



PUBLIC NOTICE

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THE FCC'S ADVISORY COMMITTEE FOR THE 2003 WORLD RADIOCOMMUNICATION CONFERENCE PROPOSES PRELIMINARY VIEWS ON WRC-03 ISSUES

On April 20, 2001, the World Radiocommunication Conference Advisory Committee (WRC-03 Advisory Committee) adopted preliminary industry views on numerous issues that the 2003 World Radiocommunication Conference (WRC-03) will address. The WRC-03 Advisory Committee was established by the Commission in January 2001 to assist it in the development of proposals for WRC-03. To that end, the WRC-03 Advisory Committee has forwarded the recommendations it has developed since the beginning of the year to the Commission for consideration. We have attached to this Public Notice the WRC-03 Advisory Committee's recommendations, which are in the form of "preliminary views" and one draft recommended proposal. We appreciate the substantial amount of work that the WRC-03 Advisory Committee has put into developing its recommendations. This Public Notice requests comments on all of these preliminary views and proposals.

Based upon our initial review of the recommendations forwarded to the Commission, the International Bureau in coordination with other Commission Bureaus and Offices tentatively concludes that we can generally support most of the preliminary views and proposals recommended by the WRC-03 Advisory Committee. We do, however, find the preliminary views reflected in documents WAC/017, WAC/019, WAC/027, WAC/033, WAC/038 and WAC/039 to be premature or inconsistent with current Commission policies. We seek comment on the recommendations that appear in all of the WRC-03 Advisory Committee documents and on our initial impressions of which preliminary views we can support.

In addition, the National Telecommunications and Information Administration (NTIA) has submitted to the Commission preliminary views that have been developed by the Executive Branch Agencies. We also request comment on these preliminary views.

The comments provided will assist the FCC in its upcoming consultations with the U.S. Department of State and NTIA in the development of U.S. preliminary views. Once agreed by these agencies of the U.S. Government, preliminary views will be used by U.S. delegations at bilateral, regional and international meetings to stimulate discussion and to attempt to achieve common proposals with other countries on these issues. The proposed preliminary views that are attached to this Public Notice may evolve in the course of interagency discussions as we approach WRC-03 and, therefore, do not constitute a final U.S. Government position on any issue.

The complete text of these preliminary views and proposals is also available in the FCC's Reference Information Center, Room CY-A257, 445 12th Street, SW, Washington, DC 20554 or by accessing the FCC's WRC-03 world wide web site at: <http://www.fcc.gov/wrc-03>. To comment on the preliminary

views and proposals, please submit an original and one copy of your comment to Julie Garcia, FCC WRC-03 Director, Federal Communications Commission, Room 6-B554, 445 12th Street, SW, Washington, DC 20554. Comments should refer to specific preliminary views by document number. Parties preferring to e-mail their comments should address their comments to: wrc03@fcc.gov. The deadline for comments on the proposed preliminary views is **May 9, 2001**. It is necessary that all comments be received by May 9, 2001 in order to allow us to finalize the U.S. position before commencement of regional WRC-03 preparatory meetings.

IWG-1

DRAFT

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.21: to consider the progress of the ITU-R studies concerning the technical and regulatory requirements of terrestrial wireless interactive multimedia applications, in accordance with Resolution 737 (WRC-2000) with a view to facilitating global harmonization;

ISSUE: What if any actions are needed by the ITU-R to facilitate the development of terrestrial wireless interactive multimedia?

BACKGROUND: At WRC-2000, a proposal from several European administrations indicated a desire to address spectrum for terrestrial wireless interactive multimedia applications. After much discussion, an agenda item was developed for WRC-03 to consider progress on the studies related to this issue. WRC-2000 also adopted Resolution 737, which invites the ITU-R to: pursue studies to facilitate worldwide spectrum allocations or identifications for terrestrial wireless interactive multimedia technologies and applications, review the regulatory means to facilitate the worldwide harmonization of spectrum for terrestrial wireless interactive multimedia, and to review service definitions in the light of convergence of applications, if necessary.

WRC-2000 also decided that any allocation changes or regulatory work on this issue would be discussed at WRC-06.

Following WRC-2000, CPM-00 (CACE/186) decided to establish Joint Task Group 1-6-8-9 to address the technical and regulatory requirements of terrestrial wireless interactive multimedia applications as discussed in Resolution 737. That group has met once (October 2000, Geneva), agreeing that its work should be focused on developing the draft CPM Report on agenda item 1.21 for WRC-03. Liaison statements asking for comment on the service, technical and regulatory aspects of terrestrial wireless interactive multimedia applications were developed for transmittal to the ITU-R groups working on related issues. Liaison statements are not due back to JTG 1-6-8-9 until its November 2001 meeting.

PRELIMINARY VIEW: WRC-2003 will consider the progress of ITU-R studies in response to agenda item 1.21, in order to fashion an appropriate agenda item for WRC-2006 related to spectrum and associated regulatory issues for terrestrial wireless interactive multimedia applications. In light of this ongoing work at the ITU, the U.S. view will be developed when more information is available from the ITU and other entities. (April 18, 2001)

IWG-1

DRAFT

PRELIMINARY VIEWS ON WRC-03

WRC-2000 Agenda Item 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 (WRC-2000).

ISSUE: To study spectrum requirements and potential frequency ranges suitable for the future development of IMT-2000 and systems beyond IMT-2000, and in what time frame such spectrum would be needed, as well as ongoing enhancements of IMT-2000 systems and systems beyond IMT-2000.

BACKGROUND: WRC-2000 considered issues related to IMT-2000, resulting in the identification of additional spectrum for the terrestrial component of IMT-2000 in the Radio Regulations S5.317A and S5.384A. This spectrum was identified in addition to that identified for initial IMT-2000 deployment at WARC-92 in footnote S5.388. WRC-2000 also identified existing global MSS allocations as being available for use by the satellite component of IMT-2000, in accordance with Resolution 225.

In Resolution 228 (WRC-2000), the ITU-R was invited to continue studies on overall objectives, applications and technical and operational implementation for the future development of IMT-2000 and system beyond. These requirements are to be reviewed by WRC-05/06, taking into consideration the results of ITU-R studies presented to WRC-03.

ITU-R Working Party 8F continues to work on issues relevant to WRC-03 agenda item 1.22. WP 8F will continue to develop a preliminary draft new recommendation (PDNR) on the vision and objectives for the ongoing enhancement of IMT-2000 and of systems beyond IMT-2000. The structure of the Vision PDNR has been agreed to, but the text and substance will be developed during the fifth (June 27-July 3, 2001, Stockholm), sixth (October 10-16, 2001, Tokyo) and seventh meetings (February 27-March 5, 2002, New Zealand). The Vision PDNR is expected to be approved by WP 8F at the eighth meeting (May 29-June 4, 2002, Canada), and will contain information essential for the future development of U.S. positions on agenda item 1.22. In addition, 8F is charged with developing CPM text for this agenda item. The Spectrum WG has developed a draft framework for the item, and the CPM text is scheduled to be approved by 8F at the New Zealand meeting in February 2002.

PRELIMINARY VIEW: WRC-2003 will consider the progress of ITU-R studies in response to agenda item 1.22, in order to fashion an appropriate agenda item for WRC-2006 related to spectrum and associated regulatory issues concerning the future development of IMT-2000 and systems beyond IMT-2000. In light of this ongoing work at the ITU, and by other entities, the U.S. view will be developed when results are available from the ITU and other entities. (April 18, 2001)

IWG-1

DRAFT**PRELIMINARY VIEWS ON WRC-03**

WRC-2000 Agenda Item 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, in response to Resolution 221 (WRC-2000);

ISSUE: Resolution 221 asks for additional technical, operational and regulatory studies to be conducted in order to review and, if necessary, revise the provisional pfd limits. Resolution 221 also asks for consideration of appropriate regulatory and technical provisions to allow bilateral coordination of HAPS in IMT-2000 systems with affected neighboring administrations.

BACKGROUND: In footnote S5.388A, WRC-2000 authorized the use of HAPS as base stations to provide International Mobile Telecommunications-2000 (IMT-2000), in accordance with Resolution 221. In Regions 1 and 3, the bands 1 885-1 980 MHz, 2 010-2 025 MHz and 2 110-2 170 MHz and, in Region 2, the bands 1 885-1 980 and 2 110-2 160 MHz may be used by high altitude platform stations. The use of HAPS as base stations within the terrestrial component of IMT-2000 is optional for administrations and does not preclude the use of these bands by any station in the services to which they are allocated and does not establish priority in the Radio Regulations. Resolution 221 from WRC-2000 resolves that HAPS shall not exceed provisional co-channel power flux-density limits to protect IMT-2000 stations in neighboring countries and out-of-band power flux-density limits to protect fixed stations. Canada is currently conducting a study to determine the compatibility of HAPS within IMT-2000 with MMDS in the 2150-2160 MHz band in Region 2. Therefore, the impact of the provisional limits on the operation of MMDS systems is not clear at this time.

PRELIMINARY VIEW:

Depending upon the results of the ITU-R studies, new procedures and/or revisions to the provisional PFD limits may need to be incorporated in the Radio Regulations to allow for the coordination, with neighboring Administrations, of a HAPS platform operating as a base station. (April 18th, 2001)

Document IWG-2/009
Author: D. Weinreich
17 April 2001

WRC-2003 ADVISORY COMMITTEE

DRAFT PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item: 1.4 - to consider the results of studies related to Resolution **114 (WRC-95)**, dealing with the use of the band 5091-5150 MHz by the fixed satellite service (Earth-to-space) (limited to non-GSO MSS feeder links), and review the allocation to the aeronautical radio-navigation service and the fixed satellite service in the band 5091-5150 MHz;

ISSUES: WRC-2003 will review the results of studies on the technical and operational issues related to sharing of the band 5 091-5 150 MHz between the aeronautical radionavigation service and the fixed-satellite service providing feeder links of the non-geostationary mobile-satellite service (Earth-to-space). Of primary concern is whether or not revisions are required to the current regulatory provisions (footnotes **S5.444** and **S5.444A** and Resolution **114 (WRC-95)**) and if so, what revisions? In addition, consideration must be given to the following: Are there requirements for MLS to use spectrum above 5 091 MHz, if yes, in what time frame? To what extent have MSS feeder links used spectrum to-date in the range 5 091-5 150 MHz? Would the MSS feeder links coexist with ARNS on a secondary basis or is there transition of feeder link use expected to frequencies above 5 150 MHz? What is the experience with coordination between the Fixed Satellite Service and microwave landing system stations and the subsequent operation of FSS stations in the 5091-5150 MHz band?

BACKGROUND: As a result of WRC-95, the Fixed Satellite Service (FSS) was granted co-primary status along with the Aeronautical Radionavigation Service in the band 5150 – 5250 MHz for the use of feeder uplinks for Non-Geostationary Mobile Satellite Service systems (**RR S5.447A**). In addition, the band 5091-5150 MHz was allocated, on a co-primary basis, to the FSS for NGSO MSS feeder uplinks under **S5.444A** and Resolution 114 (WRC-95). Resolution **114 (WRC-95)** requested ITU-R to study issues concerning sharing between Aeronautical Radionavigation Service (ARNS) and feeder links to Mobile Satellite Service (MSS) (Earth-to-space) in the band 5 091-5 150 MHz and to report results of the studies to WRC-2003. The use of this band by Microwave Landing Systems (MLS) and MSS feeder links is subject to footnotes **S5.444** and **S5.444A**, in particular the following conditions apply:

- 1) 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)**;

- 2) prior to 1 January 2010, the requirements of existing and planned international standard systems for the ARNS which cannot be met in the 5 000-5 091 MHz band, shall take precedence over other uses of this band;
- 3) after 1 January 2008, no new assignments shall be made to stations providing feeder links of non-geostationary mobile-satellite systems;
- 4) after 1 January 2010, the fixed-satellite service will become secondary to the ARNS.

In fulfillment of this allocation, three NGSO MSS systems announced plans to operate feeder uplinks in this band. Of the three systems planning use of this band, two systems have implemented spacecraft Tracking and Control operations and one system has begun commercial service using the 5091-5250 MHz band for transmitting communications traffic from Gateway earth stations to the NGSO spacecraft.

Sharing studies between NGSO/MSS feeder links and microwave landing systems resulted in ITU-R Recommendation S.1342 "Method for determining coordination distances, in the 5 GHz band, between the international standard microwave landing system in the aeronautical radionavigation service and non-geostationary mobile satellite service stations providing feeder uplink services." These studies showed that compatibility between MLS receivers and MSS feeder links (Earth-to-space) could exist if sufficient geographical separation exists between the two stations. As a result, Recommendation S.1342 was adopted to trigger coordination between the two operators to determine the acceptability of an MSS site, possibly with or without restrictions.

In the United States and several other countries, coordination of the gateway station with MLS stations has been accomplished using the methodology contained in Recommendation ITU-R S.1342.

Spacecraft Command and Control operations began in the 5091-5250 MHz band with the launch of the first Globalstar (or LEO-D, in ITU-R terminology) satellite on 14 February 1998. Six gateway stations in Argentina, Australia, France, Korea, South Africa and the USA also participated in these Command and Control operations. The ICO (or LEO-F system in ITU terminology) uses the 5150-5250 MHz band to support launch and service operations.

Revenue communications service for the LEO-D began on 6 January 2000. In addition to the gateway earth stations mentioned for Tracking and Control operations 13 other gateway stations have been added to the network as of the current date.

It is expected that if the two MSS systems currently operating gateway stations develop as planned that the number of gateway stations implemented worldwide will be approximately 65.

As of writing this document, no interference has yet been encountered by MLS stations. Based upon coordination using the methods contained in Recommendation ITU-R S.1342 it is expected that this situation will continue.

ITU-R Working Party 8B is the lead group responsible for developing CPM text on WRC-03 Agenda Item 1.4. WP 8B is currently studying the use of the 5091-5150 MHz band by the Aeronautical Radionavigation Service (ARNS) and the Fixed Satellite Service (FSS) for NGSO Mobile Satellite Service (MSS) feeder uplinks. These studies are expected to conclude no later than May 2002.

PRELIMINARY VIEW: Based upon the application of the coordination procedures in Recommendation ITU-R S.1342 and the operating experience gained to date, existing microwave landing system (MLS) and NGSO MSS feeder link stations are able to function without interference. Future deployment of both MLS and NGSO MSS facilities should be possible through coordination under ITU-R S.1342. Continued common use of the 5091-5150 MHz band by both MLS and NGSO MSS stations is dependent upon the extent of future deployment of these systems and the characteristics of new Aeronautical Radionavigation Service (ARNS) systems, if any. Further studies are needed to investigate and evaluate the continuing usage of the 5091-5150 MHz band by the ARNS and the FSS for NGSO MSS feeder uplinks to determine if changes in the existing Radio Regulations covering this band are necessary. (17 April 2001)

Document IWG-2/010
Author: D. Weinreich
17 April 2001

WRC-2003 ADVISORY COMMITTEE

DRAFT PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item: 1.6 - to consider regulatory measures to protect feeder links (Earth-to-space) for the mobile satellite service which operate in the band 5150-5250 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);

ISSUE: Regulatory measures for the protection of non-GSO MSS Feeder Uplinks at 5150-5250 MHz potentially including power flux density limits at the spacecraft altitude, limits on the output powers and constraints on the deployment of Fixed and Mobile Service transmitters in this band.

BACKGROUND: The proliferation of transmitters in the Fixed and Mobile Services providing applications such as Radio Local Area Networks (RLANs) and other non-licensed applications presents the threat of potentially serious interference to the feeder uplinks of non-GSO Mobile Satellite Service systems, operating in the Fixed Satellite Service. Regulatory measures must be devised that can effectively protect these vital links from unacceptable interference.

The band 5150-5250 MHz is allocated on a primary basis to the FSS and its use is limited to non-GSO MSS feeder links by footnote S5.447A. This band is also allocated by footnote S5.447 to the mobile service (MS) on a co-primary basis in 27 countries in Regions 1 and 3 subject to S9.21. Administrations are currently considering the introduction of Fixed and Mobile Services in the band 5150-5250 MHz on a national and unlicensed, uncoordinated basis (see Recommendation ITU-R M.1454).

At WRC-2000, Resolution 1156 called for studies by the ITU-R leading to technical and operational recommendations to facilitate sharing between existing services and Fixed and Mobile Services, including RLANs in the bands 5150-5350 MHz and 5470-5725 MHz. It is anticipated that these studies will provide assurance that allocation to Fixed and Mobile Services, in these bands, can co-exist with incumbent non-GSO MSS feeder links and Aeronautical Radionavigation Service systems.

During the 1998-2000 study period, considerable time and effort was spent on the development of three ITU-R Recommendations addressing this topic.

JRG 8A-9B developed Recommendation ITU-R M.1454 entitled "EIRP Density Limit and

Operational Restrictions for RLANs or Other Wireless Access Transmitters in order to Ensure the Protection of Feeder Links of Non-Geostationary Systems in the Mobile Satellite Service in the Frequency Band 5150-5250 MHz." This Recommendation calls for implementers of wireless access systems to limit the EIRP density of such transmitters to 10mW in any 1 MHz, operate these transmitters only indoors and ensure that the aggregate emissions of these transmitters do not exceed the power flux density limit given in Recommendation ITU-R S.1426.

Working Party 4A also considered the protection of MSS Feeder Links from wireless access system emissions and created two Recommendations in response to these studies. Recommendation ITU-R S.1426, entitled "Aggregate Power Flux Density Limits at the FSS Satellite Orbit for Radio Local Area Network (RLAN) Transmitters Operating in the 5150-5250 MHz Band Sharing Frequencies with the FSS (RR No. S5.447A)" imposes an aggregate power flux density limit on Fixed and Mobile Services equal to $-124 - 20\log_{10}(h_{\text{sat}}/1414)$ dB(W/MHz/square meter), where h_{sat} is the altitude of the spacecraft in kilometers. This limit is for the protection of FSS satellites using full earth coverage receive antenna beams.

Further, WP 4A created Recommendation ITU-R S.1427, entitled "Methodology and Criterion to Assess Interference from Radio Local Area Network (RLAN) Transmitters to Non-GSO MSS Feeder Links in the Band 5150-5250 MHz." This Recommendation specified that interference from RLAN transmitters should be assessed on the basis of an increase in ΔT_{sat} , the satellite receiver noise temperature, and, to ensure protection, this increase should be no greater than 3%. A Note to the Recommendation indicated that the interference absorbed by the satellite system should not lead to a reduction in capacity of more than 1%.

Unconstrained deployment of Fixed and Mobile Service applications will cause unacceptable levels of interference into the feeder uplinks of the non-GSO MSS. Appreciating this fact, WRC-2000 developed agenda item 1.6 for WRC-2003, which calls for the consideration of regulatory measures to protect the FSS (Earth-to-space) allocation in the band 5150-5250 MHz from RLAN interference.

PRELIMINARY VIEW: The establishment of regulatory measures to protect non-GSO MSS feeder uplinks from unlicensed applications in the Fixed and Mobile Service allocations is necessary to protect these feeder links from unacceptable interference. These regulatory measures could include Radio Regulations which address the emission and deployment limitations and the power flux density limit at the non-GSO MSS satellite altitude for transmitters in the Fixed and Mobile Services. (17 April 2001)

WRC-2003 ADVISORY COMMITTEE

DRAFT PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item: **1.15** – to review the results of studies concerning the radionavigation-satellite service in accordance with Resolutions 604 (WRC-2000), 605 (WRC-2000), and 606 (WRC-2000).

ISSUES:

1. Resolution 604: To determine whether an aggregate pfd value of -171 dB (W/m²) in a 10 MHz bandwidth at any RA observatory site, which radionavigation satellite service (RNSS) space-to-Earth systems operating in the band 5010-5030 MHz cannot exceed for more than 2% of the time in the band 4990-5000 MHz, adequately protects radioastronomy in the 4990-5000 MHz band from detrimental interference.

2. Resolution 605: (a) To ensure the protection of aeronautical radionavigation service (ARNS), specifically including Distance Measuring Equipment (DME), from RNSS space-to-Earth transmissions in the 1164-1215 MHz band; and (b) To assess the need for an aggregate power flux-density limit on RNSS space-to-Earth transmissions, and if such a need exists to confirm or revise the provisional aggregate power flux-density limit adopted in **No. S5.328A** of the Radio Regulations.

3. Resolution 606: To ensure, through appropriate technical, operational, and regulatory studies (including the assessment of the need for a power flux-density limit on new RNSS (space-to-Earth) systems in the 1215-1300 MHz band), that the RNSS (space-to-Earth) will not cause harmful interference to the radionavigation and radiolocation services.

BACKGROUND:

1. Resolution 604:

WRC-2000 introduced new space-to-space and space-to-Earth allocations to the RNSS in the band 5010-5030 MHz. For use of the band 5010-5030 MHz by the RNSS (space-to-Earth), in order to protect MLS systems operating above 5030 MHz, an aggregate pfd value of -124.5 dB (W/m²) in a 150 kHz bandwidth by all space stations of the RNSS service in the band 5030-5150 MHz is specified. To protect radioastronomy from detrimental interference, a provisional aggregate pfd value of -171 dB (W/m²) in a 10 MHz bandwidth at any RA observatory site cannot be exceeded for more than 2% of the time in the band 4990-5000 MHz. Under Resolution **604 (WRC-2000)**, the ITU-R is to review the provisional -171 dB (W/m²/10 MHz) pfd limit.

2. Resolution 605:

WRC-2000 introduced new allocations in the band 1164-1215 MHz for use by the radionavigation-satellite service (“RNSS”) (space-to-space) and (space-to-Earth) with an aggregate provisional pfd of -115 dB (W/m^2) in any 1 MHz produced at the Earth’s surface by all space stations within all RNSS systems and for all angles of arrival. It also stated in **No. S5.328A** of the Radio Regulations that the provisions of Resolution **605 (WRC-2000)** apply. There was extensive discussion at the WRC with regards to the need for a pfd limit and the value needed to protect ARNS (including Distance Measuring Equipment (DME)). Resolution **605** requests the ITU-R to study the technical, operational, and regulatory aspects of compatibility between RNSS and ARNS in the band 960-1215 MHz, including an assessment of the need for an aggregate pfd limit and if such need exists, to revise, if necessary the provisional pfd limit given in **No. S5.328A** concerning the operation of RNSS (space-to-Earth) systems in the frequency band 1164 – 1215 MHz.

3. Resolution 606:

WRC-2000 introduced allocations to the RNSS (space-to-Earth) in the 1260-1300 MHz band, and for RNSS (space-to-space) in the 1215-1300 MHz band. Where RNSS use of the 1164-1215 MHz band was made subject to a provisional aggregate pfd limits, RNSS use of the band 1215-1300 MHz band is the subject of studies to be conducted pursuant to Resolution **606 (WRC-2000)**. There are large numbers of GPS receivers operating in the band 1 215 – 1 260 MHz. The band 1 240 – 1 300 MHz is also allocated on a co-primary basis to ARNS and to radiolocation for use of long range primary radar systems. Among other things, Resolution **606** calls for studies of “the need for a power flux-density limit concerning the operation of radionavigation-satellite service (space-to-Earth) systems in the frequency band 1215 – 1300 MHz in order to ensure that the radionavigation-satellite service (space-to-Earth) will not cause harmful interference to the radionavigation and radiolocation services.”

Also in Resolution **606**, WRC-2000 resolved that no additional constraints are to be placed on RNSS systems operating in the 1215-1260 MHz band. The Global Positioning System (GPS), an RNSS system which operates on 1227.6 MHz (24 MHz bandwidth), has been in operation in the band 1215 – 1260 MHz since 1988. It provides positioning and navigation services from space. Currently, this signal is used for high precision GPS in high productivity applications, such as machine guidance in survey, construction, agriculture, and mining. With an expanding capability to receive an additional civilian GPS signal, other civilian and commercial sectors have yet to be explored. The existing signal will continue to be a low power signal in the 1215 – 1300 MHz band. This signal has been transmitted at its current power level for over 12 years and has not caused any interference to other users of the band. This has been accomplished without the need for power flux-density limits in the Radio Regulations. It is anticipated that in the future there will be requirements to improve upon the signal.

Studies are currently under way in ITU-R Working Party 8D to address these three resolutions.

