

Aeronautical Mobile Communications Panel
WORKING GROUP F
Lima, 29 March – 4 April 2001

1. Introduction

1.1. The sixth meeting of AMCP Working Group F was held in Lima from 29 March to 4 April 2001 with the meeting rapporteur being Mr. S. Mitchell from the United Kingdom. Prior to the meeting, WG-F members participated in the 2 day ICAO South American Regional Co-ordination Meeting in Preparation for ITU World Radiocommunication Conference (2003) WRC 2003; a copy of the report of this meeting can be found at Appendix C. The Agenda of the meeting is at Appendix A, the list of participants is contained in Appendix B and the list of working papers is at Appendix F.

2. Agenda Item 1: Opening and Meeting Arrangements

2.1 Mr Paulo Imre Hegedus, Regional Director South American Office officially opened the meeting and expressed a warm welcome to all participants. After the official opening the Rapporteur proceeded with the meeting where after the introduction of participants, discussion on working arrangements and agreement of the Agenda, the meeting continued with the remaining Agenda items.

3. Agenda Item 2: Review of outcome of ITU Working Parties and Task Groups (8B, 8D, 8F & 1/5)

3.1 WP 13 was introduced by Japan which highlighted the deficiency in the MSS Handbook being produced in the ITU with regards to the description of AMS(R)S. The USA and Japan both expressed an intention to rectify the situation with inputs to the ITU. Japan also provided the meeting with a copy of the relevant part of the MSS Handbook relating to AMS(R)S.

3.2 A copy of an ITU-R Draft New Recommendation (DNR) titled “The Protection of Safety Services from Unwanted Emissions” was presented as WP 6. The GNSSP WG-B at its recent meeting in Banff had the opportunity to review this DNR and provided comments in WP 35 to this meeting with regards to the use of “integrity” as opposed to “performance”. The meeting accepted the proposed comments from the GNSSP WG-B and these will be taken forward to the ITU with the intent of modifying the DNR. Also absent from the DNR was any reference to AMS(R)S. This will also be brought to the attention of the ITU. The group was also reminded that ITU-R TG 1/5 no longer existed and that TG 1/7 had taken over TG 1/5s outstanding actions.

3.3 WP 3 was introduced by the Secretariat as an overview of ITU-R Working Party 8B activities relating to aviation interests. A majority of the items in this paper were considered under other agenda items of this meeting although there were comments from the GNSSP WG-B provided in WP 35 regarding Part 6 of WP 3 regarding sharing of the band 1164 – 1215 MHz between the aeronautical radionavigation service and the radio navigation satellite service. These comments were noted and in particular that there was no firm position with regards to the 10 dB versus 6dB as an apportionment of RNSS interference to all interference. These comments will be taken forward to the ITU as and when necessary.

3.4 With respect to ITU-R Working Party 8D activities relating to aviation activities, the Secretariat introduced WP 2. In a similar situation to WP 3, most items were discussed under other agenda items. GNSSP WG-B provided comments regarding Part 2 of the paper concerning the use of Loran-C and Chayka by international civil aviation which concluded that no further action is required from the group or ICAO.

4. Agenda Item 3: Consideration of draft ICAO position for WRC-2003

4.1 The draft ICAO position for WRC-2003 was considered by the group following comments received by States from the recent State letter and a proposed revision of this position can be found as Appendix D to this report. There were 2 main areas of significant discussion within the group one regarding WRC-2003 Agenda Item 1.28 (Use of the 108 – 117.975 MHz band) and Agenda Items 1.4, 1.5 and 1.6 (all relating to the use of the 5 GHz band). The results of these discussions are reflected in the following paragraphs under this section.

4.2 Following intensive discussion a co-ordinating group was established in order to prepare text for the **Discussion** and **ICAO Position** parts of the ICAO position for WRC-2003 concerning Agenda Item 1.28 highlighted in the previous paragraph. The results of these discussions can be found within Appendix D which now contains additional material not only on GBAS but also ICAO standardised systems supporting air navigation functions which are proposed to operate in the 108 – 117.975 MHz band. It was also agreed within WG-F that regulatory provisions should be developed on the basis of ITU Radio Regulation RR S5.328 taking into account that the band can only be used by ICAO standardised systems. For information RR S5.328 is quoted below:

S5.328 The band 960-1 215 MHz is reserved on a worldwide basis for the use and development of airborne electronic aids to air navigation and any directly associated ground-based facilities.

Discussion on the actual text for regulatory provision will be co-ordinated outside the WG-F meeting by the Secretariat.

4.3 With respect to WRC-2003 Agenda Items 1.4, 1.5 & 1.6 relating to 5 GHz, a 3 pronged approach was proposed by WG-F. With respect to Agenda Item 1.6 the group agreed that ICAO should be more neutral in its approach to this band and that the words “not to oppose the deletion...” should be removed from the **Discussion** and **ICAO Position** parts of the ICAO position for WRC-2003. Following discussions under this item it was identified that in the band 5150 – 5250 MHz, it may be possible to introduce an airport ground based communication system that did not require the same level of protection as an aeronautical mobile (R) service. With this in mind it was decided that the ICAO position regarding Agenda Item 1.5 would be modified to reflect the possibility of a new allocation for this possible new system. Concerning the ICAO position regarding Agenda Item 1.4 it was agreed that at this moment in time the ICAO position should remain as currently stated. The meeting was also made aware of a study being undertaken within Eurocontrol regarding an AM(R)S study which may be able to use the band 5091 – 5150 MHz. WG-F will be kept informed of developments in this area over the next year or so which may have an impact on the ICAO position for WRC-2003 regarding Agenda Item 1.4.

4.4 Also under this agenda item and following an initial review by a small co-ordinating group, the group considered the status of the Resolutions and Recommendations of the ITU Radio Regulations. The result of these considerations can be found as Appendix E to this paper.

4.5 With regards to future WRC Agenda Items post WRC-2003 the meeting agreed that due to the shortage of VHF AM(R)S spectrum and the need to find additional spectrum for this type of service, then consideration should be given to placing an item on the WRC-2006 agenda to address this issue.

