



Results of the WARC-92 Conference

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WARC-92 was the first opportunity since 1979 for broadcasters - and indeed other users of radio spectrum - to state their case for modifications or additions to the existing frequency allocations for certain of the services for which they have a responsibility.

The intervening twelve years had seen some significant changes in the bands falling under the scrutiny of WARC-92. These were, most notably, an increase in congestion in the HF bands allocated to international broadcasting (especially below 10 MHz), and the development - at least in prototype form - of two major new broadcasting systems: Digital Audio Broadcasting, requiring frequencies in the UHF range, and wide RF band HDTV for which a new frequency band in the vicinity of 20 GHz was deemed appropriate.

Broadcasters were therefore especially concerned, at WARC-92, to safeguard their future in these three important areas, whilst remaining attentive to all other aspects of the Conference which might have a influence on present or future broadcasting services.

1. Introduction

1.1. Relevance of WARC-92 to broadcasters

For some broadcasters, the WARC-92 held in Malaga-Torremolinos, Spain, from 3 February to 3 March 1992, lacked the immediate impact (or, at least, near-immediate impact) of a broadcasting Conference. Nonetheless, in view of the considerable efforts which went into the preparations for the Conference, it was obviously of major importance. Indeed, part of the official title may be quoted as evidence of this, "World Administrative Radio Conference for dealing with frequency allocations...". This was the first such Conference since 1979 and may, if some of the proposed changes to the ITU structure take place, actually have been the last of its type, that is an allocation conference dealing with a wide variety of services over a wide frequency range. The importance attached to the subject matter may also be judged by the fact that there were some 1,500 delegates and virtually every country which is a member of the ITU was represented - some by very large delegations.

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WARC-92 Agenda items of specific interest to broadcasters were additional frequency allocations for HF broadcasting and new allocations for Digital Audio Broadcasting and for wide RF band HDTV. WARC-92 may have lacked immediate impact, but it was certainly not devoid of interest!

■ 1.2. *Recognition of broadcasters' requirements*

Many broadcasting unions had made detailed preparations for WARC-92 and these were reflected in the awareness of most delegates to the issues of broadcasting and the need for suitable frequency allocations.

Documents prepared by broadcasting unions, including the EBU Guiding Principles (EBU documents SPB 483 and 487, covering satellite and HF matters, respectively) were not issued as Conference papers, but were made available to delegates both before and during the Conference. One result of this preparation is that many of the issues of importance to broadcasters were reflected in contributions from the CCIR or from Administrations.

One of the main themes which influenced the discussions on all topics on the Agenda was that of maintaining any existing services for as long as possible. This is understandable as nobody wants to give up using a particular service or type of radio equipment until he has obtained as much value as possible from his capital investment. However, it is in direct conflict with the aim of anyone who wishes to introduce a new service and who requires new spectrum in which to do it. No matter how technically attractive the new service may be, the main requirement was to maintain the current position and avoid any risk of additional interference from a neighbouring country's new equipment.

■ 1.3. *The frequency allocation process*

It can be argued that the process of allocation is really rather easy and that it does not actually take much time or effort. This would be completely true if:

- there were no existing users of the piece of spectrum being considered;
- would-be new users, or even countries, were completely insulated from one another in the sense that the emissions by one user in no way affected the reception by another user of a different service.

In general terms, these constraints are unrealistic although the first may be met if one is talking about completely unused spectrum but this is only found at frequencies of tens or hundreds of GHz. The second constraint may be met if all countries agree to use the same part of the spectrum for the same purpose, but even this apparently simple step can take a great deal of time (and patience) in discussions. In practice, there is the added complication that the spectrum which is usable with today's technology is already in use and the spectrum for tomorrow's technology is probably already the subject of investigations in one country or even in many. Certainly all of these parts of the spectrum which were being considered by broadcasters as suitable targets for future operations, are already in widespread use. In some cases, the word "use" is not entirely accurate. Some parts of the spectrum are reserved for use if necessary by one service or another. In such cases, the spectrum may appear to be unused, possibly for considerable periods of time. However, the real situation may be different from country to country and it is at conferences such as WARC-92 that these differences can lead to substantial problems.