PRELIMINARY VIEWS:

1. Resolution 605:

The United States of America has a strong need both for RNSS spectrum in the 1164-1215 MHz band and for the protection of DME systems in the ARNS. It is participating in ITU-R technical and regulatory studies that are expected to show how DME systems can be protected while not unduly constraining the aggregate power flux-density emissions of RNSS systems. Regardless of the mechanism that is used to provide the requisite protection to DMEs, it is noted that the ITU-R currently does not have a methodology that can be used to calculate the power flux-density produced by RNSS systems, along with appropriate regulatory provisions that ensure that the desired protection is provided effectively without unnecessarily delaying or hindering the implementation and provision of RNSS (space-to-Earth) services.

2. Resolution 606:

The United States of America is of the view that there is no need for any power flux-density limit to be imposed in the 1215-1300 MHz band. RNSS systems have been successfully operating in the lower portion of the band (1215-1240 MHz) for more than 12 years with no resultant interference, and the band is not used by DME systems. Even if ITU-R studies show that radiolocation and/or ARNS systems require protection from new RNSS systems in the 1215-1240 MHz band or from RNSS (space-to-Earth) systems in the 1260-1300 MHz band, it will be necessary to consider means alternative to power flux-density limits for providing such protection.

(April 16, 2001)

DRAFT
PRELIMINARY VIEWS ON WRC-03

WRC-03 Agenda Item 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

ISSUE: Additional allocations to the non-GSO MSS for feederlinks in the bands 1390-1393 MHz and 1429-1432 MHz at WRC-03.

BACKGROUND: A total of 1.525 MHz (space-to-Earth) and 1.9 MHz (Earth-to-space) are presently allocated on a worldwide primary basis to the MSS below 1 GHz and 300 kHz (Earth-to-space) is allocated for land MSS on a worldwide primary basis. These allocations are for both the MSS service links and feeder links. Since these allocations at WARC-92 and WRC-95, the Radiocommunication Bureau has identified 25 non-GSO MSS networks at frequencies below 1 GHz, at some state of coordination under **S9.11A/Resolution 46 (Rev.WRC-97)**, and nine non-GSO MSS networks at the advance publication stage only. However, it appears that many of the proposed networks cannot be implemented in the existing allocations because there is not enough spectrum readily available in the allocated spectrum. Additional feederlink spectrum outside of the currently allocated bands would provide dedicated feederlink spectrum and free up existing allocations for scarce service link spectrum. WRC-97 approved Resolution 127 to study sharing techniques for NVNG MSS < 1 GHz feederlinks (Earth-to-space) in the 1390-1400 MHz band, and space-to-Earth feederlinks in the 1427-1432 MHz band. As a result of the favorable initial studies in these bands, WRC-00 approved Agenda Item 1.16 to consider allocations at 1390-1393 MHz for uplink feederlinks, and 1429-1432 MHz for feeder downlinks for the non-GSO MSS service with the understanding that Resolution 127 studies must be completed including testing of near-flight hardware to validate the theoretical studies approved earlier.

Sharing studies completed in the ITU-R under Resolution 127 include a) out-of-band sharing with the radioastronomy service by meeting Recommendation RA.769-1 levels of -255 dB (W/m²/Hz) for the 1400-1427 MHz band, b) out-of-band sharing with EESS by meeting Recommendation SA.1029-1 requirements of -171 dBW/27MHz for in-band pfd levels, c) in-band sharing with the EESS by meeting the time avoidance criteria, d) sharing with fixed and mobile services on the basis of not exceeding the pfd levels established for sharing in the adjacent bands of -146 dBW/m²/4kHz (since no level had been established for the 1429-1432 MHz band), and e) sharing with the radiolocation service by equipping the non-GSO MSS satellites with adequate filtering. In addition to the above, uplink sharing with the fixed and mobile services can be accommodated by geographical sharing of the small number of remotely located feederlink stations.

PRELIMINARY VIEW: The U.S. supports allocations in the 1390-1393 MHz and 1429-1432 MHz at WRC-03 for the non-GSO MSS pending completion of studies under Resolution 127. The proposed allocations are in bands close to the passive services band at 1400-1427 MHz that must be

protected from out-of-band and spurious emissions. Studies have shown that interference to radio astronomy and the other passive services can be avoided using various techniques including low-power transmitter levels, choice of modulation, symbol shaping, output filtering and band limiting filters, the use of which can minimize the band separation necessary to meet the recommended interference threshold levels for protection of these services. The U.S. expects that the hardware testing to be completed this year will confirm the theoretical results already approved by the ITU-R for the protection of the passive services. Other sharing results will be similarly definitive, and will allow allocation of these bands at WRC-03. (04/18/01)

Document IWG-2/011
Author: D. Jablonski
17 April 2001

WRC-2003 ADVISORY COMMITTEE

DRAFT PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item: 1.31 - to consider the additional allocations to the mobile-satellite service in the 1 – 3 GHz band, in accordance with resolutions **226 (WRC-2000)** and **227 (WRC-2000)**.

ISSUE (Res. 226 only): Will sharing between aeronautical mobile telemetry and the Mobile Satellite Service in the band 1518 – 1525 MHz adversely effect flight test operations?

BACKGROUND (Res. 226 only):

The 1518-1525 MHz band represents a portion of the band 1435-1525 MHz (known as the “L-band”). The sub-band 1492-1525 MHz is allocated in Region 2 for MSS. However, the United States has preserved allocation of the entire band 1435-1525 MHz for flight testing of manned aircraft. Portions of this band are also in use for flight test telemetry in other Regions of the world. Res. 226 calls for studies of the potential for sharing between the Mobile Satellite Service and aeronautical mobile telemetry (*i.e.*, flight testing).

Because the development of aircraft is increasingly a cooperative international effort, United States flight test operations may be affected adversely by possible future changes in the allocation and use of these bands in other Regions. Concerns include not only electromagnetic interference issues, but extend to the harmonization of flight test standards, spectrum, and equipment world-wide. Given the extraordinary expense of flight test programs, as well as the safety of life aspects of flight test, these are significant concerns.

The conclusions arrived at during the October 2000 meeting of Working Party 8D are summarized in the Chairman's report, Document 8D/61 Attachment 14. Of interest here are three key points contained in the Chairman's report. First, a consensus has emerged that co-frequency, co-coverage sharing between flight test and MSS is not practical. Second, there seem to be no differences in principle with the notion that flight test operations may routinely be permitted to cause radio interference to MSS operations. Third, the MSS community has suggested that the use of highly directed spot beams might allow operation of MSS systems in close proximity to flight test operations without causing the latter harmful interference.

As a result of recent studies of the MSS/flight test sharing situation, the following conclusions and concerns have emerged:

1. Co-frequency, co-coverage sharing between MSS and Aeronautical Flight Test Telemetry is typically not possible.
2. The definition of what constitutes Co-frequency, co-coverage sharing is described by the pfd

limits defined in ITU-R Recommendation 1459.

3. Interference to MSS ground stations by flight test telemetry transmitters may occur, and prior coordination to mitigate this may not be possible.
4. Relaxation of the pfd limits specified in Res. 1459 to enable sharing is not possible without seriously compromising the flight test capabilities of the ground ranges in question.
5. Interference from and coordination with other interferors may be a factor during coordination discussions between flight test operators and MSS providers.
6. The validity of the -138 dBW/m²/4kHz pfd level used in earlier studies needs to be reaffirmed in light of other data that suggest pfd levels 10 - 15 dB higher are more realistic.
7. The interpretation of idealized antenna ground footprints needs to be refined by the addition of satellite orbital data. Specifically, proposed orbital positions with respect to flight test sites, and maximum lifetime inclination angles of GSO MSS satellites need to be considered when analyzing these footprints.
8. The next generation multi-beam antennas proposed for use at L-band will exhibit effects that need to be better understood.
9. Careful regard must be given to sidelobe, intermodulation, and other relevant effects such as out-of-band emissions.

PRELIMINARY VIEW (Res. 226 only): Based on previous and ongoing studies, co-frequency, co-coverage sharing between flight test and MSS is not practical. Second, flight test operations may routinely need to be permitted to cause radio interference to MSS operations. Finally, the performance of co-frequency, non-co-coverage MSS satellites operating at L band remains a topic of concern for flight test operations. Existing and proposed MSS spot beam antennas exhibit properties that suggest reallocation of the band 1518 –1525 MHz in Regions 1 and 3 can have an adverse impact on flight test operations in the United States. (17 April 2001)

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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)

ISSUE: Determining practical methods for protecting passive services from unwanted emissions, taking into account the impact on active services.

BACKGROUND: At previous WRCs, attempts have been made to achieve a balance between the requirements of the passive services and the requirements of space-based services. However, there is a wide gap between the levels of interference that are deemed detrimental to the passive services and the unwanted emission attenuation that can be achieved by current and projected satellite designs. Recent studies in the ITU-R have focused on a band-by-band approach to solving the problem, an approach followed by the United States in ITU-R Task Group 1/7 and its precursor, Task Group 1/5. TG 1/7 is exploring a variety of solutions, ranging from case-by-case negotiated solutions to limits in certain bands in the Radio Regulations. Studies are continuing in the ITU-R but it is expected that ultimately there may still be significant differences between the passive and space-based services in terms of what is desired and what is achievable for OOB attenuation.

PRELIMINARY VIEW: While recognizing the important role that passive services play in our society, there are fundamental limitations on what satellite designers can do to mitigate interference into the passive services. In particular, cost and spacecraft weight, space, other limitations must be considered in developing the out-of-band or spurious emission limits for satellites in the FSS. The United States is committed to ensuring the viability of commercial and Government FSS systems while protecting the passive services to the greatest extent practicable.

The United States does not support inclusion of OOB emission masks in the Radio Regulations. However, the United States did agree to participate in the development of an ITU-R Recommendation on OOB emissions. Such a draft new Recommendation on OOB emissions was adopted by the November 2000 Study Group 1 meeting (ITU-R SG 1 Document 1/33-E, dated 1 November 2000). The United States supports the use of this Recommendation as a general OOB emission mask for FSS services. For satellite systems with a bandwidth greater than 1.25 MHz, it should be noted that this mask is significantly tighter than the FCC's longstanding OOB emission rules. The Recommendation also contains definitions for relevant bandwidths, directions for application of the mask to multiple carrier operations, and scaling factors for narrowband and wideband carriers that specify the extent of the OOB domain for these types of carriers.

While the recommended OOB mask described above will not completely eliminate interference to the passive services from the FSS, it does achieve a practical balance between the needs of both passive and space-based FSS systems. Additional protection of specific passive service sites, if required, could be handled on a case-by-case basis through negotiations between the passive service operator and the FSS system operator or licensee, as has been successfully done in previous cases.

(April 16, 2001)

**Informal Working Group 3 (IWG-3)
WRC-03 Advisory Committee**

**DRAFT PRELIMINARY VIEW
Agenda Item 1.11**

WRC-03 Agenda Item 1.11: to consider possible extension of the allocation to MSS (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)**.

ISSUE: WRC-03 will consider broadening the secondary MSS allocation at 14-14.5 to include AMSS should the ITU-R studies under Resolution 216 demonstrate that such use will not cause harmful interference to the primary services, including FSS, radionavigation, fixed and mobile, and will be compatible with the current secondary services.

BACKGROUND: Land and maritime mobile-satellite service networks have been successfully operating on a secondary basis in the 14-14.5 band for a number of years under an existing allocation. Resolution **216**, originally adopted by WRC-97 and modified by WRC-2000, recognizes that the existing demand for use on board aircraft of capabilities to provide broadband two-way communication and data transmission services justifies consideration of broadening the secondary MSS allocation to include aeronautical applications. The Resolution invites the ITU-R to complete in time for WRC-03 technical and operational studies on the feasibility of sharing of the band 14-14.5 GHz between the fixed-satellite (Earth-to-space), radionavigation, fixed and mobile (except aeronautical mobile) services and the aeronautical mobile-satellite service, with the latter on a secondary basis.

The ITU-R is now in the midst of a substantial work program on this issue under the lead of Working Party 8D. Working Parties 4A and 9D have already made significant progress on identifying parameters and methodologies for analyses, and have conducted initial studies. United States contributions to Working Parties 7B and 7D will be submitted soon.

PRELIMINARY VIEW: The United States was the primary proponent of agenda item 1.11 and the revision to Resolution 216 at WRC-2000. It continues to be the main proponent of the AMSS agenda item in the ITU-R, including Working Parties 8D, 4A, 9D, 7B, and 7D.

The U.S. supports the broadening of the secondary MSS allocation at 14-14.5 GHz to include AMSS, provided that the ITU-R studies indicate that this service can operate without causing harmful interference to the primary services in the band and that the service will be compatible with existing secondary uses.

(04.11.01)

IWG-3 DRAFT

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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 (WRC-2000);

ISSUE: Avoiding misapplication of non-GSO FSS single-entry limits (e.g., through artificially splitting or combining of non-GSO FSS systems).

BACKGROUND: WRC-2000 established single-entry equivalent power flux density (epfd) limits for non-GSO FSS systems in certain frequency bands in Article S22. The epfd limits are the sum of the power flux densities produced at a GSO receive station by the emissions from all the transmit stations within a non-GSO FSS system. The purpose of this item is to conduct technical studies and to consider regulatory procedures in accordance with Resolution 135 [COM5/2] (WRC-2000) to ensure that there will not be any misapplication of limits in Tables S22-1 (epfd_d), S22-2 (epfd_↑) and S22-3 (epfd_{is}) either by artificial splitting or by combining of non-GSO systems.

Misapplication of these limits, including artificial splitting or combining of non-GSO FSS systems, could:

- a) cause excess interference into GSO networks;
- b) reduce the number of non-GSO FSS systems that could be implemented in an allocated frequency band;
- c) affect the regulatory requirements for a non-GSO FSS system in the ITU coordination notification process; and
- d) affect non-GSO FSS systems that meet the single-entry limits in Article S22.

Resolution 135 (WRC-2000) invites the ITU-R to conduct technical studies and develop regulatory procedures, in time for consideration by WRC-2003, to avoid misapplication of the single-entry limits included in Tables S22-1, S22-2 and S22-3 of Article 22. This issue was also identified in the CPM report of WRC-2000 in Section 3.1.2.4.10, where it is noted that any misapplication of single-entry limits would invalidate the entire basis of the derivation of these limits.

Further, Resolution 135 instructs the Director of the Radiocommunication Bureau to review and, if appropriate, revise as of the end of WRC-2003, any finding previously made in respect of compliance with the limits contained in Article S22 for a non-GSO FSS system, for which notification information has been received on or after 22 November 1997. The Bureau's review and revision of findings is to be based on the studies undertaken by the ITU-R pursuant to Resolution 135 after WRC-2000.

PRELIMINARY VIEW:

1. It is in the interest of all administrations to avoid any misapplication of the single-entry epfd limits. Misapplication could distort the regulatory or interference situation by violating the assumptions upon which the single-entry epfd limits were based and adversely impact the GSO FSS and BSS networks to

be protected.

2. Misapplication could artificially increase the number of non-GSO FSS systems, and thereby increase the interference to GSO networks over the levels agreed at WRC-2000; it could artificially reduce the number of competing non-GSO FSS systems by making coordination between non-GSO systems more difficult.
3. The U.S. continues to participate in the studies within the ITU-R and is reviewing the need for the ITU-R to adopt regulatory procedures to avoid misapplication of the single-entry limits.

(04.12.01)

IWG-3/006(04.13.01)

Informal Working Group 3 (IWG-3)
Preparation for WRC-03

DRAFT PRELIMINARY VIEWS

WRC-2003 Agenda Item 1.27: to review, in accordance with Resolutions **540 (WRC-2000)** and **735 (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;

ISSUE: Res 540: Technical criteria and regulatory procedures associated with Appendices S30/S30A (BSS and Feederlink Plans). Res. 735: regulatory, operational and technical studies in the bands allocated to the BSS and the FSS (Earth-to-space) or terrestrial services with respect to S9.19.

BACKGROUND:

WRC-00 adopted a new Regions 1 and 3 BSS 12 GHz Plan and associated feederlink Plan, based on updated technical parameters. In addition regulatory and technical procedures for a new Regions 1 and 3 List were developed for the use of non-standard BSS parameters instead of allowing modifications to the Regions 1 and 3 Plan.

WRC-00 also adopted new sharing criteria between some of the primary allocated services in the Appendix S30 and S30A Plans.

Resolution 540 calls for the ITU-R to review:

- Changes made to regulatory procedures contained in Articles 4 – 7 of Appendices S30 and S30A as well as related modifications made to Articles S9 and S11 and Appendix S5;
- Certain sharing criteria contained in parts of Annexes 1, 3, 4 and 6 of Appendix S30 and, Annexes 1 and 4 of Appendix S30A;
- The limitations of Section A3 of Annex 7 of Appendix S30 in the context of any changes made to the sharing criteria discussed above.

Resolution 735 (WRC-2000) calls for studies of sharing procedures and criteria between receiving earth stations in the broadcasting–satellite service and transmitting earth stations or terrestrial stations in frequency bands allocated to the broadcasting–satellite service and the fixed-satellite service (Earth-to-space) or to terrestrial services. The U.S. also is participating in ITU-R studies to define the permissible pfd levels required at the edge of coverage of the BSS service area.

PRELIMINARY VIEW:**Resolution 540**

Sharing criteria contained in Annexes 1, 3, 4 and 6 of Appendix S30 and Annexes 1 and 4 of Appendix S30A, concerning inter-Regional and inter-Service sharing, need to be reviewed and updated if necessary. Additionally, regulatory aspects contained in parts of Appendices S30, S30A and S5 and Articles S9 and S11 need further review for consistency and completeness. The U.S. will participate in the ITU-R studies on these matters.

Any changes to the above criteria must ensure protection of existing U.S. BSS and FSS systems and their ability to evolve in the future. The U.S. agrees with adopting criteria that eliminates unnecessary coordination between BSS systems and between BSS and FSS systems, while still protecting the Region 2 services.

The U.S. is of the view that the new pfd levels adopted at WRC-00 for determining whether BSS systems impact terrestrial services do not need further study, this is consistent with invites ITU-R (1) of Resolution 540.

The US is of the view that the new pfd levels for Section 6 of Annex 1 to Appendix S30 adopted at WRC-00 for inter-regional sharing (Region 2 BSS modifications to protect the Regions 1 and 3 FSS and for Regions 1 and 3 List modifications to protect the Region 2 FSS), currently contained in Annex 1 to Resolution 540 (WRC-00), are sufficient and should not be modified. The US supports including these pfd limits in Section 6 of Annex 1 of Appendix S30.

The U.S. is of the view that Region 2 accepted a relaxation in the orbital arc limitations of Annex 7 at WRC-00 to allow more BSS assignments in the Regions 1 and 3 Plan and the List. The U.S. considers that any further relaxation will unduly impact the ability of Region 2 to fully use their allocation.

The U.S. will review the Bureau's findings on the impact of the Regions 1 and 3 Plan and List assignments on the BSS and other services in Region 2 when available. The U.S. supports the principle on which the replan took place that the Region 2 Plan should be protected. (See also IWG-3/10)

Resolution 735

Under S9.19 terrestrial stations coordinate with unplanned BSS - the threshold/condition in APS4 is bandwidth overlap and PFD of the terrestrial station at the edge of the BSS service area exceeding permissible levels. The U.S. is of the view that for ubiquitous BSS receivers, it is not practicable to coordinate on a specific earth station basis therefore BSS receive earth stations should be protected on a service area basis consistent with the existing Radio Regulations. (04.13.01)

IWG-3/007(04.12.01)

Informal Working Group 3 (IWG-3)
Preparation for WRC-03

DRAFT PRELIMINARY VIEWS

WRC-2003 Agenda Item 1.29: to consider the results of studies related to Resolution 78[COM5/23] (WRC-2000) dealing with sharing between non-GSO and GSO systems.

ISSUES: Resolution 78 (WRC-2000), *Development of procedures in case the operational or additional operational limits in Article S22 are exceeded*, invites the ITU-R to undertake the appropriate regulatory studies to develop procedures in cases where the operational efd_↓ limits in the bands 10.7-12.75 GHz, 17.8-18.6 GHz, and 19.7-20.2 GHz or the single-entry additional operational efd_↓ limits for 3 and 10 meter antennas in the 10.7-12.75 GHz band are exceeded at an operational GSO earth station.

BACKGROUND: Resolution 78 (WRC-2000), WRC-2000 adopted a combination of single-entry validation, operational and, for 3 and 10 meter antennas in the 10.7-12.75 GHz band, single-entry additional operational efd_↓ limits contained in Article S22, along with the aggregate efd_↓ limits in Resolution 76 (WRC-2000), which apply to non-GSO FSS systems to protect GSO networks in the bands 10.7-12.75 GHz, 17.8-18.6 GHz, and 19.7-20.2 GHz. The operational efd_↓ limits were adopted to protect *operational* GSO FSS networks from interference levels that may result in loss of synchronization, or loss of capacity, or severe degradation in performance.

Compliance with the operational efd_↓ and additional operational efd_↓ limits is not subject to verification by the ITU-BR but by individual administrations. In the case of operational efd_↓ limits, verification would be made by measurement conducted by administrations and/or their GSO system operators. A commitment by the administration (and their non-GSO operator) that the system filed will meet the additional operational efd_↓ limits is part of the Appendix S4 coordination data. A non-GSO system causing interference must reduce its efd_↓ power levels towards the affected GSO earth station to meet the single-entry operational efd_↓ limits unless otherwise agreed by the concerned administrations. The ITU-R has identified the need for specific procedures that correct in the most expeditious manner any cases where the operational efd_↓ (see Tables S22-4A through S22-4C) or additional operational efd_↓ limits (see Table S22-4A1) are exceeded, by the inclusion of appropriate procedures in the Radio Regulations.

The U.S. supports the development of ITU-R recommendations such as the preliminary draft new recommendation concerning Methodologies for measuring efd_↓ interference levels from a non-GSO space station to verify compliance with operational efd_↓ limits (WP 4A Chairman's Report 4A/93, TEMP/42), preliminary draft new recommendation on estimating the accuracy of the efd_↓ measurements (WP 4A Chairman's Report 4A/93, TEMP/28) and the draft new recommendation concerning Procedure for the identification of non-GSO satellites causing interference into an operating GSO earth station approved during the September 2000 WP 4A meeting. These

recommendations provide the methodologies needed by administrations and/or their GSO system operators to assess operational efd_↓ levels and were requested in resolves 1 of Resolution **137** (WRC-2000).

PRELIMINARY VIEW: Resolution 78 (WRC-2000),

Because compliance with the operational efd_↓ and additional operational efd_↓ limits is not subject to verification by the ITU-BR but by individual administrations, and , there is a need for a procedure to apply when there is a case that the Article S22 limits are exceeded, to assist administrations in ensuring that the operational GSO/FSS networks are properly protected for those cases where unforeseen operational non-GSO systems exceed the operational limits.

Exceedance of the operational limits may cause severe degradation to GSO terminals in the form of synchronization loss or loss of capacity. In order to expeditiously resolve cases where the operational limits are exceeded, the procedure outlined in Annex 1 of Resolution **78** should be followed. The US preference is to develop a procedure in accordance with Annex 1 of Resolution **78**, and place this procedure in Article **S15** of the Radio Regulations.

(04.12.01)

Document IWG-3/008 (04.11.01)

WRC-2003 ADVISORY COMMITTEE

DRAFT PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.29 – to consider the results of studies related to Resolutions 136 [COM5/3] (WRC-2000) and 78 [COM5/23] (WRC-2000) dealing with sharing between non-GSO and GSO systems

ISSUE (Res. 136): Frequency sharing in the range 37.5-50.2 GHz between GSO and non-GSO FSS networks.

BACKGROUND (Res. 136): Both GSO FSS and non-GSO FSS systems are planned for operation within the 37.5-42.5 GHz and 47.2-50.2 GHz bands. FSS systems based on the use of new technologies associated with both geostationary and non-geostationary orbits are capable of providing the most isolated regions of the world with high capacity and low-cost means of communications. WRC-2000 took several steps toward harmonized use of the band 37.5-42.5 GHz by fixed and space services. The band 37.5-42.5 GHz is now allocated to the FSS (space-to-Earth) on a primary basis in all three ITU Regions.

WRC-2000 adopted, in Article **S21**, power flux-density (pfd) limits on GSO and non-GSO FSS space stations in the bands 37.5-40 GHz and 40.5-42.5 GHz in order to protect terrestrial services. The new limits are provisional, and are subject to review under Resolution 84 [COM5/28] (WRC-2000) at WRC-2003. The pfd limits vary between different band segments, and between geostationary and non-geostationary systems within each band segment, and will have to be taken into consideration when addressing sharing between GSO and non-GSO FSS systems in those band segments.