5. Agenda Item 4: Preparation for WRC-2003 by regional telecommunication organisations

5.1 There were 4 WPs presented under this agenda item all of them mainly as information since preparations in the regional telecommunications organisations for WRC-2003 is only just getting underway however the group emphasised the need for active aviation participation in regional preparation activities. There were a couple of members of the group who wished it to be noted how well the ICAO regional office in Bangkok had done in presenting and defending the ICAO position for WRC-2003 at a recent meeting of the Asia Pacific Telecommunity.

6. Agenda Item 5: ITU Plenipotentiary Conference 2002

6.1 Although there were no input papers under this agenda item, the Secretariat explained that IMO had approached the ITU regarding the status at WRCs of specialised agencies of the UN dealing with safety issues. IMO had requested and obtained the support of ICAO on this issue. The Secretariat requested that it would be appreciated that where possible support should be given to future ICAO action with the ITU regarding this issue.

7. Agenda Item 6: Future use of the 5GHz band (including MLS)

7.1 Most of the discussion for this agenda item and the output of these discussions can be found under Agenda Item 3 of this meeting. With regards to the work concerning the requirements for MLS however the meeting noted from WP 35 the work ongoing within the European Region to determine the requirements for this region. This work will determine whether a planning height of 10000 feet as currently used in Europe or 20000 feet as stated in Annex 10 SARPs and take into account the requirement for triple planning (MLS/DME/ILS). The planning will require the development of a region-wide planning tool which can take into account triple pairing.

8. Agenda Item 7: Radio regulatory provision navigation datalinks in the band 108 – 117.975 MHz

8.1 All discussion for this agenda item and the output of these discussions can be found under Agenda Item 3 of this meeting.

9. Agenda Item 8: Radio regulatory provisions for a surveillance data link (VDL Mode 4) in the band 108 – 117.975 MHz including compatibility with existing and planned services

9.1 All discussion for this agenda item and the output of these discussions can be found under Agenda Item 3 of this meeting.

10. Agenda Item 9: Compatibility of GBAS, GRAS and VDL Mode 4 with FM broadcast stations operating in the band 87.5 – 108 MHz

10.1 There were no papers presented for this agenda item however the group noted from WP 35 that the GNSSP WG-B have stated that GBAS can be treated as VOR with respect to FM compatibility. The Secretariat will liaise internally within ICAO in order to ascertain the extent of work carried out by the GNSSP in this area.

11. Agenda Item 10: Interference from ultra wideband systems

11.1 WP 30 and WP 5 were presented to the meeting by the USA for information. WP 5 is an attachment to the WP 30 and contains information on the potential interference that can be caused by these types of systems to aeronautical safety services used for the provision of air traffic control. One particular area of note was that ultra wideband systems although working below current FCC spurious level limits may have the ability to exceed the GPS interference threshold by up to 30 dB. The group noted that a statement in WP 35 from GNSSP WG-B that the proposed US FCC Notice of Public Rulemaking (NPRM) EIRP limits for ultra wideband systems may require separation distances for MLS and GNSS that make it impossible to support CAT I, II and III operations.

12. Agenda Item 11: Interference from cable systems

12.1 There were 3 interesting and useful papers presented to the group under this agenda item on work ongoing within Europe. WP 36 contained information on some testing that had been performed on aeronautical equipment and although further testing was required the results so far indicate that first column of Table 2 (Minimum Wanted field Strength [dB(μ V/m)]) in WP 23 would need to be modified.

12.2 WP 37 was of much interest to the group since it contained a method for calculating the total signal power that could be received by an aircraft over at different flight levels. The meeting noted and accepted the statement in WP 37 that although it is impossible to develop a model for calculating the cumulative field strength which can reflect all the (unknown) complex factors and conditions, and which would deliver the true sum field strength the simplified calculation model in the paper, can give an impression of the order of magnitude of the sum field strength on airborne receivers.

12.3 Two areas of particular interest from WP 37 relate to the fact that no matter what height the aircraft was flying at the total received signal power was constant and the 2nd point that below a flying height of 6 km the dominant interferer was a single source whereas above 6 km multiple sources were dominant. The group also recognised that the approach contained in this paper could also be used for the assessment of other interference sources including ultra wideband.

12.4 Material from all 3 WPs presented under this section will be used to generate a section in the ICAO Handbook on radio frequency requirements for Civil Aviation on cable systems interference.

13. Agenda Item 12: Availability of spectrum for AMS(R)S in the 1.5/1.6 GHz bands

13.1 WP 14 was presented by Japan which referred to Part 5 of WP 3. The group agreed to encourage their respective radio Administrations to support the establishment of a new Question in ITU-R Working Party 8D on AMS(R)S spectrum availability with particular focus on the co-ordination process. The point of contact for work relating to this question should be Mr Suzuki from Japan. Contact should be made by e-mail on suzuki@jrnsa.or.jp

14. Agenda Item 13: Use of the band 2700 – 2900 by the mobile service (IMT-2000)

14.1 Mainly for information 3 WPs were presented to the meeting. Of particular interest was the fact that within Europe the emphasis had moved away from IMT-2000 and was now more focused on the use of the band by other systems notably ENG/OB and aeronautical telemetry in which Eurocontrol is continuing its studies on the affect of these systems on radar.

14.2 Another point of interest to the group was raised by the USA where they had performed some tests using TDMA and CDMA signals to simulate a mobile communications systems and found that interference to ATC radars could be caused by IMT-2000. In addition, Eurocontrol preliminary study results indicate that the detection of small targets such as military and general aviation aircraft may not be possible due to IMT-2000. Work is ongoing both within Europe and the USA which result in material being presented to ITU Working Party 8B.

14.3 France also stated that they had co-ordinated with the UK, Belgium and the Netherlands for the use of a very limited number of set frequencies in the 2700 – 2720 MHz portion of the band and on set air routes for the use of aeronautical telemetry. It was also stated that there are very strict conditions attached to this use with respect to the protection of radars operating in this band.

15. Agenda Item 14: Future utilisation of the HF bands

15.1 WP 32 was presented by the Secretariat under this agenda item and was a copy of the same paper presented to the Regional Co-ordination meeting. The meeting agreed with the suggested action in the paper namely that ICAO develop guidance material on frequency planning for HF DL on a worldwide basis.

16. Agenda Item 15: Compatibility of radio altimeters with the earth exploration satellite service

There were no papers presented for this agenda item.

