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PREPARATION FOR FUTURE WORLD RADIOCOMMUNICATIONS CONFERENCES International Secretariat

1. INTRODUCTION

At WARC-92 (Torremolinos), proposals for the realignment of amateur and broadcasting allocations around 7 MHz were briefly considered. In addition, future WRCs could offer other opportunities for additional allocations to the amateur servicebut conversely, future WRCs could threaten the loss of amateur services bands, or consider new sharing situations that may or may not be compatible with our operations.

2. SUPPORT AT FUTURE CONFERENCES

Whether the 7 MHz realignment or another agenda item affecting the amateur services is on the agenda of a future WRC, a successful outcome depends heavily upon the following :

- credible technical and operational bases for the proposal as reflected in the Radiocommunications Sector Recommendations and report to the conference
- country proposals to the conference
- favourable votes
- in the absence of voting, willingness of a sufficient number of delegation spokespersons to take the floor in support of the amateur services
- acquiescence of those delegations not opposed to the amateur services position.

Good relations with administration officials likely to serve on future national delegations is key to each of the items listed above. Development of such relations should not wait until it is time to prepare for the next WRC, especially with radio conferences scheduled every two years. Relationships should begin immediately upon the officials' appointment to a position that may lead to service on a WRC delegation. These should be long-term associations based on professionalism and cooperation.

3. THE OFFICIAL VIEWPOINT

It is unlikely that an administration will favour an amateur services proposal simply because we want it. It is important to view a proposal through the eyes of government officials.

Foremost, the official will consider whether a proposal for the amateur services is in the national interest for that country. Often, a proposal benefitting one service will be viewed as a loss to another service. Thus, it is necessary to show that the benefit to the amateur services and to the country outweighs the loss to the other service.

The official can be expected to consider the reputation of the amateur services, domestically and internationally. Everything matters : performance in disaster communications, contribution to the country's telecommunications development, experience in administration of the amateur services, good personal relations between the administration and the national society, willingness to cooperate, etc.

The existence of an active indigenous amateur service is no doubt important. It helps if there are credible statistics showing growing numbers of licensed amateurs and documenting contributions to the public good. Nevertheless, it is possible to have good relations with officials in countries where the amateur service is not well developed.

The national society can facilitate the work of administration officials by drafting the necessary documentation and proposals. Where possible, it is desirable to participate in preparatory meetings and national delegations.

Acceptance of amateur proposals by administration officials will be improved if the proposals are likely to be approved by other administrations. Thus it is important to keep national proposals in harmony with the IARU objectives (Annex) and to seek the active support of the IARU and its member-societies.

In many least developed countries, telecommunications policy makers and spectrum managers lack the resources to be active in Radiocommunication,, Sector Study Groups, to attend seminars abroad or to participate in radio conferences. In some cases, it may be possible to find resources to underwrite travel expenses for delegates.

4. REGIONAL ORGANISATIONS

In recent years, regional telecommunications organisations have become increasingly important in preparation for radio conferences. Two such organisations are the European Conference of Postal and Telecommunications Administrations (CEPT) and the Pan African Telecommunications Union (PATU).

It is possible for the amateur services to participate in these regional organisations in two ways : as part of a national delegation, and as the IARU regional organisation.

The representatives to regional meetings are largely the same as those for world radio conferences. In addition, however, there are likely to be other individuals in leadership positions, both from your own country and from others in the region. It is desirable to build good relations with these officials.

5. DEVELOPMENT ACTIVITIES

In December 1992, at the Additional Plenipotentiary Conference in Geneva, Mr. A.Ph. Djiwatampu of Indonesia was elected as the first Director of the Telecommunications Development Bureau (BDT). The BDT, to be known as the Development Sector, is destined to become an important ITU resource for the least developed countries.

The Development Sector is to form Study Groups similar to those in the Radiocommunications and Standardisation Sectors. There may be opportunities for the IARU and its member-societies to participate in the work of these Study Groups.

Another activity of the Development Sector will be to hold World Development Conferences (RDCs) more frequently. RDCs will likely be held in conjunction with Regional TELECOMs. Each of these meetings offer possibilities for participation by the IARU and its member-societies.