Sharing studies between GSO FSS networks and non-GSO FSS systems in the frequency range 37.5-50.2 GHz are underway taking into account the significant propagation losses at these frequencies, duration of interference events, differences in planned earth station antenna sizes, availability requirements, potential mitigation techniques such as polarization isolation, and the pfd limits in Article **S21**. Sharing between GSO FSS and non-GSO FSS systems in this range is currently regulated under No. **S22.2** of the Radio Regulations, which provides that “[n]on-geostationary-satellite systems shall not cause unacceptable interference to geostationary-satellite systems in the fixed-satellite service and the broadcasting-satellite service operating in accordance with these Regulations.”

In Resolution 130 (WRC-97), WRC-97 recognized that “the diverging interpretations arising from No. **S22.2** result in an ambiguous regulatory status for both existing and future GSO and non-GSO systems in the FSS in the bands where this provision applies, with consequential risks for both types of systems.” Because there has been little or no deployment of satellite systems to date in the band 37.5-50.2 GHz, WRC-2000 recognized in Resolution 136 (WRC-2000) that both GSO FSS and non-GSO FSS operators should be expected to exhibit flexibility in achieving the appropriate balance in the sharing environment, and urged administrations, in the application of Article **S22** to their GSO and non-GSO FSS systems in this range prior to WRC-03, to seek balanced sharing arrangements. Resolution 136 invites the ITU-R to undertake the appropriate technical, operational, and regulatory studies on sharing arrangements which achieve an appropriate balance between GSO FSS networks and non-GSO FSS systems in the 37.5-50.2 GHz frequency range.

PRELIMINARY VIEW (Res. 136):

The U.S. continues to participate in the technical, operational and regulatory studies on sharing arrangements in order to achieve an appropriate balance between GSO FSS, non-GSO FSS, space research, and terrestrial systems in the frequency range 37.5-50.2 GHz.

The development of sharing criteria between GSO and non-GSO FSS systems in the 37.5-50.2 GHz range should, notwithstanding the current applicability of No. **S22.2**, be based on a principle of “equitable burden sharing,” to be defined by appropriate ITU-R recommendations, between these two types of systems. Nevertheless, a first-come/first-served regime (e.g., **S9.11A**) without appropriate technical standards is insufficient.

(04.11.01)

Informal Working Group 3 (IWG-3)

Preparation for WRC-03

DRAFT PRELIMINARY VIEW

Agenda Item 1.34: to review the results of studies in response to Resolution 539 (WRC-2000) concerning threshold values for non-GSO BSS (sound) in the band 2630-2655 MHz and to take action as required.

Issue

Should the provisional PFD thresholds in Resolution 539 be made permanent or modified?

Background

This agenda item is prompted by the provisions of a footnote, S5.418 adopted at WARC-92 and modified at WRC-2000, and actions taken at WRC-2000 that identified the band 2500-2690 MHz as an additional band for IMT-2000 systems. The referenced footnote provides for BSS (sound) systems in the band 2630-2655 MHz in the countries listed in the footnote, and exempts such type of systems from the PFD limits indicated in Table S21-4 of the radio regulations for BSS and FSS networks.

The lead group for development of CPM text is WP 6S (BSS). A very interested contributing group is WP 8F (IMT-2000). WP 6S has established SRG 6S/11 to prepare a report on the technical sharing issues.

There are a number of administrations which either have or are proposing BSS and BSS (sound) systems for this band. These include India (GSO/BSS), Malaysia (GSO/BSS (sound)), Japan (NGSO/BSS/GSO (sound)), Indonesia (GSO/BSS), Canada (GSO/BSS), Vietnam (GSO/BSS), Saudi Arabia (GSO/BSS), Tonga (GSO/BSS) and Brunei Darussalam (GSO/BSS). Indian and Indonesian systems are already operational.

There have been a number of technical contributions to the SRG. It appears that representatives of European countries support the use of this band for IMT-2000 and are using very conservative assumptions to advocate PFD threshold values which are significantly more

restrictive than those in S21-4. There is also the suggestion that these threshold values should even be applied as hard limits. In WP-8F meetings there has been particular disagreement between satellite and IMT-2000 advocates over what I/N value should be used as a protection criteria, e.g., IMT-2000 proponents advocate an I/N of -10 dB and satellite interests advocate an I/N of -6.0 dB or greater. The resultant PFD threshold levels could effectively push BSS systems out of this band, a situation which is to be avoided. It should be noted that the text of footnote S5.384A reads “this identification (for IMT-2000) does not preclude the use of these bands by any application of the services in which they are allocated and does not establish priority in the Radio Regulations.” This concept is one that the US has strongly supported as being essential in any bands identified for IMT-2000.

In many countries, including the US, studies are being performed to determine the appropriate bands for the implementation of IMT-2000. There are a number of incumbent services in this band that need to have continued access to the spectrum. . For example, in the USA today there exists extensive ITFS, MMDS, and two-way internet access fixed systems using the band. Based on past experience, these services are adequately protected by the existing PFD levels in Table S21-4.

Preliminary View

1. The use of the band 2630 - 2655 MHz by IMT-2000 systems should not preclude the use of this band by any application of the services to which they are allocated and no radio service should have priority over other services also allocated on a primary basis in this band.
2. The PFD threshold values for non-GSO BSS (sound) systems in the band 2630-2655 MHz should be maintained at the levels indicated in Resolution 539 unless ITU-R Recommendations demonstrate a need to change them consistent with View #1 above.
3. Existing satellite networks (i.e., those for which Coordination or Notification information has been provided to the ITU) should not be subject to more restrictive PFD threshold values or limits than those currently in Resolution 539 and S21-4, and any changes in these limits must not be applied retroactively to these existing satellite networks.
4. Any attempt to extend more restrictive PFD threshold values or limits to other parts of the band should be resisted.

(04.13.01)

Informal Working Group 3 (IWG-3)
Fixed-Satellite Service / Broadcasting-Satellite Service

Document IWG-3/10(Rev.1)
12 April 2001

DRAFT PRELIMINARY VIEW ON WRC-03 AGENDA ITEM 1.35

AGENDA ITEM

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

ISSUE

Whether to incorporate into the Radio Regulations at WRC-2003 the results of the Resolution53-man-dated analysis of incompatibilities between assignments in the WRC-2000 revision of the Regions 1 and 3 BSS/feeder link Plan and assignments in the Region 2 BSS/feeder link Plan as well as assignments in other services having primary allocations in the bands used for the Regions 1 and 3 Plan

BACKGROUND

Regions 1 and 3 adopted new BSS and associated feeder link Plans for Regions 1 and 3 at WRC-2000 and also adopted new criteria and methodologies for calculating the compatibility of these Plans with the Region 2 BSS and feeder link Plans and with other services having primary allocations in the Plan bands in all three Regions. However, except for "existing" and "Part B" systems, the entries in the new Regions 1 and 3 Plans were not analyzed during WRC-2000 to determine whether they presented any inter-service and/or inter-Regional incompatibilities, especially with assignments in other services that had not been fully processed at the time of WRC-2000. Therefore, symbols were included in the "Remarks" column of the Regions 1 and 3 Plans to identify potential incompatibilities, both in terms of causing interference and receiving interference. The task of analyzing these potential incompatibilities after WRC-2000 was assigned to the Bureau by Resolution 53(Rev.WRC-2000). Agenda Item 1.35 calls upon WRC-2003 to review the results of the Bureau's analyses, as reported by the Director, and take appropriate action.

To fully understand the issues presented by this agenda item, it is first necessary to understand what Resolution 53 calls upon the Bureau and administrations to do in order to obtain the results which the Director is to report to WRC-2003.

To begin with, Resolution **53(Rev.WRC-2000)** resolves "that the Bureau, using the methodology and criteria adopted at this conference [i.e., WRC-2000] shall complete the required analyses based on the following Notes explaining the nature of the "Remarks" column entries: Notes 3 to 7 in Section 9A.2 of Article 9A of Appendix **S30A** and Notes 5 to 8 in Section 11.2 of Article 11 of Appendix **S30**." [By way of explanation, Article 11 is the BSS Plan for Regions 1 and 3, and Article 9A is the corresponding feeder link Plan. Certain of the assignments in these Plans have a numbered "note" in the remarks column of the Plan. These notes specify either the conditions under which the assignment in question can be brought into use (e.g., Note 5 for Article 11) or identify the other assignments from which it cannot claim protection (e.g., Notes 6, 7, and 8 for Article 11)].

Resolution 53 also resolves that the Bureau shall publish, after the Conference, the results of its analyses together with its related conclusions, in a circular letter, and that, once this circular letter has been sent, administrations will have 120 days to decide whether they wish to continue appearing in the remarks as "affected or affecting administrations". No reply is taken as agreement to continue appearing. An affecting administration may request deletion but only with the agreement of the corresponding affected administration. After the 120 day period has expired, the Bureau will publish the final list of

administrations to be included in the remarks column in a further Circular Letter. The coordination requirements identified in this circular letter then apply until the remarks are included in the Radio Regulations by a competent Conference. Finally, Resolution 53 instructs the Director of the BR to include the results of the Bureau's analyses of the remarks in his report to the next world radiocommunication conference.

There are thus two pre-Conference action items for the United States. The first -- which must be dealt with in the 120 days following publication of the Bureau's first Circular Letter -- is to determine whether the Remarks contained in this Circular Letter correctly reflect which assignments in the Regions 1 and 3 Plans affect, or are affected by, assignments to services (BSS, FSS, and terrestrial) of interest to the U.S. Within that 120 - day period, the U.S. must notify the Bureau of any changes that are necessary, either to correct errors in the Bureau's analyses or to reflect coordination agreements with "affected" administrations in cases where the U.S. can be deleted as an "affecting" administration.

The second action item arises after the Bureau has reviewed its analyses in the light of requests from administrations and has published its second Circular Letter with the final list of Remarks and the Director has issued his report to the WRC-2003 Conference. The U.S. must then review this Circular letter and the Director's Report and decide on the extent to which it can accept incorporation of the proposed remarks into the Radio Regulations at WRC-2003.

It should be noted that, in order to allow time to complete its processing of the backlog of systems against which the compatibility of the Regions 1 and 3 Plans will be calculated, i.e., systems received by the Bureau prior to 12 May 2000, the Bureau plans to wait until 2002 to begin its analyses. This means that the first of the two Circular letters mandated by Res 53 may not be available before summer 2002.

PRELIMINARY VIEW

The U.S. is of the view that it can support incorporation into the Radio Regulations at WRC-2003 of the Remarks on the Regions 1 and 3 BSS and feeder link Plans to be proposed in the second of the two Circular Letters referred to in Resolution 53(Rev.WRC-2000) provided that, in advance of WRC-2003, the U.S. has determined the validity of these Remarks in the manner described in the BACKGROUND section above as the two U.S. pre-Conference action items associated with Agenda Item 1.35.

(04.12.01)

WRC-2003 ADVISORY COMMITTEE**DRAFT PRELIMINARY VIEWS ON WRC-03**

WRC-2003 Agenda Item 1.37: to consider the regulatory and technical provisions for satellite networks using highly elliptical orbits;

ISSUES:

1. Categorization of highly elliptical orbits (HEOs) as a type of non-GSO and definition of the technical and operational parameters of satellite networks/systems using these orbits.
2. Sharing between non-GSO systems using HEOs and circular orbit non-GSOs, such as low earth orbit (LEO) and medium earth orbit (MEO) systems, including mitigation techniques and coordination criteria.
3. Sharing between non-GSO systems using HEOs and GSO networks in bands where the epfd limits in Article S22 do not apply.

BACKGROUND:

The ITU-R has been considering the sharing aspects of HEO satellite systems (occasionally referred to as “quasi-geostationary” systems) in a number of contexts over the last several years. Several existing study questions within the ITU-R address this type of system, and sharing among non-GSO FSS systems (including HEO non-GSO FSS systems) is currently being studied under the terms of Resolution 137 (WRC-2000).

A subcategory of non-GSO systems, HEO systems are intended for operation or are already operational in several FSS bands above 3 GHz, as well as in BSS (sound) bands at around 2 GHz. In certain configurations, HEO systems offer promise in terms of their ability to facilitate the introduction of large numbers of such co-frequency non-GSO FSS systems, as well as in terms of their potential ability to co-exist successfully with GSO networks and terrestrial systems.

To date, several categories of non-GSO orbits that are encompassed within the term “highly elliptical” have been identified within the ITU-R. The characteristics of HEO systems are under evaluation, as is the ability of the various HEO systems to share with each other, with other types of non-GSO systems, with GSO systems (at least in bands outside of the bands where equivalent power-flux density (epfd) limits were adopted by WRC-2000 for the non-GSO FSS/GSO FSS and non-GSO FSS/GSO BSS sharing cases), and with terrestrial services. Much of the study activity to date has focused on HEO-type non-GSO FSS systems, but there is no question that space services other than the fixed-satellite service use or plan to use non-GSO systems in HEO orbits.

PRELIMINARY VIEW:

1. The U.S. favors the identification of mitigation techniques and sharing criteria which may facilitate coordination between and successful co-frequency operation of non-GSO FSS systems, including HEOs.
2. The U.S. agrees that satellite networks using HEOs are non-GSOs. These networks should continue to be considered to have the same regulatory standing as other types of non-GSOs, such as MEOs and LEOs.
3. ITU-R studies on sharing between non-GSO systems using HEOs and GSO networks should continue, especially in bands for which efd limits were not adopted by WRC-2000, to ensure the protection of GSO FSS and GSO BSS networks from non-GSO FSS systems.
4. Understanding of the results of studies being conducted for WRC-03 agenda item 1.37 will be improved by the use of common definitions in ITU-R Recommendations. There is, however, no need to modify the terms and definitions in the Radio Regulations to accommodate HEO-type non-GSO operations.

(04.11.01)

IWG-3/012(04.13.01)

Informal Working Group 3 (IWG-3)

Preparation for WRC-03

DRAFT PRELIMINARY VIEWS

WRC-2003 Agenda Item 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;

Issue: Spectrum requirements for space operations in fixed-satellite service (FSS) bands below 17 GHz for telemetry, tracking and telecommand (TT&C) of FSS networks operating with service links in the frequency bands above 17 GHz.

Background: Propagation conditions and spectrum availability are of primary consideration when implementing TT&C subsystems, which must meet high reliability criteria. Some systems utilize the existing Space Operation Service allocations (all of which are below 3 GHz) for TT&C while others use part of the FSS band allocations to perform this function (FSS (space-to-Earth) for space telemetry and tracking carriers, FSS (Earth-to-space) for telecommand).

Many advance publication and coordination notices for GSO and non-GSO systems in the FSS bands above 17 GHz have been received by the BR. Many of these systems propose use of bands below 17 GHz for TT&C operation, and filed accordingly. Under the ITU regulatory structure, FSS satellites systems may use any FSS allocation to perform TT&C functions.

WRC-2000 established an agenda item 1.39 for WRC-03 to examine the spectrum requirements in the FSS bands below 17 GHz for TT&C operation of FSS networks operating with service links in the frequency bands above 17 GHz. Transmissions above 17 GHz experience higher free-space and rain attenuation losses than those below 17 GHz. The U.S. is participating in the technical studies being performed in Working Party (WP) 4A and WP 4B in response to agenda item 1.39. These studies are investigating, among other things, the reliability and availability requirements of TT&C systems operating with service links in frequency bands above 17 GHz.

Preliminary View: Once the ITU-R studies are completed, the U.S. can make a recommendation, if needed, regarding how the TT&C requirements for FSS systems operating above 17 GHz can best be satisfied, while keeping in mind the necessary reliability and flexibility needed for FSS systems to perform TT&C operations.

(04.16.01)

WRC-2003 Advisory Committee
Informal Working Group 4 (IWG-4)

IWG-4 DRAFT PRELIMINARY VIEWS

On Agenda Item 1.13

WRC-2003 Agenda Item 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** and the results of the ITU-R studies conducted in accordance with Resolutions **122 (Rev.WRC-2000)** and **734/[COM5/14] (WRC-2000)**;

ISSUE: Matters related to high-altitude platform stations in the fixed and mobile services

BACKGROUND: At WRC-97, the bands 47.2-47.5 GHz and 47.9-48.2 GHz (which were already allocated for the Fixed Service) were designated within the Fixed Service for High-Altitude Radio-Relay Platform Stations (HAPS). WRC-2000 confirmed this designation and under Resolution 122 (Rev.WRC-2000) requested that studies continue on regulatory and sharing issues in these bands. While this designation does not limit the use of a band by types of services for which it is already allocated, it does give guidance to administrations wishing to implement specific service types.

WRC-2000, through Resolution 122, requested that the ITU-R conduct studies, taking into account the requirements of other Fixed Service systems and other services, on the feasibility of identifying suitable frequencies, in addition to the 2x300 MHz paired band at 47 GHz, for the use of HAPS in the Fixed Service in the range 18 – 32 GHz in Region 3. These studies were called for at the request of several Region 3 administrations because rain fade made utilizing the previously identified 47 GHz band difficult. The studies are to focus particularly, but not exclusively, on the bands 27.5 – 28.35 GHz and 31.0 – 31.3 GHz. In addition, country footnote S5.537A was adopted to permit the use of HAPS (HAPS-to-ground) in the Fixed Service allocation in the band 27.5-28.35 GHz on a non-interference, non-protected basis in certain Region 3 countries. This band, by country footnote S5.543A was paired with the 31-31.3 GHz band for use by HAPS (ground-to-HAPS) also on a non-interference, non-protected basis. Additionally use of the 31 – 31.3 GHz band is subject to not causing harmful interference to EESS (passive) and RAS services operating in the 31.3-31.8 GHz band. The footnote urged the identified administrations to utilize only the 31.0-31.15 GHz band until studies were completed.

The same concerns expressed at WRC-00 by many Administrations, including the US, with respect to identifying HAPS use in the Fixed Service in the 18 – 32 GHz band are still valid today.

Internationally the FSS is allocated on a global basis from 17.7 – 21.2 GHz and 27.5 – 31.0 GHz band. The FSS community is very concerned about their ability to deploy planned global FSS satellite systems without hindrance from HAPS deployment in the same band. The FSS community has invested large amounts of resources and time in the development of global FSS systems that will operate in certain parts of the 18 – 32 GHz band. Additionally there is concern regarding compatibility of HAPS with existing global FSS systems that operate in these bands. ITU-R Study Group 4-9S is currently studying this situation.

In addition to the above, WRC-2000 requested studies on the use of HAPS in both the fixed and mobile services in bands above 3 GHz allocated exclusively for terrestrial radiocommunication.

PRELIMINARY VIEW:

Identification of suitable Fixed Service bands for HAPS should be in bands that are already allocated to the Fixed Service on a primary basis. The bands considered should be limited to the 27.5 – 28.35 GHz and 31.0 – 31.3 GHz bands identified in Resolution 122. The identification of bands for HAPS should not impact the ability to operate existing and planned FSS systems. The identification of HAPS bands should be by country footnote and limited to Region 3 countries that expressed a need for an additional 2 x 300 MHz identification of bands because of difficulties with rain attenuation associated with the existing 2 x 300 MHz bands at 47 GHz identified for HAPS.

Prior to any identification of HAPS use in the Fixed Service bands technical studies by the ITU-R should confirm that sharing is feasible with existing and planned services in a particular frequency band. Additionally the amount of spectrum identified for HAPS systems in the referenced bands , 27.5 – 28.35 GHz and 31.0 – 31.3 GHz, should be consistent with the amount identified at 47 GHz (i.e. 2x300 MHz), unless a specific technical rationale for more spectrum is provided.

The U.S. is following the ITU-R studies being conducted in accordance with Resolution 734 on the use of HAPS in both the fixed and mobile services in bands above 3 GHz allocated exclusively for terrestrial radiocommunication and will develop a preliminary view in due course.

*WRC-2003 Advisory Committee
Informal Working Group-4*

**IWG-4 Preliminary Views on
WRC-03 Agenda Item 1.25**

WRC-2003 Agenda Item 1.25: *“to consider, with a view to global harmonisation 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.”*

ISSUE: Adoption of regulatory provisions and identification of certain FSS bands to facilitate high-density applications in the FSS (HDFSS).

BACKGROUND:

The demand for broadband services is increasing. Leading market research groups project substantial growth in broadband multi-media satellite access. This growth is projected for both residential and business purposes. By 2005, the average bandwidth required per user for high-speed access will be at least 10 times that which it is today. Provisions of these services by satellites provide an attractive competitive alternative to terrestrial communication systems. Satellite systems typically require a much longer lead time than do terrestrial systems to develop and implement; therefore, some regulatory assurances that terminal deployment will be commercially viable is essential.

HDFSS means ubiquitous deployment of a large number of small FSS earth stations. This type of earth station deployment is not compatible either with site-by-site coordination between FS and HDFSS stations within a country, or with a regime in which an individual authorization is required for each earth station. Therefore, it is appropriate for administrations to authorize HDFSS earth stations under a class (“blanket”) licensing policy. Implementation of class licensing procedures does not obviate the need for satellite network coordination in accordance with the ITU Radio Regulations (or applicable national regulations) or preclude the use of FSS networks with other types of earth stations and characteristics. Nor does class licensing relieve, where required, an HDFSS network from the ITU requirements to coordinate with FS networks across international borders. This type of licensing or authorization regime does, however, greatly facilitate the early and efficient introduction of HDFSS earth stations, and hence HDFSS services, into a country.

Regarding the band 17.3 – 17.7 GHz, in all three Regions this is a planned band for BSS feeder links (Earth-to-space) (AP S30A). In Region 2, the FSS (Earth-to-space) allocation in this band is limited to GSO BSS feederlinks. Also, in Region 2, as per S5.517, an allocation to the BSS in the band 17.3-17.7 GHz shall come into effect on 1 April 2007. Radiolocation systems, including aeronautical systems, operate worldwide in the 17.3-17.7 GHz band (on a secondary basis). Furthermore, there is an agenda item (1.18) of WRC-03 to possibly introduce a primary FS allocation in the 17.3-17.7 GHz sub-band for Region 1.

Many administrations have submitted ITU filings for FSS systems in the 17.7 – 20.2 GHz (space-to-Earth)/27.5 – 30.0 GHz (Earth-to-space) and in the 40-42 GHz (space-to-Earth)/ 48.2-50.2 GHz (Earth-to-space) bands. Many of these FSS filings propose using all or portions of these bands for global HDFSS systems (using GSO and/or NGSO satellites) that will deliver global communications services, including to areas that presently are not served. It is impractical to coordinate HDFSS earth stations with FS because of the large number of HDFSS earth stations and the type of user.

Many administrations, including the U.S., through national spectrum management regulations have developed or are developing rules that facilitate the deployment of HDFSS in some of these frequency bands. In particular many Administrations have implemented policies to allow HDFSS applications in the 29.5 – 30.0 GHz/19.7 – 20.2 GHz bands, due to great demand for use of this band and the fact that there is no co-primary FS allocation in these bands in the ITU Table of Frequency Allocations. The bands 18.8-19.3 GHz/28.6-29.1 GHz have also been included for HDFSS in many countries. In the U.S., in order to facilitate HDFSS, the FCC has adopted rules that allow class (i.e., blanket) licensing of FSS terminals and has prohibited the use of FS in certain of these bands. This policy precludes the need to coordinate each FSS earth station with FS stations (except for transition periods when there was already use of FS in the band and near international borders).

Other administrations are currently in the process of determining how to appropriately provide for HDFSS services in their countries. Some of these administrations are looking to the ITU for guidance on spectrum management issues concerning the FS and HDFSS.

WRC-97 and WRC-00 identified bands for High Density Fixed Services (HDFS) in the 31 GHz, 37.0-43.5 GHz and 55 GHz range. WRC-97 and WRC-00 also globally allocated the band 40.5-42.5 GHz to the FSS. Although no bands have yet been specifically identified for HDFSS use, WRC-00 did advise administrations that may be contemplating HDFS use of the bands 39.5-40 GHz and 40.5-42 GHz to take into account constraints to HDFS due to the potential deployment of high-density applications in the FSS. Further, Resolution 84 (WRC-2000) urges administrations considering regulatory provisions relating to the band 40-40.5 GHz to take into account that there were a number of proposals to WRC-00 to identify the band for HDFSS applications.

PRELIMINARY VIEW:

The identification of appropriate frequency bands for high-density applications in the FSS, and the adoption of associated regulatory provisions to facilitate deployment of HDFSS earth terminals, can help administrations and HDFSS satellite system operators in their earth station deployment.