17. Agenda Item 16: RNSS in frequency bands used by GNSS

17.1 Although there were no papers directly input for this agenda item, WP 35 from the GNSS WG-B contained information which was addressed under Agenda Item 2 of this meeting. GNSS WG-B stated in this paper that currently there was not enough information to support the current value or propose changes to the provisional pfd for the DME band. It is anticipated that a conclusion on this issue can be reached at the next meeting of the GNSS spectrum sub group.

18. Agenda Item 17: RNSS in other bands

18.1 WP 39 contains details of a presentation made by Mr Philippe Gerard of the Agence Nationale des Frequences (ANFR), France concerning the interference into an aeronautical radar operating in the band 1215 – 1300 MHz from RNSS operating in the same band. The meeting expressed its appreciation for the work done and its interest in being kept informed of future developments. The presentation identified that although it seems that it should not be too difficult to model the interference environment there is a large discrepancy between the theoretical results and reality. This needs to be investigated further in order to improve the model and work in ongoing in this area.

18.2 The group also noted that the interference situation in the future may worse for radars operating in the 1215 – 1300 MHz band particularly in light of any additional RNSS systems or modifications to existing RNSS systems using this band. It was also noted that the actual spectrum overlap between a RNSS system and a radar needs to be considered since in at least one State it was found that where a interference problem was expected practical measurements had revealed this not to be the case.

18.3 WP 15 presented by Eurocontrol concentrated on the interference thresholds for aeronautical radar receivers. Other assessments to date has used a –6 dB I/N level and this figure can be found in ITU Recommendations for a significant degradation of service. From studies carried out on behalf of Eurocontrol for “S” band radars which also involved practical testing, it was revealed that this preliminary figure should be between –10 to –12 dB. Eurocontrol intend to prepare a paper for the ITU.

18.4 WP 3, Part 1, contained information on ITU WP8D work on the sharing of the band 1 300 - 1 350 MHz between the RNSS (Earth-to-space) and the ARNS. The meeting expressed concern about some of the assumptions used and supported the Secretariat comments contained in WP 3.

19. Agenda Item 18: Use of the band 2400 – 2500 MHz for airport wireless communication systems

There were no papers presented for this agenda item.

20. Agenda Item 19: Consideration of amendments to Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including statement of approved policies

20.1 WP 19 presented by the Secretariat contained proposed amendments to the above handbook. Most of the changes are consequential as a result of WRC-2000 and of editorials. The group was however requested to review the Policy statements within the document and suggest changes as necessary.

20.2 One policy statement of particular concern was that relating to the recovery of an exclusive allocation for AMS(R)S. After a very lengthy discussion the group felt that at this moment in time it would not be possible to recover an exclusive allocation and therefore the emphasis was changed to try to get the procedures working correctly and that if this failed then attempt to obtain an exclusive allocation. The results of this discussion and the output of the group under this agenda item can be found as Appendix G to this report.

21. Agenda Item 20: Consideration of unified method for assessing compatibility between FM broadcasting and ILS/VOR/GBAS

There were no papers presented for this agenda item.

22. Agenda Item 21: Compatibility of GBAS/GRAS with systems operating in the band 117.975 – 137 MHz

There were no papers presented for this agenda item.

23. Agenda Item 22: Any Other Business

23.1 WP 21 presented by Eurocontrol related to the shortage of spectrum for air/ground communications. Some of this paper was considered under Agenda Item 3 since it related to the possibility of using the 5 GHz band for short range communication. The meeting agreed that it would generate a new agenda item for future WG-F meetings aimed at the shortage of spectrum for air/ground communications.

23.2 WP 9 presented by the Secretariat could not be considered in full due to the limited time available towards the end of the meeting. The WP related to personal electronic devices on board aircraft and the fact were now regularly asked for information in this area. After limited discussion the meeting agreed that this could be considered further and that an agenda item will be generated for future meetings of WG-F.

23.3 In considering WP 20 the meeting agreed that CCIR report 927-2 contained essential information as far as the aeronautical community was concerned and that this information should not be lost. It was agreed that the Secretariat would try and draft a PDNR for input to the ITU based on this CCIR report.

23.4 The USA through WP 22 informed the group of work they had ongoing to try and reduce the guardbands around 121.5 MHz. Results to date had been encouraging and through co-operation with SRSAT the USA felt that some relaxation could be achieved.

23.5 Some discussion took place on the status of WG-F particularly in light of the fact that there were a number of WGs within ICAO Panels dealing with frequency and spectrum issues. The main feeling of the meeting was that WG-F should be raised to the level of a Panel and therefore become responsible for all frequency and spectrum work within ICAO. It was explained by the Secretariat that the only way that this was likely to be achieved was by States bringing the issue for discussion into the ICAO forum via their permanent ICAO representatives.

23.6 The date of the next meeting of WG-F is scheduled for 15-27 November 2001 in Bangkok with the 1st 2 days arranged as a regional co-ordination meeting.

Appendices

Appendix A – Agenda

Appendix B – List of participants

Appendix C – Report of Regional co-ordination meeting

Appendix D - Consideration of draft ICAO position for WRC-2003

Appendix E - Resolutions and Recommendations of the ITU Radio Regulations

Appendix F – List of working papers

Appendix G - Consideration of amendments to Handbook on Radio Frequency Spectrum
Requirements for Civil Aviation including statement of approved policies

**Aeronautical Mobile Communications Panel
Working Group F
(Lima, 27 March – 4 April 2001)**

Agenda

1. Opening and working arrangements;
2. Review of outcome of ITU Working Parties and Task Groups (8B, 8D, 8F & 1/5);
3. Consideration of draft ICAO position for WRC-2003;
4. Preparation for WRC-2003 by regional telecommunication organisations
 - a. Asia-Pacific Telecommunity (APT),
 - b. European Conference of Post and Telecommunication administrations (CEPT),
 - c. Inter-American Committee for Telecommunications (CITEL),
 - e. Pan-African Telecommunications Union (PATU);
5. ITU Plenipotentiary Conference 2002;
6. Future use of the 5 GHz band (including MLS);
7. Radio regulatory provision for navigation datalinks in the band 108 – 117.975 MHz;
8. Radio regulatory provisions for a surveillance datalink (VDL Mode 4) in the band 108 – 117.975 MHz including compatibility with existing and planned services;
9. Compatibility of GBAS, GRAS and VDL Mode 4 with FM broadcast stations operating in the band 87.5 – 108 MHz;
10. Interference from ultra wideband systems;
11. Interference from cable systems;
12. Availability of spectrum for AMS(R)S in the 1.5/1.6 GHz bands;
13. Use of the band 2700 – 2900 MHz by the mobile service (IMT-2000);
14. Future utilisation of the HF bands;
15. Compatibility of radio altimeters with earth exploration satellite service;

16. RNSS in frequency bands used by GNSS;
17. RNSS in other frequency bands;
18. Use of the band 2400 – 2500 MHz for airport wireless communication systems;
19. Consideration of amendments to Handbook on radio frequency spectrum requirements for Civil aviation including statement of Approved ICAO Policies;
20. Consideration of a unified method for assessing compatibility between FM broadcasting and ILS/VOR/GBAS;
21. Compatibility of GBAS/GRAS with systems operating in the band 117.975-137 MHz;
22. Any Other Business.