6. CONCLUSIONS

The IARU and its member-societies must adjust to the new structures and accelerated schedules of the ITU and regional telecommunications organisations. Failure to keep pace could place our allocations in jeopardy. WAR-79 and WARC-92 have provided a foundation for retention of existing amateur allocations, and possibly seeking needed extensions to some band.

Emphasis should be placed on development of solid and long-term relations with telecommunications officials of administrations and regional organisations.

Extract (only concerning the spectrum above 30 MHz) of the document :

Spectrum Requirements of the Amateur and Amateur-Satellite Services

Prepared by the IARU Administrative Council, Revised March 1999

Introduction

The present and anticipated future requirements for radio spectrum allocations to the Amateur and Amateur-Satellite Services have been identified from decisions taken at the conferences of the three regional organizations of the International Amateur Radio Union. The requirements are identified below, so that they may be taken into account in the formulation of national policies with respect to proposed and possible future international allocations conferences.

The position of the IARU on behalf of the worldwide Amateur and Amateur-Satellite Services takes into account the following factors, among others:

1. There are presently nearly three million licensed Amateur Radio stations, a number that has been increasing at an annual rate of approximately 7% for several decades. At this rate, in five years there will be approximately four million amateur stations.
2. The number and variety of modes of emission used by radio amateurs also are expanding greatly, creating internal pressures within the amateur services for their accommodation at the expense of users of established modes such as single-sideband telephony and manual Morse code (CW) operations. These new modes include digital voice, data and image. Their use improves the efficiency of amateur operations, but also increases the popularity of Amateur Radio and therefore the amount of congestion.
3. Spectrum-efficient modes such as single-sideband telephony, which has been in widespread use in the Amateur Service for more than forty years, already are employed almost universally in the amateur services. Opportunities for additional spectrum efficiency in amateur operation, at least at HF, are limited at present.
4. While sharing with some other services in some parts of the spectrum is a practical and viable solution for improved utilization of the spectrum, sharing with the amateur services as a solution to spectrum congestion in other services is limited by the following factors: the widespread geographic distribution of amateur stations, the variety of emissions used by amateur stations, and the relatively low signal levels that amateurs employ.

Spectrum Requirements

Where possible, country footnotes for additional or alternative allocations in bands that are listed in the international Table of Frequency Allocations as Amateur or Amateur-Satellite allocations, should be deleted. Efforts to add the names of countries to such footnotes should be opposed.

50-54 MHz

The Amateur Service requires retention of the exclusive 50-MHz allocation where it now exists, and provision of an allocation of at least 2 MHz in other geographic areas, with at least 500 kHz on an exclusive basis.

This band is used for local amateur communication on an around-the-clock basis, including radio control of objects. Tropospheric scatter and sky-wave propagation (principally sporadic-E and occasional F-layer propagation at sunspot maxima) are used for longer distances, as well as auroral propagation at the higher latitudes. Meteor scatter has been used for Morse code and voice communications primarily during meteor showers. Newer computer-based techniques promise to make meteor scatter a routine propagation mode for distances up to 2,000 km.

In Regions 2 and 3, and in some countries in Region 1, there is an allocation of 4 MHz to the Amateur Service. In some local areas, proximity to television broadcasting on frequencies adjacent to the band limits the usefulness of some portions of the band.

In the CEPT process of European harmonization, IARU Region 1 has achieved an amateur secondary allocation in the band 50 - 52 MHz in the CEPT European Common Allocation Table (ECA). It has also achieved a CEPT-ERC statement in support of global harmonization. Action by member-societies could be helpful in accelerating this process through achieving primary status nationally, as had already been accomplished in some countries.

144-148 MHz

The Amateur and Amateur-Satellite Service seek retention of 144-146 MHz as a worldwide exclusive allocation, with elimination of the existing footnotes that allow operation by other services in some countries; and retention of 146-148 MHz in Regions 2 and 3.