The U.S. objective of enabling HDFSS in specific bands will be pursued by proposing adoption of footnotes to the International Table of Frequency Allocations that would “identify” certain bands for use by high-density applications in the FSS within existing FSS allocations. These footnotes could reference a resolution that would encourage those administrations desiring to take advantage of the benefits of HDFSS to adopt regulatory procedures, such as class (blanket) licensing of FSS earth stations, and to halt deployment of FS in the applicable bands in view of the sharing difficulties, in order to facilitate the

introduction of HDFSS earth stations. The U.S. does not support removal of any existing allocations from the International Table of Frequency Allocations under WRC-03 Agenda Item 1.25.

In reviewing bands above 17.3 GHz, the U.S. has developed the following specific preliminary views:

- Regarding the band 17.3 – 17.7 GHz, in all three Regions this is a planned band for BSS feeder links (Earth-to-space) (AP S30A). In Region 2, the FSS (Earth-to-space) allocation in this band is limited to GSO BSS feederlinks. Also, in Region 2, as per S5.517, an allocation to the BSS in the band 17.3-17.7 GHz shall come into effect on 1 April 2007. Radiolocation systems, including aeronautical systems, operate worldwide in the 17.3-17.7 GHz band (on a secondary basis). Furthermore, there is an agenda item (1.18) of WRC-03 to possibly introduce a primary FS allocation in the 17.3-17.7 GHz sub-band for Region 1. Given these allocations, this band is not available for HDFSS identification.
- The bands 29.5 – 30.0 GHz and 19.7 –20.2 GHz are allocated globally to the FSS in the Earth-to-space and space-to-Earth directions, respectively. There is no co-primary FS allocation in the ITU Table of Frequency Allocations in these bands. Many administrations are planning to deploy HDFSS applications in these bands on a global basis. Therefore the U.S. supports the identification of these bands for HDFSS on a global basis.
- The paired bands 28.6-29.1 GHz and 18.8-19.3 GHz, are allocated globally to the FSS in the Earth-to-space and space-to-Earth directions, respectively. Furthermore, these are the only bands where NGSO FSS systems are not required to protect every current and future GSO FSS system and therefore represent the best opportunity for ubiquitously deployed NGSO FSS user terminals. Therefore the U.S. supports the identification of these bands for HDFSS on a global basis.
- The bands 18.58-18.8 GHz, and 40-42 GHz (all space-to-Earth), and 28.35-28.6 GHz, 29.25-29.5 GHz and 48.2-50.2 GHz (all Earth-to-space), are also planned for use by many administrations for HDFSS applications. Therefore the U.S. supports the identification of these bands for HDFSS on a global basis.

The U.S. will continue to participate in ITU-R studies related to agenda item 1.25 and develop views on other frequency bands as appropriate.

(12.04.01)

**WRC-2003 Advisory Committee
Informal Working Group 4 (IWG-4)**

**IWG-4 PRELIMINARY VIEWS
On Agenda Item 1.26**

WRC-2003 Agenda Item 1.26: To consider the provisions, under which earth stations located on board vessels, could operate in fixed satellite networks, taking into account the ITU-R studies in response to Resolution 82.

Issue -

At WRC-2000 Resolution 82 was adopted which recognizes the existence and importance of communications services provided by VSAT like terminals on board ships operating in the 3700-4200 MHz and 5925-6425 MHz Fixed Satellite Service bands. Now RR need to be developed to implement the guidelines in Res. 82.

Background -

Resolves 4 of Resolution 82 states that until WRC-03 takes further action the guidelines in its Annexes 1 and 2 should be used as a basis for bilateral or multilateral agreement between administrations licensing ESVs and affected administrations. ESVs have been operating for over 10 years either under S4.4 or on the basis of a coordination agreement with affected administrations while not causing unacceptable interference to co-frequency terrestrial services.

Countries have provided authorizations to operate ESV terminals at ports, in territorial waters, and within a distance beyond which no coordination is required. This has occurred even though the ship on which the ESV is located does not carry the flag of the country which could receive interference.

Several actions are now underway in ITU-R Study Groups to develop Recommendations related to this agenda item. These include:

- a. In Working Party 4A a Recommendation is being developed on the Characteristics of ESVs.

b. In Joint Working Party 4-9S several Recommendations are being developed on methods to be used for achieving coordination with fixed stations when ESVs are in motion near the shore, including definition of a distance beyond which no coordination is necessary.

A. Preliminary View

The Preliminary View of the U.S. on this agenda item is:

a. A footnote should be added to the allocation 3700-4200 MHz and 5925-6425 MHz which references a revised Resolution 82. To the extent that studies within the ITU-R have been satisfactorily completed on the use of 11/14 GHz for this application, a similar footnote should be added to appropriate bands. The footnote could read:

S5.ESV Earth-stations on board vessels operating in this band shall do so in accordance with the provision of Resolution 82 (Rev. 2003).

b. Resolution 82 should be modified to change the guidelines of Annex 1 to resolves (suppress the existing resolves) and remove the title of Annex 1.

c. Change Annex 2 to Annex 1.

d. When operating in the territorial waters of a country or within a distance from the shore of a country outside of which there will be no unacceptable interference to terrestrial stations, a vessel having an earth station on board should be permitted to transmit once compliance with the technical criteria for avoiding interference as established by that country has been demonstrated.

WRC-2003 Advisory Committee
Informal Working Group-4

**IWG-4 PRELIMINARY VIEWS
ON WRC-03 AGENDA ITEM 1.32**

WRC-2003 Agenda Item 1.32a: to consider technical and regulatory provisions concerning the band 37.5 - 43.5 GHz, in accordance with Resolutions **128 (Rev. WRC-2000)** and **84 (WRC-2000)**.

ISSUES: 1. Adequacy of provisional limits on power flux-density (“PFD”) produced into the radio astronomy (“RA”) service band at 42.5 - 43.5 GHz by non-GSO satellites operating in the space-to-Earth direction in the fixed-satellite service (“FSS”) or broadcasting-satellite service (“BSS”) in the band 41.5 - 42.5 GHz, and by GSO FSS or BSS satellites operating in the space-to-Earth direction in the band 42.0 - 42.5 GHz.

2. Identification of technical and operational measures that FSS/BSS satellite networks can take to protect RA operations in the 42.5 - 43.5 GHz band, and of measures that may be implemented by RA service users to reduce the susceptibility of stations in the RA service to harmful interference.

BACKGROUND: The band 42.5 - 43.5 GHz is allocated to the RA service on a co-primary basis, while the frequency bands immediately below 42.5 GHz are allocated to the FSS and BSS (both space-to-Earth) on a co-primary basis with each other and with terrestrial services. To protect operating RA stations, WRC-2000 established a new footnote **S5.551G**, which contains a provisional PFD limit - not to exceed – 167 dB(W/m²) in any 1 MHz band at the site of a radio astronomy station for more than 2% of the time - on emissions produced into the 42.5 - 43.5 GHz band by non-GSO FSS or BSS systems operating in the 41.5 - 42.5 GHz band. A similar limit was imposed on emissions that GSO FSS or BSS satellites operating in the 42.0 - 42.5 GHz band may produce at the sites of RA stations operating in the 42.5 - 43.5 GHz band.

Pursuant to Resolution **128 (Rev. WRC-2000)**, the ITU-R is to conduct studies to review these provisional PFD limits; to identify technical and operational measures in the band 41.5 – 42.5 GHz, including possible mitigation techniques to protect RA operations; and to propose measures that may be implemented to reduce the susceptibility of stations in the RA to harmful interference.

PRELIMINARY VIEWS:

For Agenda Item 1.32a, protection should be provided for RA sites, during periods of observations, from emissions produced into the 42.5 - 43.5 GHz band by non-GSO FSS and BSS satellites operating in the 41.5 - 42.5 GHz band, as well as from GSO FSS or BSS satellites operating in the 42.0 - 42.5 GHz band. The United States is participating in studies now ongoing within the ITU-R. For the protection of RA from FSS, a guardband of 500 MHz appears to be adequate.

WRC-2003 Advisory Committee
Informal Working Group-4

**IWG-4 PRELIMINARY VIEWS
ON WRC-03 AGENDA ITEM 1.32**

WRC-2003 Agenda Item 1.32b: to consider technical and regulatory provisions concerning the band 37.5 - 43.5 GHz, in accordance with Resolutions **128 (Rev. WRC-2000)** and **84 (WRC-2000)**.

ISSUES: 1. How to achieve the successful co-existence of the fixed service (“FS”) (including high-density applications in the FS), the fixed-satellite service (“FSS”) (including high-density applications in the FSS), the mobile-satellite service (“MSS”) and the broadcasting-satellite service (“BSS”) within the 37.5 - 42.5 GHz frequency range.

2. How to ensure that FSS satellites that operate in clear sky conditions in the 37.5 – 40.0 GHz and 42.0 - 42.5 GHz bands at reduced power flux-density (“PFD”) levels use downlink fade compensation to overcome fading conditions in the least intrusive way practicable.

3. How to ensure that ubiquitously-deployed FSS terminals in the 40.0 – 42.0 GHz band will be protected from interference caused by co-frequency FS transmitters.

BACKGROUND: Various segments of the 37.5 - 43.5 GHz band are allocated to the FS, FSS, BSS and MSS on a co-primary basis. Segments of this band are being used or planned for high-density applications in the FS (“HDFS”), and other segments of the band are planned for deployment of high-density applications in the FSS (“HDFSS”). Co-frequency sharing is not feasible between HDFS and HDFSS systems, but sharing situations where only one of the services operates with ubiquitously-deployed small terminals may be practicable.

Significant actions were taken at WRC-2000 with respect to the 37.5 – 43.5 GHz band:

1. A framework for a comprehensive sharing arrangement for terrestrial and satellite services in the 37.5 - 43.5 GHz band was established, based on each service using some portions of the band more intensively than others.
 - (a) The 40.5 - 42.5 GHz band allocation for FSS was harmonized across all three ITU Regions.
 - (b) The 37.5 - 40.0 GHz and the 40.5 - 43.5 GHz bands, among others, were identified for HDFS applications in footnote **S5.547**, noting the potential deployment of HDFSS

applications in the bands 39.5 - 40.0 GHz and 40.5 - 42.0 GHz and the constraints such deployments may impose on use by HDFS.

- (c) PFD limits were established in Article **S21** (Table **S21-4**) for the FSS (space-to-Earth) in the bands 37.5 - 40.0 GHz and 42.0 - 42.5 GHz, and for the MSS (space-to-Earth) in the band 39.5 - 40.0 GHz, which are favorable to high-density applications in the FS, but which also permit “gateway”-type FSS operations. The PFD limits in the bands 40.0 - 40.5 GHz and 40.5 - 42.0 GHz are favorable for high density applications in the FSS.
 - (d) In the bands 37.5 - 40.0 GHz and 42.0 - 42.5 GHz, footnote **S5.551AA** provides that non-GSO FSS systems should employ power control or other methods of downlink fade compensation, on the order of 10 dB, to reduce the level of interference to the FS while ensuring that the satellite systems are at power levels required to meet the desired link performance.
 - (e) With regard to the consideration of regulatory provisions for the band 40.0 - 40.5 GHz, Administrations were urged to take into account that WRC-2000 received a number of proposals to identify the band 40.0 - 40.5 GHz for high-density applications in the FSS.
 - (f) ITU-R is to study criteria and techniques to address interference from transmitters of FS into earth station receivers in high-density applications in the FSS in the bands 39.5 - 40.0 GHz and 40.5 - 42.0 GHz intended to operate in the same geographic area.
 - (g) WRC-2000 established provisional PFD limits on BSS satellites in the band 40.5 - 42.5 GHz and requested the ITU-R to study technical and operational characteristics of BSS and to review the provisional PFD limits.
2. HDFS deployments in the 37.0 - 40.0 GHz band in ITU Region 2 were provisionally afforded greater protection from interference from FSS systems than they are in ITU Regions 1 and 3. In Region 2, prior to WRC-03, before an Administration brings into use a frequency assignment for a GSO FSS network in the 37.5 - 40.0 GHz band, it shall seek the agreement of any Administration in Region 2 on whose territory the PFD produced exceeds the values in Table **S21-4** minus 12 dB.
 3. ITU-R is to conduct studies to determine whether the PFDs in Article **S21** in the bands 37.5 - 40.0 GHz and 42.0 - 42.5 GHz will adequately protect the FS from FSS and MSS transmissions (39.5 - 40.0 GHz only), taking into account the need to ensure a proper balance in terms of the impact on both the FS and space services sharing the same band.
 4. ITU-R is to conduct studies to determine whether the PFDs in Article **S21** in the band 40.5 - 42.0 GHz band will adequately protect systems in the FS, taking into account the requirements of the FSS and recognizing that some Administrations plan to deploy FSS systems using ubiquitous very small aperture terminals in the 39.5 - 42.0 GHz band.
 5. In the bands 37.5 - 40.0 GHz and 42.0 - 42.5 GHz, ITU-R is to study the nominal clear sky PFD levels, and the percentage of time during which they may be exceeded to overcome fading conditions for FSS, in order to protect the FS while permitting operation of FSS using coordinated large antennas.

6. ITU-R is to study the use of mitigation techniques to improve sharing conditions between the space services and FS systems, taking account of the impact on systems of all affected services.

PRELIMINARY VIEWS:

The U.S. continues to fully support the comprehensive sharing arrangement that the CITEL countries took into WRC-2000. This approach is equitable, and allows the competing needs of the FS and the FSS in the 37.5 – 43.5 GHz band to be satisfied.

The unique characteristics of some HDFS networks in the 37.5 – 40.0 GHz band, which include links across a very wide range of elevation angles, makes them much more sensitive to satellite downlink interference than more traditional FS networks or HDFS networks with smaller concentrations of high elevation angle links. The PFD limits established in Article **S21** (Table **S21-4**) for the FSS (space-to-Earth) in the bands 37.5 - 40.0 GHz and 42.0 - 42.5 GHz, and for the MSS (space-to-Earth) in the band 39.5 - 40.0 GHz should be maintained, and should be used for validation purposes. When GSO and non-GSO satellites operate in these bands under clear-sky conditions, their operational PFD levels should be reduced to the levels in Table **S21-4** minus 12 dB.

The U.S. supports a policy that allows FSS satellites operating at the nominal clear-sky levels (Table **S21-4** minus 12 dB) under clear-sky conditions in the bands 37.5 – 40.0 GHz and 42.0 - 42.5 GHz to increase PFD by up to 12 dB to compensate for fading conditions between the satellite and one or more geographically separated Earth stations. The U.S. is currently participating in ITU-R studies that will determine the appropriate percentage(s) of time during which satellite networks and systems will need to use downlink fade compensation, and any associated conditions that are appropriate to minimize the impact of such use on affected HDFS links.

The PFD limits in the bands 37.5 - 40.0 GHz and 42.0 - 42.5 GHz should still be adequate to permit “gateway”-type FSS operations. FS operations in the 40.0 - 42.0 GHz band should be able to be accommodated subject to constraints that would be imposed due to deployment of high-density applications in the FSS.

Document IWG-5/___
Author: Kris Hutchison
April 6,2001

WRC-2003 ADVISORY COMMITTEE

DRAFT PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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)

Issue:

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.

Background:

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 aeronautical operational control (AOC) communications.

Solutions affecting 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 affect 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.

PRELIMINARY VIEW: To support enforcement of regulatory provisions, cooperative action by administrations, and the implementation of recommended measures and techniques, aimed at reducing this threat to the safety of air operations.

Informal Working Group 5 (IWG-5)

Preparation for WRC-03

DRAFT PRELIMINARY VIEWS

WRC-03 Agenda Item 1.24: to review the usage of the band 13.75-14 GHz, in accordance with Resolution **733** (WRC-2000), with a view to addressing sharing conditions;

ISSUE: To determine sharing conditions required by the FSS, Radionavigation, Radiolocation, and Space Research services while taking into consideration:

- 1) the constraints in footnote **S5.502** regarding the minimum antenna diameter of GSO FSS Earth stations and alternatives to those constraints,
- 2) review the e.i.r.p. for operation of Radiolocation service,
- 3) the needs of the Space Research service per **S5.503**.

BACKGROUND: Prior to WRC-2000, footnote **S5.502** contained constraints such as, e.i.r.p. and antenna size limits on the fixed-satellite service and e.i.r.p. limits on the radiolocation service. Footnote **S5.503** contained e.i.r.p. limits on the fixed-satellite service to protect the space research service. These constraints were intended to accommodate a delicate sharing of the band among these services. These constraints were developed based upon the planned use of 13.75-14.0 GHz by geostationary satellites in the FSS, and were intended to limit the number of FSS earth stations to the point that sharing could occur, though a potential for interference from the limited number of earth stations would still exist. Since the time that the regulatory constraints were developed, GSO FSS operators have expressed interest in operating small earth stations. This is due to the increased requirement for broadband data services delivered to businesses, hospitals, schools, etc., in both rural and urban areas. Radiolocation operators have expressed interest in using higher than currently allowed e.i.r.p. values. WRC-2000 modified footnotes **S5.502** and **S5.503** to include:

- within footnote **S5.502** that the protection of the receiving space stations in the FSS operating with earth stations that, individually, have an e.i.r.p. of less than 68 dBW shall not impose constraints on the operation of the radiolocation and radionavigation stations operating in accordance with the Radio Regulations.
- within footnote **S5.503** that the e.i.r.p. density of emissions from any earth station in the FSS operating with a space station in non-geostationary satellite orbit shall not exceed 51 dBW in band 13.772 to 13.778 GHz until those geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 Jan. 1992 cease to operate in this band.

The conference has created a Joint Task Group 4-7-8 to address the sharing conditions in footnotes **S5.502** and **S5.503** with a view to review the minimum antenna diameter of GSO FSS Earth station's and the e.i.r.p. constraints of radiolocation service.

It is believed that the ITU-R studies will take into account the reductions in resulting Radiolocation power flux density transmissions towards over-the-horizon inland earth station sights. Such studies should result in quantifying the reduction of interference into FSS earth

station receivers located inland from the operating Radiolocation sea lanes. That, in turn, would indicate the reduced protection needs and consequently smaller earth station antenna sizes at those locations. Studies will also have to be conducted which take into account those Space Research Satellites still having priority in the 13.772 – 13.788 GHz band.

PRELIMINARY VIEW: Based on the ITU-R studies, it would be the U.S. view to relax the 4.5 meter constraint on the GSO FSS to smaller sizes in proportion to the pfd reductions afforded to over the horizon FSS earth station inland sight locations while also temporarily taking into account the needs of the remaining Space Research satellites still operating in the 13.772 – 13.778 GHz band.

(4/3/01)

Document IWG-5/_____
Author: Kris Hutchison
April 6, 2001

WRC-2003 ADVISORY COMMITTEE
DRAFT PRELIMINARY VIEWS ON WRC-03

WRC-2003 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.

Issue:

Provision of an allocation for the transmission of the ICAO standard GNSS augmentation systems.

Background:

An aviation requirement has emerged for the transmission of differential correction (augmentation) data for the Global Navigation Satellite System (GNSS), to be used by aircraft receivers to satisfy the stringent accuracy and integrity requirements for GNSS applications. Following ICAO 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 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 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.

PRELIMINARY VIEW: 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.

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Informal Working Group 6

Preliminary Views on WRC-03

WRC-2003 Agenda Item 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)*

Issue: Pursuant to Resolution 1156 of WRC-2000, modify Article S5 of the Radio Regulations at WRC-2003 to identify frequency bands that could be used on a global/regional basis by administrations intending to implement future solutions for public protection agencies and organizations, including those dealing with emergency situations and disaster relief.

Background: WRC-2000 took notice of the growing telecommunication needs of public protection and disaster relief agencies, the requirements imposed by future advanced solutions employing high data rates, video and multimedia technologies, and the need for interoperability among service providers dealing with emergency situations and disaster relief. In recognition of the importance of such growing needs to the maintenance of law and order and the protection of life and property, WRC-2000 resolved to study, as a matter of urgency, identification of frequency bands that could be used on a global/regional basis by administrations intending to implement future solutions for public protection agencies, including those dealing with emergency situations and disaster relief, to consider the identification of globally/regionally harmonized bands at WRC-2003, and to make regulatory provisions, as necessary.

These studies are to be conducted in WP 8A. A questionnaire has been circulated to all ITU members requesting information on the type of PPDR services presently deployed and planned, distinguishing among narrowband, wideband, and broadband technologies, and spectrum allocations for PPDR services present and future. Further work of WP 8A will include analyzing the questionnaire responses, discussing a methodology for determining how much spectrum is needed for PPDR, and developing draft text for the WRC 2003 CPM Report.

This initiative is designed to enhance the ability of public protection and disaster relief organizations to work together through improved communications interoperability and to enable the equipment economies of scale necessary to lower the costs of specialized telecommunications systems to publicly funded entities that protect life and property. A harmonized spectrum plan may also result in the availability of spectrum for broadband applications for high data rate and multimedia systems designed to meet the specific future needs of public protection and disaster relief agencies. Harmonizing spectrum and regulatory requirements should improve the potential for communications interoperability when a country receives assistance from its global village partners during times of disaster. When disaster relief agencies respond around the world they generally bring their own communications equipment. In such cases, it is necessary to establish an inter-agency communications function to effectively coordinate efforts and maximize the number of lives

saved. Harmonized spectrum provides the potential for relief organizations around the world to communicate and interact more quickly and efficiently, thereby speeding disaster relief efforts.

Preliminary Views: At WRC-03, the United States should support the identification of globally/regionally harmonized frequency bands for the provision of public protection and disaster relief services. (17 April 2001)

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17 April 2001

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Informal Working Group 6

PRELIMINARY VIEW ON WRC-03

WRC-2003 Agenda Item 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);*

ISSUE: The need for a worldwide exclusive spectrum allocation for the amateur and amateur-satellite services in the three ITU Regions.

BACKGROUND:

Before 1938 the amateur service was allocated 300 kHz, 7000-7300 kHz, on a worldwide basis. At the 1938 Cairo Conference, the 300 kHz was reduced to 150 kHz for Regions 1 and 3 by the insistence of the Europeans. The allocation was further reduced to 100 kHz for Regions 1 and 3 at the 1947 Atlantic City Conference. The 200 kHz from 7100-7300 kHz was reallocated to the broadcasting service on a primary basis for Regions 1 and 3 for broadcasting within those regions.

Although the amateurs in Region 2 retained a 300 kHz exclusive allocation, 7000-7300 kHz, they have to protect the broadcasting service in Regions 1 and 3 that were broadcasting to areas within Regions 1 and 3 (RR Footnote S5.142). In addition, certain national footnotes further limited the amateurs' allocation by assigning 7000-7050 kHz to the fixed service on a primary basis (RR Footnotes S5.140 & S5.141).

At WARC-92, the United States proposed a worldwide amateur allocation in band 6900-7200 kHz as a consequence of proposed additional allocations for the broadcasting service above 7 MHz. That proposal failed because the modification of broadcasting service allocations was insufficient to cause a consequential change in the amateur allocation. WARC-92 agreed to Recommendation 718 (WARC-92) to consider realignment of the bands around 7 MHz at a future conference. A CEPT position was presented at WRC-97 that supported action at WRC-99 to carry out a realignment of the bands around 7 MHz and set out a number of facts and principles on which the re-alignment should be based. The proposed agenda item was eventually agreed to for inclusion on the provisional agenda for WRC-03.

As the only primary allocation to the amateur service between 4 and 14 MHz, the 7 MHz band is in heavy use 24 hours each day. During daylight hours, the band carries the bulk of amateur sky wave communication over distances of less than 1300 km. During the winter and during periods of low solar activity, and at other times when the maximum usable frequency (MUF) falls below 10 MHz, it must support the bulk of amateur intercontinental communication during the hours of darkness. As such, the Amateur Service is heavily dependent upon the 7 MHz band during natural disasters, when communications provided by radio amateurs may be the only means of maintaining critical communications links.

The requirement for at least a 300 kHz allocation is even greater today than in the past, owing to the increasing number of amateur stations and the expanding diversity of modes of emission used in the amateur service. However, the requirement is being met only in Region 2 and in certain countries in Regions 1 and 3 that permit their amateur stations to operate in the band 7100-7300 kHz under the provisions of Radio Regulation S4.4, and then only at those times (mostly during daylight hours) when broadcasting interference does not preclude full use of the band by amateur stations. In most countries in Regions 1 and 3, amateurs are limited to the portion of the band that is exclusively amateur, worldwide: 7000-7100 kHz.

Though broadcasting in the band 7000-7100 kHz has been reduced substantially, congestion in the amateur service is a significant problem and a return to the previous allocation of 300 kHz, worldwide, in the vicinity of 7 MHz is *strongly* indicated (RES 641, Rev.HFBC-87).