List of Participants

Name	Telephone	FAX	e-mail	State/Organisation
Carlos Adragna	(5411) 4317-6314	(5411) 4317-6160	caadragnamixmail.com	Argentina
Annesley De Soyza	(02) 62684721	(02) 62685191	annesley.desoyza@airservices.gov.au	Australia
Hugo Balderrama Barrios	(5912) 370340	(5912) 370340	hbalderrama@latinmail.com	Bolivia
Ricardo Senra de Oliveira	(5521) 3814-6236	-	rsendra@starmedia.com	Brazil
John Taylor	(613) 993-4061	-	taylorj@tc.gc.ca	Canada
Ricardo Velásquez Aravena	(562) 290-4661	(562) 644-1446	ce3hdi@hotmail.com	Chile
Victor Manuel Pachón Castañeda	(571) 266-2226	(571) 413-9838	-	Colombia
Raúl Madrigal Muñoz	(537) 55-1121/55-1146	(537) 55-1183	raul.madrigal@iacc.avianet.cu	Cuba
Julio Zurita	(5932) 603-739	(5932) 603-739	-	Ecuador
Maria Alexandra Contreras C.	(5932) 506-576	(5932) 504-530	alexia_contreras@hotmail.com	Ecuador
Eleuterio Estaban del Pozo	(3491) 321-3278	(3491) 321-3212	eesteban@aena.es	Spain
Alain Delrieu	(331) 5809-4770	(331) 5809-3609	delrieu@dna.dgac.fr	France
Jean Claude Ordas	(331) 5809-4822	(331) 5809-4920	-	France
Philippe Gerard	-	(332) 9834-1199	-	France (ANFR)
Torsten Jacob	(4969) 8054-1530	(4969) 8054-1595	torsten.jacob@dfs.de	Germany
Masuda Shigeki	(813) 5253-8111, Ext. 51457	(813) 5253-1663	masuda-s2sa@mlit.go.jp	Japan
Takashi Uneme	(813) 5253-8111	(813) 5253-1663	uneme-t2gn@mlit.go.jp	Japan
Yoshio Suzuki	(813) 3431-7084	(813) 3431-7385	suzuki@jransa.or.jp	Japan
Andrés A. Barahona	(507) 232-6065	(507) 232-5279	naerea@gob.pa	Panama
Abdiel Vásquez	(507) 232-6011	(507) 232-5279	-	Panama
Elliot Náquira Henriquez	(511) 575-1354	(511) 575-1354	elliotnaquira@yahoo.com	Peru
Jorge García Villalobos	(511) 575-1354	(511) 575-1354	jgarcia@corpac.gob.pa	Peru
Larry Johnsson	(4640) 613-1381/ (4670) 815-1381	(4640) 613-1378	larry.johnsson@lfv.se	Sweden
Steve Mitchell	(44) 1293 576556	(44) 1293 576431	steve.mitchell@natsnav.co.uk	United Kingdom
John Mettrop	(44) 207453 6531	(44) 207453 656	john.mettrop@dap.caa.co.uk	United Kingdom
Donald Willis	(202) 267-9715	(202) 267-5901	donald.willis@faa.gov	United States
George Sakai	(202) 267-9710	(202) 267-5901	george.sakai@faa.gov	United States
Leonardo Torres Yépez	(58212) 509-2460/2461	(58212) 574-2013	ltorresy@cantv.net.ve	Venezuela

Davidsa A. Guzmán Salazar	-	(58212) 574-2013	davidsags@yahoo.com	Venezuela
Kris Hutchison	(410) 266-43486	(410) 266-2047	keh@arinc.com	ARINC
Christian Pelmoine	(322) 729-3375	(322) 729-3511	-	EUROCONTROL
Geoff Perry	(44) 1273-671532	(44) 1273-671532	geoffperry@pavilion.co.uk	SITA
Alessandro Capretti	(514) 954-5847	(514) 954-6759	acapretti@icao.int	ICAO, Montreal
Carlos Stehli	(511) 575-1646	(511) 575 0974	cs@lima.icao.int	ICAO, Lima
Bill Young	-	-	-	ICAO, Montreal (Advisor)

APPENDIX C

A copy of the report of the Regional Co-ordination meeting can be found at <http://www.lima.icao.int/>

Agenda Item 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

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).

ICAO has also developed standards for systems in which data derived from navigation systems onboard aircraft are transmitted over a data link to other aircraft and to Air Traffic Control on ground. Such data link can assist the navigation of aircraft and one such system is designed to operate also in the band 108 – 117.975 MHz.

The selected frequency band is currently allocated to the aeronautical radionavigation service. It has been argued that the new datalink systems currently standardized by ICAO and supporting aeronautical navigation functions, do 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 for the transmission of data supporting aircraft navigation functions.

Within this agenda item, the main civil aviation interest is to assure the protection of existing and expansion, as required, of the present systems (VOR/ILS) in this band, while at the same time supporting the implementation of new ICAO standardised systems supporting aeronautical navigation functions that can offer civil aviation benefits.

ICAO ensures through its international standards, that the different aeronautical radio systems already operating or planned to be operated in this band can safely coexist and will not cause harmful interference to each other. Compatibility and frequency planning criteria for the VOR/ILS and the new services are being developed by ICAO. With regard to adjacent bands, aeronautical systems must also conform to the relevant ITU provisions on unwanted emissions.

Compatibility with FM broadcast services in the band 87.5 – 108 MHz would be ensured through conformity with ITU-R Recommendation IS.1009.