The 144-MHz allocation is very heavily used by amateur stations throughout the world, employing a variety of modes of emission. The band supports extensive terrestrial voice and data networks, as well as a number of low-Earth-orbit amateur satellites. In many of the more populous areas,

occupancy is so heavy that additional stations and new uses of the band cannot be accommodated satisfactorily. Experimentation such as Earth-Moon-Earth (EME) communication is very popular in this band because of the relative absence of natural and man-made noise and the relative ease with which sensitive receiving equipment can be placed into service and maintained. Amateurs have observed propagation phenomena in this band that previously were unknown or were believed to be extremely rare at this order of frequency.

Once thought to be safe against commercial encroachment, except for some illegal use in certain countries, this band has been named a "candidate band" for possible allocation on a shared basis to commercial low-Earth-orbit (LEO) satellites in the mobile-satellite service (MSS). The IARU strongly opposes this and any other sharing, which would severely restrict opportunities for future amateur use of the band. The exclusivity of this band has also been confirmed by the 42 CEPT countries in the ECA.

220-225 MHz

Retention of 220-225 MHz as a primary, shared amateur band is vital to the amateurs in Region 2, and would be desirable in Regions 1 and 3 to alleviate congestion in other bands.

The characteristics of the band 220-225 MHz are similar to those of the band 144-148 MHz. However, because the band 144-148 MHz is overcrowded in many areas, the 220-MHz band provides the only opportunity for the use of relatively broadband emissions by the Amateur Service in a primary VHF allocation. Wide bandwidths are required for efficient transmission of data at rapid rates, and for efficient time sharing of channels. Where allocated, the band is the best solution for the overcrowding of the amateur band 144-148 MHz. Some characteristics of the band 220-225 MHz are unique; for example, radio amateurs have observed the only recorded instances of sporadic-E propagation at this frequency.

420-450 MHz

The amateur services require the establishment of the band 430-440 MHz as a worldwide exclusive band, with continued sharing of 420-430 MHz and 440-450 MHz where now permitted. In addition, the deletion from the Radio Regulations of footnotes for fixed and mobile operation in some countries in the band 430-440 MHz is sought.

This band is particularly important to the amateur services. It is the lowest frequency band in which amateurs can use conventional fast-scan television (6M00C3F emission), and other emissions with similar bandwidths. The band provides reliable local voice and data communication while at the same time affording opportunities for experimentation with various forms of tropospheric propagation and with Earth-Moon-Earth (EME) communication.

The Amateur-Satellite Service relies heavily on the subband 435-438 MHz, which presently is the only space-to-Earth amateur allocation between 146 MHz and 2.4 GHz. Because of the crowding of the existing band 435-438 MHz with unmanned amateur satellites and manned space stations, it is desirable to expand the band to 435-440 MHz when possible.

Because amateurs pursue so many different operating interests in this band, they must observe voluntary sharing arrangements among themselves based on frequency, time, and geography. Highly directive antenna arrays are practical for many applications, and facilitate sharing. However, sharing with other services can impose additional constraints that may severely limit amateur operation, depending on the nature of the other service. To facilitate international communication and experimentation, it is extremely desirable for both the Amateur and the Amateur-Satellite Service in all countries to have access to common, exclusive frequency allocations, free of interference from other services and from constraints designed to protect other services from interference. The introduction of additional low-power (unlicensed) SRDS transmitters around 433 MHz should be opposed.

Parts of the band have already been studied as MSS candidate bands for allocation at several recent WRCs. Administrations have objected to such use as being incompatible with government radiolocation operations in the band 420-450 MHz.

In preparation for WRC-2000, even though the item is no longer on the agenda for this conference, the band 420-470 MHz is being studied in an attempt to accommodate the stated requirement of the earth exploration-satellite service (active) for up to 6 MHz of spectrum for spaceborne sensors capable of penetrating the canopy of forests. The IARU is participating in this work. Preliminary studies indicate that this use would be incompatible with existing and planned amateur and (particularly) amateur-satellite operations.

Frequencies between 450 MHz and 24 GHz

Between 450 MHz and 24 GHz, amateur allocations have evolved in the following manner. The 1947 Atlantic City Conference adopted worldwide, exclusive allocations for the Amateur Service in the bands 1215-1300 MHz, 2300-2450 MHz (shared in part with ISM), 5650-5850 MHz (shared with ISM), and 10-10.5 GHz, and exclusive allocations in Region 2 in the band 3300-3500 MHz and the band 5850-5925 MHz.