PRELIMINARY VIEW:

The U.S. supports the alignment of the bands around 7 MHz to eliminate the Regional differences between the allocations to the broadcasting service and the amateur services. The U.S. supports the allocation of the band 6900-7200 kHz on a worldwide primary basis to the amateur service, and allocating a band starting at 7200 kHz to the broadcasting service. Alternatively, the U.S. could support the allocation of 7000-7300 kHz on a world wide primary basis to the amateur service, with the broadcasting service allocation beginning at 7300 kHz. (17 April 2001)

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16 April 2001

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Informal Working Group 6

PRELIMINARY VIEW ON WRC-03

WRC-2003 Agenda Item 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);*

ISSUE: The use of the frequency band 420-470 MHz by the earth exploration-satellite service (EESS) (active) (Resolution **727 (Rev.WRC-2000)**), used extensively by government radars and the amateur services.

BACKGROUND: A similar agenda item was debated at WRC-97 resulting in a decision not to adopt proposed allocations for EESS (active) in the 420-470 MHz band. The Earth sensing community has identified that the need for an allocation at a radio spectrum wavelength of approximately one meter. Experiments have shown good correlation of backscatter radiation from biomass and soil moisture, which are parameters needed for forest monitoring. The need for such forest monitoring was emphasized at the United Nations Conference on Economic Development (UNCED) (Buenos Aires - 1992). Studies have identified a minimum bandwidth requirement of 6 MHz to satisfy mission objectives.

The amateur community is concerned with the possibility of harmful interference to amateur operations in the 430-440 MHz portion of the band. There are currently 16 amateur satellites in orbit that use frequencies within the band 435-438 MHz for both up and down links internationally.

The band 430–440 MHz is allocated to the amateur service on a co-primary basis in Region 1, and on a primary basis in eight Region 2 countries: Argentina, Colombia, Costa Rica, Cuba, Guyana, Honduras, Panama and Venezuela (No. **S5.278**). Elsewhere in Region 2 and in Region 3, the amateur service allocation is secondary. Additionally, the bands 420–430 MHz and 440–450 MHz are allocated to the amateur service on a secondary basis in Australia, the United States, Jamaica and the Philippines (No.**S5.270**).

The band 420-450 MHz is also allocated to the radiolocation service on a primary basis and is used for telemetry, telecommand and long-range surveillance by land, ship and airborne stations for early missile warning, detection of low-observable targets, and the tracking of all objects in

Earth orbit. The band 450-470 MHz is used by the Fixed, Mobile and Mobile-Satellite services.

Studies to date have shown the potential for interference between EESS (active) sensors, and amateur stations when the SAR is in the line of sight of amateur stations, and specifically in the band 435-438 MHz, which would be the worst-case scenario for the amateurs.

PRELIMINARY VIEW: The U.S. opposes this allocation in the band 420-470 MHz unless it can be shown that the EESS (active) sensors do not cause harmful interference to amateur systems and stations. (16 April 2001)

WRC-2003 Advisory Committee

IWG-7

DRAFT RECOMMENDED PROPOSAL

1. Reference: Agenda Item 1.1

WRC-95 added footnote **S5.389D** to the Table of Allocations in the simplified Radio Regulations adopted by that Conference. Since the date specified in the footnote has come and gone, the United States is of the view that its name can be deleted from this provision in accordance with Resolution 26 (WRC-97). Consequently, the following modification is proposed:

MOD S5.389D In Canada ~~and the United States~~ the use of the bands 2 010-2 025 MHz and 2 160-2 170 MHz by the mobile-satellite service shall not commence before 1 January 2000.

Reason: Footnote is overcome by date and is no longer needed.

WRC-2003 Advisory Committee**IWG-7****DRAFT PRELIMINARY VIEWS ON WRC-03**

WRC-2003 Agenda Item 1.30[b]: to consider possible changes to the procedures for the advance publication, coordination and notification of satellite networks in response to Resolution 86 (Minneapolis, 1998)

ISSUE [b]: Coordination-Arc Approach - Potential modifications to Articles S9 and S11 of the Radio Regulations (RR) and associated appendices to the RR (e.g., Appendix S4) with respect to the coordination-arc approach.

BACKGROUND: Resolution 86 (Minneapolis, 1998) resolves to request WRC-2000 and subsequent WRCs to continually review and update the advance publication, coordination and notification procedures, including the associated technical characteristics, and the related Appendices of the Radio Regulations, so as to ensure that they reflect the latest technologies, as well as to achieve additional simplification and cost savings for the Radiocommunication Bureau and administrations.

WRC-2000 implemented a coordination-arc approach to replace the Appendix S8 ($\Delta T/T$) coordination threshold, in certain frequency bands, in determining which administrations and networks are affected by a network entering the coordination phase. The coordination-arc approach affects the 6/4, 14/11, and 30/20 GHz “commercial” satellite bands. The determination of the need for coordination between GSO FSS networks is based on coordination arcs of ± 10 degrees, in the bands 3 400-4 200 MHz, 5 725-5 850 MHz (Region 1) and 5 850-6 725 MHz, ± 9 degrees in the bands 10.95-11.2 GHz, 11.45-11.7 GHz, 11.7-12.2 GHz (Region 2), 12.2-12.5 GHz (Region 3), 12.5-12.75 GHz (Regions 1 and 3), 12.7-12.75 GHz (Region 2), and 13.75-14.5 GHz, and ± 8 degrees in the bands 17.7-20.2 GHz and 27.5-30.0 GHz about the nominal orbital positions of those networks. An administration may request that a co-frequency GSO FSS satellite network outside the coordination arc be included in coordination when the administration can demonstrate by analysis that the increase in the system noise due to the proposed network ($\Delta T/T$) exceeds 6%. A co-frequency GSO FSS satellite network within the coordination arc may also be excluded from the coordination when the increase in system noise to the network is less than 6%. Although it is unlikely that WRC-2003 will see an expansion of the coordination-arc concept to FSS other bands without agreement on the arcs within Study Group (SG) 4, there may be proposals to expand the arc concept to other bands.

PRELIMINARY VIEW: The coordination-arc approach should be limited to the frequency bands identified by WRC-2000 unless SG4 comes to an agreement on additional specific FSS bands where the arc concept is warranted, and develops appropriate coordination arcs for these bands. The effectiveness of the coordination arc approach in improving satellite network coordination procedures should be demonstrated before expanding the concept to other bands.

WRC-2003 Advisory Committee

IWG-7

DRAFT PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.30[c]: to consider possible changes to the procedures for the advance publication, coordination and notification of satellite networks in response to Resolution 86 (Minneapolis, 1998)

ISSUE [c]: Reduction of Data Requirements - Potential modifications to Articles S9 and S11 of the Radio Regulations (RR) and associated appendices to the RR (e.g., Appendix S4) with respect to the amount and type of information submitted to the Radiocommunication Bureau for coordination and notification.

BACKGROUND: Resolution 86 (Minneapolis, 1998) resolves to request WRC-2000 and subsequent WRCs to continually review and update the advance publication, coordination and notification procedures, including the associated technical characteristics, and the related Appendices of the Radio Regulations, so as to ensure that they reflect the latest technologies, as well as to achieve additional simplification and cost savings for the Radiocommunication Bureau and administrations.

There is still a 32-month backlog for ITU publication of coordination special sections for satellite networks. WRC-2003 may see proposals to simplify the RR procedures to speed up processing of coordination requests. There has been a proposal within WP4A such that a minimum amount of information would be sent to the BR for coordination. The WP4A proposal may proceed successfully through the Study Group process and become a proposal to WRC-2003.

The idea of the WP4A proposal is to submit to the Bureau only the data for the most interfering links and the links most sensitive to interference. This minimum amount of information is all that is needed by the BR to determine affected administrations or for other administrations to determine whether they need to be brought into the coordination procedure. However, in practice administrations need information in greater detail to effect coordination. Furthermore, it may be difficult to identify the most interfering and most sensitive carriers since the carrier parameters of the satellite to which interference is caused or from which interference is received, the modulation type, and channel plan may need to be taken into account.

Some satellite operators have found it difficult to obtain clarification on network characteristics prior to coordinations. Reductions in the mandatory Appendix S4 coordination/notification information (ApS4/II) would make it even more difficult to perform the necessary interference analysis resulting in operators not being fully prepared for coordination discussions/meetings.

There are other means to simplify the data solely by not requiring redundant information. Information in the current Appendix S4 filings is essentially repeated one or more times for the

same network (e.g., for each polarization and for each beam) where the information is identical. Significantly reformatting the Appendix S4 data to reduce repetition could lead to a need to modify the ITU software for capturing, validating and storing the data.

PRELIMINARY VIEW: Any reduction in mandatory Appendix S4 coordination/notification information (ApS4/II) should be approached cautiously so that information essential to interference analyses is not eliminated. Additionally, any reduction in the ApS4/II data should not inadvertently eliminate administrations/networks for which coordination would be required under the existing Radio Regulations and Appendix S4. The benefits from simplifying or reformatting the Appendix S4 data to reduce repetition should be carefully weighed against the potential cost of consequential modifications to the ITU software for capturing, validating and storing the data. Elimination of redundant information could be acceptable with appropriate cross-referencing.

WRC-2003 Advisory Committee

IWG-7

DRAFT PRELIMINARY VIEWS ON WRC-2003

WRC-2003 Agenda Item 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)**;

ISSUE: Incorporation by reference.

BACKGROUND: A number of provisions of the Radio Regulations make reference to specific ITU-R Recommendations. As these referenced ITU-R Recommendations are updated at future meetings, it is then necessary for WRCs to review the corresponding Radio Regulations to see if the references they contain should be revised to reflect the new version. WRC-2000 revised the process of incorporation by reference and narrowed the purview of the standing agenda item. **Resolution 27 (Rev.WRC-2000)** contains principles and procedures for use of incorporation by reference in the Radio Regulations. As revised by Istanbul, proposals to clarify the status of references (*i.e.*, whether mandatory or non-mandatory) or to add wholly new references may only be considered where relevant to a specific substantive WRC agenda item. **Resolution 28 (Rev.WRC-2000)** directs WRCs to review ITU-R Recommendations incorporated by reference in the Radio Regulations that have been revised during the elapsed study period (based on the list to be provided by the Radiocommunication Assembly). To facilitate this task, the Director is instructed to present to the CPM prior to the WRC an initial list of those recommendations incorporated by reference that have been, or are likely to be, revised in time for the WRC.

PRELIMINARY VIEW: WRC-2003 should follow the incorporation by reference process in **Resolutions 27 and 28 (Rev.WRC-2000)**. It should, in accordance with **Resolution 28**, review those revised ITU-R Recommendations listed by the Director to the CPM and communicated by the Radiocommunication Assembly to the WRC to determine whether the updated version should be incorporated by reference in the Radio Regulations in place of the previous version.

Document IWG-2/005

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April 18, 2001

WRC-03 ADVISORY COMMITTEE

DRAFT PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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)

ISSUE: Additional allocations at WRC-03 for non-GSO MSS (Little LEO) service uplinks below 1 GHz.

BACKGROUND:

Non-GSO MSS below 1 GHz systems have been implemented and additional systems are planned to initiate service before WRC-03. Spectrum needs have been identified in CPM 99 in the range of 17 MHz for service links, and 4 MHz for feeder links. ITU-R studies conducted at several frequencies below 1 GHz (148-149.9 MHz and 450-470 MHz) have shown that frequency sharing is technically feasible with terrestrial allocations under certain technical and operating constraints such as:

- limiting the duration of burst transmissions by the MSS,
- limiting the duty cycle of transmissions,
- time constraints before reuse of an uplink frequency,
- use of dynamic channel assignment techniques (as referenced in ITU-R Rec. M. 1039)

Currently operating non-GSO MSS systems below 1 GHz continue to demonstrate the practical feasibility of co-frequency sharing in the VHF band with fixed and mobile systems similar to those in other fixed and mobile bands below 1 GHz. Already completed ITU-R studies on MSS and terrestrial system frequency sharing have resulted in sharing models to be applied (Rec. M.1039), technical characteristics of MSS systems (Rec. M. 1184), technical characteristics of land mobile systems (PDNR 8A/[LMS.CHAR]), and sharing criteria for MSS and terrestrial systems. Sharing study results have been included in the CPM Reports to WRC-97 and WRC-00. Additional studies are planned for completion prior to WRC-03. Completed sharing studies since 1995 include:

- a. A NGSO system operating in the 460 MHz band vs. a modeled land mobile analogue system (or digitally modulated, binary-FSK system) in which the worst case interference would reduce the land mobile availability less than 0.1 %, or from 99.0 to 98.9 %. The mean time between interference events for a land mobile user with 0.01 Erlangs of traffic was calculated to range from 10 hours to 21 months, which is much less than 0.1% decrease in channel availability.
- b. Using a different non-GEO MSS network operating in a portion of the 450-470 MHz band, and constraints similar to those now used in the 148-149.9 MHz band, another study concluded that shared access to a minimum of 4 MHz of spectrum by five non-voice, non-GSO MSS can meet the modelled land mobile service (LMS) protection requirements.
- c. A third study analyzed non-GSO interference to active remote pickup unit (RPU) channels linked to a

sound broadcasting station in an urban noise environment (assumed to be -138 dBW). The remote unit antenna height was 15 m and the base station receiving antenna height was 60 m. The simulation results showed that the probability of interference was 0.00015% (due to one interfering non-GSO MSS system). This is equivalent to a single short, one-half second, interference event every four days, assuming that the RPU is operating continuously for that period.

- d. Studies of sharing between an MS system and the mobile units and the base stations of two digital trunked land mobile systems which may be deployed in Region 1 and other countries, and in Region 2. Four different geographical regions were used in the studies, Europe, North America, South America, and Central America & Caribbean. For the range of parameters studied, the maximum probability of interference into a single terrestrial link was 0.0030% for the first system and 0.0027% for the second system. . The results may be viewed as 99% channel availability being reduced to 98.9970% for the highest probability of interference in the cases studied.
- e. Other studies were performed on two kinds of land mobile wireless systems used by broadcasting utilities. One of these systems is used in one administration for monitoring of incoming signals 24 hours per day at base stations located at an altitude of up to 1 000 m. Additional interference due to MES transmissions in the presence of a waiting mode receiver may increase the number of times that the squelch is activated and decrease the lifetime of the squelch relay to some extent. Some MES transmissions may be too short to activate the squelch circuit.

At WRC-95 and WRC-97 limited regional and country footnote allocations to the non-GSO MSS were made in 454-456 MHz and 459-460 MHz. Although this was a useful first step, these bands must be converted to worldwide allocations for the non-GSO MSS to be viable for these global systems. Due to the shared nature of these uplink bands and the permissive sharing techniques employed by the non-GSO MSS systems, additional worldwide allocations are needed for service uplink bands. Additional bandwidth allocated to the MSS will insure that the non-GSO MSS systems will be able to find adequate channels, while maintaining a very low probability of interference to other systems sharing that spectrum.

PRELIMINARY VIEW: Additional worldwide allocations for shared non-GSO MSS uplink service use should be made at WRC-03. The U.S. believes that the NVNG MSS < 1 GHz systems have proved their ability to share effectively in the 148.0-149.9 MHz band, and that studies completed in the ITU-R Study Groups have further confirmed the ability of Little LEO systems to share service uplink channels with fixed and mobile systems in other frequency bands under similar conditions. The U.S. view on Agenda Item 1.20 includes:

- Additional allocations for service uplink channels are urgently needed to maintain the viability of multiple non-GSO MSS systems due to the sharing of uplink frequencies with other services. For this reason, uplink channels are more urgently needed at this time than downlink service channels.
- Numerous sharing studies have been done to support additional allocations. Studies on sharing with specific systems are planned for completion prior to WRC-03. (04/18/2001)

Donald Abelson
Chief of the International Bureau
Federal Communications Commission
445 12th Street SW
Washington, D.C. 20554

Donald Abelson:

The National Telecommunications and Information Administration on behalf of the Executive Branch Agencies, has approved the release of several draft United States Preliminary Views for WRC-2003. Some of our initial preliminary view documents only contain background information at this time. We will continue to develop our inputs for the "U.S View" section on all the preliminary views and provide them at a later time. The enclosure containing our preliminary views is forwarded for review by your WRC-2003 Advisory Committee. Karl Nebbia from my staff will contact Julie Garcia and reconcile any differences.

Sincerely,

(Signed February 27, 2001)
William T. Hatch
Associate Administrator
Office of Spectrum Management

Enclosure

Radio Conference Subcommittee (RCS)

Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.1: requests from administrations to delete their country footnotes or to have their country footnotes deleted from footnotes, if no longer required, in accordance with Resolution **26 (Rev. WRC-97)**;

ISSUE: Deletion of Footnotes to the Table of Frequency Allocations in Article **S5** of the Radio Regulations

BACKGROUND: Resolution **26 (Rev.WRC-97)** urges administrations to review footnotes periodically and to propose the deletion of their country footnotes or of their country names from footnotes, as appropriate.

U.S. VIEW: In dealing with this agenda item, the U.S. supports the application of the approach used at WRC-2000. (February 6, 2001)

Radio Conference Subcommittee (RCS)

Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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 (Rev. WRC-2000)**, **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;

ISSUE: Preparing the regulatory way for the introduction of digital modulation use in the HF broadcasting bands.

BACKGROUND: Starting around 1995, active design and experimentation is being done on the use of digital modulation techniques for use in all the broadcasting bands below 30 MHz. Because of the special international broadcasting role at HF, documentation of an essentially regulatory nature began to be introduced within the ITU-R, initially through Study Group 10 (now Study Group 6).

WRC-97, in response to the development up to that time of digital modulation for HF broadcasting, modified some of the articles, resolutions and recommendations pertinent to HF broadcasting. There was no agenda item at WRC-00 associated with HF broadcasting.

The future agenda item committee at WRC-00, however, approved this agenda item for WRC-03 as a comprehensive item to permit WRC-03 to modify all the relevant ITU-R material cited in the agenda item in order to pave the regulatory way for the introduction of digital radio in the HF bands. This is being done at this time so as not to delay the introduction of improved radio in these bands beyond the time when industry will be able to have consumer radios on the market.

The collection of articles, resolutions and recommendations cited in the agenda item relate to:

- Access to WARC-92 extension bands for HFBC
- New system parameters, transmitter and receiver surveys, manufacturing implementation
- Protection ratios
- Cessation of double sideband analog modulation

(February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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 (WRC 2000);

ISSUE: The primary issues within this agenda item are: Do the issues raised in the **Resolution 645** require global harmonization of spectrum. If so, what are the spectrum requirements for public protection and disaster relief? If global harmonization would be beneficial, what are the appropriate mechanisms for facilitating it?

BACKGROUND: WRC-2000 established Agenda Item 1.3 to consider identification of globally/regionally harmonized bands, to the extent practicable, for 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. WP8A was designated as having responsibility to undertake appropriate studies related to public protection and disaster relief and report the results of these studies to WRC-03. In order to help facilitate the study of Agenda Item 1.3, WP8A circulated a questionnaire to gather requirements for public protection and disaster relief communications, develop a methodology for estimating spectrum requirements and identify appropriate frequency bands. In addressing whether or not spectrum should be identified for public protection or disaster relief services, consideration should be given as to whether those services should be given the benefit of extraordinary protection at the expense of other services, as is provided for "public safety" services. This could vary on a band-by-band or case-by-case basis.

Resolution 645 does not ask for a specific Recommendation, Resolution, or a Report, however; Resolution 645 does request the development of a draft resolution identifying the technical and operational basis for cross-border circulation. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.4: to consider the results of studies related to Resolution **114 (WRC-95)** dealing 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 aeronautical radionavigation service and the fixed-satellite service in the band 5 091-5 150 MHz;

Resolution **114 (WRC-95)** Use of the band 5 091-5 150 MHz by the fixed-satellite service (Earth-to-space) (limited to feeder links of the Non-Geostationary Mobile-Satellite Service)

ISSUE: WRC-2003 will review the results of studies on the technical and operational issues related to sharing of the band 5 091-5 150 MHz between the aeronautical radionavigation service and the fixed-satellite service providing feeder links of the non-geostationary mobile-satellite service (Earth-to-space). Are there requirements for MLS to use spectrum above 5 091 MHz, if yes, in what time frame? To what extent have MSS feeder links used spectrum to-date in the range 5 091-5 150 MHz? Would the MSS feeder links coexist with ARNS on a secondary basis or is there transition of feeder link use expected to frequencies above 5 150 MHz? Are revisions required to the current regulatory provisions (footnotes **S5.444** and **S5.444A** and Resolution **114 (WRC-95)** and if so, what revisions?

BACKGROUND: Resolution **114 (WRC-95)** requested ITU-R to study issues concerning sharing between Aeronautical Radionavigation Service (ARNS) and feeder links to Mobile Satellite Service (MSS) (Earth-to-space) in the band 5 091-5 150 MHz and to report results of the studies to WRC-2003. The use of this band by Microwave Landing Systems (MLS) and MSS feeder links is subject to footnotes **S5.444** and **S5.444A**, in particular the following conditions apply:

- 1) 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)**;
- 2) prior to 1 January 2010, the requirements of existing and planned international standard systems for the ARNS which cannot be met in the 5 000-5 091 MHz band, shall take precedence over other uses of this band;
- 3) after 1 January 2008, no new assignments shall be made to stations providing feeder links of non-geostationary mobile-satellite systems;
- 4) after 1 January 2010, the fixed-satellite service will become secondary to the ARNS.

Sharing studies between NGSO/MSS feeder links and microwave landing systems resulted in ITU-R Recommendation S.1342 "Method for determining coordination distances, in the 5 GHz band, between the international standard microwave landing system in the aeronautical radionavigation service and non-geostationary mobile satellite service stations providing feeder uplink services." These studies showed that compatibility between MLS receivers and MSS feeder links (Earth-to-space) could exist if sufficient geographical separation exists between the two stations. As a result, Recommendation S.1342 was adopted to trigger coordination between the two operators to determine the acceptability of an MSS site, possibly with or without restrictions. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES
PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.5: To consider, in accordance with Resolution 736 (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;

ISSUE: The technical feasibility of accommodating all of the requests for new and additional allocations for the mobile, fixed (Region 3), Earth exploration-satellite (EESS) and space research (SRS) services and also the upgrade of the radiolocation allocation in a limited amount of spectrum.

BACKGROUND: At WRC-2000 there were several proposals for items to be placed on the WRC-03 Agenda dealing with spectrum in the 5 GHz range. These items included new and additional allocations to the mobile (for Radio Local Area Networks (RLAN)), fixed (for Fixed Wireless Access (FWA) in Region 3), Earth exploration-satellite and (active) and space research (active) services. Also, an upgrade of the radiolocation allocation in 5 350-5 650 MHz was proposed. These were combined into one agenda item, since the possible allocation to any one of these services would affect the potential allocation of one or more of the other services within this frequency range.

Technology has evolved to the point where wireless networks can be readily and inexpensively deployed to support the businessman or student that is in a campus environment. These devices are becoming widely used in some parts of the world, particularly in North America and Europe. The U.S. domestic allocation table already allows for the use of Radio LAN and FWA devices on a non-interference basis in the 5 150-5 350 and 5 725-5 825 MHz bands. These devices have power level and antenna gain restrictions on them to protect the existing services. Europe has also implemented these devices in similar spectrum, also with significant usage restrictions. Preliminary studies indicate that without these restrictions, sharing between the existing services and RLANS is not feasible. It is also expected that similar restrictions on FWA systems will be necessary to protect the EESS and SRS. For, example, studies show that presence of outdoor wireless access system transmitters can cause significant interference to spaceborne active sensors that operate in the EESS and SRS. In addition, the ITU-R has concluded that restrictions are also necessary to protect the MSS feederlinks in the 5 150-5 250 MHz band. Lastly, preliminary ITU-R studies of radiolocation sharing with FWA have shown that large separation distances or other mitigation techniques such as receiver standards or error-correction coding are required to prevent mutual interference.

Active microwave sensors on board spacecraft are an increasingly important tool for monitoring the Earth's environment and oceans through the determination of wave height and oceanic

currents as well as for radar imaging of the Earth's surface. The need for an additional 110 MHz of spectrum adjacent to the current international allocation from 5 250 – 5 460 MHz is well documented within the ITU-R. The member space agencies of the Space Frequency Coordination Group (SFCG) have reviewed requirements for the various active sensor measurements, including TOPEX/POSEIDON and JASON. They have recognized the requirement for an extension of the existing allocated primary band (5 250 - 5 460 MHz) for enhanced vertical resolution for spaceborne altimeters and enhanced horizontal resolution for synthetic aperture radars (SARs). Previous studies and past operational experience has shown that operation in bands allocated to the radiolocation, radionavigation and aeronautical radionavigation services has proven to be feasible. Although further study is needed to confirm that this true in the 5 460 – 5 570 MHz band, ITU-R preliminary studies indicate that this is the case.

