ILS (marker beacons, localizer, glide path)

74.8 - 75.2 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
74.8-75.2	AERONAUTICAL RADIONAVIGATION S5.180 ~~S5.181~~	

S5.180 The frequency 75 MHz is assigned to marker beacons. Administrations shall refrain from assigning frequencies close to the limits of the guardband to stations of other services which, because of their power or geographical position, might cause harmful interference or otherwise place a constraint on marker beacons.

Every effort should be made to improve further the characteristics of airborne receivers and to limit the power of transmitting stations close to the limits 74.8 MHz and 75.2 MHz.

~~**S5.181** *Additional allocation:* in Egypt, Israel, Japan, and Syria, the band 74.8-75.2MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **S9.21.** In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedure invoked under No. **S9.21.**~~

108 - 117.975 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
108-117.975	AERONAUTICAL RADIONAVIGATION ~~S5.197~~	

~~**S5.197** Additional allocation:in Japan, Pakistan and Syria, the band 108-111.975 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No.S9.21. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedures invoked under No.**S9.21**.~~

328.6 - 335.4 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
328.6-335.4	AERONAUTICAL RADIONAVIGATION S5.258 ~~S5.259~~	

S5.258 The use of the band 328.6-335.4 MHz by the aeronautical radionavigation service is limited to Instrument Landing Systems (glide path).

~~**S5.259** Additional allocation: in Egypt, Israel, Japan, and Syria, the band 328.6-335.4MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No.**S9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedure invoked under No.**S9.21**.~~

b. Footnotes in the band 117.975 - 137 MHz, used for air-ground communications (voice and data)

117.975 - 137 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
117.975-137	AERONAUTICAL MOBILE (R) S5.111 S5.198 S5.199 S5.200 S5.201 S5.202 ~~S5.203~~ NOC S5.203A S5.203B	

~~**S5.203** In the band 136-137 MHz, existing operational meteorological satellites may continue to operate, under the conditions defined in No. **S4.4** with respect to the aeronautical mobile service, until 1January2002. Administrations shall not authorize new frequency assignments in this band to stations in the meteorological-satellite service.(WRC-97)~~

NOC S5.203A *Additional allocation:* in Israel, Mauritania, Qatar and Zimbabwe, the band 136-137 MHz is also allocated to the fixed and mobile, except aeronautical mobile (R), services on a secondary basis until 1 January 2005. (WRC-97)

c. Footnotes in the band 1559 - 1610 MHz used for elements of the ICAO Global Navigation Satellite System (GLONASS, GPS and augmentation systems)

1 559 - 1 610 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
1 559-1 610	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) S5.329A S5.341 S5.363 S5.355A S5.359A	

S5.355A *Additional allocation:* in Bahrain, Bangladesh, Congo, Egypt, Eritrea, Iraq, Israel, Jordan, Kuwait, Lebanon, Malta, Morocco, Qatar, Syria, Somalia, Sudan, Chad, Togo and Yemen, the band 1 559-1 610 MHz is also allocated to the fixed service on a secondary basis until ~~1January2015date, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite~~ 1 January 2005. After this date the fixed service ~~and not authorize new frequency assignments to fixed-service systems~~ will cease to operate in this band.

S5.359A *Additional allocation:* The band 1 559-1 610 MHz is also allocated to the fixed service on a primary basis until 1 January 2005 in Germany, Armenia, Azerbaijan, Belarus, Benin, Bosnia and Herzegovina, Bulgaria, Spain, France, Gabon, Georgia, Greece, Guinea, Guinea-Bissau, Hungary, Kazakstan, Latvia, Lithuania, Moldova, Mongolia, Nigeria, Uganda, Uzbekistan, Pakistan, Poland, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, the Russian Federation, Senegal, Swaziland, Tajikistan, Tanzania, Turkmenistan and Ukraine, ~~and until 1January2010 in~~ Saudi Arabia, Cameroon, Jordan, Kuwait, Lebanon, Libya, Mali, Morocco, Mauritania, Syria and Tunisia. After ~~these dates~~ this date, the fixed service ~~may continue~~ will cease to operate ~~on a secondary basis until 1January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and the aeronautical radionavigation service and not authorize new frequency assignments to fixed-service systems~~ in this band.

d. Footnotes in the band 4200 - 4400 MHz, used for airborne radio altimeter.

4 200 - 4 400 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
4 200-4 400 AERONAUTICAL RADIONAVIGATION S5.438 ~~S5.439~~ S5.440		

S5.438 Use of the band 4 200-4 400 MHz by the aeronautical radionavigation service is reserved exclusively for radio altimeters installed on board aircraft and for the associated transponders on the ground. However, passive sensing in the earth exploration-satellite and space research services may be authorized in this band on a secondary basis (no protection is provided by the radio altimeters).

~~**S5.439** *Additional allocation:* in Iran (Islamic Republic of) and Libya, the band 4200-4400MHz is also allocated to the fixed service on a secondary basis.~~

5 000 - 5 150 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
5 000-5 150 AERONAUTICAL RADIONAVIGATION S5.367 S5.444 S5.444A S5.444B S5.444C		

NOC **S5.444** The band 5 030-5 150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. The requirements of this system shall take precedence over other uses of this band. For the use of this band, No. **S5.444A** and Resolution **114 (WRC-95)** apply.

NOC **S5.444A** *Additional allocation:* the band 5 091-5 150 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a primary basis. This allocation is limited to feeder links of non-geostationary mobile-satellite systems and is subject to coordination under No. **S9.11A**.