Subsequently, the radiolocation service was introduced into these bands and the Amateur Service was made secondary. Additional satellite and terrestrial sharing partners were introduced at subsequent WARC. The band 1215-1300 MHz was narrowed to 1240-1300 MHz. The Amateur-Satellite Service gained access, on a non-interference or secondary basis, to portions of each of these bands. A new Region 2 secondary allocation in the band 902-928 MHz was added.

Thus, while radio amateurs continue to have access to this portion of the spectrum, the international

Table of Frequency Allocations between 450 MHz and 24 GHz does not provide automatically for common worldwide allocations for amateur uses, unlike the frequencies below and above this range.

902-928 MHz

The Amateur Service seeks retention of the band 902-928 MHz in Region 2 and upgrading the sub-band 902-905 MHz to primary status.

This band is available only in Region 2. It is used for industrial, scientific and medical (ISM) applications and is shared with other services (FIXED, Mobile except aeronautical and Radiolocation). While there are sharing problems in some locations, the band is a valuable resource, where available.

1240-1300 MHz

The Amateur Service seeks retention of the band 1240-1300 MHz and upgrading the 1260-1300 MHz segment to primary status. The Amateur-Satellite Service seeks retention of the band 1260-1270 MHz and deletion of the "Earth-to-space only" restriction.

The global navigation-satellite service (GNSS) has expressed interest in the band 1240-1260 MHz, although the primary candidate for a new civil Global Positioning System (GPS) frequency is 1176.45 MHz. Another candidate frequency, 1250 MHz, could affect amateur use of the band 1240-1260 MHz.

2300-2450 MHz

The Amateur Service requires retention of access to the band 2300-2450 MHz and upgrading where possible the band 2390-2450 MHz to primary status, and the Amateur-Satellite Service requires retention of the band 2400-2450 MHz.

The band 2300-2450 MHz is allocated to the Amateur Service on a secondary basis in all three Regions. Actions by WARC-92 and certain administrations in their domestic allocations have reduced the amount of spectrum within this band available to the Amateur Service. Also, some administrations have permitted (unlicensed) low-power devices to operate in this band. The band segment 2400-2450 is used for industrial, scientific and medical (ISM) applications.

The USA administration has upgraded the Amateur Service allocation to primary status in the bands 2390-2400 MHz and 2402-2417 MHz. The Radio Amateurs of Canada (RAC) is seeking similar upgrades.

3300-3500 MHz

The Amateur Service seeks the retention of the secondary allocations of the band 3300-3500 MHz in Regions 2 and 3, and a secondary allocation of the band 3400-3500 MHz throughout Region 1. Further, the Amateur Service seeks upgrading the allocation status of the sub-band 3400-3410 MHz to primary. The Amateur-Satellite Service seeks to retain its bi-directional (Earth-to-space and space-to-Earth) allocation of the band 3400-3410 MHz in Regions 2 and 3, and to expand this allocation to Region 1.

CEPT DSI Phase I established an Amateur Service secondary allocation at 3400-3500 MHz. In addition, the following footnote was adopted by the CEPT (numbering of CEPT footnotes is subject to change):

EU17: In the sub-bands 3400-3410 MHz, 5660-5670 MHz, 10.36-10.37 GHz and 10.45-10.46 GHz the amateur service operates on a secondary basis. In making assignments to other services, CEPT administrations are requested wherever possible to maintain these sub-bands in such a way as to facilitate the reception of amateur emissions with minimal power flux densities.

In effect, EU17 encourages administrations to afford some consideration to amateur weak-signal operations in the band sub-band 3400-3410 MHz, among others.

There is a major effort by the telecommunications industry to promote the band 3400-3650 MHz for fixed wireless access (FWA) applications, which could affect amateur uses of the band. Radiolocation interests oppose FWA applications of this band.

5650-5925 MHz

The Amateur Service seeks the retention of at least secondary allocations of the band 5650-5850 MHz in all Regions and upgrade to primary status in the bands 5650-5670 MHz and 5830-5850 MHz. The Amateur Service seeks the retention of the band 5850-5925 MHz on a secondary basis in Region 2.