The real difficulty of the allocation process is that any existing user must be re-located. This involves two steps. The first is that of finding some spectrum, already allocated to the service in question, which has enough capacity to be able to accept the users who have been displaced from their current frequencies. The second step is that of actually effecting the transfer and funding the necessary new equipment. This can be very expensive, especially for a developing country and it is thus not surprising that the voices of the developing countries are among the loudest raised in opposition to proposals for re-allocation. These are not the only voices of opposition, of course. There can be substantially different viewpoints among the more-developed countries, even between near-neighbours in a given continent.

■ 1.4. *WARC-92 - a good thing for broadcasters?*

It will not be possible to give a full analysis of the results of WARC92 until the Final Acts of the Conference have been studied in detail. Because of the extreme time pressure experienced at the end of the Conference, it is to be expected that there will be a number of changes to the copy of the Final Acts which was available then. Although the editing process which the ITU will undertake after the end of the Conference is really only intended to remove editorial mistakes, it is

possible that some of these will have unexpected effects.

It is worth recalling that the final Conference session which dealt with the 1 to 3 GHz region of the spectrum, the most difficult in practice, started at about 0930 on Monday 2nd March and finished at about 0700 on Tuesday 3rd March. In addition, some parts of the document dealing with the difficult subjects of the Broadcasting Satellite Service (Sound) and complementary terrestrial service, the Mobile Satellite Service (MSS) and the Future Public Land Mobile Telecommunications Service (FPLMTS), had really not been seen in anything even like a complete form until about 2300 on 2nd March and the hand-written corrections to the draft documents were not made until the early hours of 3rd March. One of the results is that an incomplete version of the Final Acts is all that was available for signature at the end of the Conference.

In the event, broadcasting received quite a lot of support during the Conference deliberations:

- there was general agreement that HF broadcasting needed more spectrum in order to alleviate the current problems of congestion;
- there was complete agreement that a BSS (Sound) service was a necessity, perhaps especially in the developing countries;
- there was general agreement that spectrum for HDTV was needed (it was accepted that this meant a digital system, but this constraint was not added to the Final Acts), although there was also some support for the idea that the existing allocation at 12 GHz could be used in place of additional spectrum.

This general measure of support did not necessarily translate into ready acceptance of specific additional bands for broadcasting purposes and in the case of BSS (Sound) in particular, there was no complete agreement even at the end of the Conference.

The real work at an allocation conference is not the relatively simple matter of evaluating the technical merits of different proposals. In any case, this will usually have been done in advance, for example by the CCIR. The real work is the delicate task of reaching compromises which can be accepted by all administrations (representing the users) who are present. Very often, the compromise consists in accepting a reduction of the amount of spectrum originally requested, or accepting a long transition period before the spec-

trum under discussion is fully available for a new user. Of course, the process of compromise almost invariably leaves everyone somewhat unhappy. Indeed, it could be argued that the primary goal of an allocation conference is to leave everyone equally unhappy*. The remainder of this article identifies the items dealt with by the conference which were of most interest to broadcasters and also attempts to give the reasons for the broadcaster's happiness and unhappiness.

2. HF Broadcasting

2.1. Background

Many broadcasters had developed a case for an additional allocation of about 1.5 MHz of spectrum for HF broadcasting. This view was supported by most of the European Administrations (speaking together as the CEPT) and a similar view was held by the USA and the Russian Federation (the new designation for part of the old USSR), together with their partners (Belarus and the Ukraine). However, it was not a view held by the Administrations of some of the developing countries.

2.2. Results

The results can be seen to be some justification for the claims made by most broadcasters, because 790 kHz will be given to the HF broadcasting service. However, there are some difficulties:

- the new spectrum will officially only be made available in the year 2007 (see *Resolution COM5/7*, reproduced on *page 30*);
- only a total of 200 kHz of additional spectrum will be made available in the critical region below 10 MHz where the congestion is at its worst.

