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**Documents of the World Administrative Radio Conference for the planning of the HF bands allocated
to the broadcasting service (2nd session) (WARC HFBC-87 (2))
(Geneva, 1987)**

To reduce download time, the ITU Library and Archives Service has divided the conference documents into sections.

- This PDF includes Document DL No. 1-33
- The complete set of conference documents includes Document No. 1-279,
DL No. 1-33, DT No. 1-73

AGENDA
OF THE
MEETING OF HEADS OF DELEGATIONS
Monday, 2 February 1987 at 09.30 hrs
(Room II)

Document No.

- | | |
|------------------------------------------------------------------------------------|------|
| 1. Opening by the Secretary-General and designation of the Chairman of the meeting | - |
| 2. Approval of the agenda of the meeting | - |
| 3. Proposals for the election of the Chairman of the Conference | - |
| 4. Proposals for the election of the Vice-Chairmen of the Conference | - |
| 5. Conference structure | DT/1 |
| 6. Proposals for the election of the Chairmen and Vice-Chairmen of the Committees | - |
| 7. Draft agenda of the first Plenary Meeting | DT/2 |
| 8. Allocation of documents to Committees | DT/3 |
| 9. Other business | |

R.E. BUTLER
Secretary-General



STEERING COMMITTEE

DRAFT

GENERAL SCHEDULE OF THE WORK OF THE CONFERENCE

Week 1 (2-6 February)

Organization and commencement of work

Week 2 (9-13 February)

Continuation of work in Working Groups and Committees

Week 3 (16-20 February)

Friday 20 - End of work of Working Groups of Committee 4

Week 4 (23-27 February)

Monday 23 - End of work of Working Groups of Committee 5

Tuesday 24 - End of work of Committee 4

Wednesday 25 - End of work of Committee 5
End of work of Working Groups of Committee 6

Friday 27 - End of work of Committee 6

Week 5 (2-6 March)

Tuesday 3 - Report of Committee 2

Wednesday 4 - First reading by Plenary of last texts of the Final Acts

Thursday 5 - Second reading by Plenary of last texts of the Final Acts

Friday 6 - Report of Committee 3

Signing Ceremony and Closing

Note 1 Plenary meetings will be scheduled as necessary during each week of the Conference

Note 2 This schedule may be changed in the course of the work of the Conference

WORKING GROUP 4-A

Working Group 4-A

SUMMARY OF DISCUSSION OF RECEPTION AREAS

During the discussion on ways of specifying reception areas it was generally accepted that for most purposes the CIRAF zones, together with their division into quadrants, as defined at the First Session of the Conference, are appropriate. These zones contain 911 test points and for most purposes these are sufficiently closely spaced.

There are two categories of circumstances where some difficulties arise:

1. where a large quadrant contains a test point or points where a service is not required;
2. where the required reception area, particularly where it is at a short distance from the transmitter, is a small area which cannot be treated as a quadrant of a CIRAF zone.

In the first case a number of administrations advocated a procedure which would permit one or more test points to be specified so that they would not be included in the assessment. It was pointed out that another way of dealing with this problem would be to divide into smaller units, or to adjust boundaries where this difficulty arises.

In the second case, the footnote to paragraph 3.7.1 of the Report to the Second Session was noted where an alternative way of specifying the area by azimuth and range was given for exceptional cases. It was suggested that this wording could be improved to allow two azimuths and maximum and minimum ranges to be specified. The IFRB explained that such cases were treated by using test points related to the sector for assessment. It was further suggested that where the sector did not include a test point an additional test point could be identified.

The way in which such cases are dealt with during a compatibility analysis was not mentioned during the discussion but may need to be taken into account.

Comment

The difficulties arise where quadrants, and their associated test points, do not coincide with the requirements for reception areas. Although it is possible to envisage very flexible ways of specifying a reception area, consideration should be given to the way in which such requirements would be handled in a compatibility analysis procedure. It seems likely that there is a need for uniformity in specification so as to facilitate the work.

A possible way forward is:

1. to set up a small Sub-Group of interested participants to examine the boundaries of CIRAF zones and quadrants and to see if all difficulties can be resolved by a modest amount of further subdivision or rearrangement;
2. if this effort does not succeed to adopt a procedure to allow a limited number of test points in any quadrant to be specified as not requiring service;
3. to clarify the wording in the footnote to include the specification of an area between two azimuths and ranges and to indicate the need for the IFRB, after consultation, to identify new test points or to relocate existing ones to best advantage;
4. if Committee 5 decides that national broadcasting should be treated differently from international broadcasting, the wording in the footnote should be re-examined.

L.W. BARCLAY
Chairman of Working Group 4-A

4.2.3.4.4 Limitation of frequency change

1.1 Continuity in the use of a frequency is an important matter for both the broadcaster and the listener, it is a characteristic inherent in the broadcasting of a programme. In addition, limitations imposed by the technical characteristics of the means of transmission available to some administrations will impose mandatory requirements for frequency continuity.

1.2 The desirable aim is that changes in frequency should be limited only to those necessitated by changes in propagation conditions. Frequency changes due to incompatibilities may also be permitted. In these cases, the number of frequency changes during any contiguous periods of operation shall be limited to the minimum necessary.

2. Definitions2.1 Intra-seasonal2.1.1 Type 1 continuity

Continuity of use of the same frequency within an hour or from one hour to another consecutive hour within each requirement.

2.1.2 Type 2 continuity

Continuity of use of the same frequency in the same season when passing from one requirement to another or one time block to another.

2.2 Inter-seasonal2.2.1 Type 3 continuity

Continuity of use of the same frequency by the same requirement in [two] consecutive seasons.

2.2.2 Type 4 continuity

Continuity of use of the same frequency by the same requirement in two [consecutive] equinoctial seasons.

2.2.3 Type 5 continuity

Continuity of use of the same frequency by the same requirement in the same season of [two] consecutive years.

3. Relationship between frequency continuity and appropriate band(s)

3.1 The frequency assigned to a requirement is dependent on the band determined to be the "appropriate band". The appropriate band is established within the HFBC System by taking account, amongst other things, of the

desirability of maintaining maximum frequency continuity within the limits of the agreed reference value for BBR (at present BBR = 80%).

3.2 When the requirement under consideration is eligible to use a second or third frequency according to the procedures established in section 3.8.2 of the report of the First Session, the frequency continuity conditions applicable to the first frequency should also be applied to the second (and third) frequency.

3.3 In cases where propagation conditions are changing rapidly to the extent that would result in changes to the appropriate band then an administration may elect to choose extended frequency continuity at the expense of BBR. If in this case the BBR falls below the reference value, the second and/or third frequencies are afforded only when the application of frequency continuity would not result in a number of additional frequencies greater than what would be needed with another band.

4. Application of continuity

4.1 Type 1 continuity shall be applied automatically to all requirements, as long as the appropriate band does not change, under the conditions set out in 4.2.3.4.4 (3).

4.2 Type 2 continuity shall be applied at the request of the administration. [Provision of type 2 continuity will be mandatory if requested by the administration and that administration advises the constraints that necessitate the frequency continuity.]

4.3 Type 3 continuity shall be applied to the extent possible within the HFBC System when requested by the administration.

4.4 Type 4 continuity shall be applied to the extent possible within the HFBC System when requested by the administration.

4.5 Type 5 continuity shall be applied to the extent possible within the HFBC System when requested by the administration.

K.G. MALCOLM
Drafting Group Coordinator 5-A-3

EDITORIAL GROUP 5-A-1

REQUIREMENTS FILE

1. For the purposes of this Article, a Requirements File shall be established, containing the existing or expected requirements for HF broadcasting. Each requirement listed in the File shall give the characteristics listed in Appendix 2 and indicate the season(s) in which the requirement will be used.

2. For the purposes [of the HFBC System], a requirement shall be defined as follows:

"Need stated by an administration to provide a broadcasting service at specified periods to a specified reception area from a given broadcasting station".

3. For the purposes of Article 17, a requirement shall be defined as above with indication of the assigned frequency. In the application of Article 17, when a requirement does not give the assigned frequency/or the preferred band, the frequency to be assigned shall be recommended by the Board under No. of the Radio Regulations.

4. The Board shall take the necessary steps to establish the File far enough in advance during the period preceding the entry into force of the Final Acts so that it can be used for the first seasonal schedules.

5. Any administration may at any time notify the Board of any additions, modifications or deletions it wishes to make in its requirements in the Requirements File. However, information specific to a particular season as indicated in Appendix 2 must reach the Board not more than [x] months or less than [y] months¹ before the beginning of the season in question.

6. The Board shall verify that the information provided is complete and, in consultation with the administration concerned, shall endeavour to make any necessary corrections. The Board shall attempt so far as possible to identify incompatible requirements in advance and shall request the administrations concerned to take the necessary steps to eliminate them. If, by the date for the start of processing of a particular season, the information for a requirement is still incomplete despite the action taken by the Board, it shall be left out of account for the season in question.

¹ The period may vary depending on whether the information is to be used for the HFBC System or for Article 17.

7. For each [season] [half-year] [year], the Board shall fix the date[s] on which it will start processing the requirements for the season[s] concerned and give administrations prior notification thereof. The requirements appearing in the Requirements File on the above-mentioned date[s] shall be used in drawing up the seasonal schedules without any priority being conferred by the date of revision of the Requirements File.

8. The processing of urgent additions or modifications notified to the IFRB after the date[s] given in [7] shall be considered under the Article 17 and HFBC procedures.

9. Committee 5 might consider the desirability of recording the history of the use of each assignment in the Requirements File if the principle of an annual list is maintained.

D. SAUVET-GOICHON
Chairman of Editorial Group 5-A-1

APPENDIX 2

Information relating to the broadcasting service
in the exclusive HFBC bands
(see Article(s))

PART A: General instructions

A separate notice, or requirement form shall be sent to the IFRB for:

- each frequency assignment , or requirement to be put into use for a particular season;
- any change in the characteristics of a frequency assignment or requirement;
- any deletion of a frequency assignment or requirement.