WRC-97 first considered the possibility of an allocation upgrade for the radiolocation service in the 2.9-3.4 GHz and 5.35-5.65 GHz bands by placing this matter on the draft WRC-2001 Agenda. A need of 600 MHz of additional primary radiolocation spectrum for radiolocation systems has been determined. Changes in technology are driving the need for larger bandwidth in order to be able to pick smaller and less reflective radar targets out of background clutter. Experience has shown that the radiolocation service can successfully share the band 5 350-5 650 MHz with radionavigation and EESS/SRS active systems. In fact studies of sharing between radiolocation and active space borne sensors carried out for CPM-97 by JWP-7-8R generally support such sharing.

U.S. VIEW: Based upon the long history of successful co-band operations and the JWP 7-8R studies, it should be possible to achieve the upgrade for radiolocation with the incumbent services. By the same reasoning, the EESS extension in the 5 460-5 570 MHz band is also feasible. It is possible for radiolocation, EESS/SRS and MSS feederlinks to share with communications systems such as RLANs in the mobile service or FWA in the fixed service, but that restrictions will need to be placed upon the RLAN and FWA systems to protect the other services. (February 6, 2001)

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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);

ISSUE: MSS Feeder Links at 5 150–5 250 MHz

BACKGROUND: The proliferation of radio local area networks (RLANs) poses a serious threat to mobile-satellite service feeder links in the 5 150–5 250 MHz frequency band. The RLANs require neither licensing nor coordination, so identification of sources is difficult or impossible when interference occurs. Moreover, enforcement of aggregate interference power limits is very problematic. The Recommendations listed in the Agenda Item, however, provide guidance for addressing the problems. Recommendation ITU-R S.1426 provides recommended levels of aggregate power flux-density for RLANs visible to an NGSO spacecraft with full Earth coverage, though the case of spot beam antennas requires further study. Recommendation ITU-R S.1427 states that the rise in satellite noise temperature $\Delta T/T$ should not exceed 3%. Furthermore, RLANs transmitters should be operated indoors, according to Recommendation ITU-R M.1454, which also provides information for sharing studies. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES
PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.7: To consider issues concerning the amateur and amateur satellite services;

ISSUE: Issues concerning Amateur Radio - 1.7.1 possible revision of Article S25

BACKGROUND: This item was prompted by a proposal at WRC-95 to delete the requirement for amateurs to demonstrate Morse code capability to be licensed to operate on amateur bands below 30 MHz. At that WRC, the International Amateur Radio Union (IARU) requested a delay because it needed to consult its three regional organizations, which meet in turn over a three-year period. This consultation has taken place and IARU provided an input document to Working Party 8A at its 1999 meeting and made a further input at WP 8A's 2000 meeting. The inputs resulted in a Draft New Recommendation adopted at SG 8. The DNR establishes minimum qualifications for amateur operators and provides for knowledge of various methods of radiocommunication including radiotelegraphy but does not specify Morse code. The draft CPM text generated by WP 8A in November 2000 says that the Morse code provision could be suppressed by WRC-2003 and the DNR could be considered for possible incorporation by reference.

Other provisions of Article S25 that are to be addressed under this agenda item are provisions concerning third party traffic and reciprocal operating agreements. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES
PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.7: To consider issues concerning the amateur and amateur satellite services;

ISSUE: Issues concerning Amateur Radio - **1.7.2** review of the provisions of Article S19

BACKGROUND: This item is concerning the formation of call signs in the amateur services in order to provide flexibility for administrations. This item arose at WRC-2000 as the result of a proposal to provide more flexibility in amateur station call sign structure, especially to commemorate special events. Some administrations already allow special event call signs for temporary use. Many administrations interpret the use of **S19** differently, which is the temporary use of call signs. However, some administrations want to have the Radio Regulations to be explicit in the use of temporary call signs. WP8A has developed a flexible structure by replacing “three letters” by “four characters” the last of which would be a letter. This change would considerably expand the number of possible call sign combinations and provided Administrations with increased flexibility without creating conflict with the call sign formats specified for stations in other services. (February 7, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES
PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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**;

ISSUE: Boundary Between the Out-of-Band and Spurious Domains

BACKGROUND: While the intent of the unwanted emission limits in Appendix **S3** is that they would apply to spurious emissions, it is not generally feasible to distinguish between out-of-band and spurious emissions as defined by Article **S1**. Therefore, the limits are applied to all unwanted emissions further removed from the center frequency than a specified *boundary*. This boundary is generally 250% of the necessary bandwidth.

Task Group 1/5 recognized that, since spurious emissions can occur anywhere outside the necessary bandwidth of an emission, no boundary actually exists between out-of-band and spurious emissions. TG 1/5 solved this problem by defining the out-of-band and spurious *domains*, disjoint frequency ranges specified such that out-of-band or spurious emissions generally predominate within them. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)

Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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);

ISSUE: Review of Appendix **S13** (Distress and Safety Communications (non-GMDSS)) with the view of deleting duplicate or unneeded provisions.

BACKGROUND: In accordance with the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, all ships subject to this convention were fitted for the Global Maritime Distress and Safety System (GMDSS) by 1 February 1999. GMDSS changed maritime distress and safety communications from essentially a ship-to-ship to primarily a ship-to-shore system. This change was based on the theory that a properly established shore facility could better organize a search and rescue effort. It further changed a highly manpower intensive system to one with considerable automation. During the transition period to full implementation of the GMDSS, the RR had dual provisions; **S13** includes the non-GMDSS provisions. Since the GMDSS provisions are applicable only to SOLAS vessels, there are a considerable number of maritime vessels that are not fitted with the automated communications systems, necessitating some continued operation on frequencies and modes used prior to the implementation of GMDSS. Support of the old and new distress and safety systems for an extended period of time is cost prohibitive. Many administrations have worked to increase fitting of GMDSS elements (e.g., radios incorporating DSC functions and satellite EPIRBs) on non-SOLAS vessels through rule-makings for specific classes of vessels and equipment certification requirements. This agenda item would review the requirements included in **S13** with the expectation of time-phased deletion of some of the non-GMDSS requirements. (February 7, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.10.1: to consider the results of studies, and take necessary actions, relating to exhaustion of the maritime mobile service identity numbering resource (Resolution **344 (WRC-97)**);

ISSUE: Presently Maritime mobile service identities (MMSIs) are required for many shipboard communications equipment (e.g., DSC, mobile earth stations). As the number of vessels carrying these systems increase, the availability of MMSIs have decreased. This is due to the near exhaustion of available Maritime Identification Digits (MIDs). The ITU, following established procedures, refuses to provide additional MIDs until administrations populate the ITU databases and List of Ship Stations.

BACKGROUND: The MMSI (Article **S19**) is a 9-digit number to uniquely identify ship stations, group ship stations, coast stations and group coast stations. Three of the nine digits are the Maritime Identification Digits (MIDs). MIDs represent territory or geographical area of administrations and are assigned by the ITU. The total possible number of MMSIs is reduced by a requirement to assign MMSIs ending in 3-zeros to vessels requiring access to certain satellite services. Additional MIDs are assigned by the ITU based on an administration exhausting available MMSIs based on the total number of ship stations entered into the ITU maritime database shown on the ITU List of Ship Stations. This problem is exacerbated for administrations that do not normally register non-convention vessels or military vessels in the ITU List of Ship Stations or other ITU databases. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.10.2: to consider the results of studies, and take necessary actions, relating to shore-to-ship communication priorities (Resolution 348 (WRC-97));

ISSUE: A shore-based search and rescue authority has no means to interrupt or preempt the satellite communications to a vessel in a distress or safety situation. This communications inability may increase the probability of lost of life and property.

BACKGROUND: At present, when vessels are using their ship earth stations, it is not possible to send them a distress or safety message without extremely complex and time-consuming manual intervention at a land earth station to remove all other shipboard traffic. Although this is technically possible, it is not practical. In a recent distress case, the shore-based search and rescue authorities were unable to contact a vessel because of on-going routine traffic to the vessel. This inability to preempt lower priority traffic hindered the overall search and rescue operation. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.12a: 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)**;

ISSUE: Resolution **723 (Rev.WRC-2000)** resolves to recommend that WRC-03 consider the provision of up to 3 MHz of frequency spectrum for the implementation of telecommand links in the space research and space operations services in the frequency range 100 MHz to 1 GHz.

BACKGROUND: ITU-R Recommendation **SA.363-5** recommends that frequencies below 1 GHz are technically suitable for telecommand of satellites in the space science services operating below an altitude of 2000 km. A deficiency in telecommand (uplink) frequency allocations has been previously identified, compared to the available telemetry (downlink) allocations in the 100 MHz to 1 GHz range. This deficiency was first noted in Resolution **712 (WARC-92)**, repeated in Resolution **712 (Rev. WRC-95)**, and again in Resolution **723 (WRC-97)**.

This item was originally placed on the WRC-97 agenda due to the imbalance that exists between telemetry spectrum and telecommand spectrum in the 100 MHz to 1 GHz region. WRC-97 determined that insufficient study had been completed to take action on this agenda item. Sharing studies are currently being carried out within ITU-R WP 7B to determine whether or not these telecommand links will interfere with fixed and mobile (to include airborne mobile) systems of other administrations. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)

Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.12b: 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)**;

ISSUE: To consider incorporating in the Table of Frequency Allocations the existing primary allocation to the space research service in the band 7 145 - 7 235 MHz under No. S5.460. (Resolution **723 (Rev.WRC-2000)**, *resolves 2*)

BACKGROUND: The 7 145 - 7 235 MHz band is allocated by footnote S5.460 on a primary basis to the space research service (Earth-to-space), subject to agreement under No. S9.21. The companion downlink band, 8 400-8 500 MHz, is allocated on a primary basis in the Table of Frequency Allocations. These bands are used on a worldwide basis for cross-support in accordance with international agreements concluded between a number of space agencies. The footnote calling for agreement under No. S9.21 was originally applied at WARC-79 because the coordination parameters necessary for earth station coordination were not agreed at that time. Currently, Appendix S7 contains these coordination parameters for transmitting earth stations for the space research service in the 7 145 - 7 235 MHz band. Therefore, the premise behind requiring agreement under No. S9.21 no longer exists.

Worldwide decisions in the framework of ITU on IMT-2000 core bands (which include the band 2 110-2 120 MHz allocated to Space Research Service, Deep Space) are 'de-facto' constraining both the existing space research service and the planned IMT-2000 systems (see RR S5.388). With the planned implementation of IMT-2000 starting in 2001, the band 2 110-2 120 MHz will be increasingly difficult to use by the powerful Earth-to-space links of the space research/deep space service. The space research service will be forced to migrate all but emergency operations to an alternative band, i.e., to the existing allocation within 7 145 - 7 235 MHz.

U.S. VIEW: The U.S. supports the addition of the space research service (Earth-to-space) to the Table of Frequency Allocations on a primary basis in the 7 145 - 7 235 MHz band and the modification of footnote S5.460 to delete everything except the final sentence of the current footnote. (February 6, 2001)

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.12c: 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)**;

ISSUE: To review existing allocations to space science services near 15 GHz and 26 GHz, with a view to accommodating wideband space-to-Earth space research applications. (Resolution **723 (Rev. WRC-2000)**, *resolves 4*)

BACKGROUND: Currently, only the 8 450-8 500 MHz band is available below 30 GHz for the down-link of broadband data from spacecraft in the space research service (SRS). The next available band allocated for SRS use is 37-38 GHz. This band is expected to be heavily utilized for lunar and planetary missions and additionally may be constrained by deployment of HDFS. An allocation is needed to support planned high data rate space research missions (requiring bandwidths up to 400 MHz) that will carry telescopes and/or other passive instruments used to measure phenomenon such as the earth's magnetosphere and solar flares. These missions will be limited in number with no more than an estimated 3-5 satellites per year worldwide, and will generally be in equatorial orbits with some geostationary and others at the L1 or L2 libration points.

The 25.5-27.0 GHz band is currently allocated on a worldwide primary basis to the Earth exploration-satellite service (EESS) (space-to-Earth). The telecommunications requirements for the SRS (near Earth missions) are in general similar to those in the EESS and systems of these services are expected to share ground network resources. There are no plans for, nor is there any foreseeable need, for broad distribution of such data. The sharing situation for the SRS with other services allocated in these bands are expected to be very similar to those involved between the EESS and these other services and therefore do not present additional burden to the other allocated services.

Additionally, there is a secondary space research allocation covering 14.5–15.35 GHz. The possibility of upgrading all or part of this allocation to primary status is under investigation.

U.S. VIEW: The U.S. supports the need for additional space research service downlink spectrum below 30 GHz to facilitate broadband SRS mission requirements. Either the 14.5 - 15.35 GHz or 25.5-27 GHz bands under study would fulfill the SRS requirements. The U.S. anticipates submitting a proposal to WRC-2003 for a primary SRS allocation within the bands under investigation. (February 6, 2001)

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.12d: 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)**;

ISSUE: to review the allocations to the space research service (deep space) (space-to-Earth) and the inter-satellite service, taking into account the coexistence of these two services in the frequency range 32-32.3 GHz, with a view to facilitating satisfactory operation of these services. (Resolution **723 (Rev. WRC-2000)**, *resolves 3*)

BACKGROUND: Signals received on Earth from spacecraft in deep space are extremely weak and highly susceptible to interference of all kinds. In particular, the presence of near-Earth airborne and spaceborne interference sources can easily overwhelm the desired (but extremely weak) signal from deep space. Geographic isolation is not possible in the case of near-Earth orbiting spacecraft sharing the same band with space research (deep space). To satisfy present and future science deep space data return requirements, heavy reliance is being placed on space-to-Earth links in the 31.8-32.3 GHz band. The lack of compatibility between the inter-satellite service and the space research service (deep space) has been demonstrated and is documented in Recommendation ITU-R SA. 1016.

U.S. VIEW: Sharing between the space research service (deep space) (space-to-Earth) and the inter-satellite service does not appear feasible. The U.S. anticipates proposing that the inter-satellite service allocation from 32-33 GHz be modified to exclude the 32-32.3 GHz band. The U.S. is in the process of removing the inter-satellite service from this band in its National Table of Frequency Allocations. (February 6, 2001)

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.12e: 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 (WRC-2000)**;

ISSUE: Resolution **730 (WRC-2000)**, resolves 1 and 2, and review of all Earth exploration-satellite service and space research service allocations between 35 and 38 GHz.

1 to invite ITU-R to study sharing between spaceborne precipitation radars and other services in the band 35.5-35.6 GHz;

2 to recommend that WRC-03 review the results of those studies and consider the removal of the restriction currently contained in No. S5.551A on spaceborne precipitation radars operating in the Earth exploration-satellite service in the band 35.5-35.6 GHz.

Footnote S5.551A, which places restrictions on the use of the EESS and SRS (active) allocations in the 35.5-36 GHz band, is to be reexamined to determine if there is technical justification for its removal.

BACKGROUND: The frequency band 35.5 – 36 GHz is allocated to the Earth exploration-satellite (active) service on a primary basis limited by footnote **S5.551A** and is also allocated to the meteorological aids and radiolocation services on a primary basis. Prior to WRC-97, operation by radars located on spacecraft on a primary basis was permitted in the band 35.5–35.6 GHz by footnote **S5.551 (SUP WRC-97)**. This 100 MHz band is used by precipitation radars located on spacecraft. Furthermore, studies have shown that sharing between spaceborne active sensors and radiolocation systems in the band 35.5–36 GHz is feasible, as indicated in § 5.7.2.1 of Chapter 5 of the CPM-97 Report. ITU-R Joint Working Party 7-8R, which studied compatibility between spaceborne active sensors and other services prior to WRC-97, noted that in the band 33.4–36 GHz, compatibility analysis between spaceborne altimeters and scatterometers and terrestrial radars in the radiolocation service indicated that interference from these spaceborne active sensors into the radiolocation systems would not exceed the interference criteria for terrestrial radiolocation systems that are in normal use. JWP 7-8R also examined the compatibility of active sensors with radiolocation systems from the aspect of potential interference from these radiolocation systems into altimeters and scatterometers and concluded that interference into these sensors would not exceed their interference criteria. Therefore, JWP 7-8R and subsequently CPM-97 concluded that compatibility between known spaceborne active sensors and radiolocation systems in the 33.4–36 GHz band existed and that an allocation of 500 MHz in

this frequency range should be made. Therefore, there was no technical reason behind applying the footnote **S5.551A** to the table allocation for the Earth exploration-satellite (active) and space research (active) services in the 35.5-36 GHz band.

With respect to the EESS (passive) and SRS (passive) allocations in the band 36-37 GHz and the space research service allocation in the band 37–38 GHz, there have been no changes in the requirements for these allocations, nor have there been changes in the sharing conditions in these bands that would warrant any changes.

U.S. VIEW: The U.S. believes that the footnote **S5.551A** should not have been applied to the band 35.5–35.6 GHz due to the nature of the primary allocation by footnote **S5.551 (SUP WRC-97)**. Therefore, the U.S. supports the removal of the restriction currently contained in footnote **S5.551A** on spaceborne precipitation radars operating in the Earth exploration-satellite service in the band 35.5-35.6 GHz. Furthermore, there is no technical basis for the application of footnote **S5.551A** to the remainder of the allocation from 35.6–36 GHz. Therefore, the U.S. supports the suppression of footnote **S5.551A**.

Further, the U.S. supports maintaining the allocations to the Earth exploration-satellite (passive) and space research (passive) services in the band 36-37 GHz and to the space research service in the band 37-38 GHz without change. (February 6, 2001)

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES
PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.13: 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)**;

ISSUE: Matters related to high-altitude platform stations in the fixed and mobile services

BACKGROUND: At WRC-97, the bands 47.2-47.5 GHz and 47.9-48.2 GHz (which were already allocated for the Fixed Service) were designated for High-Altitude Radio-Relay Platform Stations (HAPS). WRC-2000 confirmed this designation and requested that studies continue on regulatory and sharing issues in these bands. While this designation does not limit the use of a band by types of services for which it is already allocated, it does give guidance to administrations wishing to implement specific service types. Within the U.S., the band 47.2-48.2 GHz is also being evaluated for Fixed Service use (including HAPS), using sets of two 100 MHz paired channels with each pair being separated by 500 MHz.

WRC-2000 also requested studies of the bands between 18 and 32 GHz on the feasibility of allocating additional spectrum in Region 3, at the request of several administrations because rain fade made utilizing the previously-identified 47 GHz band difficult. In addition, the band 27.5-28.35 GHz to HAPS (HAPS-Earth) was allocated by country footnote on a non-interference basis. This band was paired with the 31-31.3 GHz band for Earth to HAPS use, additionally subject to not causing harmful interference to EESS (passive) and RAS services operating in the 31.3-31.8 GHz band. The footnote urged the identified administrations to utilize only the 31.0-31.15 GHz band until studies were completed.

The EESS (passive) and RAS service communities are very concerned about the possibility of interference from HAPS stations in this spectrum. The 31–31.3 GHz band is adjacent to the band 31.3–31.5 GHz passive band allocated on a primary basis to the Earth exploration-satellite (passive) and space research (passive) services for passive remote sensing of the Earth. This passive sensing band is of vital importance in Earth observation and weather forecasting because it is the reference band used in conjunction with the unique oxygen absorption bands from 50.2–59.3 GHz. Unwanted interference in this band from out-of-band emissions from HAPS would be particularly harmful to the remote sensing use of the band.

In addition to the above, WRC-2000 requested studies on the use of HAPS in both the fixed and mobile services in bands above 3 GHz allocated exclusively for terrestrial radiocommunication.

U.S. VIEW: Worldwide use of the 31.3–31.5 GHz passive band for remote sensing of the Earth

must be protected. (February 6, 2001)

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DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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)**;

ISSUE: There has been considerable interference to HF frequencies used by the aeronautical and maritime mobile services for distress and safety communications. Routine calling is prohibited on channels allocated for digital selective calling (DSC) under the GMDSS. Additionally, proposals were made to prohibit routine calling on several HF frequencies that are not part of the GMDSS and are presently allocated for distress, safety and calling. Removal of the calling function may present potential communications difficulties among and between GMDSS and non-GMDSS fitted vessels.

BACKGROUND: In an ongoing effort to reduce interference to HF distress and safety frequencies used in the GMDSS, previous conferences determined that general calling should not be made on channels allocated for distress. Although this may reduce the amount of traffic on these channels, it reduces or eliminates the ability of vessels to call or communicate with other vessels for routine purposes. This could occur since GMDSS fitted vessels are not required to monitor channels outside the GMDSS requirements (e.g., HF-DSC).

It has additionally been proposed that frequencies 12 290 kHz (channel 1221) and 16 420 kHz (channel 1621) be re-allocated to distress and safety only (i.e., remove the calling function). Removal of the calling function would require vessels to increase their monitoring capabilities (e.g., monitor distress channels and calling channels). (February 6, 2001)

U.S. VIEW:

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DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.17: to consider upgrading the allocation to the radiolocation service in the frequency range 2 900-3 100 MHz to primary;

ISSUE: Obtaining sufficient primary spectrum for radiolocation in the range 2 900-3 400 MHz to support expanding radiolocation operations; sharing between radiolocation and incumbent services – radiolocation and radionavigation.

BACKGROUND: WRC-97 (Resolution 722) first considered the possibility of an allocation upgrade for the radiolocation service in the 2.9-3.4 GHz and 5.35-5.65 GHz bands by placing this matter on the draft WRC-2001 agenda. Changes in technology are driving a need for larger bandwidth in order to be able to pick smaller and less reflective radar targets out of background clutter. This upgrade is necessary in view of the expanding requirements of radiolocation. The radiolocation service, while recognizing the special needs of radionavigation services noted in RR S.4.10, has a long successful history of sharing the band 2 900-3 100 MHz with radionavigation systems. The radiolocation service needs this spectrum to provide primary spectrum contiguous with the band 3 100-3 400 MHz. ITU-R WP8B will conduct studies on technical and operational issues related to the upgrading of the radiolocation service allocation taking into account Nos. S5.425, S5.426 and S5.427.

U.S. VIEW: Based upon the long history of successful co-band operations it may be possible to achieve this upgrade for radiolocation with the incumbent services by regulatory text similar to that contained in RR S5.448B. However, the situation regarding radiolocation sharing with communications systems such as FWA in the fixed service, is not promising. Sharing studies are just now getting under way in the ITU-R. (February 8, 2001)

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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 (WRC-2000);

ISSUE: The single-entry equivalent power flux-density (epfd) limits in Tables S22-1 (epfd_↓), S22-2 (epfd_↑), and S22-3 (epfd_{is}) of Article S22 are the sum of the power flux-densities produced at a GSO receive station by the emissions from all the transmit stations within a non-geostationary-satellite system. Misapplication of non-GSO FSS single-entry limits could occur by artificially splitting or combining the number of transmit stations associated with a non-GSO FSS system.

BACKGROUND: WRC-97 adopted, in Article S22, provisional epfd limits to be met by non-GSO FSS systems in order to protect GSO FSS and GSO BSS networks in parts of the frequency range 10.7-30 GHz. CPM-99 specifically identified possible misapplication of single-entry limits as one area that may require possible procedural/regulatory actions. As stated in the CPM Report to WRC-2000, it was agreed that that such misapplication would invalidate the entire basis of the derivation of the single-entry limits. No conclusions were reached by WRC-2000 on the issue of misapplication of the single-entry epfd limits. Resolution 135 (WRC-2000) was adopted for the purpose of developing criteria and processes for the resolution of possible cases of misapplication of non-GSO FSS single-entry limits in Article S22.

U.S. VIEW:

1. It is in the interest of all administrations to avoid any misapplication of the single-entry epfd limits. Misapplication could distort the regulatory or interference situation by violating the assumptions upon which the single-entry epfd limits were based and adversely impact the GSO FSS and BSS networks to be protected.
2. The number of non-GSO FSS systems that can share co-frequency in the 14/11 and 30/20 GHz bands will be limited. The more homogenous the non-GSO FSS system constellation parameters, the greater the number of systems that will be able to share co-frequency. Coordination under No. S9.12 effectively places the obligation for implementing mitigation techniques on the later systems to be filed with the BR. Misapplication could reduce the number of competing non-GSO FSS systems, make coordination between non-GSO systems more difficult, or lead to differing regulatory effects for non-GSO FSS systems which meet the limits and those which misapply the limits and should be avoided in order to protect compliant non-GSO systems.