This additional allocation has to be seen against the background of the current reality which is that some 62 broadcasters are actually operating outside the "official" broadcasting bands and that in the region below 10 MHz considerably more than 200 kHz of extra spectrum is already being used for broadcasting purposes. Under such circumstance, the "offer" of 200 kHz, especially when tied to a time-scale of 15 years, seems rather less than generous.

* Except for the conference officials and, privately, most delegates who are only too happy that the conference is finally over.



It has to be added that the current amount of out-of-band broadcasting is likely to continue. The adoption of *Recommendation COM4/B*, which says that out-of-band broadcasting should be stopped, is thus unlikely to have much effect.

A further point is that it is proposed that there should be a further attempt at an HF Planning Conference (*Resolution COM4/8*), although some concern was expressed about the cost and the likely failure of such a Conference (because not enough additional spectrum was made available, especially below 10 MHz). There was also a great deal of discussion about the overlap of

broadcasting and amateur bands near 7 MHz, taking all Regions into account. While this matter was not resolved, there is a Recommendation to deal with it at a future WARC (*Recommendation COM4/C*).

■ 2.3. Action by broadcasters

Because there is already a large amount of out-of-band broadcasting and because it is unlikely that many Administrations, if any, will really call for this to be stopped in the near future, it seems that little action is required by broadcasters and that their current transmissions can continue.

Resolution COM5/7

Implementation of Changes in Frequency Allocations Between 5 900 kHz and 19 020 kHz

The World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992) considering

- a) that parts of the frequency bands between 5 900 kHz and 19 020 kHz which were previously allocated on an exclusive or shared basis to the fixed and mobile services have been reallocated to the broadcasting service;
- b) that some existing fixed and mobile assignments may need to be removed progressively from those reallocated bands to make way for the broadcasting service;
- c) that the assignments to be removed, termed "displaced assignments", must be reaccommodated in other appropriate frequency bands;
- d) that developing countries may require special assistance from the IFRB, as well as in application of Resolution COM 5/9, in replacing their displaced assignments with appropriate protection;
- e) that procedures already exist in Article 12 of the Radio Regulations that may be used to this effect;

recognizing

the difficulties that administrations and the IFRB might encounter during the period of transition from the previous allocations to those made by this Conference;

resolves

1. that the duration of the transition period shall be from 1 April 1992 to 1 April 2007;
2. that, as of 1 April 1992, administrations should no longer notify any frequency assignments to stations of the fixed and mobile services in the reallocated bands. Assignments notified in these bands after 1 April 1992 shall bear a symbol to indicate that the finding will be examined by the IFRB as of 1 April 2007 in accordance with the provisions of No. 1240 of the Radio Regulations;
3. that, as of 1 April 1992, the IFRB shall undertake a continuing action to review the Master International Frequency Register with the help of administrations concerning the frequency assignments to links for which another satisfactory means of telecommunication exists, with a view to either downgrading assignments of class of operation A or deleting such assignments;
4. that administrations shall, for assignments of class of operation A in the reallocated bands, either notify the replacement frequencies to the IFRB or request the IFRB's assistance in selecting the replacement frequencies in application of No. 1218 of the Radio Regulations and Resolution 103;
5. that the IFRB shall develop in due time a draft procedure to be used for the replacement of remaining frequency assignments and shall consult administrations in accordance with No. 100.0 of the Radio Regulations;
6. that the IFRB should modify the draft procedures taking into account, to the extent practicable, comments received from administrations and propose replacement assignments at the latest three years before 1 April 2007. In so doing, the IFRB shall request administrations to take appropriate action to bring their assignments in conformity with the Table of Frequency Allocations by the due date;
7. that a replacement frequency assignment whose basic characteristics, with the exception of the assigned frequency, have not been modified in the above process, shall keep its original date. However, if these basic characteristics of a replacement frequency assignment are different from those of the displaced assignment, the replacement assignment shall be treated in accordance with Nos. 1376 to 1380 of the Radio Regulations;

invites administrations

when seeking reaccommodation of the displaced assignments for their fixed and mobile services in the bands between 5 900 and 19 020 kHz which have been reallocated to the broadcasting service, to make every effort to find replacement assignments in the bands allocated to the fixed and mobile services concerned.