ICAO is currently developing draft regulatory text to be considered for incorporation in the Radio Regulations.

ICAO Position:

Support an allocation permitting the use of the band 108 – 117.975 MHz for ICAO standard systems supporting air navigation functions.

Ensure conformity with ITU-R Recommendation IS.1009 regarding compatibility with the FM broadcast service in the band 87.5 – 108 MHz.

Additional note (not to be included in the ICAO position): It was agreed by WGF6 that the regulatory provisions should be developed on the basis of RR S5.328 taking into account that the band can only be used by ICAO standard systems. The current text of RR S5.328 is quoted below:

S5.328 *The band 960-1 215 MHz is reserved on a worldwide basis for the use and development of airborne electronic aids to air navigation and any directly associated ground-based facilities.*

Review of Resolutions and Recommendations from Radio Regulations

1. Introduction

During the AMCP WGF6 meeting, a small group (W.Young, J. Taylor and K.Hutchinson) reviewed WP10 and developed proposals based on WP10 for inclusion in the ICAO position on Agenda item 4 of ITU WRC-2003. The proposal, as modified by WGF/6, are shown below.

2. Abbreviations

Abbreviations used below are:

NOC	Retain without change
RAM	Retain – amending as necessary
RUPD	Retain and update (ie update is necessary)
RAMUPD	Retain, amend and update (ie both treatments are necessary)
DEL	Delete
DEL(ST)	Delete when studies have been completed
NP	No position (no impact on aeronautical services)

An asterisk in front of an item indicates a difference from the original proposal in WP10.

3. Resolutions

RES 13	NP
RES 18	NOC
RES 20	NOC
*RES 26	NOC
*RES 27(Rev.WRC-97)	NOC
*RES 28	RAM
*RES 44 (Mob-87)	RUPD1
*RES 63	RUPD2
RES 72 (WRC-2000)	NP
RES 75(WRC-2000)	NP
*RES 95 (WRC-2000)	NOC
RES 114 (WRC-95)	DEL(ST) (agenda WRC-2003 item 1.4)
RES 125 (WRC-97)	NP

1 Update *considering* a) and b) to reflect the current situation

2 General update of text

*RES 127 NP (agenda WRC-2003 item 1.16)

RES 205 RUPD3

RES 207 (REV.WRC-2000) NOC (agenda WRC-2003 item 1.14)

RES 209 NP

RES 216 DEL(ST) (agenda WRC-2003 item 1.11)

RES 217 (WRC-97) NOC

*RES 222 (WRC-2000) RUPD4

RES 223 (WRC-2000) NP

*RES 225 (WRC-2000) NOC

*RES 228 (WRC-2000) RAMUPD5

RES 405 NOC

RES 603 (WRC-2000) DEL(ST)

RES 604 (WRC-2000) NP

RES 605 (WRC-2000) DEL(ST)

RES 606 (WRC-2000) DEL(ST)

RES 607 (WRC-2000) DEL(ST)

*RES 644 (WRC-2000) NOC

*RES 645 (WRC-2000) NOC

RES 703 (Rev.WARC-92) NP

*RES 705 (Mob-87) RAM

*RES 706 (WRC-2000) NOC

RES 724 (WRC-97) NP

*RES 725 (WRC-97) DEL(ST)

RES 729 (WRC-97) NOC6

RES 733 (WRC-2000) NP

*RES 736 (WRC-2000) RAMUPD7

3 Include recent ICAO policy to incorporate frequency 406.1 MHz as a frequency for aircraft emergencies.

4 RES 222 is referred to through a “shall” statement in footnote S5.357A and constitutes the present regulatory basis for the protection of AMS(R)S in the 1.5/1.6 GHz band. It also calls for studies on the feasibility and practicality of prioritization and real-time pre-emptive access between different networks of mobile-satellite systems, and may need to be modified in the future depending on the results of the studies.

5 Amend to exclude aeronautical safety bands.

6 *Resolves* 1.2, first bullet, to be retained without change

7 Add: “ARNS in band 5 150 – 5 250 MHz”.

RES 800 (WRC-2000) DEL(ST)

*RES 801 (WRC-2000) RUPD8

RECOMMENDATIONS

REC 7 NOC

*REC 8 RAM

REC 9 NOC

REC 14 NOC

*REC 34 NOC

REC 35 (WRC-95) NP

*REC 61 NOC

*REC 63 DEL(ST)

*REC 64 DEL(ST)

*REC 66 DEL(ST)

REC 71 NOC

*REC 401 RAM

REC 402 DEL

REC 604 NOC

REC 606 DEL9

REC 701 NP

REC 702 NP

REC 707 NP

REC 709 NP

REC 710 NP

8 RES 801 contain the draft agenda for WRC-2006 and should be modified to include items of interest to aviation and to suppress items of concern to aviation.

9 Studie have now been completed.

List of working papers

NO.	Presented By	Subject	Agenda Item
-	Rapporteur	Invitation	-
IP 1 (Eng)	Secretary	General Information	-
IP 1 (Sp)	Secretary	Información General	-
WP 1	Rapporteur	Draft Agenda	-
WP 2	Secretary	ITU-R Working Party 8B activities	2
WP 3	Secretary	ITU-R Working Party 8D activities	2
WP 4	Secretary	State Letter E 3/5-00/101	3
WP 4 - Appendix	Secretary	State Letter E 3/5-00/101 - Appendix	3
WP 5	Don Willis	Assessment of compatibility between ultrawideband devices and selected federal systems (NTIA Special Publication)	10
WP 6	Steve Mitchell	ITU-R Task Group 1-5 DRAFT NEW RECOMMENDATION ITU-R SM.[SAF] THE PROTECTION OF SAFETY SERVICES FROM UNWANTED EMISSIONS	2
WP 7	Secretary	Preliminary CEPT Brief on WRC-2003 agenda items addressed in the ICAO position (Excerpts from Annex VII to CEPT CPG03-1 Report)	4b
WP 8	Secretary	Excerpts from ITU WRC-2000 Final Acts	-
WP 9	Secretary	Use of personal electronic devices on board an aircraft	22
WP 10	Secretary	Review of Resolutions and Recommendations from the Radio Regulations	3
WP 11	Secretary	Proposed amendments to Sections 7.I and 7.II of the ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc 9718)	19
WP 12	Secretary	ASIA-PACIFIC TELECOMMUNITY - STATUS OF ACTIVITIES AND VIEWS ON VARIOUS WRC-2003 AGENDA ITEMS AND IDENTIFICATION OF ISSUES AND ACTION ITEMS	4a
WP 13	Shigeki Masuda	ITU Working Party 8D activities	2
WP 14	Shigeki Masuda	New ITU-R Question to study Spectrum Availability of AMS(R)S in the Band 1545 to 1555 MHz and 1646.5 to 1656.5 MHz	12
WP 15	Eurocontrol	PROTECTION OF ATC - RADARS OPERATING IN THE BAND 1215 - 1300 MHZ FROM EMISSIONS OF SPACE STATIONS IN THE RADIONAVIGATION-SATELLITE SERVICE	17
WP 16	Eurocontrol	[RESTRICTED] Comments on the current study methodology used to predict the level of interference from a UMTS network	13
WP 17	Eurocontrol	[RESTRICTED] Preliminary study into the effects of interference on an ATC radar system	13
WP 18	Larry Johnsson	Radio regulatory provisions for a surveillance datalink (VDL Mode 4) in the band 108 - 117.975 MHz including compatibility with existing and planned services	8
WP 19	Secretary	Response to liaison statement from AMCP WG C/1 on radio spectrum available to support future aeronautical systems	22
WP 20	Secretary	CCIR Report 927-2	22