In the band 5 091-5 150 MHz, the following conditions also apply:

— prior to 1 January 2010, the use of the band 5 091-5 150 MHz by feeder links of non-geostationary-satellite systems in the mobile-satellite service shall be made in accordance with Resolution **114 (WRC-95)**;
— prior to 1 January 2010, the requirements of existing and planned international standard systems for the aeronautical radionavigation service which cannot be met in the 5 000-5 091 MHz band, shall take precedence over other uses of this band;
— after 1 January 2008, no new assignments shall be made to stations providing feeder links of non-geostationary mobile-satellite systems;
— after 1 January 2010, the fixed-satellite service will become secondary to the aeronautical radionavigation service.

S5.444B *Additional allocation:* The band 5 000 - 5 010 MHz is also allocated to the radionavigation-satellite service (Earth-to-space) on a primary basis. See Resolution **603 (WRC-2000)**.

S5.444C *Additional allocation:* The band 5 010 - 5 030 MHz is also allocated to the radionavigation-satellite service (space-to-Earth) (space-to-space) on a primary basis. In order not to cause harmful interference to the microwave landing system operating above 5 030 MHz, the aggregate power flux-density produced at the Earth's surface in the band 5 030 - 5 150 MHz by all the space stations within any radionavigation-satellite service system (space-to-Earth) operating in the band 5 010 - 5 030 MHz shall not exceed –124.5 dB(W/m^2) in a 150 kHz band. In order not to cause harmful interference to the radio astronomy service in the band 4 990 - 5 000 MHz, the aggregate power flux-density produced in the 4 990 - 5 000 MHz band by all the space stations within any RNSS (space-to-Earth) system operating in the 5 010 - 5 030 MHz band shall not exceed the provisional value of –171 dB(W/m^2) in a 10 MHz band at any radio astronomy observatory site for more than 2% of the time. For the use of this band, Resolution **604 (WRC-2000)** applies.

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5 350 - 5 470 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
5 350-5 460 EARTH EXPLORATION-SATELLITE (active) S5.448B AERONAUTICAL RADIONAVIGATION S5.449 ~~Radiolocation~~ RADIOLOCATION S5.AAA		
5 460-5 470 RADIONAVIGATION S5.449 ~~Radiolocation~~ RADIOLOCATION S5.AAA		

S5.448B The earth exploration-satellite (active) service operating in the band 5 350-5 460 MHz shall not cause harmful interference to, or constrain the use and development of, the aeronautical radionavigation service. (WRC-97)

S5.449 The use of the band 5 350-5 470 MHz by the aeronautical radionavigation service is limited to airborne radars and associated airborne beacons.

S5.AAA The Radiolocation service shall not cause harmful interference to the Aeronautical Radionavigation Service and the Radionavigation Service nor claim protection from these services.

14 - 14.5 GHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
14-14.25 FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 RADIONAVIGATION S5.504 Mobile-satellite (Earth-to-space) ~~except aeronautical mobile-satellite~~ Space research S5.505		
14.25-14.3 FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 RADIONAVIGATION S5.504 Mobile-satellite (Earth-to-space) ~~except aeronautical mobile-satellite~~ Space research S5.505 S5.508 S5.509		
14.3-14.4 FIXED FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) ~~except aeronautical mobile-satellite~~ Radionavigation-satellite	**14.3-14.4** FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 Mobile-satellite (Earth-to-space) ~~except aeronautical mobile-satellite~~ Radionavigation-satellite	**14.3-14.4** FIXED FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) ~~except aeronautical mobile-satellite~~ Radionavigation-satellite
14.4-14.47 FIXED FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) ~~except aeronautical mobile-satellite~~ Space research (space-to-Earth)		
14.47-14.5 FIXED FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) ~~except aeronautical mobile-satellite~~ Radio astronomy S5.149		

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2 900 - 3 100 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
2 900-3 100 RADIONAVIGATION S5.426 ~~Radiolocation~~ RADIOLOCATION S5.BBB S5.425 S5.427		

S5.423 In the band 2 700-2 900 MHz, ground-based radars used for meteorological purposes are authorized to operate on a basis of equality with stations of the aeronautical radionavigation service.

S5.424 Additional allocation: in Canada, the band 2 850-2 900 MHz is also allocated to the maritime radionavigation service, on a primary basis, for use by shore-based radars.

S5.425 In the band 2 900-3 100 MHz, the use of the shipborne interrogator-transponder system (SIT) shall be confined to the sub-band 2 930 -2 950 MHz.

S5.426 The use of the band 2 900-3 100 MHz by the aeronautical radionavigation service is limited to ground-based radars.

S5.427 In the bands 2 900-3 100 MHz and 9 300-9 500 MHz, the response from radar transponders shall not be capable of being confused with the response from radar beacons (racons) and shall not cause interference to ship or aeronautical radars in the radionavigation service, having regard, however, to No. **S4.9**.

S5.BBB The Radiolocation Service shall not cause harmful interference nor claim protection from the Aeronautical Radionavigation Service and the Radionavigation Service

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108 - 117.975 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
108-117.975	AERONAUTICAL RADIONAVIGATION ~~S5.197~~ S5.CCC	

~~**S5.197** *Additional allocation:* in Japan, Pakistan and Syria, the band 108 - 111.975 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **S9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation stations, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedures invoked under **No.S9.21**.~~ (See also agenda item 1.1.)

S5.CCC The band 108 - 117.975 is also allocated to the Aeronautical Mobile (R) Service and limited for the transmission of ground-based signals that provide supplemental navigational data for the radio navigation satellite service, by ICAO standardized systems.

— END —