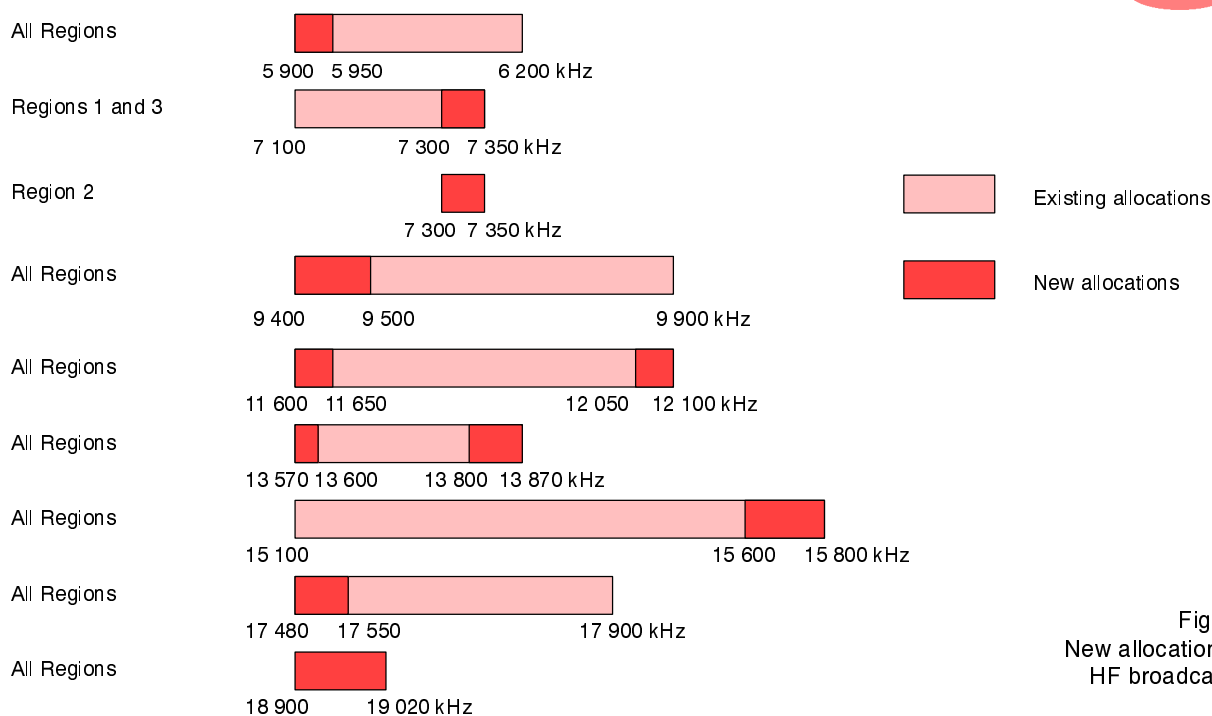


Figure 1
New allocations for HF broadcasting

However, in the longer term, it seems to be quite certain that there will be a trend towards the cessation of double sideband (DSB) transmission (*Recommendation COM4/A*) and the introduction of single sideband (SSB), both to make better use of the spectrum and to make considerable savings in the running costs of transmitters. In order to make SSB transmissions successful, it is essential that new receivers capable of SSB reception become available at a reasonable price and broadcasters should take every opportunity to press this view upon receiver manufacturers.

3. Wide RF band HDTV

3.1. Background

While there had been some hope that a common world-wide allocation for HDTV could be made available, there was too much opposition for this to occur. There was a large majority in favour of an allocation from 21.4 to 22 GHz (this was also the band preferred by the EBU), with a smaller number of countries supporting 17.3 to 17.8 GHz or 24.65 to 25.25 GHz. As noted earlier, the main requirement for most countries was the overrid-

ing need to protect their existing services for as long as possible and this explains the reason why different countries had chosen different bands as their preference. In addition, there was a significant minority of countries which preferred the use of the existing 12 GHz band.