WP 21	Eurocontrol	Review of Future Spectrum Requirements for Short Range Air/Ground Communications	22
WP 22	Eurocontrol	Annex to letter 85 - DIS COM comments on the ICAO Position concerning the ITU WRC 2003	3
WP 23	Eurocontrol	Coaxial Cable Television Interference to Aviation Systems	11
WP 24	USA	121.5 MHz Guardband Channels	22
WP 25	USA	Expand Use of the 5 GHz Band	6
WP 26	USA	Preparations for WRC-2003 by Regional Telecommunication Organizations	4c
WP 27	USA	Ground Based Augmentation System (GBAS) Study	7
WP 28	USA	U.S. Reply to ICAO Request for Comments on ICAO Position on Areas of Critical Concern to International Civil Aviation to be Discussed at WRC-2003	3
WP 29	USA	Use of the Band 2700-2900 MHz for IMT-2000	13
WP 30	USA	Ultra-Wideband Technology	10
WP 31	Secretary	Draft compilation of replies to State Letter E 3/5-00/101	3
WP 32	Secretary	Frequency planning for HF DL	14
WP 33	Eurocontrol	European CEPT structure to prepare WRC-03	4b
WP 34	Eurocontrol	European CEPT CPG preparations for WRC-03	4b
WP 35	Secretary	Extract from the draft report of GNSSP WGB meeting (March 2001, Banff, Canada)	TBD (Sec.)
WP 36	Otto Lindenau	Information on laboratory measurements about interference of VHF/UHF COM, VOR and ILS (loc and gp) receivers with digital modulation to be used in cable TV networks	11
WP 37	Otto Lindenau	A proposal for the assessment of the sum field strength generated by a large number of single leaks of an extended cable network	11
WP 38	Torsten Jacob	GNSSP SPECTRUM SUBGROUP ACTION ITEM RESPONSES - SG1/7 Document the SARPS GBAS unwanted emission requirements, compare to ITU regulations.	7
WP 39	Philippe Gerard	Resolution 606 Interference from RNSS to radars in the 1215 - 1300 MHz band	17

Amendments to the ICAO RF policy statements in the RF Handbook on radio frequency spectrum requirements for civil aviation including statement of approved ICAO policies (Doc. 9718-AN/957).

- 1 Section 7-II.
Civil Aviation frequency allocations - ICAO policies and related information.

1.1 Frequency band 9 - 14 kHz

This band is allocated to the radionavigation service and was reserved for use by the long-range Omega radionavigation system. Since operation of the Omega system ceased several years ago, it is proposed to remove all references to the Omega system and to this band, including the relevant policy statements.

Band 9 - 14 kHz
ICAO POLICY
Until withdrawal of Omega, this frequency band must be protected
After withdrawal of Omega, no international civil aviation requirements for use of this band have been stated

1.2. Frequency band 90 - 110 kHz

This band is allocated to the radionavigation service and used for the Loran-C long-range radionavigation system. The ICAO policy statement requires to retain the allocation until there is evidence that the requirement for Loran-C has ceased. Since Loran-C is now expected to continue to be available in the medium term, this statement should be amended as shown below.

Band 90 - 110 kHz
ICAO POLICY
Retain the allocation to the Radionavigation Service and S5.62
Support deletion of the fixed service and S5.64 as envisaged in Resolution 706

.....

Secretary’s note: NDB band: third policy bullet (S5.70, 5.80 and 5.86). Investigate why we do not include other, similar footnotes, eg 5.77, 78 , 88 etc

1.3. HF bands between 2850 -22000 kHz

These bands are used for long distance voice communications. The proposed amendment addresses the technical studies relating to interference caused by unauthorized transmissions as discussed at WRC-2000. (Resolution 207 refers). These studies require support by ICAO. The statement addressing HF data link needs to be amended to reflect the adoption of SARPs for HF data link in 1998

HF bands (2850 - 22000 kHz)
ICAO POLICY
To retain the current allocations in the HF bands to the aeronautical mobile (route) service (AM(R)S bands for the foreseeable future for HF voice and HF data
Investigate possibilities for expansion into aeronautical mobile (off-route) serves (AM(OR)S) bands or other bands
Support measure facilitating the introduction of the HF data linkin conformity with ICAO SARPs. Provisional estimates of a further expansion of 30 kHz in the bands above 5 MHz have been stated.
To protect the use of the aeronautical HF bands in accordance with the provisions of Appendix S27 is necessary. The introduction of non-aeronautical systems in these bands cannot be accepted
No change to S5.111 and S5.115
To support measures and participate in technical studies addressed in Resolution 207 (Rev. WRC. 2000) addressing the unauthorized use of and interference to frequencies in the bands allocated to the aeronautical mobile (R) service. Consider technical solutions which can be implemented without changes to aircraft equipment, or disruption of aeronautical services.