PART B: Permanent Basic characteristics common to both procedures

- 1 - name of the transmitting station;
- 2 - geographical coordinates of the transmitting station;
- 3 - symbol of the country or geographical area in which the transmitting station is located;
- 4 - required service area;
- 5 - hours of operation (UTC) [legal clock time changes];
- 6 - class of emission.

PART C: Basic seasonal characteristics relative to the HFBC system

- 1 - range of antenna characteristics;
- 2 - range of power capabilities;
- 3 - preset frequencies;
- 4 - number of frequencies that can be used simultaneously;
- [5 - nature of requirement (national or international).]

PART D: Basic seasonal characteristics relative to Article 17

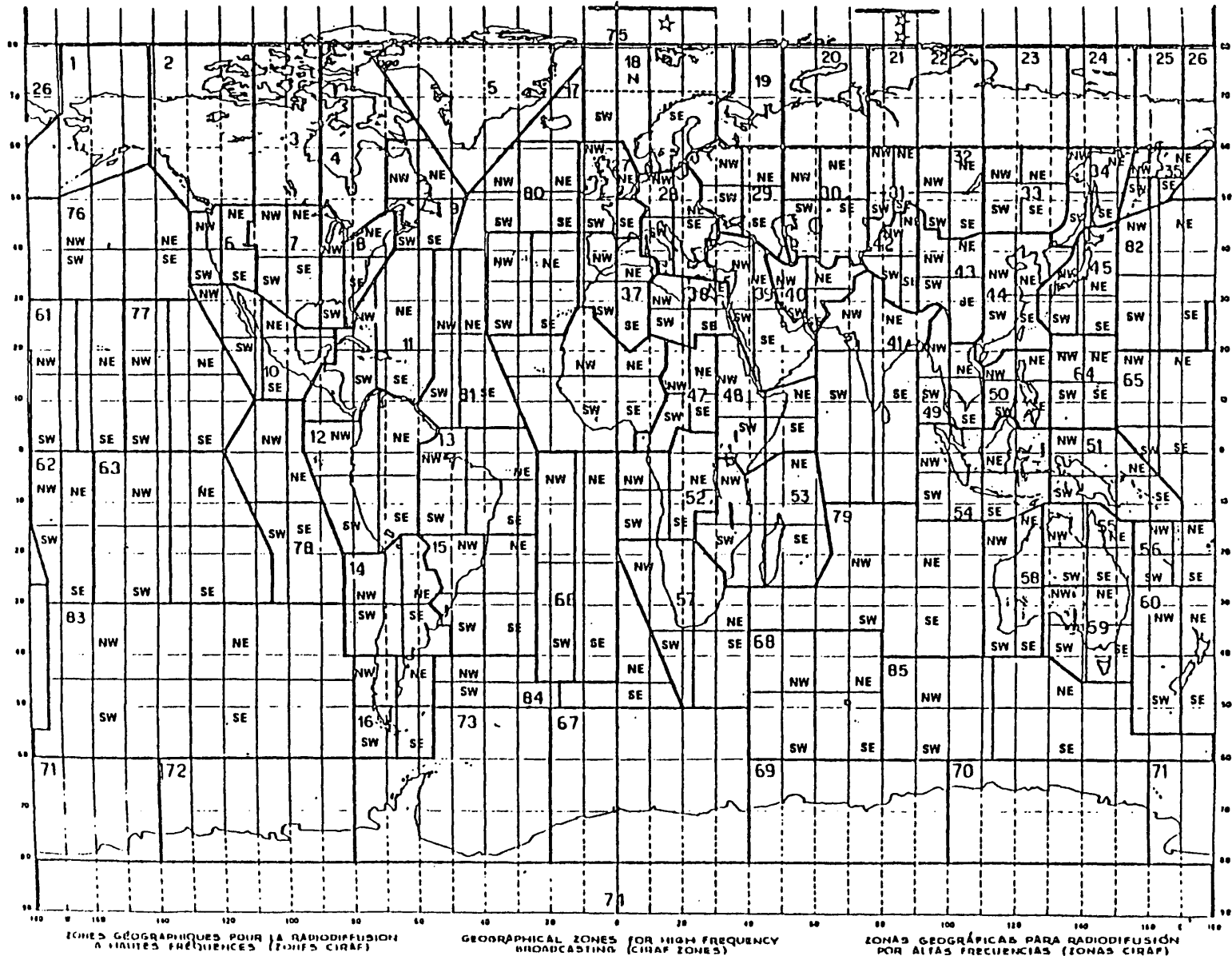
- 1 - assigned frequency (kHz);
- 2 - alternative frequency (kHz);
- 3 - frequency band (MHz);
- 4 - power (kW);
- 5 - transmitting antenna characteristics;
- 6 - other frequencies simultaneously utilized for same programme to the same area(s).

PART E: Optional Supplementary characteristics relative to the HFBC System

- 1 - preferred frequencies or preferred bands;
- 2 - request for frequency continuity between two requirements in the same season;
- 3 - request for frequency continuity between two requirements in different seasons;
- 4 - request for synchronous operations between two requirements;
- 5 - request for a seasonal fixed frequency for one or more requirements;
- 6 - other equipment limitations;
- 7 - lowest value of BBR to be used for frequency continuity applications in the same season.

ANNEX TO APPENDIX 2

GEOGRAPHICAL ZONES FOR BROADCASTING



* CIRAF Zone 18 has been divided into three quadrants.

** The parallel dividing CIRAF Zone 31 has been lowered.

RELIABILITY

DRAFT MODIFICATIONS TO THE REPORT TO THE SECOND SESSION CONCERNING THE
 CALCULATION OF RELIABILITY, AND THE APPLICATION OF RELIABILITY TO THE
 CHOICE OF FREQUENCY BANDS (SECTIONS 2.7, 3.2.4 TO 3.2.4.5 AND 3.8
 OF THE REPORT TO THE SECOND SESSION)

| Section | Title | Proposal |
|------------|--------------------------------------------------------|------------------------|
| 2.7 | Terms relating to reliability | Retain |
| 3.2.4 | Reliability | Retain |
| 3.2.4.1 | Calculation of basic circuit reliability (BCR) | Retain |
| Table 3-8 | Parameters used to compute basic circuit reliability | Retain |
| Figure 3-4 | Parameters used to compute basic circuit reliability | Retain |
| 3.2.4.2 | Calculation of overall circuit reliability (OCR) | Retain |
| Table 3-9 | Parameters used to compute overall circuit reliability | Modify - see next page |
| Figure 3-5 | Parameters used to compute overall circuit reliability | Retain |
| 3.2.4.3 | Basic reception reliability (BRR) | Retain |
| 3.2.4.4 | Overall reception reliability (ORR) | Retain |

DRAFT

TABLE 3-9

Parameters used to compute
overall circuit reliability

| STEP | PARAMETER | DESCRIPTION | SOURCE |
|------|-----------------------|----------------------------------------------------------------------|-----------------------------------------|
| 1 | E_W dB (μ V/m) | Median field strength of wanted signal | Prediction method (section 3.2.1) |
| 2 | E_i dB (μ V/m) | Median field strength of interfering signals E_1, E_2, \dots, E_i | Prediction method (section 3.2.1) |
| 3 | I dB (μ V/m) | Resultant field strength of interference (see text) | * |
| 4 | SIR(50)dB | Median signal to interference ratio | $E_W - I$ |
| 5 | D_U (SIR)dB | 10% fading allowance | 10 dB(<60°), 14 dB(≥60°) ^{1,2} |
| 6 | D_L (SIR)dB | 90% fading allowance | 10 dB(<60°), 14 dB(≥60°) ^{1,2} |
| 7 | SIR(10)dB | Subjective signal-to-interference ratio exceeded 10% of the time | SIR(50) + D_U (SIR) |
| 8 | SIR(90)dB | Subjective signal-to-interference ratio exceeded 90% of the time | SIR(50) - D_L (SIR) |
| 9 | RSI dB | Required RF protection ratio | (section 3.3.1) |
| 10 | ICR | Circuit reliability in presence of interference only (without noise) | See figure 3-5 |
| 11 | BCR | Basic circuit reliability | See figure 3-4 |
| 12 | OCR | Overall circuit reliability | Min(ICR, BCR) |

Note 1 - If any point on that part of the great circle which passes through the transmitter and the receiver and which lies between control points located 1,000 km from each end of the path reaches a corrected geomagnetic latitude of 60° or more, the values for ≥ 60° have to be used. The relationship of corrected geomagnetic latitude to the geographical coordinates is shown in figures 3-2 and 3-3 of paragraph 3.2.3.2.

Note 2 - These values apply for overall circuit reliabilities not exceeding 80%.

*
$$I = 20 \log_{10} \sqrt{\left(\frac{E_1}{10^{20}}\right)^2 + \left(\frac{E_2}{10^{20}}\right)^2 + \left(\frac{E_3}{10^{20}}\right)^2 + \dots}$$

TABLE 3-10
Basic reception reliability

The following parameters are involved :

Single-frequency operation

| Step | Parameter | Description | Source |
|------|-----------------|-----------------------------------------------|--------------------|
| (1) | $BCR(F_1)$ % | Basic circuit reliability for frequency F_1 | step 11, Table 3-8 |
| (2) | $BRR(F_1)$ % | Basic reception reliability | $BCR(F_1)$ |

Two-frequency operation¹

| | | | |
|-----|----------------------|-----------------------------------------------|--------------------------------------------------------------------------------------|
| (3) | $BCR(F_2)$ % | Basic circuit reliability for frequency F_2 | step 11, Table 3-8 |
| (4) | $BRR(F_1)(F_2)$ % | Basic reception reliability | $1 - \prod_{n=F_1}^{F_2} (1 - BCR(n))$ <hr/> Maximum value of $[BCR(F_1), BCR(F_2)]$ |

¹ The two frequencies F_1 and F_2 shall be situated in different frequency bands allocated to the HF broadcasting service.