The 12 GHz band was planned in 1977 but has had relatively little use for television transmissions up until now. However it offers a major advantage, especially for countries where the rainfall rate is very high, that the provision of satellite transmissions is more economical than at around 22 GHz. It also has to be remembered that equipment for transmission and reception is already relatively easily available.

3.2. Results

In the end, the world was split on ITU Regional lines with Regions 1 and 3 opting for 21.4 to 22 GHz and Region 2 (the Americas) choosing 17.3 to 17.8 GHz. In return, the 22.5 to 23 GHz broadcasting allocation in Regions 2 and 3 which had been available since 1979 (but which suffers from very high losses due to water vapour in the atmosphere) has been given up. The fact that

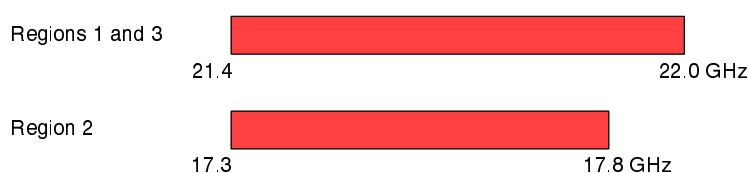


Figure 2
New allocations for wide RF band HDTV



Resolution COM 5/5

Introduction of High-Definition Television (HDTV) Systems of the Broadcasting-Satellite Service (BSS) in the Band 21.4–22.0 GHz in Regions 1 & 3

The World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992)

considering

- a) that this Conference has reallocated the band 21.4–22.0 GHz in Regions 1 and 3 to the broadcasting-satellite service to be implemented after 1 April 2007;
- b) that until 1 April 2007 the existing services operating in the band 21.4–22.0 GHz in Regions 1 and 3 in accordance with the Table of Frequency Allocations are therefore entitled to continue operating without harmful interference from other services;
- c) that it is nevertheless desirable to facilitate the introduction of experimental HDTV systems in this band before 1 April 2007 without affecting the continued operation of existing services;
- d) that it also may be possible to introduce operational HDTV systems in this band before 1 April 2007 without affecting the continued operation of existing services;
- e) that after 1 April 2007 the introduction of HDTV systems in this band must be regulated in a flexible and equitable manner until such time as a future competent world administrative radio conference has adopted definitive provisions for this purpose in accordance with Resolution 507;
- f) that procedures are required for the three sets of circumstances envisaged in considerations c), d) and e) above;

resolves

to adopt the interim procedures contained in the annex hereto with effect from 1 April 1992;

invites all administrations

to comply with the above procedures;

instructs the IFRB

to apply the above procedures.

Annex to Resolution COM5/5

Interim Procedures for the Introduction of BSS (HDTV) Systems in the Band 21.4–22.0 GHz in Regions 1 & 3

Section I. General Provisions

1. It shall be understood that prior to 1 April 2007 all existing services in the band 21.4–22.0 GHz in Regions 1 and 3 operating in accordance with the Table of Frequency Allocations shall be entitled to continue to operate. After that date they may continue to operate, but they shall neither cause harmful interference to BSS (HDTV) systems nor be entitled to claim protection from such systems. It shall be understood that the introduction of an operational BSS (HDTV) system in the band 21.4–22.0 GHz in Regions 1 and 3 should be regulated by an interim procedure in a flexible and equitable manner until the date to be decided by a future competent conference.

Section II. Interim Procedure Relating to Experimental BSS (HDTV) Systems Introduced Before 1 April 2007

2. For the purpose of introducing experimental BSS (HDTV) systems in the band 21.4–22.0 GHz in Regions 1 and 3 under the provisions of Article 34 of the Radio Regulations, the procedures contained in the Resolution 33 shall be applied.