The Amateur-Satellite Service seeks to retain access to the band 5650-5670 MHz in the Earth-to-space direction and 5830-5850 MHz in the space-to-Earth direction.

(See CEPT footnote EU17, above, as it applies to the band 5660-5670 MHz.)

An additional CEPT footnote applies:

EU23: In the sub-bands 5660-5670 MHz (Earth to space), 5830-5850 MHz (space to Earth) and 10.45-10.50 GHz the amateur-satellite service operates on a secondary and non interference basis to other services. In making assignments to other services, CEPT administrations are requested wherever possible to maintain these allocations in such a way as to facilitate the reception of amateur emissions with minimal power flux densities.

At the present time, 5760-5762 MHz is the segment used for amateur weak-signal work.

10-10.5 GHz

The Amateur Service seeks to retain at least secondary allocation status in the band 10-10.5 GHz and an upgrade to primary status the sub-band 10.35-10.45 GHz. The Amateur-Satellite Service seeks to retain access to the band 10.45-10.5 GHz and upgrade its status to primary. (See CEPT footnotes EU17 and EU23, above.)

Frequencies between 24 and 275 GHz

In the range 24-275 GHz, the general pattern is for a narrow, exclusive allocation to the two Amateur Services to be adjacent to a wider allocation shared with other services. This pattern allows amateurs worldwide to pursue their experimental activities within a common frequency allocation, while providing administrations with the flexibility to tailor the width of the amateur allocation and the conditions of sharing in the light of national requirements.

Radio astronomers and other passive science services have developed new spectrum requirements that take into account certain spectral lines (frequencies related to specific elements) and absorption windows (frequencies that are more transparent to radio signals than those above and below). WRC-2000 is scheduled to consider some reallocations to accommodate these requirements.

The Amateur Services seek to retain all primary and secondary allocations in the band 47-275 MHz and will consider shifting of allocations to meet the requirements of other services without disadvantaging the Amateur Services. The ratio of primary to secondary should remain at least the same. Atmospheric attenuation in any new bands should not be greater than in the existing allocations.

24-24.05 GHz

The Amateur Services seek to retain their primary allocations in the band 24-24.05 GHz.

24.05-24.25 GHz

The Amateur Service seeks to retain its secondary allocation in the band 24.05-24.25 GHz.

Consideration should be given to shifting the ISM center frequency from 24.125 to 24.15 and make the ISM band 200 MHz wide instead of 250 MHz, to clear the band 24-24.05 for amateur development.

47-47.2 GHz

The Amateur Services seek to retain their primary allocations in the band 47-47.2 GHz.

75.5-76 GHz

The Amateur Services seek to retain their primary allocations in the band 75.5-76 GHz.

76-81 GHz

The Amateur Services seek to retain at least their secondary allocations in the band 76-81 GHz and to upgrade these allocations to primary status.

Automotive collision-avoidance radars are now using the band 76-77 GHz. In recognition thereof, the USA administration has suspended authority for amateurs to use the band 76-77 GHz pending further study. To offset any potential impact on Amateur Service operations resulting from this suspension, the administration established a co-primary allocation in the band 77.5-78 GHz for the Amateur Services.

119.98-120.02 GHz

The Amateur Services seek to retain at least their secondary allocations in the band 119.98-120.02 GHz, upgrade these allocations to primary and expand the band if possible.

142-144 GHz

The Amateur Services seek to retain their primary allocations in the band 142-144 GHz.

144-149 GHz

The Amateur Services seek to retain at least their secondary allocations in the band 144-149 GHz and to upgrade them to primary status.

241-248 GHz

The Amateur Services seek to retain their secondary allocations in the band 241-248 GHz and upgrade them to primary status.

248-250 GHz

The Amateur Services seek to retain their secondary allocations in the band 248-250 GHz.

Frequencies above 275 GHz

The ITU has not allocated any frequency bands above 275 GHz but WRC-[2003] may consider allocations in the band 275-400 GHz or possibly as high as 1000 GHz.

In order to continue with their experimental activities, the Amateur Services will require a number of allocations (approximately 10.7% of the spectrum) spaced throughout the range 275-1000 GHz.

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