TABLE 3-10 (continued)
Basic reception reliability

Three-frequency operation¹

| Step | Parameter | Description | Source |
|------|--------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| (5) | BCR (F ₃) % | Basic circuit reliability for frequency F ₃ | Step 11, Table 3-8 |
| (6) | BRR (F ₁)(F ₂)(F ₃) % | Basic reception reliability | $1 - \prod_{n=F_1}^{F_3} (1 - \text{BCR}(n))$ <hr/> Maximum value of [BCR(F ₁), BCR(F ₂), BCR(F ₃)] |

¹ The three frequencies F₁, F₂ and F₃ shall be situated in different frequency bands allocated to the HF broadcasting service.

TABLE 3-11
Overall reception reliability

The following parameters are involved :

Single-frequency operation

| Step | Parameter | Description | Source |
|------|----------------------------|----------------------------------------------------------|-----------------------|
| (1) | OCR (F ₁) % | Overall circuit reliability for frequency F ₁ | Step 12, Table 3-9 |
| (2) | ORR (F ₁) % | Overall reception reliability | OCR (F ₁) |

Two-frequency operation¹

| | | | |
|-----|----------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (3) | OCR (F ₂) % | Overall circuit reliability for frequency F ₂ | Step 12, Table 3-9 |
| (4) | ORR (F ₁) (F ₂) % | Overall reception reliability | $1 - \prod_{n=F_1}^{F_2} (1 - \text{OCR}(n))$ <div style="border-top: 1px dashed black; padding-top: 5px;">Maximum value of [OCR(F₁), OCR(F₂)]</div> |

¹ The two frequencies F₁ and F₂ shall be situated in different frequency bands allocated to the HF broadcasting service.

TABLE 3-11 (continued)
Overall reception reliability
Three-frequency operation¹

| Step | Parameter | Description | Source |
|------|-------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (5) | OCR (F ₃) % | Overall circuit reliability for frequency F ₃ | Step 12, Table 3-9 |
| (6) | ORR (F ₁) (F ₂) (F ₃) % | Overall reception reliability. | F_3 $1 - \prod_{n=F_1} (1 - \text{OCR}(n))$ <hr style="border-top: 1px dashed black;"/> Maximum value of [OCR(F ₁), OCR(F ₂), OCR(F ₃)] |

¹ The three frequencies F₁, F₂ and F₃ shall be situated in different frequency bands allocated to the HF broadcasting service.

3.2.4.5 Basic and overall broadcast reliability

The determination of basic broadcast reliability involves the use of test points within the required service area. The basic broadcast reliability is an extension of the basic reception reliability concept to an area instead of a single reception point. The method for computing basic broadcast reliability is outlined in Table 3-12. In step (1), the basic reception reliabilities BRR (L_1), BRR (L_2), --- BRR (L_N) are computed as described in Table 3-10 at each test point L_1 , L_2 --- L_N . These values are ranked in step (2) and the basic broadcast reliability is the value associated with a percentile X specified in paragraph 4.2.4 (page 78).

In a similar way, the overall broadcast reliability is computed as described in Table 3-13 and it is the value associated with a percentile X specified in 4.2.4.

Note that the test points used in determining broadcast reliability must be specified, e.g. see section 3.8 for the use of BBR in choosing additional frequency bands and section [A] for the use of BBR [and OBR] in assessing the quality of an assignment.

Broadcast reliability is associated with the expected performance of a broadcast service at a given hour. For periods longer than an hour, computation at one-hour intervals is required.

3.8 Maximum number of frequencies required for broadcasting the same programme to the same zone

3.8.1 Introduction

3.8.2 Use of additional frequencies

The number of frequencies needed to achieve the specified level of basic broadcast reliability shall be determined by the method given below. If the calculated basic broadcast reliability for a single frequency does not reach the adopted value, it is necessary to consider whether coverage could be improved by additional frequencies in separate bands and whether the improvement would justify the use of additional frequencies.

3.8.3 In cases where the BBR¹ for the first band, based on all test points in the required service area, is between 50% and 80%, an additional band shall be tested as follows.

Those test points whose basic circuit reliability BCR is less than the BBR are identified and only these points are used to determine the second band. For each band, the minimum value of BCR (BCR_{min}) at these points is determined and that band having the highest BCR_{min} value is selected. The two-band BBR for all test points in the required service area is then computed and if it exceeds

¹ For calculation of the basic broadcast reliability, see paragraph 3.2.4.5 (page 34).

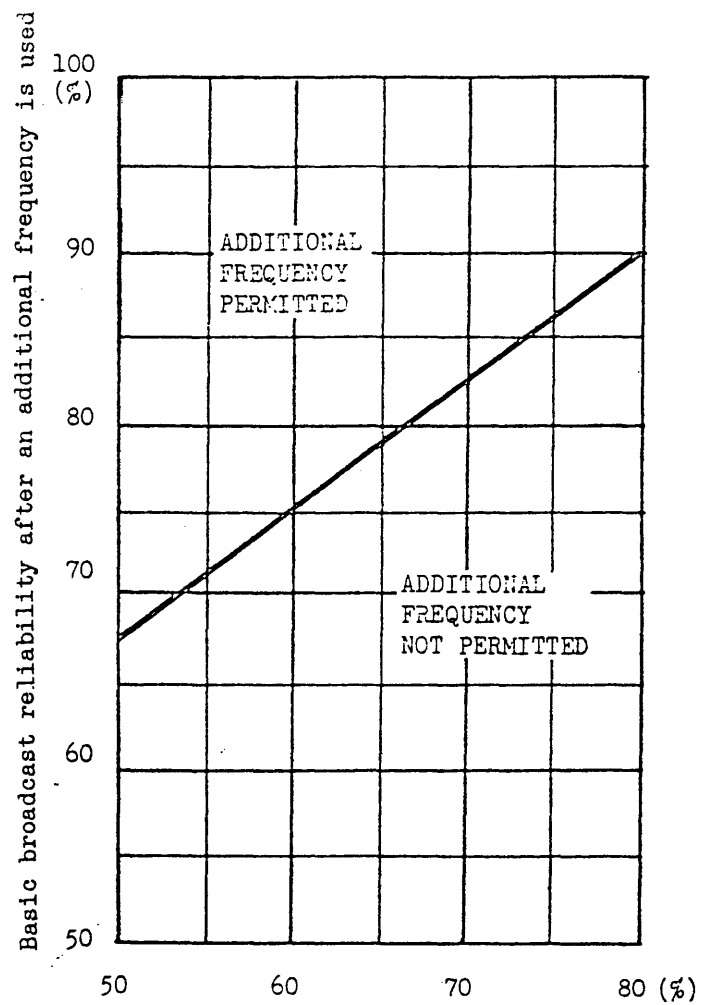
[P]¹ then the second band may be used. Additionally, if this BBR is less than [R]¹ then a third band shall be tested as follows.

Those test points whose basic reception reliability (BBR) for the two bands (section 3.2.4.3) is less than the two-band BBR are identified and these points are used for the calculation of the BCRs for the remaining bands. The minimum value of BCR (BCR_{min}) at these points is determined and that band having the highest BCR_{min} value is selected as the third band and may be used if the BBR for all test points exceeds [Y]¹.

Use of synchronized transmitters should be encouraged whenever possible with a view to minimizing the need for additional frequencies.

In the calculation of BCR at the test points within the required service areas of synchronized transmitters, the field strength value is calculated by the method of root sum square of the contributing field strengths in volts/metre.

¹ P, R and Y are percentage values used in determining the application of additional frequency bands. In the Report to the Second Session R = 80% (page 59) and P and Y are specified in Figure 3-14 (page 60).



Basic broadcast reliability before an additional frequency is to be used

FIGURE 3-14

Limits for use of an additional frequency

D.B. ROSS
Chairman of Working Group 4-A ad hoc 2

WORKING GROUP 4-A AD HOC 2

ASSESSMENT OF AN ASSIGNMENT

In order to assess satisfactorily the quality of a plan, for a requirement or an assignment, the following values should be given per transmission hour or for the duration of the requirement:

- 1) BBR - basic broadcast reliability;
- 2) OBR - overall broadcast reliability;
- 3) S/I
 - i) signal-to-interference value at [X%] percentile of test points,
 - ii) percentage of test points achieving a specified value of S/I;
- 4) F - number of frequency changes associated with an [assignment] [requirement];
- 5) Sp - extent of suspended periods associated with an [assignment] [requirement].

A combination of these values may be considered appropriate for this assessment.

D.B. ROSS
Chairman of Working Group 4-A ad hoc 2

Information Note from the Chairman of Working Group 6 Ad Hoc 2

1. At several occasions the Conference has to deal with the Technical criteria that need to appear in the Radio Regulations. It appeared that it may be useful to analyse in which way this matter was resolved by different conferences.
2. The Radio Regulations contain different types of technical parameters:
 - A first type is in the form of a limit not to be exceeded in order to ensure under all circumstances operational compatibility between stations of different radio services;
Example: RR 2505
RR 2582.1.
 - A second type is in the form of a procedure with technical criteria to be applied to identify administrations with which an agreement is required. This is the case of Appendices 28, 29, 30 and 30A of the Radio Regulations. Such criteria are generally conservative and serve only to identify the administration(s) to contact. Coordination negotiations between administrations are to be carried out on more precise criteria which are left to the administrations to agree upon;
Example: RR 1620.1
RR 2619.1

In the case of continuous disagreement the notices are examined using the IFRB Technical Standards.

 - A third type is in the form of criteria developed and used for the preparation of a plan such as Appendix 30. They are included in the Radio Regulations because the modifications to the plan are evaluated from the viewpoint of the deterioration of the results of the basic plans. In cases such as Appendices 26 and 27 for which this evaluation is not required, only very limited technical criteria are not included in the Radio Regulations. The detailed criteria for these cases are contained in the IFRB Technical Standards.
3. Where a provision of the Radio Regulations refers to an agreement between administrations it generally recommends to use the criteria contained in CCIR Recommendations;

Example: RR 1630.1.
4. In all other cases, namely where there is a need to evaluate the effect of a new assignment of an administration on the assignments registered on behalf of other administrations, the technical criteria used are contained in the IFRB Technical Standards.