Section III. Interim Procedure Relating to Operational BSS (HDTV) Systems Introduced Before 1 April 2007

3. For the purpose of introducing operational BSS (HDTV) systems in the band 21.4–22.0 GHz in Regions 1 and 3 before 1 April 2007, the procedure contained in Resolution 33 shall be applied, if the power flux-density at the Earth's surface produced by emissions from a space station, on the territory of any other country, exceeds:

- -115 dB (W/m²) in any 1 MHz band for angles of arrival between 0 and 5 degrees above the horizontal plane; or
- -105 dB(W/m²) in any 1 MHz band for angles of arrival between 25 and 90 degrees above the horizontal plane; or
- values to be derived by linear interpolation between these limits for angles of arrival between 5 and 25 degrees above the horizontal plane.

These limits relate to the power flux-density which would be obtained under assumed free-space propagation conditions.

4. If the power flux-density at the Earth's surface produced by emission from a space station does not exceed these limits, the procedure in Sections B and C of Resolution 33 only shall be applied.

Section IV. Interim Procedure Relating to BSS (HDTV) Systems Introduced After 1 April 2007

5. For the purpose of introducing and operating BSS (HDTV) systems in the band 21.4–22.0 GHz in Regions 1 and 3 after 1 April 2007, and before a future conference has taken decisions on definite procedures, the procedure in Sections B and C of Resolution 33 shall be applied.

6. For the purpose of this Section, BSS (HDTV) systems introduced under provisions of Sections II and III of the Resolution shall be taken into account.

7. Administrations shall, to the maximum extent possible, seek to ensure that operational BSS (HDTV) systems introduced in the band 21.4–22.0 GHz in Regions 1 and 3 under Section III and IV of this Resolution have characteristics which taken into account the studies of the CCIR for the preparation of a future competent world administrative radio conference.

there are two different bands (21.4 to 22 GHz and 17.3 to 17.8 GHz) allocated will make little practical difference. The geographic separation between Region 2 and the other Regions means that there is no problem with regard to interference and the frequency differences are not sufficiently great to make a large amount of difference in receiver design.

In practice, there seemed to be relatively little dissent regarding the choice of frequency band:

- partly because the need for an allocation was agreed by everybody;
- partly because there was an existing allocation (at least in two of the three Regions) which could be given up;
- partly because the time-scales are seen to be quite long and thus there is no immediate threat to any existing service.

■ 3.3. Action by broadcasters

The new allocations will become generally available in the year 2007 but there are special arrangements (see *Resolution COM5/5*, reproduced on

page 32, and *Resolution COM5/6*) which should permit an earlier use for experimental purposes or even some operational use. Under these circumstances, it is desirable for broadcasters to start making plans for experimental transmissions and to give these plans sufficient publicity. This is needed to ensure that the spectrum regulators and existing users realize that there is some pressure to use the new bands and that it is necessary for them to start to make provisions for their transfer out of the band. If this realization does not occur, there are likely to be further delays, even after the nominal start date of 2007, while existing equipment is removed.

■ 4. BSS (Sound)

This topic has been left until last because it is by far the most difficult.

■ 4.1. Background

At the start of the Conference there was virtual unanimity that a BSS (Sound) allocation was necessary and that from a technical point of view, the 1.5 GHz band was best. The EBU shared this view. However, there was complete disagree-

Resolution COM4/(W)

Introduction of the Broadcasting-Satellite Service (Sound) Systems and Complementary Terrestrial Broadcasting in the Bands Allocated to these Services Within the Range 1-3 GHz

The World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992) *considering*

- a) that this Conference has made frequency allocations to the broadcasting-satellite service (sound) and complementary terrestrial broadcasting;
- b) that it is necessary to ensure that the introduction of the broadcasting-satellite service (sound) and complementary terrestrial broadcasting proceeds in a flexible and equitable manner;
- c) that efficient use of the spectrum will be enhanced by a worldwide allocation;
- d) that a worldwide allocation may cause difficulties to some countries in relation to their existing services;
- e) that future planning may limit the effect on other services;

resolves

1. that a competent conference should be convened, preferably not later than 1998, for the planning of the broadcasting-satellite service (sound) in the bands allocated to this service in the range 1-3 GHz; and the development of procedures for the coordinated use of complementary terrestrial broadcasting;
2. that this Conference should review criteria for sharing with other services;
3. that in the interim period, BSS systems may only be introduced within the upper 25 MHz of the appropriate band in accordance with Resolution 33. The complementary terrestrial service may be introduced during this period subject to coordination with administrations that may be affected;
4. that the calculation methods and the interference criteria to be employed in evaluating the interference should be based upon relevant CCIR Recommendations agreed by the administrations concerned as a result of Resolution 703 or otherwise;

invites the CCIR

to conduct the necessary studies prior to the Conference;

instructs the Secretary-General

to bring this Resolution to the attention of the Administrative Council to consider including in the agenda of an administrative radio conference to be held preferably not later than the year 1998 the matters addressed above.