3. The U.S. continues to participate in the technical studies on sharing between non-GSO FSS and GSO FSS and BSS networks and review the need to adopt regulatory procedures to avoid misapplication of the single-entry limits. There have been no apparent cases involving potential misapplication of the single-entry epfd limits to date. (February 6, 2001)
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DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-2003

WRC-2003 Agenda Item 1.20: to consider additional allocations on a worldwide basis for the non-GSO (NGSO) MSS with service links operating below 1 GHz, in accordance with resolution 214 (Rev WRC-2000);

ISSUE: Additional allocations to the NGSO MSS below 1 GHz for earth-to-space and space-to-earth service links

BACKGROUND: WRC-2000 considered proposals for new allocations to the NGSO MSS below 1GHz. The allocation proposals were made to the Conference in response to Resolutions 214 and 219. Resolution 214 addressed a broad range of NGSO MSS below 1 GHz allocation issues while Resolution 219 specifically addressed the potential use of the band 405-406 MHz in the space-to-earth direction.

Resolution 219 was suppressed by the Conference with no allocation made to the NGSO MSS in the band 405-406. Resolution 214 was revised to take into account the information considered by the Conference. As currently written, the NGSO MSS may continue to pursue an allocation within the band 401-406 MHz under Resolution 214.

This item has been on the agenda for three conferences and has received little support. Many countries have previously expressed the position that sufficient spectrum has been allocated to the MSS below 1 GHz to satisfy market requirements. The band 401-406 MHz must be segmented in order to allow use by the MSS. While the impact of loss of spectrum in this band may be small in some countries, the entire band is required for meteorological operations in many other countries, including the whole of Europe. Spectrum below 1 GHz is heavily used and no other options for downlink spectrum have been identified.

Resolution 214 is the single mechanism under which the NGSO MSS below 1 GHz may conduct studies to identify additional spectrum. Resolution 214 resolves that further studies are required on sharing between the NGSO MSS and other services and invites WRC-2003 to consider the results of these studies. In addition, the Resolution invites the ITU-R to carry out the required studies on sharing, study interference mitigation techniques for sharing between the NGSO MSS and other services, and bring the results to WRC-2003 for consideration. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
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**DRAFT UNITED STATES
PRELIMINARY VIEWS ON WRC-03**

WRC-2003 Agenda Item 1.21: to consider the progress of the ITU-R studies concerning the technical and regulatory requirements of terrestrial wireless interactive multimedia applications, in accordance with Resolution **737 (WRC-2000)** with a view to facilitating global harmonization;

ISSUE: What if any actions are needed by the ITU-R to facilitate the development of Terrestrial Wireless Interactive Multimedia.

BACKGROUND: At WRC-2000, a proposal from several European administrations indicated a desire to address spectrum for Terrestrial Wireless Interactive Multimedia technologies and applications. After much discussion, a very open agenda item was developed to consider a progress report on the studies related to this issue. Among the items to be studied are the regulatory means to facilitate the worldwide harmonization of spectrum for Terrestrial Wireless Interactive Multimedia, and to review service definitions in the light of convergence of applications, if necessary.

WRC-2000 also decided that any allocation changes or regulatory work on this issue would be discussed at WRC-06. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
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**DRAFT UNITED STATES
PRELIMINARY VIEWS ON WRC-03**

WRC-2000 Agenda Item 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 (WRC-2000);

Resolution 228, “Studies to consider requirements for the future development of IMT-2000 and systems beyond IMT-2000 as defined by ITU-R”

ISSUE: To study spectrum requirements and potential frequency range suitable for the future development of IMT-2000 and systems beyond IMT-2000, and in what time frame such spectrum would be needed. No action is required by the Conference.

BACKGROUND: WRC-2000 considered issues related to IMT-2000, resulting in the identification of additional spectrum for the terrestrial component of IMT-2000 in the Radio Regulations S5.317A and S5.384A. This spectrum was identified in addition to that identified for initial IMT-2000 deployment at WARC-92 in footnote S5.388. WRC-2000 also identified existing global MSS allocations as being available for use by the satellite component of IMT-2000, in accordance with Resolution 225.

In Resolution 228 (WRC-2000), the ITU-R was invited to continue studies on overall objectives, applications and technical and operational implementation for the future development of IMT-2000 and system beyond. These requirements are to be reviewed by WRC-05/06, taking into consideration the results of ITU-R studies presented to WRC-03.

U.S. VIEW: No action is required at WRC-03 on this agenda item. (February 6, 2001)

Radio Conference Subcommittee (RCS)
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DRAFT UNITED STATES
PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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);

ISSUE: To have the same spectrum allocation for the amateur/amateur-satellite services in all three ITU Regions.

BACKGROUND: As part of a long standing historical situation, the amateur/amateur satellite exclusive allocation in Region 2 goes from 7000 to 7300 kHz, while it goes only from 7000 to 7100 kHz in Regions 1 and 3. The other 200 kHz for Regions 1 and 3 are allocated exclusively to the broadcasting service. The amateur radio community has been trying to “realign” this “imbalance” for decades. WRC-00 for the first time specified that the agenda item be on the agenda for the next WRC, in this case WRC-03.

Although the term “realign” invokes a feeling of ease of accommodation, this agenda item is liable to be very controversial. It all depends on the way of looking at how much spectrum to “realign”. Through Working Party 8A, for example, the amateur/amateur-satellite representatives have documented two alternatives: (a) from 6900 to 7200 kHz for the amateur/amateur-satellite service and (b) from 7000 to 7300 kHz. It is unlikely that the broadcasting service community will wish to relinquish any spectrum, particularly since this spectral region is within the 4 to 10 MHz spectral region, where under WRC-03 agenda item 1.36 the broadcasters are in effect asking for more spectrum.

It is equally unlikely that the amateur/amateur-satellite service proponents will propose reducing the amateur/amateur-satellite allocation in Region 2 so that the “realignment” would take away spectrum just to have equal amounts for each Region.

Because of the potential impact of such realignment, the agenda item will most likely become an allocation item involving the other allocated services. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
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DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-03 Agenda Item 1.24: to review the usage of the band 13.75-14 GHz, in accordance with Resolution 733 (WRC-2000), with a view to addressing sharing conditions;

ISSUE: To determine the sharing conditions affecting the radionavigation, radiolocation, space research and fixed-satellite service, several issues must be taken into consideration:

- 1) the review of constraints in footnote S5.502 regarding the minimum antenna diameter of GSO FSS Earth stations and the constraints on the e.i.r.p. of the radiolocation service,
- 2) the potential to disrupt the sharing of the band among the services, and cause mutual interference between the FSS and the radiolocation, radionavigation and space research services due to the potential change in the GSO FSS earth station minimum antenna requirements, and
- 3) the requirement for the radiolocation service to operate with a higher e.i.r.p.

BACKGROUND: Prior to WRC-2000, footnote S5.502 contained constraints such as, e.i.r.p. and antenna size limits on the fixed-satellite service and e.i.r.p. on the radiolocation service. Footnote S5.503 contained e.i.r.p. limits on the fixed-satellite service to protect the space research service. These constraints were intended to accommodate a delicate sharing of the band among these services. These constraints were developed based upon the planned use of 13.75-14.0 GHz by geostationary satellites in the FSS, and were intended to limit the number of FSS earth stations to the point that sharing could occur, though a potential for interference from the limited number of earth stations would still exist. Since the time that the regulatory constraints were developed, GSO FSS operators have expressed interest in operating small earth stations. Radiolocation operators have expressed interest in using higher than currently allowed e.i.r.p. WRC-2000 modified the requirement in S5.503 for the FSS earth stations to use a minimum e.i.r.p. less than 68 dBW, while ensuring such use will not impose constraints on RL and RN use of this band. The potential interference to or additional regulatory limitations upon systems in the radiolocation, radionavigation and space research services in the frequency band 13.75-14.0 GHz, can adversely affect their operations. Also, WRC-2000 extended the current 59 dBW limit in footnotes S5.502 and S5.503 on e.i.r.p. of RL to all directions of space and limited maximum e.i.r.p. of non-GSO earth stations to 51 dBW in the band 13.772-13.778 MHz. The conference resolved to study the continued need for a minimum GSO FSS earth station antenna diameter size and the constraint on the e.i.r.p. of the radiolocation service.

U.S. VIEW: No further relaxation of the limitations upon the FSS as contained in S5.502, or changes to those WRC-2000 added to S5.503, can be considered unless ITU-R study results supporting such changes are available. (February 6, 2001)

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DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.27: to review, in accordance with Resolutions [GT PLEN-1/1] (WRC-2000) and [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;

ISSUE: Studies are required to revise certain procedures and sharing criteria as a consequence of decisions taken at WRC-2000 with respect to the bands around 12 GHz (and the feeder links associated with them) for satellite and terrestrial services.

BACKGROUND: WRC-2000 made significant changes in the use of those bands allocated to the BSS from 11.7 to 12.5 GHz, largely due to the major re-planning modifications to the Regions 1 and 3 BSS Plans (S30) and the feeder links (roughly 17.3 to 17.8 GHz (S30A).

In particular, there is a consequential need to determine sharing criteria and sharing procedures between receiving earth stations in the BSS (consumer downlink dishes, for example) and transmitting earth stations and terrestrial stations in these bands for the other services using these frequencies (BSS, FSS and FS).

Additionally, interregional and inter-service pfd limits were agreed upon at WRC-00 for Regions 1 & 3 BSS into Region 2 FSS, Region 1 BSS into Region 3 FSS and Region 2 BSS into Regions 1 & 3 FSS downlinks under the proviso that these situations would be studied further. The results of these sharing studies on pfd limits would be reported to WRC-03.

Presumably, final quantitative values will be established at WRC-03, and placed in the appropriate parts of Appendices **S30** and **S30A**. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
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DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 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;

ISSUE: Addition of a new allocation of the band 108 - 117.975 MHz to the aeronautical-mobile (Route) service to be used only by the International Civil Aviation Organization (ICAO) standard Ground-Based Augmentation System (GBAS), which will provide supplemental signals for the Global Navigation Satellite System (GNSS) on a co-primary basis with the aeronautical radionavigation service.

BACKGROUND: The augmentation to the GNSS signal is referred to as the Ground-Based Augmentation System (GBAS). The GBAS is intended to complement the ICAO standardized Space-Based Augmentation System (SBAS), and function together to provide seamless satellite-based navigation for all phases of flight landings. In practical terms, this means that GBAS and SBAS will be used to fulfill requirements for en-route navigation through precision landings. In addition, GBAS will provide the user with a navigation signal that can be used for all weather surface navigation capability enabling all weather surface surveillance/traffic management systems.

The GBAS will broadcast its correction message via very high frequency (VHF) line-of-sight radio data link from a ground-based transmitter. It is the VHF data link that requires the new allocation.

The GBAS will provide many benefits for all users. Curved precision approach paths, which are not supportable using the current instrument landing systems (ILS), will be possible with GBAS. Approaches will be designed to avoid obstacles, restricted airspace, noise sensitive areas, and congested airspace. Unlike current ILS, a single GBAS ground station will provide precision approach capability to all runway ends at an airfield, eliminating the need for multiple ILS installations at a single airport. GBAS may also provide surface navigation at the airport.

Implementation of the GBAS will primarily affect the following users of the National Airspace System:

- **Air Traffic Controllers:** Controllers will be dealing with a seamless navigation system for all phases of flight using GNSS, SBAS and GBAS. Controllers will also be able to provide improved surface navigation capability to their customers (air carriers, business, and general aviation).
- **Pilots:** The GBAS will potentially reduce cockpit workload by integrating the GNSS/SBAS/GBAS into primary means of radio navigation. GBAS will reduce pilot training requirements by reducing the number of required navigation systems onboard.

- ***Airway Facilities Personnel:*** The number of navigation and surveillance systems that must be maintained will be reduced with the implementation of the GBAS. The life cycle for the GBAS will be twenty years with replacement of hardware every five to seven years. This will provide system maintainers with a state of the art system that will be more reliable and maintainable. Software will be upgraded as required over the GBAS life cycle.

U.S. VIEW: The U.S. supports the proposal to allocate the band 108-117.975 MHz to the aeronautical mobile (Route) service (limited to GNSS ground-based augmentation system) on a primary basis worldwide. (February 6, 2001)

Radio Conference Subcommittee (RCS)
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DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.29: to consider the results of studies related to Resolutions 136 [COM5/3] (WRC-2000) and 78[COM5/23] (WRC-2000) dealing with sharing between non-GSO and GSO systems;

ISSUES: Resolution 136 (WRC-2000), Frequency sharing in the range 37.5-50.2 GHz between GSO FSS networks and non-GSO FSS systems, invites the ITU-R to undertake technical, operational and regulatory studies on sharing arrangements which achieve an appropriate balance between GSO FSS networks and non-GSO FSS systems in the frequency range 37.5-50.2 GHz.

BACKGROUND: Both GSO FSS and non-GSO FSS systems are planned for operation within the 37.5-42.5 GHz and 47.2-50.2 GHz bands. WRC-2000 took several steps toward harmonized use of the band 37.5-42.5 GHz by both fixed and fixed-satellite services (FSS). The band 37.5-42.5 GHz is now allocated to the FSS (space-to-Earth) on primary basis in all three ITU Regions. WRC-2000 adopted, in Article S21, power flux-density (pfd) limits on FSS space stations in the band 37.5-42.5 GHz in order to protect terrestrial services. The pfd limits vary between different band segments and between geostationary and non-geostationary systems within each band segment. Sharing studies between GSO FSS networks and non-GSO FSS systems in the frequency range 37.5-50.2 GHz are underway taking into account the significant propagation losses at these frequencies, duration of interference events, differences in planned earth station antenna sizes, availability requirements, and potential mitigation techniques such as polarization isolation.

U.S. VIEW:

Frequency Sharing in the Range 37.5-50.2 GHz

The U.S. continues to participate in the technical, operational and regulatory studies on sharing arrangements in order to achieve an appropriate balance between GSO FSS, non-GSO FSS, space research, and terrestrial systems in the frequency range 37.5-50.2 GHz.

The U.S. supports the PFD limits as adopted at WRC-2000 for the space research service use of the 37-38 GHz band. (February 6, 2001)

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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;

ISSUES: Resolution **78 (WRC-2000)**, *Development of procedures in case the operational or additional operational limits in Article S22 are exceeded*, invites the ITU-R to undertake the appropriate regulatory studies to develop procedures in cases where the single-entry operational epfd_{\downarrow} limits in the bands 10.7-12.75 GHz, 17.8-18.6 GHz, and 19.7-20.2 GHz or the single-entry additional operational epfd_{\downarrow} limits for 3 and 10 meter antennas in the 10.7-12.75 GHz band are exceeded at an operational GSO earth station.

BACKGROUND: WRC-2000 adopted a combination of single-entry validation, single-entry operational and, for 3 and 10 meter antennas in the 10.7-12.75 GHz band, single-entry additional operational epfd_{\downarrow} limits contained in Article S22, along with the aggregate epfd_{\downarrow} limits in Resolution 76 (WRC-2000), which apply to non-GSO FSS systems to protect GSO networks in the bands 10.7-12.75 GHz, 17.8-18.6 GHz, and 19.7-20.2 GHz. The operational epfd_{\downarrow} limits were adopted to protect *operational* GSO FSS networks from interference levels that may result in loss of synchronization or severe degradation in performance.

Compliance with the operational epfd_{\downarrow} and additional operational epfd_{\downarrow} limits is not subject to verification by the ITU-BR but by individual administrations. In the case of operational epfd_{\downarrow} limits, verification would be made by measurement conducted by administrations and/or their GSO system operators. A commitment by the administration (and their non-GSO operator) that the system filed will meet the additional operational epfd_{\downarrow} limits is part of the Appendix S4 coordination data. A non-GSO system causing interference may have to reduce its epfd_{\downarrow} power levels towards the affected GSO earth station to meet the single-entry operational epfd_{\downarrow} limits unless otherwise agreed by the concerned administrations. The ITU-R has identified the need to correct, in the most expeditious manner; any cases where the operational epfd_{\downarrow} or additional operational epfd_{\downarrow} limits are exceeded.

U.S. VIEW: The U.S. supports the development of ITU-R recommendations such as the preliminary draft new recommendation concerning Methodologies for measuring epfd_{\downarrow} interference levels from a non-GSO space station to verify compliance with operational epfd_{\downarrow} limits and the draft new recommendation concerning Procedure for the identification of non-GSO satellites causing interference into an operating GSO earth station approved during the September 2000 WP 4A meeting. These recommendations provide the methodologies needed by administrations and/or their GSO system operators to assess operational epfd_{\downarrow} levels and were requested in resolves 1 of Resolution 137 (WRC-2000).

Since compliance with the operational epfd_{\downarrow} and additional operational epfd_{\downarrow} limits is not subject to verification by the ITU-BR but by individual administrations and because the administration responsible for the non-GSO must commit that the system filed will meet the additional operational epfd_{\downarrow} limit, the responsibility for defining and implementing the appropriate procedures should be a matter largely left to individual administrations.

It appears unnecessary for the ITU-R to develop additional procedures or remedies in the Radio Regulations for cases where non-GSO systems exceed the operational or additional operational epfd_{\downarrow} limits. The intent of Resolution 78 (WRC-2000) is already met by the existing Article S15 provisions (Section V, Reports of Infringements, and Section VI, Procedure in a Case of Harmful Interference), which may be applied in order to expeditiously correct any cases where the operational epfd_{\downarrow} or additional operational epfd_{\downarrow} limits are exceeded. (February 7, 2001)

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.31: to consider the additional allocations to the mobile-satellite service in the 1-3 GHz band, in accordance with **Resolutions 226 (WRC-2000)** and **227 (WRC-2000)**;

ISSUE: Allocations to MSS (space-to-Earth) in the 1 518-1 525 MHz band

BACKGROUND: WRC-2000 considered proposals for an allocation to the mobile-satellite service (MSS) (space-to-Earth) in Regions 1 and 3 in the frequency band 1 518-1 525 MHz. This band is adjacent to the 1 515-1 559 MHz band in use by GSO MSS operators. An earlier proposal, using the 1 559-1 567 MHz band considered in response to Resolution **220 (WRC-97)**, was dismissed by WRC-2000 and this band will not be considered further for MSS use.

The frequency band 1 492-1 525 MHz is allocated to the MSS (space-to-Earth) in Region 2 on a primary basis, except in the United States where, as an alternative allocation, the band 1 452-1 525 MHz is allocated to the fixed and mobile services on a primary basis under the provisions of No. **S5.344**. No. **S5.343** gives priority in Region 2 to the aeronautical mobile service for telemetry over other uses by the mobile services. There has been no MSS implemented in the 1 492-1 525 MHz band due to the incompatibility between aeronautical telemetry and MSS systems.

In Regions 1 and 3, 1 518-1 525 MHz is allocated to the fixed service on a primary basis, to the mobile service on a primary basis in Region 3, and to the mobile, except aeronautical mobile, service on a primary basis in Region 1. In a number of countries in Region 1, 1 429-1 535 MHz is allocated to the aeronautical mobile service on a primary basis exclusively for the purposes of aeronautical telemetry within their national territories under the provisions of No. **S5.342**.

WRC-2000 concluded in Resolution 226 that the proposed allocation to the MSS (space-to-Earth) at 1 518-1 525 MHz due to their potentially widespread emissions upon the Earth from either geostationary or non-geostationary systems, could have an impact on the terrestrial mobile service, including aeronautical mobile and aeronautical mobile telemetry, in all three Regions. Resolution 226 also states there is a need to review the pfd values in Appendix **S5** in order to ensure that they are adequate to protect new point-to-multipoint systems operating in the fixed service in the band, as well as, a need to study sharing between the MSS and aeronautical mobile telemetry in all the Regions in the band.

Recommendation ITU-R M.1459 gives the values needed for protection of the aeronautical mobile service for telemetry systems in the 1 452-1 525 MHz band from geostationary satellites operating in the MSS. The required separation distances between co-frequency telemetry and MSS operations are very large, making the feasibility use of the 1 518-1 525 MHz band by MSS anywhere in the world questionable.

U.S. VIEW: Use of the 1 518 to 1 525 MHz band for MSS is incompatible with aeronautical telemetry and other services in the band. Therefore, new allocations to MSS should not be made in this frequency band and consideration should be given to removing the MSS allocation in Region 2. (February 6, 2001)

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES
PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.31: to consider the additional allocations to the mobile-satellite service in the 1-3 GHz band, in accordance with Resolutions 226 (WRC-2000) and 227 (WRC-2000);

ISSUE: Allocations to MSS (Earth-to-space) in the band 1 683-1 690 MHz

BACKGROUND: WRC-2000 considered proposals for worldwide allocation of the band 1 683-1 690 MHz to the MSS (Earth-to-space) in response to Resolution 213 (WRC-95). The frequency band 1 675-1 710 MHz is allocated to the MSS (Earth-to-space) in Region 2 on a co-primary basis. However, the 1 683-1 690 MHz is mainly used by the meteorological-satellite (MetSat) and meteorological aids (MetAids) services. While there are only a limited number of main MetSat earth stations operating in this band in all three Regions, there are a large number of MetSat earth stations operating in Regions 2 and 3, and the locations of many of these stations are unknown. Sharing between MetSat and MSS in the band 1 675-1 690 MHz is feasible only if appropriate separation distances are maintained.

Sharing between MetSat and MSS may not be feasible in those countries where a large number of MetSat stations are deployed. Recommendation ITU-R SA.1158-2 indicates that additional studies are required in order to determine the criteria for coordination between MSS and the MetSat service for GVAR/S-VISSR stations operated in the band 1 683-1 690 MHz in Regions 2 and 3.

Other spectrum identified in Resolution 213 included 1 690-1 710 MHz, however, it has been concluded in the ITU-R that co-channel sharing between MSS and MetAids is not feasible and that co-frequency sharing between MetAids and MetSat services is not feasible. WMO has identified future spectrum requirements for MetAids operations as limited to the 1 675-1 683 MHz portion of the 1 675-1 700 MHz band, but some administrations will continue to require spectrum in the range 1 683-1 690 MHz for MetAids operations.

The existing Region 2 allocation includes the provision that MSS operation should not constrain current and future development of the MetSat service, as specified in No. S5.377. No MSS services have been implemented under the Region 2 allocation in this band.

Resolution 227 invites the ITU-R to complete technical and operational studies on the feasibility of sharing between MSS and MetSat, by determining appropriate separation distances between mobile earth stations and MetSat stations, including GVAR/S-VISSR stations, in the band 1 683-1 690 MHz, (Recommendation ITU-R SA.1158-2); and to assess the current and future spectrum

requirements of the MetAids service, taking into account improved characteristics, and of the MetSat service in the band 1 683-1 690 MHz, taking into account future developments.

U.S. VIEW: MSS is not compatible with existing services in the 1 683-1 690 MHz band and no additional MSS allocations should be made in this band. Consideration should be given to removing the Region 2 allocation for MSS in this band. (February 6, 2001)

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

**DRAFT UNITED STATES
PRELIMINARY VIEWS ON WRC-03**

WRC-2003 Agenda Item 1.31: to consider the additional allocations to the mobile-satellite service in the 1-3 GHz band, in accordance with **Resolutions 226 (WRC-2000)** and **227 (WRC-2000)**;

ISSUE: Additional allocations to MSS (Earth-to-space) in the 1- 3 GHz band

BACKGROUND: Resolutions 226 and 227 (see other two issues under this agenda item) call for expanding the frequency bands to be examined in the event that the studies of the specific frequency band referred to in these resolutions (1 518-1 525 and 1 683-1 690 MHz) lead to an unsatisfactory conclusion. The ITU-R is to carry out sharing studies in order to recommend alternative MSS (Earth-to-space) frequency bands in the 1-3 GHz range, but excluding the band 1 559-1 610 MHz, for consideration at WRC-03. The Resolutions go on to state that the MSS allocations should be on a global basis, preferably in the vicinity of the existing allocations around 1.5/1.6 GHz.

The spectrum required for additional MSS allocations is not well defined. Previous ITU-R conference preparatory documentation refers to an unmet need for additional MSS spectrum. However, in light of recent developments where many MSS services have not had market success, it is questionable whether additional MSS is a high priority given other demands for spectrum.