E.D. DUCHARME
Chairman of Working Group 6 Ad Hoc 2

COMMITTEE 5

Note by the Chairman of Committee 5

DRAFT TERMS OF REFERENCE OF WORKING GROUPS

Terms of reference of Working Group 5-B

- To determine the frequency bands in which the HFBC System will [might] be applied once it has been improved.
- To examine the problem of the number of requirements to be planned.
- [To examine the number of requirements which could be planned by the HFBC System.]

Terms of reference of Working Group 5-C

To prepare for consideration by Committee 6 guidelines for the improvement of Article 17 of the Radio Regulations.

Terms of reference of Working Group 5-D

To prepare a draft Recommendation for consideration by the Administrative Council on the possibility of extending the frequency bands allocated to HF broadcasting at a future competent world administrative radio conference.

C.T. NDIONGUE
Chairman of Committee 5

COMMITTEE 4

DRAFT REVISION TO PAGE 2 DOCUMENT 116

3.8.3 Determination of additional frequency bands

In cases where the BBR¹ for the first band, based on all test points in the required service area, is between 50% and 80%, an additional band shall be tested as follows.

Those test points whose basic circuit reliability BCR is less than or equal to the BBR are identified and only these points are used to determine the second band. For each band, the minimum value of BCR (BCR_{min}) at these points is determined and that band having the highest BCR_{min} value is selected. If more than one band has this value, the highest frequency band is selected. The two-band BBR, taking account of the BRR at all test points in the required service area is then computed and if it exceeds the limit specified in Figure 3-14² then the second band is permitted. In those special cases where the two-band BBR is less than 80% then a third band shall be tested as follows.

The BBR for each of the remaining bands is computed considering all test points in the required service area. Of these bands, that band having the highest BBR is selected as the third band. If more than one band has this value, the highest frequency band is selected. If the resulting three-band BBR taking account of the BRR at all test points exceeds the limit specified in Figure 3-14, the third band is permitted.

¹ For calculation of the basic broadcast reliability, see paragraph 3.2.4.5.

Delete Note 2 and replace with:

² The contents of this figure can be expressed by the following equation:

BBR (after) > 30 + .75*BBR (before) additional frequency permitted

BBR (after) ≤ 30 + .75*BBR (before) additional frequency not permitted

I.E. DAVEY
Drafting Group 1 of Committee 4

WORKING GROUP 4-A

TERMS OF REFERENCE OF WORKING GROUP 4-A AD HOC 5

METHOD FOR THE PREDICTION OF HF FIELD STRENGTH

At the meeting of Working Group 4-A on 17 February, it was agreed to set up an ad hoc Group to deal with texts relating to the method of field strength prediction.

The agreed Terms of Reference are:

- 1) to prepare a text, probably as a Recommendation, which clearly identifies the method to be used in the near future:
 - this method shall be the method implemented by the IFRB and used by the IFRB in the form of a computer program during the intersessional work. (Note for the work of Working Group 4-A ad hoc 5: This method is based on the decisions of the First Session of the Conference, on additional details by the IFRB during implementation, and on CCIR Recommendation 621; care should be taken to refer only to valid source material in the texts produced by the Group. Reference should be made to the appropriate section of Document DT/34.),
 - the IFRB should provide full documentation of this method as soon as possible as a technical standard,
 - recognition should be given to the provisions for improvement and updating, for example, Documents 87 and 112;
- 2) to prepare a statement based, in principle, on paragraph 3.2.1 of the Report to the Second Session (e.g. of about two pages in length) which gives the philosophy of the method and outlines the procedures, but without full technical detail, in a form suitable for treatment by Committee 6. This text is to be included in section 1.5.1 of [Document DT/34]. The text should include adequate reference to the computer algorithm implemented by the IFRB, for which a technical standard is to be prepared, according to item 1 of the Terms of Reference, as the source for additional technical details.

L.W. BARCLAY
Chairman of Working Group 4-A

WORKING GROUP 4-A AD HOC 5

DRAFT

RECOMMENDATION [COM4/F]

**Propagation Method to be Used for the Planning of the
Broadcasting Service in the HF Bands**

The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987),

considering

- a) the decisions of the First Session of the WARC to adopt a prediction method for HFBC;
- b) the work by the CCIR during the intersessional period in improving some aspects of the method;
- c) that the IFRB has prepared the intersessional work for the Second Session based on the decisions of the First Session and the further work by the CCIR;
- d) that the method prepared by the IFRB was considered by the Conference as the starting basis for any further improvements of the prediction method;
- e) that the IFRB has not yet fully documented the method prepared during the intersessional period,

recommends

- 1. that the prediction method to be used immediately after the Conference shall be that developed by the IFRB during the intersessional period;
- 2. that the IFRB prepare documentation of this method for inclusion in its Technical Standards;
- 3. that the procedures included in Resolution [Document 112] be used for the further improvements to this method.

T. DAMBOLDT

Chairman of Working Group 4-A ad hoc 5

PERCENTILE

In HFBC Planning the term percentile is used when determining a single value which represents a set of values.

The X percentile (X%) value for a given set of values is defined by the following conditions:

1. the X% value is a member of the set of values;
2. the X% value is that value which is equal to or exceeded by at least X per cent of the members in the set;
3. the X% value is the largest value satisfying conditions 1 and 2.

I.E. DAVEY
Chairman of Drafting Group 1 of Working Group 4-A

COMMITTEE 6

DRAFT RESOLUTION [COM6/1]

(see Document 112)

Text proposed by IND for resolves 4:

"4. that the IFRB should circulate a summary of comments it received from the administrations along with the Board's views thereon, including the necessity or otherwise of organizing a [information meeting/consultative meeting of experts] before a final decision is taken. If a majority of replies received from administrations thereafter supports the action proposed by the Board, the Board shall proceed accordingly;".

R. BLOIS
Chairman of Committee 6



WORKING GROUP 5-B

NOTE BY THE CHAIRMAN OF WORKING GROUP 5-B

Working Group 5-B devoted its first three meetings to the following item of its terms of reference:

"To determine the frequency bands in which the HFBC Planning System once it has been improved and approved in accordance with the decisions of this Conference would be applied."

It considered Documents 11, 33, 35, 72, 110 and DT/50.

Having regard to the Group's terms of reference, it emerged from the lengthy discussions that the following proposals had been considered:

application of the HFBC Planning System once it has been improved and approved in accordance with the decisions of this Conference:

- A in the frequency band extensions between 9 and 21 MHz allocated to HF broadcasting;
- B by widening the frequency band extensions between 9 and 26 MHz, possibly to as much as 50% of these bands as a whole;
- C in the whole of the bands between 11 and 26 MHz;
- D in all of the bands between 13 and 26 MHz;
- E in the whole of the bands between 13 and 26 MHz, as well as the 9 and 11 MHz band extensions;
- F in parts of all the bands.

During the discussions, the following proposals were also identified:

- application of the HFBC Planning System in the whole of the bands from 6 to 26 MHz;
- postponement of planning until the HFBC Planning System tests have produced conclusive results.

The Working Group also identified a proposal to the effect that proposal A should be examined initially, in anticipation of a procedure which would lead, by successive stages, to the planning of part or all of the bands.

C. TERZANI
Chairman of Working Group 5-B

[ARTICLE 17]

1. Periodically administrations shall confirm to the IFRB which of their requirements appearing in the HFBC requirements file are to be used in a given season. Administrations may also notify additions and modifications to, or deletions from, the HFBC requirements file. For this purpose, the administrations shall furnish to the Board at least the basic characteristic listed in Appendix 2. When the Board finds that the information submitted by the administration is in conformity with Appendix 2, it shall update the seasonal file accordingly.

[Boxes
1,3]

Administrations may:

- submit for all or part of their requirements the intended frequency schedule;
- request the Board to select the appropriate frequencies for their requirements.

On the basis of this information a seasonal file shall be established.

2. The closure dates for the receipt of the information referred to in [1] are set by the Board in order to permit the advance period required for the establishment of the seasonal schedule to be reduced gradually to the minimum practicable.

[RR 17]

If, in spite of reminders by the Board, no reply is received from an administration by the date set by the Board as in paragraph [2], the Board shall consider that the requirements appearing in the requirements file for the season under consideration are [confirmed and that the requirements without an indication of a frequency shall have the frequencies selected by the Board]/[considered as not confirmed and therefore not included in the seasonal file].

3. The IFRB shall identify for each requirement its appropriate bands and shall calculate the field strength at each test point and the basic broadcasting reliability (BBR) in each of these bands. In so doing account shall be taken of the need to ensure a continuity in the frequency usage as indicated in [-]. The [results obtained relating to the requirements] of an administration shall be sent to it indicating, where appropriate, the number of frequencies required to achieve the required BBR.

[Boxes
4,6]

4. Following the receipt of this information administrations within a period of [-] weeks shall, as appropriate:

- indicate to the Board the intention to use some or all of the frequencies already appearing in the seasonal file;
- indicate to the Board the intention to use a frequency or frequencies other than those in the seasonal file;
- indicate to the Board the frequency or frequencies intended for use for those requirements in the seasonal file that do not have a frequency or frequencies associated with them;
- request the Board to select the most appropriate frequency or frequencies.

[Boxes
7,8,10]

If an administration does not communicate to the Board the information within this period, the Board will select a frequency or frequencies, taking account of the information submitted in paragraph [1], for those requirements within the seasonal file that do not specify frequencies.

5. Administrations may, following the receipt of the information referred to in [3], communicate additional requirements in the form prescribed in Appendix 2 with the indication or not of the selected frequency. These additional requirements shall be included in the seasonal file.