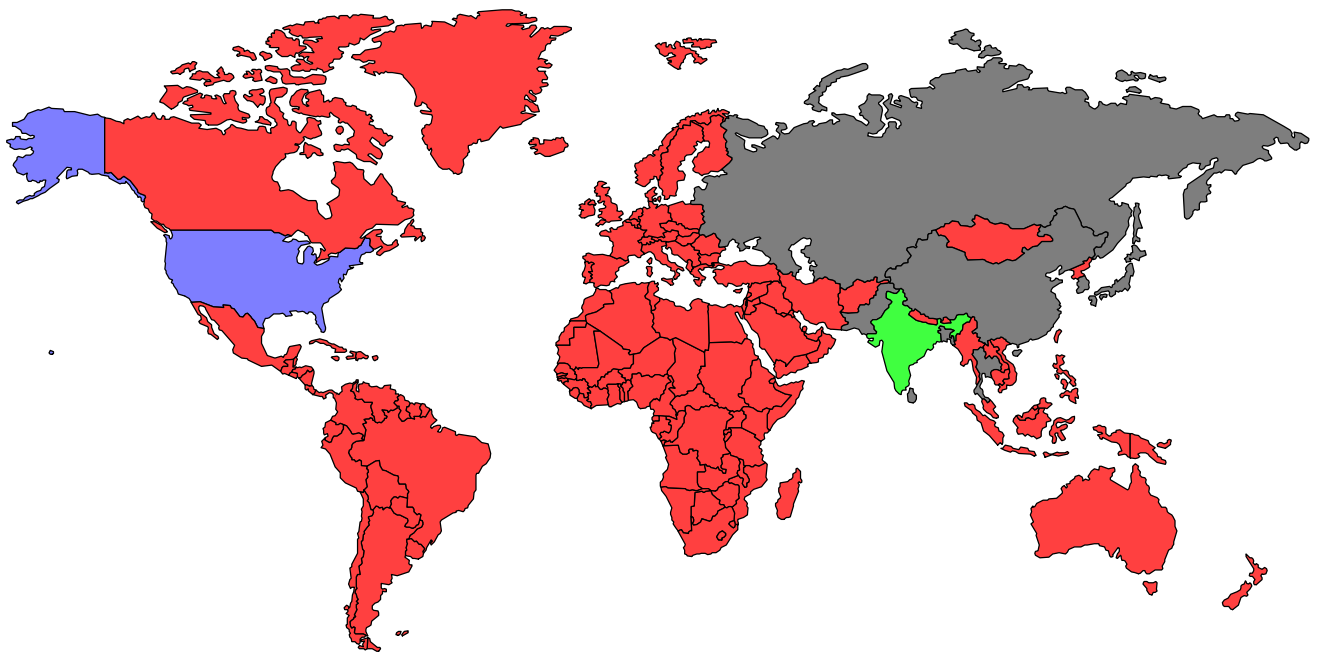
ment about which band could be made available. The two main contenders were near 1.5 GHz and near 2.6 GHz, with the USA forming a minority (almost alone) in saying that 2.3 GHz should be used. In fact, there were almost equal numbers in support of 1.5 and 2.6 GHz and each group had very strong opposition to the other's proposal, primarily because of the need to protect existing services for as long as possible. This position could be identified in the first few days of the Conference and hardly changed during the next three weeks.