While the scope of this issue is very broad and could affect many different spectrum interests, so far only one alternative band has been identified, 1 670-1 675 MHz for Earth-to-space direction. This band is included in the preliminary WRC-2003 documentation from the responsible ITU-R study group, WP8D. This is also the subject of a current U.S. reallocation proposal in FCC Docket ET-00-221 (FCC NPRM FCC 00-395 at paragraph 38). This band was identified for aeronautical public correspondence by WARC-92. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)

Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.32a: 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)**;

ISSUE: Protection of Radio Astronomy in the 42.5 - 43.5 GHz Band

BACKGROUND: The 42.5 – 43.5 GHz band is allocated to the radio astronomy service on a primary basis, while the adjoining frequency bands on the lower side are allocated to the fixed-satellite (space-to-Earth) and broadcasting-satellite services. To protect the radio astronomy allocation, WRC-2000 established a new footnote **S5.551G** providing provisional aggregate power flux-density limits for space-to-Earth links in the 41.5 – 42.5 GHz band. These provisional limits are being reviewed in accordance with Resolution **128**. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.32b: 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)**;

ISSUE: PFD Limits in the 37.5–43.5 GHz Band

BACKGROUND: Various segments of the 37.5–43.5 GHz frequency band are allocated to the fixed-satellite, broadcasting-satellite, and mobile-satellite services on a primary basis. Segments of the band are also being used for high-density fixed service systems, generally very short links between antennas at different levels on buildings. Such links can have large elevation angles; contrary to the usual assumption for fixed service links, upon which sharing between the fixed and fixed-satellite services is based. The high-density fixed service links require power flux-density limits on fixed-satellite service downlinks that are much more stringent than usual.

WRC–2000 developed power flux-density limits in accordance with Nos. **S21.16.10** and **S21.16.12** as well as other provisional PFD limits. Resolution **84** invites review of the PFD limits as well as other studies of compatibility between the fixed and space services. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2000 Agenda Item 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, in response to Resolution 221 (WRC-2000);

Resolution 221 (WRC-2000), “Use of high altitude platform stations providing IMT-2000 in the bands 1885-1980 MHz, 2010-2025 MHz and 2110-2170 MHz in Region 1 and 3 and 1885-1980 MHz and 2110-2160 MHz in Region 2”

ISSUE: Resolution 221 asks for additional technical, operational and regulatory studies to be conducted in order to review and, if necessary, revise the provisional pfd limits. Resolution 221 also asks for consideration of appropriate regulatory and technical provisions to allow bilateral coordination of HAPS in IMT-2000 systems with affected neighboring administrations.

BACKGROUND: Provisions for operation of HAPS were originally made at WRC-97, for HAPS providing FS operations in the 47.2-47.5 GHz and 47.9-48.2 GHz bands (S5.552A). A definition of HAPS was also added to S1.66A. The use of HAPS as base stations to provide terrestrial IMT-2000 was considered at WRC-2000, resulting in provisions to facilitate this being added to the Radio Regulations S5.388A. Resolution 221 from WRC-2000 includes provisional co-channel and out-of-band power flux-density limits for HAPS operation, for the protection of other station either sharing the same band or operating in adjacent bands.

Additional ITU-R study is needed to consider compatibility of HAPS within IMT-2000 with some other services that share portions of these bands on a co-primary basis. (February 6, 2001)

U.S VIEW:

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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;

ISSUE: Sharing criteria needed to accommodate highly elliptical orbit BSS(sound) systems in a band with co-allocations with the fixed and mobile services.

BACKGROUND: WARC-92 allocated frequencies for the BSS(sound) in the band 2 535 to 2 655 MHz. Some administrations in Regions 1 and 3 accepted the allocation.

Since WARC-92, until recently, the technical/sharing concentration in the Study Groups of the ITU-R for BSS(sound) systems have dealt with systems that would use geo-stationary orbits. Recently, as certain technical data from studies and experiments were developed, interest has increased in the use of highly elliptical non-geo-stationary orbits for a few satellites in the system. Each satellite can spend most of its orbital period at high elevation angles for locations in medium to high latitudes. This mitigates against some of the foliage and building blockage that a geo-stationary satellite faces when serving higher latitude coverage areas. When properly synchronized a few highly elliptical orbit satellites will provide continuous coverage service.

Japan is developing such a satellite system for use within the upper 25 MHz of the band from 2 535 to 2 655 MHz allocated at WARC-92.

Sharing criteria are needed for this type of orbital system at these frequencies. The results of the relevant studies are to be presented to WRC-03. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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;

ISSUE: The BR is responsible for analysis that will update the “remarks” column of tables in Article 9A of Appendix S30A and Article 11 of Appendix **S30**.

BACKGROUND: Article 11 of Appendix **S30** contains the specifics of the Regions 1 & 3 Plans in a table containing 17 columns. A similar table with 19 columns deals with the feeder links (Appendix S30A). These two tables are the essence of the Plans.

The last column in each table is called “remarks”. There is a numerical code for the “remarks” column – 8 possibilities for a downlink and 9 for a feeder link. A “remark” example is “This assignment shall not claim protection from ...” Most assignments do not have an entry in the “remarks” column in the old Plan (see WRC-97).

WRC-2000 made a total overhaul of the Regions 1 and 3 Plans by in general doubling the number of assignments in each Plan per administration. The BR was responsible for conducting an enormous amount of work during the Conference to meet a deadline not long before the end of the Conference so that the Plans could be accepted by the Conference in Plenary at the end.

The “remarks” column needs to be completed by the BR, first as a draft to be circulated to administrations. After this review process, the BR is instructed to present the agreed upon “remark” inclusions in the tables for review and possible action at WRC-03. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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;

ISSUE: All things considered, do HF international broadcasters need additional frequency allocations in the lower part of the HF spectrum in order to serve their listeners with clear signals during all portions of the 11 year sunspot cycle?

BACKGROUND: 790 kHz of additional frequency bands were allocated at WARC-92 to the HF broadcasting service. Of this amount, only 200 kHz were allocated in frequencies below 10 MHz. Frequencies below 10 MHz are the most desirable ones, for propagation reasons, for many circuit applications, particularly during the several years of low sunspot activity. This is encountered during the seasonal planning coordination meetings that precede every six-month HF broadcasting schedule development. And it is manifest in actual broadcasting where interference is a severe problem at these lower frequencies and there also results lower service levels for those broadcasts that have to accept poorer propagation conditions at the higher frequencies because of limited capacity below 10 MHz.

Therefore, after WARC-92 broadcasters proposed an agenda item to deal with this problem. Agenda item 1.36 for WRC-03 has followed from that initial step many years ago.

Any additional allocation for HF broadcasting will impact on the fixed service, either by removing the allocation over a period of time or permitting some level of sharing between the services. This assumes that the studies on capacity vs. demand, etc. that will be completed for inclusion in the CPM-02 report show a clear inadequacy of the existing HF broadcasting service allocations in the HF bands below 10 MHz.

Parenthetically, agenda item 1.23, on alignment of the amateur/amateur-satellite and broadcasting services around 7 MHz, might be considered to be a “subset” of this agenda item. (February 22, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.37: to consider the regulatory and technical provisions for satellite networks using highly elliptical orbits;

ISSUES: Categorization of highly elliptical orbits and definition of technical and operational parameters of systems using these orbits. Sharing between non-geostationary orbit (non-GSO) systems using highly elliptical orbits (HEOs) and lower altitude non-GSOs such as low earth orbit (LEO) and medium earth orbit (MEO) systems, including mitigation techniques and coordination criteria. Sharing between non-GSO systems using HEOs and GSO networks in bands where coordination is required.

BACKGROUND: Resolution 721 (WRC-97) recommended to the Council that resources be provided to include an agenda item for WRC-2000 concerning quasi-geostationary satellite networks. The Council decided not to provide the additional resources and the agenda item was not addressed at WRC-2000. Resolution 800 (WRC-2000) proposed agenda item 8.2 for WRC-03, which was accepted by the Council-2000 meeting as agenda item 1.37 concerning satellite networks using HEOs.

Many documents have been considered in the ITU-R WP 4-9S, WP 4A, and JTG 4-9-11 on this topic over the past several years. At the September 2000 meeting of Working Party 4A, it was agreed that satellite networks using HEOs referred to in WRC-03 Agenda item 1.37 are non-GSO systems. The literal meaning of *highly elliptical* is a high value of eccentricity; however, WP 4A identified three categories of orbits that, in its view, are within the scope of this agenda item: high inclination circular geosynchronous orbits, high inclination elliptical geosynchronous orbits, and high inclination elliptical orbits with periods that are fractions of the geosynchronous period. Services other than the fixed-satellite service may also use HEO orbits.

Sharing among non-GSO FSS systems in the bands 10.7-12.75 GHz, 17.8-18.6 GHz and 19.7-20.2 GHz was studied under WRC-2000 agenda item 1.13. The results are documented in section 3.1.1 of the Conference Preparatory Meeting (CPM) Report on and regulatory/procedural matters to be considered by the 2000 World Radiocommunication Conference (WRC). Sharing between inhomogeneous non-GSO constellations was shown to be feasible if one or both of the systems employs mitigation techniques. No conclusions were reached regarding the particular case of inhomogeneous sharing between non-GSO systems in high altitude (HEOs) and lower altitude non-GSOs such as LEOs and MEOs and studies are continuing. The equivalent power-flux density (epfd) limits in Article S22 adopted by WRC-2000 apply to non-GSO FSS systems in these bands to protect GSO FSS and BSS networks.

Resolution 137 (WRC-2000) addresses studies relating to the sharing criteria to be applied during coordination between non-GSO fixed-satellite service (FSS) systems. Systems with HEOs are

one type of non-GSO being considered in response to Resolution 137. Sharing between non-GSO FSS systems in HEO and other non-GSO FSS systems in the frequency bands 17.8-20.2 GHz is being studied in WP 4A with the aim of identifying interference mitigation techniques to facilitate coordination and sharing criteria that might be applied during coordination between non-GSO FSS systems.

U.S. VIEW:

1. The U.S. favors the identification of mitigation techniques and sharing criteria which may facilitate coordination between non-GSO FSS systems, including HEOs.
2. The U.S. agrees that satellite networks using HEOs are non-GSOs. These networks should continue to be considered on the same, equal regulatory basis as other types of non-GSOs such as MEOs and LEOs.
3. Studies on sharing between non-GSO systems using HEOs and GSO networks in bands should continue, recognizing that power limits have been adopted in certain bands (e.g., the efd limits specified in the bands 10.7-12.75 GHz, 17.8-18.6 GHz, and 19.7-20.2 GHz covered by Article S22). Studies should focus on sharing between non-GSO systems, including HEOs, and GSO networks in bands where coordination is required.
4. Understanding of the results of studies being conducted for WRC-03 agenda item 1.37 will be improved by the use of common definitions in ITU-R Recommendations. There is no need to modify the terms and definitions in Article S1 of the Radio Regulations. (February 6, 2001)

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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)**;

ISSUE: Use of the frequency band 420-470 MHz by the earth exploration-satellite (active) service (Resolution **727 (Rev.WRC-2000)**)

BACKGROUND: A similar agenda item was debated at WRC-97 resulting in a decision not to adopt proposed allocations for the Earth exploration-satellite service in the 420-470 MHz band. The Earth sensing community has identified that the need for such an allocation, at a radio spectrum wavelength of approximately one meter, is important because experiments have shown good correlation of backscatter radiation with biomass and soil moisture, which are parameters needed for forest monitoring. The need for such forest monitoring was emphasized at the United Nations Conference on Economic Development (UNCED) (Buenos Aires - 1992). Subsequent to UNCED 1992, studies have identified a minimum bandwidth requirement of 6 MHz to satisfy mission objectives.

Studies to date have shown the potential for interference between EESS (active) sensors and ground-based radars when in the line of sight of the ground-based radars. Preliminary studies have also shown that there is a potential for interference from EESS (active) to airborne radars operating worldwide.

The amateur community is concerned over possible interference to amateur operations in the 430-440 MHz band.

U.S. VIEW: The U.S. continues to oppose this allocation based on the grounds that the EESS (active) sensors would interfere with terrestrial radar systems. (February 6, 2001)

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES
PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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;

Issue: The use of fixed-satellite service (FSS) bands below 17 GHz for telemetry, tracking and telecommand (TT&C) of FSS networks operating with service links in the frequency bands above 17 GHz as a means of reducing free-space transmission loss and/or atmospheric loss and/or increasing the aggregate bandwidth available for service.

Background: Propagation conditions and spectrum availability are of primary consideration when implementing TT&C subsystems, which must meet high reliability criteria. Some systems utilize the existing Space Operation Service allocations (all of which are below 3 GHz) for TT&C while others use part of the FSS allocation occupied by the service link to perform this function (FSS (space-to-Earth) for space telemetry and tracking carriers, FSS (Earth-to-space) for telecommand). Many advance publication and coordination notices for GSO and non-GSO systems in the FSS bands above 17 GHz have been received by the BR.

WRC-2000 established an agenda item 1.39 for WRC-03 to examine the spectrum requirements in the FSS bands below 17 GHz for TT&C operation of FSS networks operating with service links in the frequency bands above 17 GHz. Transmissions above 17 GHz experience higher free-space and rain attenuation losses than those below 17 GHz. In addition, the aggregate bandwidth needed to accommodate the TT&C carriers of FSS networks with service links above 17 GHz is likely to be substantial. The use of FSS allocations below 17 GHz may provide another mechanism to satisfy the TT&C requirements of FSS networks operating with service links in the frequency bands above 17 GHz. Studies are being performed in Working Party (WP) 4A and WP 4B in response to agenda item 1.39 and ITU-R Question 257/4 to determine performance reliability criteria, differences between TT&C subsystems for networks using service links above 17 GHz and networks using service links below 17 GHz, additional coordination burden, and the spectrum requirements.

U.S. View:

1. The U.S. is participating in the technical studies on spectrum requirements below 17 GHz for TT&C of FSS networks operating with service links above 17 GHz, taking into account the factors above.
2. Any identification of FSS bands below 17 GHz for TT&C operation of FSS networks operating with service links in the frequency bands above 17 GHz should be based on technical studies showing sharing is feasible with current users of the FSS bands below 17 GHz. (February 22, 2001)

Radio Conference Subcommittee (RCS)
Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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)**;

ISSUE: Incorporation by Reference

BACKGROUND: A number of provisions of the Radio Regulations make reference to the ITU-R Recommendations. As the ITU-R Recommendations are updated, it is necessary to review the Radio Regulations to see if these references should be revised. **Resolution 27** clarifies the procedures for incorporation by reference in the Radio Regulations so that WRC 2003 will be the last general opportunity to review all existing references. **Resolution 27** and **Resolution 28** must be reviewed together and limits the WRC to reviewing only those Resolutions and Recommendations that are linked to national proposals. (February 6, 2001)

U.S. VIEW:

Radio Conference Subcommittee (RCS)

Preparation for ITU Radiocommunication Conferences

DRAFT UNITED STATES

PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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;

ISSUE: General review of the Resolutions and Recommendations of WARC's and WRC's

BACKGROUND: The Director of the Radiocommunication Bureau conducts a review of the Resolutions and Recommendations indicating their current status and if any follow up action is needed. (February 6, 2001)

U.S. VIEW:

March 27, 2001

Donald Abelson
Chief of the International Bureau
Federal Communications Commission
445 12th Street SW
Washington, D.C. 20554

Dear Mr. Abelson:

The National Telecommunications and Information Administration on behalf of the Executive Branch Agencies, has approved the release of five additional Preliminary Executive Branch [NTIA] Views considering federal agency inputs toward the development of U.S. Preliminary Views for WRC-2003. These preliminary views address WRC-2003 agenda items 1.8.1, 1.8.2, 1.16, 1.27, and 1.35. The preliminary view for agenda item 1.8.2 only contains background information at this time. We will develop the "U.S. View" section for this preliminary view and provide it at a later time. The enclosure is forwarded for review by your WRC-2003 Advisory Committee. Karl Nebbia from my staff will contact Julie Garcia and reconcile any differences.

Sincerely,

(Signed March 27, 2001)
William T. Hatch
Associate Administrator
Office of Spectrum Management

Enclosure

Radio Conference Subcommittee (RCS)

Preparation for ITU Radiocommunication Conferences

DRAFT PRELIMINARY VIEW FOR WRC-03

WRC-2003 Agenda Item 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**;

ISSUE: Boundary Between the Out-of-Band and Spurious Domains

BACKGROUND: While the intent of the unwanted emission limits in Appendix **S3** is that they would apply to spurious emissions, it is not generally feasible to distinguish between out-of-band and spurious emissions as defined by Article **S1**. Therefore, the limits are applied to all unwanted emissions further removed from the center frequency than a specified *boundary*. This boundary is generally 250% of the necessary bandwidth.

Task Group 1/5 recognized that, since spurious emissions can occur anywhere outside the necessary bandwidth of an emission, no boundary actually exists between out-of-band and spurious emissions. TG 1/5 solved this problem by defining the out-of-band and spurious *domains*, disjoint frequency ranges specified such that out-of-band or spurious emissions generally predominate within them.

U.S. VIEW: The United States supports adoption of the definitions of the out-of-band and spurious domains in Article **S1** of the *Radio Regulations*, since they are required to remove contradictions in the terminology used to describe unwanted emission limits. The United States supports the use of the boundary values developed in Task Group 1/5 to update Appendix **S3**. (8 March 2001)

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DRAFT PRELIMINARY VIEW FOR WRC-03

WRC-2003 Agenda Item 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)**;

ISSUE: Protection of Passive Services

BACKGROUND: Because of their highly sensitive receivers, needed to detect weak signals from sources that are usually beyond their control, passive systems in the radio astronomy, Earth exploration-satellite, and space research services are particularly susceptible to radio frequency interference.

For years the ITU-R has sought a solution to the problem of unwanted emission interference to passive systems, especially from satellites. Measures taken by passive systems to avoid interference may restrict the operation of the passive systems and thereby reduce their value. On the other hand, filtering of satellite emissions in the passive service bands may be costly or impractical.

This issue is currently the subject of Task Group 1/7, established in November 2000. Recent work on this issue by Task Group 1/5 led to “band-by-band” studies to quantify the problem and explore possible solutions. Progress in TG 1/7 on this issue will require *very* creative ideas and perhaps a willingness on the part of space and passive interests to compromise.

U.S. VIEW: (8 March 2001)

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DRAFT PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 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**;

ISSUE: Additional allocations for feeder links for little LEO's in the neighborhood of 1.4 GHz, in particular in the bands 1 390-1 393 MHz and 1 429-1 432 MHz for non-GSO MSS feeder uplink and downlink, respectively, while sharing with the services now operating in the band, and with no impact on the passive services (radio astronomy and remote sensing) operating in the neighboring 1 400-1 427 MHz band.

BACKGROUND: Service allocations to the little LEO MSS were first made at WARC-92. Since 1995, additional allocations were sought by the little LEOs for feeder links, but to date this requirement has not been satisfied. **Resolution 127 (WRC-97)** identified the bands 1 390-1 400 MHz and 1427-1432 MHz for studies to accommodate the up and downlinks, respectively, provided sharing with services using these bands was feasible and that the passive services operating in the 1 400-1 427 MHz band can be fully protected. Subsequent to WRC-97, little LEO requirements have been restricted to the 1 390-1 393 MHz and 1 429-1 432 MHz bands, for up and downlinks, respectively, and this is reflected in **Resolution 127 (Rev. WRC-00)**. Work in SG 7 started, towards showing that under certain conditions the planned little LEO feeder links could meet the unwanted emission level required in the band 1 400-1 427 MHz for no impact on the operation of the passive services in the 1 400-1 427 MHz band. This work has not yet been concluded.

The 1 400-1 427 MHz band is allocated on a primary, exclusive basis to the passive services, worldwide. This is arguably the most important, and certainly the most frequently and extensively observed radio astronomy band below 70 GHz. Observations in the band are conducted at a large number of sites in the U.S. and worldwide, to study the distribution, kinematics and dynamics of neutral hydrogen (the most commonly occurring element in the Universe) in our own as well as in other galaxies. Ocean and soil salinity and other measurements are conducted in the band under the EESS allocation. Full retention and unconstrained access to the 1 400-1 427 MHz band is considered essential by both the radio astronomy and EESS communities. The radio astronomy and remote sensing communities are worried about the possible impact that unwanted emissions from satellite and terrestrial stations may have on observations carried out in the 1 400-1 427 MHz passive band.

U.S. VIEW: The U.S. cannot support 1.4 GHz non-GSO FSS uplink and downlink allocations unless it is conclusively demonstrated, including measurement of emissions that would be employed in operational systems, that unwanted emissions into the 1 400-1 427 MHz band can be kept below the detrimental interference levels in **ITU-R RA.769-1** (mainly with respect to space-to-Earth links) and in **ITU-R SA.1029-1** (mainly with respect to Earth-to-space links) for this band. Studies are now going on in the ITU-R to that effect. U.S. support for allocations to non-GSO MSS feeder links in the 1 390-1 393 MHz and 1 429-1 432 MHz band is contingent upon: 1) successful conclusion of the ITU-R studies, and 2) fully assured regulatory protection of the passive services in the 1 400-1 427 MHz from

out-of-band emissions of non-GSO uplinks that may operate in the 1 390-1 393 MHz band and downlinks that may operate in 1 429-1 432 MHz band. (March 15, 2001)

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DRAFT PRELIMINARY VIEW FOR WRC-03

WRC-2003 Agenda Item 1.27: to review, in accordance with Resolutions [GT PLEN-1/1] (WRC-2000) and [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;

ISSUE: Studies are required to revise certain procedures and sharing criteria as a consequence of decisions taken at WRC-2000 with respect to the bands around 12 GHz (and the feeder links associated with them) for satellite and terrestrial services.

BACKGROUND: WRC-2000 made significant changes in the use of those bands allocated to the BSS from 11.7 to 12.5 GHz, largely due to the major replanning modifications to the Regions 1 and 3 BSS Plans (S30) and the feeder links (roughly 17.3 to 17.8 GHz (S30A)).

In particular, there is a consequential need to determine sharing criteria and sharing procedures between receiving earth stations in the BSS (consumer downlink dishes, for example) and transmitting earth stations and terrestrial stations in these bands for the other services using these frequencies (BSS, FSS and FS).

Additionally, interregional and inter-service pfd limits were agreed upon at WRC-2000 for Regions 1 & 3 BSS into Region 2 FSS, Region 1 BSS into Region 3 FSS and Region 2 BSS into Regions 1 & 3 FSS downlinks under the proviso that these situations would be studied further. The results of these sharing studies on pfd limits would be reported to WRC-03.

Presumably, final quantitative values will be established at WRC-03, and placed in the appropriate parts of Appendices S30 and S30A.

U.S. VIEW: The U.S. will require that final sharing criteria and sharing procedures determined at WRC-03 between the various affected Services and Regions does not adversely affect any Region 2 network's performance. Furthermore, since there are U.S. based providers with network entries in the unplanned list for Regions 1 and 3 delivery, the sharing criteria associated solely within these two Regions should not adversely affect any unplanned elements of the overall composition of satellite networks for these delivery and feeder link bands. (March 15, 2001)

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DRAFT PRELIMINARY VIEW FOR WRC-03

WRC-2003 Agenda Item 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;

ISSUE: The BR is responsible for analysis that will update the “remarks” column of tables in Article 9A of Appendix S30A and Article 11 of Appendix S30.

BACKGROUND: Article 11 of Appendix S30 contains the specifics of the Regions 1 & 3 Plans in a table containing 17 columns. A similar table with 19 columns deals with the feeder links (Appendix S30A). These two tables are the essence of the Plans.

The last column in each table is called “remarks”. There is a numerical code for the “remarks” column – 8 possibilities for a downlink and 9 for a feeder link. A “remark” example is “This assignment shall not claim protection from ...” Most assignments do not have an entry in the “remarks” column in the old Plan (see WRC-97).

WRC-2000 made a total overhaul of the Regions 1 and 3 Plans by in general doubling the number of assignments in each Plan per administration. The BR was responsible for conducting an enormous amount of work during the Conference to meet a deadline not long before the end of the Conference so that the Plans could be accepted by the Conference in Plenary at the end.

The “remarks” column needs to be completed by the BR, first as a draft to be circulated to administrations. After this review process, the BR is instructed to present the agreed upon “remark” inclusions in the tables for review and possible action at WRC-03.

U.S. VIEW: The U.S. agrees with the need to update the “remarks” column of Article 9A of Appendix S30A and of Article 11 of Appendix S30 consistent with the decisions made at WRC-2000 on the replanning of the BSS for Regions 1 and 3. (March 15, 2001)