[Box 9]

6. At the end of the period indicated in [4] the Board shall repeat the calculations referred to in [3] and shall determine the number of appropriate frequencies necessary for each requirement in accordance with section [] of Appendix []. If the Board finds that the administration has indicated a number of frequencies which exceeds the number of appropriate frequencies mentioned above, the Board shall, in consultation with the administration concerned, reduce the number of frequencies for the requirement in question to a number resulting from the Board's calculations.

[Boxes
11,12]

The frequencies included in the seasonal schedule shall be limited to one frequency per frequency band per requirement and these frequencies shall be in conformity with No. 1240 of these Regulations and of Appendix [] thereto.

7. The Board shall select frequencies for those requirements which do not have an [associated] [already selected] or a preset frequency. In so doing, the Board shall take into account the need to ensure continuity in frequency usage as indicated in []. The Board shall undertake a calculation of the possible incompatibilities between all requirements and an assessment of the performance of each requirement as indicated in [].

[Box 13]

8. A draft seasonal schedule shall be prepared for publication indicating for each requirement the frequency, notified or selected, and those basic characteristics permitting to easily identify the requirement concerned. This schedule shall be sent to administrations

[Box 14]

[x] months before the start of the season. At the same time the Board shall also send the detailed results of calculations and performance assessment to each administration relating to its requirements indicating for each requirement a reference to the requirements with which it is incompatible. In addition, the Board shall provide, in a timely manner and on request, all other information deemed necessary by an administration.

9. Administrations shall endeavour to resolve the incompatibilities either bilaterally or multi-laterally. In this endeavour the principles enunciated in section 4.1 of the Report to the Second Session shall be taken into consideration. If required the assistance of the Board may be requested. Changes in the transmission characteristics resulting from these consultations or decided unilaterally by the administration with the view to improve the situation shall be notified to the Board as soon as possible but not later than [] weeks following the date of publication of the draft seasonal schedule.

[Boxes]
[15,16]

10. Administrations may at the same time notify additional requirements which shall be taken into account in the preparation of the seasonal schedules.

[Box 17]

11. Using the information received in application of [9] the Board apply the calculation process described in [7] and shall prepare for publication the seasonal schedule to be published [x] months before the beginning of the season.

J.F. BROERE
Chairman of Drafting Group 6-1

[ARTICLE 17]

1. Periodically administrations shall confirm to the IFRB which of their requirements appearing in the HFBC requirements file are to be used in a given season. Administrations may notify additions and modifications to, or deletions from, the HFBC requirements file. Administrations without entries in the requirements file may notify their requirements. These additions, modifications or deletions will be entered in the seasonal file if they are complete. Administrations may:

[Boxes
1,3]

- indicate all or part of their intended frequency schedule;
- request the Board to select the appropriate frequencies for their requirements.

On the basis of this information a seasonal file shall be established.

2. The closure dates for the receipt of the information referred to in [1 and 2] are set by the Board in order to permit the advance period required for the establishment of the seasonal schedule to be reduced gradually to the minimum practicable.

[RR 17]

3. The IFRB shall identify for each requirement its appropriate bands and shall calculate the field strength at each test point and the basic broadcasting reliability (BBR) in each of these bands. In so doing account shall be taken of the need to ensure a continuity in the frequency usage as indicated in [-]. The [results obtained] relating to the requirements of an administration shall be sent to it indicating, where appropriate, the number of frequencies required to achieve the required BBR.

[Boxes
4,6]

4. Following the receipt of this information administrations shall within a period of [-] weeks:

- confirm to the Board the intention to use the frequencies already appearing in the seasonal file; or
- indicate to the Board the intention to use the frequency or frequencies other than those in the seasonal file; or
- indicate the frequency or frequencies it intends to use for the requirements in the seasonal file without assigned frequencies;
- request the Board to select the most appropriate frequency or frequencies.

[Boxes
7,8,10]

If no reply is received from an administration at the issue of the period indicated above, the Board shall consider that the frequencies appearing in the seasonal file are confirmed and that the requirements without the indication of a frequency shall have a frequency designated by the Board.

5. Administrations may, following the receipt of the information referred to in [4], communicate additional requirements with the indication or not of the assigned frequency. These additional requirements shall be included in the seasonal file to the extent that they are complete.

[Box 9]

6. At the issue of the period indicated in [5] the Board shall repeat the calculations referred to in [4] and shall compare the number of frequencies required for each requirements to those indicated by the administrations. When the administration has indicated a number of frequencies exceeding the minimum number resulting from the application of Appendix [] the Board shall in consultations with the notifying administration reduce the number of frequencies to the appropriate number.

[Boxes
11,12]

7. The Board shall select frequencies for those requirements which have not already an assigned frequency or have not a preset frequency. In so doing, the continuous use of a frequency during the transmission period, when passing from one requirement to another or from one season to another shall be applied following the conditions contained in []. It shall also assess the performance of each requirement as indicated in [].

[Box 13]

8. A draft seasonal schedule shall be prepared for publication indicating for each requirement the frequency, notified or selected, and those basic characteristics permitting to easily identify the requirement concerned. At the same time the Board shall send to each administration the detailed results of calculations relating to its requirements indicating for each requirement a reference to the requirements with which it is incompatible. [This communication shall also indicate for each of the administrations concerned in the incompatibility, the number of their requirements having in any band one or more quadrants common with the requirement concerned.]

[Box 14]

9. Administrations shall endeavour to resolve the incompatibilities either bilaterally or multi-laterally. In this endeavour the principles enunciated in section 4.1 of the Report to the Second Session shall be taken into consideration. If required the assistance of the Board may be requested. Changes in the transmission characteristics resulting from these consultations or decided unilaterally by the administration with the view to improve the situation shall be notified to the Board as soon as possible but not latter than [] weeks following the date of publication of the draft seasonal schedule.

[Boxes
15,16]

10. Administrations may at the same time notify additional requirements which shall be taken into account in the preparation of the seasonal schedules.

[Box 17]

11. Using the information received in application of [10] the Board apply the calculation process described in [8] and shall prepare for publication the seasonal schedule to be published [x] months before the beginning of the season.

J.F. BROERE

Chairman of Drafting Group 6-1

DRAFTING GROUP 6-1

[ARTICLE 17]

1. Periodically administrations shall confirm to the Board their requirements appearing in the HFBC Requirement File which are to be used in a given season. In so doing they may either:

- indicate all or part of their intended frequency schedule;
or
- request the Board to select the appropriate frequencies for their requirements.

[Boxes
1,3]

On the basis of this information a seasonal file shall be established.

2. When confirming their requirements as indicated in [1], administrations may notify additions or modifications to the HFBC Requirement File. These additions and modifications will be entered in the seasonal file if they are complete.

3. The closure dates for the receipt of the information referred to in [1 and 2] are set by the Board in order to permit the advanced period required for the establishment of the seasonal schedule to be reduced gradually to the minimum practicable.

[RR 17]

4. The IFRB shall identify for each requirement its appropriate bands and shall calculate the basic broadcasting reliability (BBR) in each of these bands. In so doing account shall be taken of the need to ensure a continuity in the frequency usage as indicated in [-]. The results obtained relating to the requirements of an administration shall be sent to it indicating, where appropriate, the number of frequencies required to achieve the required BBR.

[Boxes
4,6]

5. Following the receipt of this information administrations shall within a period of [-] weeks inform the Board of the following:

- the confirmation of its intent to use the frequencies already appearing in the seasonal file; or
- the selection of alternative frequencies; or
- the indication of the frequency it is intending to use;
or
- the request to the Board to select for it the most appropriate frequency.

[Boxes
7,8,10]

If no reply is received from an administration at the issue of the period indicated above, the Board shall consider that the frequencies appearing in the seasonal file are confirmed and that the requirements without the indication of a frequency shall have a frequency designated by the Board.

6. Administrations may, following the receipt of the information referred to in [4], communicate additional requirements with the indication or not of the assigned frequency. These additional requirements shall be included in the seasonal file to the extent that they are complete.

[Box 9]

7. At the issue of the period indicated in [5] the Board shall repeat the calculations referred to in [4] and shall compare the number of frequencies required for each requirements to those indicated by the administrations. When the administration has indicated a number of frequencies exceeding the minimum number resulting from the application of Appendix [] the Board shall in consultations with the notifying administration reduce the number of frequencies to the appropriate number.

[Boxes
11,12]

8. The Board shall select frequencies for those requirements which have not already an assigned frequency or have not a preset frequency. In so doing, the continuous use of a frequency during the transmission period, when passing from one requirement to another or from one season to another shall be applied following the conditions contained in []. It shall also assess the performance of each requirement as indicated in [].

[Box 13]

9. A draft seasonal schedule shall be prepared for publication indicating for each requirement the frequency, notified or selected, and those basic characteristics permitting to easily identify the requirement concerned. At the same time the Board shall send to each administration the detailed results of calculations relating to its requirements indicating for each requirement a reference to the requirements with which it is incompatible. [This communication shall also indicate for each of the administrations concerned in the incompatibility, the number of their requirements having in any band one or more quadrants common with the requirement concerned.]

[Box 14]

10. Administrations shall endeavour to resolve the incompatibilities either bilaterally or multi-laterally. If required the assistance of the Board may be requested. Changes in the transmission characteristics resulting from these consultations or decided unilaterally by the administration with the view to improve the situation shall be notified to the Board as soon as possible but not latter than [] weeks following the date of publication of the draft seasonal schedule.

[Boxes
15,16]

11. Administrations may at the same time notify additional requirements which shall be taken into account in the preparation of the seasonal schedules.

[Box 17]

12. Using the information received in application of [10] the Board apply the calculation process described in [8] and shall prepare for publication the seasonal schedule to be published [x] months before the beginning of the season.