Compromise proposals were then developed which would have made allocations at both 1.5 and 2.6 GHz. Although this was seen to be undesirable, because it offered little but disadvantage to everyone concerned, it was impossible to obtain agreement on a single band. It was really because of the expected difficulties for the other potential spectrum users that a breakthrough occurred on the 29th February when the CEPT group of countries announced that they would change their support from 2.6 to 1.5 GHz.

4.2. Results

This change of support gave the 1.5 GHz proposal for BSS (Sound) enough backing to ensure that it obtained a place in the Frequency Tables from 1.452 to 1.492 GHz. However, a group of countries, mainly in Asia but also including the Russian Federation, announced that they would use 2.6 GHz and the USA announced that it would use 2.3 GHz.

In return for the additional 40 MHz at 1.5 GHz given to broadcasting, at least from the year 2007 (see *Resolution COM4/[W]*, reproduced on page 33), there has been a reduction of 40 MHz in the existing broadcasting allocation from 2.50 to 2.69 GHz, where its primary use is for community reception television systems, largely but not entirely in the developing world. Because most of these schemes have not yet been fully developed, this loss should not have a major impact and was seen as a reasonable price to pay for a world wide allocation at 1.5 GHz, even if it may not be used by some countries.



All Regions except USA

USA and additional allocation to India

Additional allocation to : Bangladesh, Belarus, China, Republic of Korea, Russian Federation, India, Pakistan, Singapore, Sri Lanka, Thailand, Ukraine

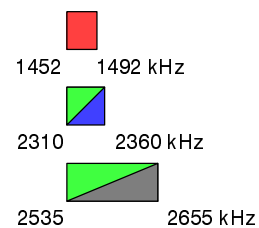


Figure 3
New allocations for Digital Audio Broadcasting, and geographical distribution

■ 4.3. Action by broadcasters

Because there will be severe restrictions on satellite services in order to protect the existing users of the 1.5 GHz band, it is almost certain that the initial use of this band by broadcasters will be from terrestrial transmitters. The restrictions relate, in particular, to a power flux density (PFD) limit of around $-152 \text{ dBW/m}^2/4 \text{ kHz}$ which was widely discussed; the CCIR was requested to undertake additional studies in this field. This is in addition to any proposals for terrestrial transmissions in the VHF or UHF bands (*Resolution COM5/10*). It is very highly desirable that some firm plans should be developed soon for experimental or even operational terrestrial services at 1.5 GHz in any countries where the Administrations are prepared to authorise them. If this can be done before the planning Conference, which is proposed for around 1998, it should help to minimize the delays which will be needed in order to protect existing users.

The time-scales for such delays can be very long. For example, at the 1961 Stockholm Conference, there was agreement to protect certain mobile radio services in the United Kingdom. The relevant restrictions were not finally lifted until the end of 1989, nearly 30 years later, and were not reflected in the Radio Regulations until WARC-92.

The last point mentioned is rather important because the current proposal is that the existing users of the 1.5 GHz band will be able to continue in operation restriction and will be able to claim protection from any new broadcasting user. To ensure that broadcasters will have full access to

the new band for satellite as well as for terrestrial services, it seems essential that an early start must be made to promote the idea of these new services. This should serve as an indication to the existing users that they should start to look for accommodation in a new band and should not seek, at a future BSS planning Conference, to protect themselves for a very long time period.

■ 5. Wind profiler radars

One topic which did not generate much discussion at the WARC was that of an allocation for wind profiler radars. This was mainly because it was not on the Conference agenda.

Wind profiler radar systems transmit at frequencies in the vicinity of 50, 400 and 1000 MHz to measure wind direction and speed as a function of altitude, notably for studies of climate and for air navigation purposes. 400-MHz radar provides data for altitudes ranging from 500 to about 10,000 m. Broadcasters will need to pay careful attention to the development of these systems as there are already proposals, in Europe at least, that a suitable home for the requirement in the vicinity of 400 MHz can be found in the UHF television band. This would be in addition to the continued, and probably expanded, use of 50 MHz.

In the light of a request from the World Meteorological Organization concerning frequency allocations for this service, WARC-92 produced a Recommendation that the subject should be dealt with by a competent future WARC (*Recommendation GT-PLN/A*).