1.4. Frequency band 108 - 117.975 MHz

** (changes below are consistent with position on AI 1.28 agreed by WGF6)** This band is used for ILS (Localizer) and VOR. This band is to be used for GNSS ground based augmentation systems such as GBAS. Other ICAO systems may also be considered for introduction in the band. This is not possible under the current framework of the Radio Regulations and an appropriate allocation needs to be introduced in the Radio Regulations in 2003. Also, compatibility with FM broadcasting stations, operating in the adjacent band below 108 MHz, needs to be secured.

.

108 - 117.975 MHz

ICAO POLICY
No change to the current allocation to the aeronautical radionavigation serviced
Support an allocation permitting the use of the band 108 – 117.975 MHz for ICAO standard systems supporting air navigation functions.
Deletion of S5.197
Ensure by appropriate measures conformity with ITU-R Recommendation IS-1009 regarding the compatibility of the aeronautical use with the FM Broadcast services in the band 87.5 - 108 MHz

Band 328.6-335.4

Replace “deletion of S5.197” with “deletion of S5.259”

1.5 Frequency band 960 - 1215 MHz

This band is used for SSR and DME. At WRC-2000 an allocation was made in a part of this band to the Radionavigation Satellite Service, in order to accommodate spectrum requirements for GPS and Galileo. The need for further studies was recognized by the ITU in Resolution 605. Depending on the outcome of these studies, additional regulatory measures may be necessary to ensure the protection of DME and SRR from interference from these satellite systems. The proposed amendments to the ICAO position are consequential to the amendments to the Radio Regulations and are also reflected in the ICAO position for WRC-2003.

Secretary’s note: In this and other post-WRC-2000 bands, WGF6 saw a contradiction in those places where we say: “don’t change footnote XX” and in the next bullett we say “introduce a pfd value in the footnote” (ie “change footnote XX”). So merging of two or more bullets was done in all those cases.

960 - 1215 MHz
ICAO POLICY
No change to the current allocation to the aeronautical radionavigation service in the band 960 - 1215 MHz
No change to S5.328
No change to the regulatory provisions contained in S5.328A pending the development of an appropriate pfd limit agreed by ICAO within the framework of the studies under ITU Resolution 605 (WRC-2000)
Support agreement on any additional regulatory measures in ITU Resolutions and ITU-R Recommendations that promote the protection of DME

1.6 Frequency bands 1215 - 1260 MHz and 1260 - 1400 MHz

These bands are used for primary long-range radar systems. At WRC-2000 allocations were introduced in this band to accommodate spectrum requirements for the Radionavigation satellite service, in particular for the Galileo system. These spectrum requirements are not intended to provide safety applications and it was agreed that no additional constraints be imposed on other systems operating in these bands. WRC-2000 also agreed to further study the conditions for sharing of these bands between the radionavigation and radionavigation satellite services (Resolution 606 refers). The proposed amendments to the ICAO position are consequential to these changes and are also reflected in the ICAO position for WRC-2003.

1215 - 1260 MHz
ICAO POLICY
No change to the allocation to the radionavigation service in S5.330, S5.331 and S5.334 No change to S5.332 No change to the regulatory provisions of S5.329 and S5.329A pending the development of an appropriate aggregate pfd limit agreed by ICAO within the framework of the studies under Resolution 606 (WRC-2000) for the protection of radar stations from the radionavigation satellite service. Support the adoption of a regulatory framework having full mandatory force to implement the protection measures for the terrestrial radionavigation services operating in this band Support the ITU-R studies under Resolution 606 (WRC-2000)

1260 – 1400 MHz
ICAO POLICY
No change to the allocation to the aeronautical radionavigation service No change to S5.331, S5.332, S5.337 and S5.337A No change to the regulatory provisions of S5.329 and S5.329A pending the development of an appropriate aggregate pfd limit agreed by ICAO within the framework of the studies under Resolution 606 (WRC-2000) for the protection of radar stations from the radionavigation satellite service. Support regulatory and technical measures which complement the allocation provisions to give the radar services full assurance that their safety case will not be infringed. Support the ITU-R studies under Resolution 606 (WRC-2000) and 607 (WRC-2000)

1.7. Frequency bands 1525 - 1559 MHz and 1626.5 - 1660.5 MHz

These bands are used for aeronautical mobile (route) satellite communications. At WRC-2000, the protection to the aeronautical mobile satellite (R) service was improved although an exclusive allocation to the aeronautical mobile satellite (R) service was not re-instated. The amendments to the ICAO policy statements mainly are consequential to the deletion of Resolution 218 (WRC-97) and the introduction of Resolution 222 (WRC-2000) which is calling for further studies on the feasibility and practicality of affording aeronautical safety communications priority and real-time pre-emptive access over other communications.

1525 -1559 MHz and 1626.5 – 1660.5 MHz
ICAO POLICY
Support the establishment of adequate technical and regulatory procedures to 1) guarantee the availability of spectrum in the bands 1 545 – 1 555 MHz and 1646.5 – 1 660.5 for aeronautical communications as required; and 2) ensure that aeronautical communications in Categories 1 to 6 of Article S.44 are given priority and immediate access at all times If adequate procedures cannot be established, recover the exclusive allocation of the bands to the AM(S)RS.Retain S5.357, S5.375, S5.376 and S5.362A No change to S5.357A and to Resolution 222 (WRC-2000) pending the results of studies under Resolution 222 on the feasibility and practicality of prioritization and real-time pre-emptive access between different networks Monitor and review experimental and trial applications of generic-type operations with the objective of assessing their suitability for aeronautical safety services Support the studies in ITU-R SG 8 on the sharing between fixed services and AMS(R)S in the bands 1545 - 1555 MHz and 1646.5 – 1656.5 MHz (S5.355 and S5.359 refer) with a view to suppressing the use of the bands by the fixed serviceSupport the studies in ITU-R SG 8 on the provision of distress and safety satellite services in the 1.5/1.6 mobile satellite bands

1.8 Frequency band 1559 - 1626.5 MHz

In this band the portion 1559 - 1610 MHz is used for GPS and GLONASS, elements of the ICAO GNSS system. The band 1610 - 1626.5 MHz is available for next generation mobile satellite systems using non-geostationary orbits. No such systems that offer global mobile satellite services to aviation are however currently available. At WRC-2000, significant steps to secure protection of the band 1559 - 1610 MHz for the continued use by the ICAO GNSS system and deleted Resolution 220. Also, WRC-2000 agreed to provisions aiming at the deletion, as from 2015, for the fixed services from this band. As from 2010, the fixed service will be downgraded in most countries to a secondary

status thus required to providing protection to GNSS. The proposed amendments to the ICAO policy statements reflect these changes.