DRAFTING GROUP 6-1

HFBC REQUIREMENTS FILE

1. Administrations shall submit to the IFRB, their operational and projected broadcasting requirements in the bands allocated exclusively to the broadcasting service between 5 950 and 26 100 kHz. These requirements shall be entered in the HFBC requirements file¹ which shall contain:

- requirements which are to be used within the next [] years;
- all requirements taken into account in the preparation of a seasonal schedule or during its operation;
- requirements used during the preceding [5] year period.

2. An entry in the HFBC requirements file shall be defined as a requirement indicated by an administration to provide a broadcasting service at specified periods of time to a specified reception area from a particular transmitting station.

3. Each requirement listed in the HFBC requirements file shall contain at least the basic characteristics listed in Appendix 2 together with the indication of the season(s) in which the requirement was or will be used.

4. Each seasonal schedule to be established in accordance with [] shall cover one of the seasonal propagation periods indicated below. The month shown in the parentheses indicates the month to be used for the propagation prediction:

- Season D - November - February (January);
- Season M - March - April (April);
- Season J - May - August (July);
- Season S - September - October (October).

Each seasonal [plan or seasonal] schedule shall be implemented at 0100 UTC on the first Sunday of the season concerned.

5. Administrations shall notify the Board, using Appendix 2, of any addition, modification or deletion of a requirement in the HFBC requirements file. Additions, modifications or deletions notified to the Board for a given season shall be taken into account provided that following their examination by the Board they are considered complete.

¹ The initial establishment of the requirements file will be in accordance with Resolution [COM5/1].

6. Upon receipt of notices pursuant to paragraph 5 above, the Board shall ensure that the basic information listed in Appendix 2 is given and is correct and shall request the notifying administration to notify the correct or missing information. Following this examination the Board shall indicate those incompatibilities which can be identified without the need for detailed calculations and shall inform the administrations concerned of the results obtained together with any recommendation that may assist in avoiding this incompatibility.

7. After the end of each seasonal period, the Board shall enter into the requirements file for each requirement the frequency or frequencies used, together with any indication from administrations on the actual use of the requirement. Requirements already used shall be kept in the HFBC requirement file for a period of five years. No priority shall be derived from this history of use.

8. (See DL/18.)

J.F. BROERE
Chairman of Drafting Group 6-1

DRAFTING GROUP 6-1

HFBC REQUIREMENT FILE

1. Periodically, administrations shall submit to the IFRB, their operational and projected broadcasting requirements in the bands allocated exclusively to the broadcasting service between 5 980 and 26 100 kHz. These requirements shall be entered in the HFBC requirements file. The first requirement file shall be established in accordance with Resolution [COM5/1] which shall be the basis of the [seasonal plans in accordance with section [] and of] seasonal schedules in accordance with section []. This HFBC requirement file shall contain:

- requirements which are to be used within the next [] years;
- requirements used during the preceding [5] year period.

2. For the purposes of the seasonal schedules established in accordance with section [---] an entry in the HFBC requirement file shall be defined as a requirement indicated by an administration to provide a broadcasting service at specified periods of time to a specified reception area from a particular transmitting station.

3. Each requirement listed in the HFBC requirement file shall contain at least the basic characteristics listed in Appendix 2 together with the indication of the season(s) in which the requirement was or will be used.

4. Each [seasonal plan to be established in accordance with section [] and] seasonal schedule to be established in accordance with [] shall cover one of the seasonal propagation periods indicated below. The month shown in the parentheses indicates the month to be used for the propagation prediction:

- Season D - November - February (January);
- Season M - March - April (April);
- Season J - May - August (July);
- Season S - September - October (October).

Each seasonal [plan or seasonal] schedule shall be implemented at 0100 UTC on the first Sunday of the season concerned.

5. Administrations shall notify the Board, using Appendix 2, of any addition, modification or deletion of a requirement in the HFBC requirement file. Such notifications shall reach the Board not more than [X] months or less than 12 months before the date of commencement of the season concerned. Additions and modifications notified to the Board before the date limit fixed for the season concerned shall be taken into account provided that following their examination by the Board they are considered complete.

6. Upon receipt of notices relating to additions or modifications to the HFBC requirement file the Board shall ensure that the basic information listed in Appendix 2 is given and is correct and shall request the notifying administration to notify the correct or missing information. Following this examination the Board shall, without having recourse to detailed calculations, identify apparent incompatibilities. An example of such a case is of two transmissions to the same area with the same preset frequency and shall inform the administrations concerned of the results obtained together with any recommendation that may assist in avoiding this incompatibility.

7. After the end of each seasonal period, the Board shall enter into the requirements file for each requirement the frequency or frequencies used, together with any indication from administrations on the actual use of the requirement. [It shall also indicate, when possible, those requirements which have been confirmed for use in accordance with [-] and [-] but were not actually used.] Requirements already used shall be kept in the HFBC requirement file for a period of five years. No priority shall be derived from this history of use.

8. When a broadcasting requirement is taken out of service for one or more seasons, because the transmission facility has been rendered inoperative, the administration concerned shall notify the Board accordingly. This information shall be entered in the HFBC requirement file.

J.F. BROERE

Chairman of Drafting Group 6-1

DRAFTING GROUP 6-1

PARAGRAPH 8 OF DOCUMENT DL/17(REV.1)

An administration shall inform the Board when a broadcasting requirement is temporarily withdrawn from service, due to a natural disaster or other calamitous events, for a period of time [not exceeding ...]. The Board shall identify this requirement in the requirements file by an appropriate symbol. When the administration concerned informs the Board that the requirement can again be brought into service and requests the removal of the symbol, the Board shall act in conformity with the request. If a request for the removal of the symbol is not received by the Board within the period of [.....] referred to above, the requirement shall be deleted from the requirements file.

J.F BROERE
Chairman of Drafting Group 6-1

DRAFTING GROUP 6-1

DRAFT OF PARAGRAPH 8 OF DL/17

When a broadcasting requirement is temporarily withdrawn from service, due to a natural disaster or other calamitous events, for a period of time [not exceeding ...], and the administration concerned wishes the reinstatement of the requirement in the requirements file after this period, it shall inform the Board accordingly. The Board shall identify this requirement in the requirements file by an appropriate symbol and take appropriate action when the request for reinstatement of the requirement is received.

J.F. BROERE
Chairman of Drafting Group 6-1

DRAFTING GROUP 6-2

DRAFT PROCEDURES RELATIVE TO THE HFBC PLANNING SYSTEM: OUTLINE

1. Establishment of Requirements File
 - 1.1 Submissions
 - 1.2 Modifications and late submissions
2. Establishment of Seasonal File
 - 2.1 Modifications
3. Propagation analysis; determination of appropriate bands
 - 3.1 Equipment constraints (preset, preferred frequencies)
 - 3.2 Frequency continuity
4. Frequency assignment
 - 4.1 Preferred frequencies
 - 4.2 Preset frequencies
 - 4.3 Frequency continuity
 - 4.4 Congestion and its Resolutions
 - 4.4.1 GIR
 - 4.4.2 Reduction of protection ratio
 - 4.4.3 Suspension rules
 - 4.4.4 Treatment of suspended requirements
 - 4.4.5 Consultation procedure
5. Production of tentative plan
 - 5.1 Satisfied requirements
 - 5.1.1 Performance assessment
 - 5.2 Non-satisfied requirements.

S.M. CHALLO
Chairman of Drafting Group 6-2

COMMITTEE 1

DRAFT STRUCTURE OF THE FINAL ACTS
HFBC-87

1. PREAMBLE AND CONCLUDING PARAGRAPH

2. ANNEX

- Partial revision of the Radio Regulations, including appendices and Resolutions/Recommendations
- Article [X]
 - X.1 Requirements file
 - X.2 HFBC planning method
 - X.3 Improved [former Article 17] procedure
- Article 69 - Entry into force of the Radio Regulations
- Any other articles

-
- Appendix 2
 - Appendix 7
 - Any other appendices
-

- Amended versions of existing Resolutions and Recommendations

3. RESOLUTIONS AND RECOMMENDATIONS ADOPTED BY HFBC-87

4. FINAL PROTOCOL (to be published separately)

Pro. mem.: Texts to be inserted in IFRB Technical Standards.

DRAFTING GROUP 6-1

DRAFT

FIRST REPORT OF DRAFTING GROUP 6-1 TO COMMITTEE 6

Drafting Group 6-1 is composed of the representatives of the following delegations:

ALG, B, CAN, CHN, CLM, D, F, G, IND, URS, USA.

The IFRB also participated.

In the light of the guidelines provided by Committee 5 for improvement in the existing provisions in Article 17 of the Radio Regulations (Document 177), the Drafting Group has drafted the required regulatory provisions which are attached as annex.

These procedures have been drafted on the assumption that they will apply to all the unplanned HFBC bands.

It is understood that Drafting Group 6-2 will draft provisions for the planned HFBC bands.

It is foreseen that the drafts of the texts relating to the requirement file resulting from Drafting Groups 6-1 and 6-2 will be combined.

In conformity with the note from the Chairman of Committee 5 to the Chairman of Committee 6, as reflected in Document 177, square brackets have been placed around paragraphs 10, 11 and 12 of section [].

Subject to the results of the Conference with regard to the compromise "package", Algeria expressed a general reservation regarding the results of Drafting Group 6-1.

Algeria furthermore requested that paragraph 2bis of section [] be placed between square brackets to indicate that options other than the two appearing in the text of the paragraph could be considered.

The United States, supported by Canada, expressed reservations with regard to the deletion of the following sentence of paragraph 9 of the section HFBC requirements file:

"It shall also indicate, when possible those requirements which have been confirmed for use in accordance with [-] and [-] but were not actually used."

With regard to paragraph 3 of section [], some concern was expressed on the cost that may result from the distribution of the results of calculations regarding field strength at each test point.

J.F. BROERE
Chairman of Drafting Group 6-1

DRAFTING GROUP 6-2

DRAFT*

SECTION [3] PROCEDURES RELATING TO THE HFBC PLANNING SYSTEM

[1. The provisions of this section apply to the broadcasting service in the bands [].]

2. Periodically, administrations shall confirm to the IFRB which of their requirements appearing in the HFBC requirements file are to be used in a given season. Administrations may also notify additions or modifications to, or deletions from, the HFBC requirements file. When the Board finds that the information submitted by the administration is in conformity with Appendix 2, it shall update the seasonal file accordingly.

3. The closure date for the receipt of the information referred to in [2] is set by the Board. The Board shall gradually reduce the time period between the closure date and the start of the season to the minimum practicable.

If, in spite of reminders by the Board, no reply is received from an administration by the closure date set by the Board, the Board shall consider that the requirements appearing in the requirements file for the season under consideration are [confirmed and that the requirements without an indication of a frequency shall have the frequencies selected by the Board]/[considered as not confirmed and therefore not included in the seasonal file].

4. The IFRB shall calculate the field strength [at each test point] and the basic broadcasting reliability (BBR) in each of these bands and shall identify for each requirement the appropriate bands. In so doing account shall also be taken of the need to ensure a continuity in the frequency usage as indicated in [-].

5. The IFRB shall, on the basis of the above calculations, apply the planning method contained in [Appendix -] from which the following results are derived for each hour/band:

- a) a list of resolved requirements that shall be entered in the tentative plan including:
 - requirements with the protection ratio greater than or equal to 17 dB;
 - requirements with protection ratio less than 17 dB.
Consultation shall be undertaken with administrations which have indicated in their submissions a desire for consultation;

* Reservations by the United Kingdom.

- b) a list of the requirements that could not be entered into the tentative plan as a result of a) above which need to be reviewed for their possible entry in the tentative plan following the consultations of the administrations concerned.

6. For those administrations wishing to be consulted and having requirements in the list of [5 a) second indent] the Board will consult the administration concerned to see if it wishes to have the requirement in the tentative plan with the characteristics notified and the resulting protection ratio criteria.

7. For those administrations wishing to be consulted and having requirements in the list of [5 a) second indent] and who have indicated that they do not wish their requirements to be inserted in the tentative file under the specified conditions, the Board shall transfer those requirements to the list of [5 b)].

8. The Board shall send to each administration having requirements in the list of [5 b)] the results of its calculations. The Board shall also request administrations to submit any possible modifications to their requirements within a period of [6] weeks.

9. Upon receipt of the information referred to in [8] administrations shall reconsider their requirements and shall submit to the Board their proposals to modify their requirements.

If, in spite of reminders communicated by telex to the administrations two weeks prior to the deadline, no reply is received within the time limit, the Board will attempt to insert these requirements in the tentative plan in accordance with [12].

10. Any administration may submit requirements after the closure date and before the date referred to in [9].

11. The Board shall advise all administrations of the time limit indicated in [9].

12. Following the receipt of the information received in accordance with [9 and 10], the Board shall process these requirements and shall attempt to insert them in the tentative plans following the steps indicated in [Appendix -] without affecting* those requirements already entered in the tentative plan.

13. All requirements which could not be inserted following the application of [12] above will not be inserted in the tentative plan and the administrations will be informed accordingly.**

* The criteria to determine whether a requirement is adversely affected are to be found in [Appendix -].

** Reservation by the United States of America.

14. Administrations who so wish may request the Board to select alternative frequencies for their requirements. The Board shall attempt to select alternative frequencies without affecting the requirements appearing in the Plan. If the Board receives no comment from administrations following the publication of the tentative plan, it shall consider that the frequencies indicated in the seasonal plan will be assigned by administrations to their stations.

[Note 1 - Suspension Rules N1, N2 and N3 shall not apply to national requirements.]

[Note 2 - All rules shall only apply to requirements above an equal minimum number of requirement hours that should be satisfied for each administration on an equal basis.]

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Chairman of Drafting Group 6-2

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SECTION [3] PROCEDURES RELATING TO THE HFBC PLANNING SYSTEM

[1. The provisions of this section apply to the broadcasting service in the bands [].]

2. Periodically, administrations shall confirm to the IFRB which of their requirements appearing in the HFBC requirements file are to be used in a given season. Administrations may also notify additions or modifications to, or deletions from, the HFBC requirements file. When the Board finds that the information submitted by the administration is in conformity with Appendix 2, it shall update the seasonal file accordingly.

3. The closure date for the receipt of the information referred to in [2] is set by the Board. The Board shall gradually reduce the time period between the closure date and the start of the season to the minimum practicable.

If, in spite of reminders by the Board, no reply is received from an administration by the closure date set by the Board, the Board shall consider that the requirements appearing in the requirements file for the season under consideration are [confirmed and that the requirements without an indication of a frequency shall have the frequencies selected by the Board]/[considered as not confirmed and therefore not included in the seasonal file].

4. The IFRB shall calculate the field strength [at each test point] and the basic broadcasting reliability (BBR) in each of these bands and shall identify for each requirement the appropriate bands. In so doing account shall also be taken of the need to ensure a continuity in the frequency usage as indicated in [-].

5. The IFRB shall, on the basis of the above calculations, apply the planning method contained in [Appendix -] from which the following results are derived for each hour/band:

- a) a list of resolved requirements that shall be entered in the tentative plan including:
 - requirements with the protection ratio greater than or equal to 17 dB;
 - requirements with protection ratio less than 17 dB. Consultation shall be undertaken with administrations which have indicated in their submissions a desire for consultation;

* Reservations by the United Kingdom.

- b) a list of the requirements that would not be entered into the tentative plan as a result of a) above need to be reviewed for their possible entry in the tentative plan following the consultations of the administrations concerned.

6. For those administrations wishing to be consulted and having requirements in the list of [5 a) second indent] the Board will consult the administration concerned to see if it wishes to have the requirement in the tentative plan with the characteristics notified and the resulting protection ratio criteria.

7. For those administrations wishing to be consulted and having requirements in the list of [5 a) second indent] and who have indicated that they do not wish their requirements to be inserted in the tentative file under the specified conditions, the Board shall transfer those requirements to the list of [5 b)].

8. The Board shall send to each administration with requirements in the list of [5 b)] the results of its calculations. The Board shall also request administrations to submit any possible modifications to their requirements within a period of [6] weeks.

9. Upon receipt of the information referred to in [5 b)] administrations shall reconsider their requirements and take any steps that they may consider appropriate.

If no reply is received within the time limit, the Board will attempt to insert these requirements in the tentative plan in accordance with [11].

10. Administrations may submit additional requirements after the closure date and before the date referred to in [9].

11. Following the receipt of the information received in accordance with [9 and 10], the Board shall process these requirements and shall attempt to insert them in the tentative plans following the steps indicated in [Appendix -] without affecting those requirements already entered in the tentative plan.

12. All requirements which could not be inserted following the application of [10] above will not be inserted in the tentative plan and the administrations will be informed accordingly.*

* Reservation by the United States of America.

13. Administrations who so wish may request the Board to select alternative frequencies for their requirements. The Board shall attempt to select alternative frequencies without affecting the requirements appearing in the Plan. If the Board receives no comment from administrations following the publication of the tentative plan, it shall consider that the frequencies indicated in the seasonal plan will be assigned by administrations to their stations.

[Note 1 - Suspension Rules N1, N2 and N3 shall not apply to national requirements.]

[Note 2 - All rules shall only apply to requirements above an equal minimum number of requirement hours that should be satisfied for each administration on an equal basis.]

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SECTION [3] PROCEDURES RELATING TO THE HFBC PLANNING SYSTEM

[1. The provisions of this section apply to the broadcasting service in the bands [].]

2. Periodically, administrations shall confirm to the IFRB which of their requirements appearing in the HFBC requirements file are to be used in a given season. Administrations may also notify additions or modifications to, or deletions from, the HFBC requirements file. When the Board finds that the information submitted by the administration is in conformity with Appendix 2, it shall update the seasonal file accordingly.

3. The closure date for the receipt of the information referred to in [2] is set by the Board. The Board shall gradually reduce the time period between the closure date and the start of the season to the minimum practicable.

If, in spite of reminders by the Board, no reply is received from an administration by the closure date set by the Board, the Board shall consider that the requirements appearing in the requirements file for the season under consideration are [confirmed and that the requirements without an indication of a frequency shall have the frequencies selected by the Board]/[considered as not confirmed and therefore not included in the seasonal file].

4. The IFRB shall calculate the field strength [at each test point] and the basic broadcasting reliability (BBR) in each of these bands and shall identify for each requirement the [number of] appropriate bands. In so doing account shall be taken of the need to ensure a continuity in the frequency usage as indicated in [-].

5. The IFRB shall, on the basis of these calculations, apply the planning method contained in [Appendix -] from which the following results are derived for each hour/band:

- a) a list of resolved requirements that shall be entered in the tentative plan including:
 - requirements with the protection ratio greater than or equal to 17 dB;
 - requirements with protection ratio less than 17 dB. Consultation shall be undertaken with administrations which have indicated in their submissions a desire for consultation;

- b) a list of the requirements that need to be reviewed for their possible entry in the tentative plan following the consultations of the administrations concerned and the application of paragraph [].

6. Upon receipt of the information referred to in [5] administrations shall reconsider their requirements and take any steps that they may consider appropriate and which would not cause a drastic change in the planning configuration or result in suspension of any requirement identified in 5a) above or result in any of these requirements being adversely affected. Administrations shall, within a period of 45 days from the date [.....] submit to the Board the modifications to their requirements.

If, in spite of reminders, no reply is received within the time limit, the Board will consider that these requirements are not to be further processed.

7. Administrations may submit additional requirements after the closure date and before the date referred to in [6].

8. Following the receipt of the information received in accordance with [6 and 7], the Board shall process these requirements and shall attempt to insert them in the tentative plans following the steps indicated in [Appendix -] without affecting those requirements already entered in the tentative plan.

9. All requirements which could not be inserted following the application of [7] above will not be inserted in the tentative plan and the administrations will be informed accordingly.