1559 - 1610 MHz
ICAO POLICY
No change to the allocation to the radionavigation satellite service and to the aeronautical radionavigation service in the band 1559 - 1610 MHz No new allocations to be made in the band 1559 - 1610 MHz No change to S5.364, S5.365, S5.366, S5.367 and S5.368 Delete S5.362B and S5.362C on the grounds that the allocation to the fixed service is not compatible with the safe operation of ICAO GNSS services Delete S5.363and S5.371 Support the establishment of maximum permitted levels of spurious emission in the band 1559 - 1610 MHz to ensure protection of ICAO GNSS on a global basis Support studies in ITU-R which provide a sound technical basis for the operation and protection of ICAO GNSS

1.9 Frequency band 2700 - 3300 MHz

This band is extensively used for terminal and approach radar systems on airports. In particular the band 2700 - 2900 MHz is being considered for use by mobile systems such as cellular phones and other systems such as very small aperture satellite terminals (VSAT). Such use is not compatible with radar and, when allocations to these services are approved, will result in a severe reduction of spectrum available for radar.

2700 - 2900 MHz
ICAO POLICY
No change to the frequency allocations to the aeronautical radionavigation service in this band No change to S5.333 (Secretary's Note: because the other service is secondary), S5.423, S5.426 and S5.427 Oppose any allocation that would endanger the operation of radar services Insist that any sharing studies carried out encompass the total technical and operational aspects of radar use, including possible derogation of the safety case for this usage

Oppose any proposal that places undue or unreasonable economic penalty on radar systems presently in use

Support an upgrading of the radiolocation service to a primary status on a non-interference basis only

1.10 Frequency band 4200 - 4400 MHz [Secretary's Note: S5.437 was SUP at WRC-2000 and China got out of S5.4.39)

This band is used by radio altimeters. Proposals have been developed to upgrade the earth exploration satellite and space research service, which in this band has a secondary status, to a primary status. Although such an upgrade would not cause harmful interference to the radio altimeters, it is not possible to protect the earth exploration satellite service from harmful interference caused by radio altimeters.

4200 - 4400 MHz
ICAO POLICY
No change to the allocation to the aeronautical radionavigation service in the light of the continuing requirement for radio altimeters to operate in this band and of the results of ITU-R studies indicate that 200 MHz is required to meet the stringent operational requirements for accuracy and integrity for radio altimeters
No change to S5.438 that could constrain the operation of radio altimeters
Delete S5.439

1.11 Frequency band 5000 - 5250 MHz

The portion 5030 - 5150 MHz of this band is reserved for use by MLS. The whole band is available to the aeronautical radionavigation service. However, due to the introduction of several allocations to non-aeronautical service in the recent years, the band 5150 - 5250 is not longer considered feasible for use by internationally standardized radionavigation systems. The band 5000 - 5030 MHz has at WRC-2000 also been allocated to the radionavigation satellite service in order to meet certain requirements for the Galileo system. The proposed amendments to the ICAO policy statement reflect the recent changes to the Radio Regulations and the results of studies in ITU-R

5000 - 5250 MHz
ICAO POLICY
The allocation table, as amended by WRC-95 to be maintained without change until the review by ICAO of the band 5091 - 5150 MHz, as required by ITU Resolution 114 (WRC-95), is completed for discussion by ITU WRC-2003
This review should include a statement on, firstly, the immediate use of the band by civil aviation and, secondly, the longer term expectations for 2010 and after. The total ARNS requirement, of which MLS may only be a part, is required by Resolution No. 114 (WRC-95) and must be considered
Apply the methodology contained in ITU-R Recommendation S.1342 in the

coordination of MLS with FSS Earth stations in the band 5091 - 5150 MHz . Apply, in support to the studies under Resolution 603 (WRC-2000) the same methodology to unwanted emissions from RNSS earth stations operating in the band 5000 5010 MHz

Monitor developments of future aeronautical systems that could be deployed in the band with a view to identifying those requiring support in ITU fora.

1.12 Frequency band 5350 - 5470 MHz

This band is used for airborne weather radars. WRC-2003 will examine the upgrading of the radiolocation service in this band to a primary status. This use is compatible with that of the airborne weather radars. However, upgrading should take place on a non-interference basis in order to protect the weather radars.

5350 570 MHz
ICAO POLICY
These bands are used extensively, particularly for airborne weather radar, and are needed for the foreseeable future. No changes should be made which could restrict the aeronautical use. Do not oppose an upgrading of the radiolocation service to a primary status on a non-interference basis only Retain S5.448B and S5.449

Edit the text for 9 – 9.5 GHz: First bullet: “no allocation changes that can affect adversely aviati

1.13 Frequency band 15.4 - 15.8 GHz

This band is used for a variety of aeronautical radionavigation systems such as airport surveillance detection equipment (ASDE radar) and airborne radar systems such a ground mapping radar and radio altimeters, in particular for smaller aircraft. At WRC-95 an allocation to the fixed satellite service was introduced in parts of this band. This usage was considered incompatible with the use by the radionavigation service and various studies were launched. The amendment to the ICAO policy statement is aimed at protecting the current status in this band and to not placing any further restrictions on its aeronautical use.

15.4 - 16.8 GHz
ICAO POLICY
No change to the allocation to the aeronautical radionavigation service. These bands are preferred bands for ASDE radar, and extensive use of these systems are expected as airport congestion increases and saturation occurs at many major airports in high

density locations in the future. This band must be protected for present and future use of these systems.

Systems using radar measurements of height and distance also use this band and are expected to be used by smaller aircraft, helicopters and other aircraft for safe landing at secondary landing areas. These also require protection and the capability for ongoing use.

The addition of the fixed satellite service as a primary allocation must not prejudice these important aviation applications. (ITU-R Recommendations S.1340 and S.1341 refer). Account needs to be taken of other expected developments in technological aeronautical applications to which this band is particularly suited.

No change to S5.511A, S5.511C and S5.511D introducing further restrictions to aeronautical use of this band.

Delete “airborne” in the 31.8 GHz band, second line of policy, before “use”.