10. Administrations who so wish may request the Board to select alternative frequencies for their requirements. The Board shall attempt to select alternative frequencies without affecting the requirements appearing in the Plan. If the Board receives no comment from administrations following the publication of the tentative plan, it shall consider that the frequencies indicated in the seasonal plan will be assigned by administrations to their stations.

[Note 1 - Suspension Rules N1, N2 and N3 shall not apply to national requirements.]

[Note 2 - All rules shall only apply to requirements above an equal minimum number of requirement hours that should be satisfied for each administration on an equal basis.]

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PROCEDURES RELATIVE TO THE HFBC PLANNING SYSTEM

1. Periodically, administrations shall confirm to the IFRB which of their requirements appearing in the HFBC requirements file are to be used in a given season. Administrations may also notify additions and modifications to, or deletions from, the HFBC requirements file.
2. The closure date for the receipt of the information referred to in [1] is set by the Board in order to permit the advance period required for the establishment of the seasonal plan to be reduced gradually to the minimum practicable.
3. The IFRB shall calculate the field strength [at each test point] and the basic broadcasting reliability (BBR) in each of these bands and shall identify for each requirement its appropriate bands. In so doing account shall be taken of the need to ensure a continuity in the frequency usage as indicated in [-].
4. The IFRB shall, on the basis of these calculations, apply the planning steps indicated in [Appendix -] from which the following results are derived for each hour/band:
 - a) a list of requirements that shall be entered in the seasonal plan;
 - b) a list of requirements with protection criteria lower than the limit used for the above list which shall be entered in the seasonal plan; administrations that so wish it may be consulted before the entry is made;
 - c) a list of the requirements that need to be reviewed for their possible entry in the seasonal plan following the consultations of the administrations concerned.
5. Administrations having requirements in list [4c)] shall be consulted and requested to review their requirements for a possible:
 - suppression, or
 - reduction of their period of transmission, or
 - reduction of their power, or
 - reduction of their service area, or

- other modifications that would not cause a drastic change in the planning configuration or result in suspension of any requirement included in the "file of resolved requirements" or result in any of these requirements being adversely affected.

The Board shall provide them with results of calculations that may permit them to reconsider the situation.

6. Upon receipt of the information referred to in [5] administrations shall reconsider their requirements and take any steps that they may consider appropriate to improve the situation and shall, within a period of 45 days from the date [.....] inform the Board of the modifications they intend to make to their requirements.

7. Following the receipt of the information received in accordance with [6], the Board shall process requirements appearing in the list referred to in [4c)] as it may be modified by the administrations and shall attempt to reinsert them in the seasonal plans following the steps indicated in [Appendix -] without affecting those requirements already entered in the seasonal plan.

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HFBC (2)

INTERNATIONAL TELECOMMUNICATION UNION
**WARC FOR THE PLANNING OF THE HF BANDS
ALLOCATED TO THE BROADCASTING SERVICE**
SECOND SESSION, GENEVA, February-March 1987

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DRAFTING GROUP 6-2

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APPENDIX [-]

**RULES APPLICABLE TO THE PLANNING
OF THE BROADCASTING SERVICE IN THE
HF BANDS EXCLUSIVELY ALLOCATED TO THIS SERVICE**

I. INTRODUCTION

I.1 The planning of the HFBC in accordance with sections [--] and [--] of Article 17 shall use the criteria and method contained in this appendix.

I.2 The application of this appendix shall ensure the maximum possible utilization of all available channels.

II. DEFINITION

II.1 Appropriate frequency band

The appropriate band for a requirement, is the band which will ensure the continuity of use of the same frequency during the longest possible period of operation, with the best possible values of BBR, taking account of propagation conditions, operational limitations and equipment availability and limitations.

II.2 Circuit reliability

Probability for a circuit that a specified performance is achieved at a single frequency.

II.3 Reception reliability

Probability for a receiver that a specified performance is achieved, taking into account all transmitted frequencies.

II.4 Broadcast reliability

Probability for a service area that a specified performance is achieved, taking into account all transmitted frequencies.

II.5 Percentile

The X percentile (X%) value for a given set of values is defined by the following conditions:

- 1) the X% value is a member of the set of values;
- 2) the X% value is that value which is equal to or exceeded by at least X per cent of the members in the set;
- 3) the X% value is the largest value satisfying conditions 1 and 2.

Note 1 - In the above terms, circuit means a one-way transmission from one transmitter to one receiving location.

Note 2 - The term "reliability" is qualified by the word "basic" when the background consists of noise alone and by "overall" when the background consists of both noise and interference.

Note 3 - When the background consists of both noise and interference, the term "reliability" may relate either to the effects of a single interferer or to multiple interference from co-channel and adjacent-channel transmissions.

Note 4 - The specified performance is expressed by a given value of signal-to-noise ratio or signal-to-(noise and interference) ratio.

Note 5 - The term "reliability" relates to one or more periods of time, which shall be stated.

II.6 Minimum usable field strength (E_{\min})¹

Minimum value of the field strength necessary to permit a desired reception quality, in specified receiving conditions, in the presence of natural and man-made noise, but in the absence of interference from other transmitters.

II.7 Usable field strength (E_u)¹

Minimum value of the field strength necessary to permit a desired reception quality, in specified receiving conditions, in the presence of noise and interference, either in an existing situation or as determined by agreements or frequency plans.

[III. HFBC PLANNING SYSTEM]

III.1 Planning constraints

III.1.1 Preset frequency

- a) When an administration indicates that its facilities can operate only on a limited number of fixed specified frequencies, the planning method shall take them into account as indicated in III.3.10.

III.1.2 Limited use of the frequency bands

- a) When an administration indicates that its facilities can operate only in a given frequency band, only frequencies from that band shall be included in the plan.
- b) When an administration indicates a preferred frequency band, the system shall attempt to select a frequency from this band. If this is impossible, frequencies from the nearest appropriate band shall be tried. Otherwise the system will select frequencies from the appropriate band, taking into account the equipment constraints referred to in paragraph 4.2.3.4.3.1.

¹ The terms "minimum usable field strength" and "usable field strength" refer to the specified field strength values which a wanted signal must have in order to provide the required reception quality.

In determining whether these requirements are met, the median value (50%) of a fading signal should be used.

III.1.3 Power

- a) When an administration indicates only a single power value due to equipment constraints, it shall be used in the planning process.
- b) When an administration indicates several possible power values, the appropriate value shall be used to achieve the basic circuit reliability, and a single power value shall be determined for the duration of the emission.

III.1.4 Antenna

When an administration indicates that its antenna can operate only in a given frequency band, only frequencies from that band shall be included in the plan.

III.1.5 Preferred frequency

In accordance with the planning principles and without imposing constraints on planning, the following provisions shall be applied in the seasonal plans:

- 1) administrations may indicate the preferred frequency;
- 2) during the planning process, attempts shall be made to include the preferred frequency in the plan;
- 3) if this is impossible, attempts shall be made to select a frequency in the same band.

Otherwise, the automated system shall be used to select the appropriate frequencies in such a way as to accommodate the maximum number of requirements, taking into account the constraints imposed by the technical characteristics of the equipment.

III.2 Frequency continuity

III.2.1 Introduction

Continuity in the use of a frequency is an important matter for both the broadcaster and the listener, it is a characteristic inherent in the broadcasting of a programme. In addition, limitations imposed by the technical characteristics of the means of transmission available to some administrations will impose mandatory requirements for frequency continuity. The desirable aim is that changes in frequency should be limited to those necessitated by changes in propagation conditions. The rules for applying frequency continuity are given in paragraph 4 below.

III.2.2 Definitions

III.2.2.1 Intra-seasonal

III.2.2.1.1 Type 1 continuity

Continuity of use of the same frequency within an hour or from one hour to another consecutive hour within a requirement.

III.2.2.1.2 Type 2 continuity

Continuity of use of the same frequency in the same season when passing from one requirement to another or one time block to another.

III.2.2.2 Inter-seasonal

III.2.2.2.1 Type 3 continuity

Continuity of use of the same frequency by the same requirement in two consecutive seasons.

III.2.2.2.2 Type 4 continuity

Continuity of use of the same frequency by the same requirement in two consecutive equinox seasons.

III.2.2.2.3 Type 5 continuity

Continuity of use of the same frequency by the same requirement in the same season of two consecutive years.

III.2.3 Relationship between frequency continuity and appropriate band(s)

III.2.3.1 For the case where a single frequency is sufficient to provide BBR equal to or greater than the agreed reference value, the appropriate band is to be established by the HFBC Planning System by taking account, amongst other things, of the rules set out in section 4 regarding the maintenance of the maximum frequency continuity within the limits of the agreed reference value for BBR 80%.

However, an administration may choose extended frequency continuity at the expense of BBR and shall indicate the lower value of BBR to be used in this event. As, in this portion of the requirement, the BBR falls below the above-mentioned reference value the second and/or third frequencies are afforded only when the application of frequency continuity would not result in a number of additional frequencies greater than would be necessary with operation in the appropriate bands.

III.2.3.2 In the case where BBR obtainable by use of a single frequency is less than 80% continuity of use of the first frequency or the single operating frequency will be provided within the lower limits of BBR indicated by the administration.

When the administration indicates that it has the capability to operate on more than one frequency the use of this lower value of BBR shall not lead to the use of a third frequency.

III.2.3.3 When the requirement under consideration is eligible to use a second or third frequency according to the procedures established in section 3.8.2 of the Report of the First Session, frequency continuity shall also be applied to the second (and third) frequency in the same manner as for the first frequency.

III.2.3.4 When the type 2 continuity is requested (from one requirement to another), the HFBC Planning System shall identify the appropriate band separately for each of the requirements concerned. The frequency assigned to the first of these requirements, shall be assigned to another related requirement if it is in its appropriate band.

III.2.4 Application of continuity

III.2.4.1 Type 1 continuity shall be applied automatically to all requirements under the conditions set out in section 3 above.

III.2.4.2 At the request of an administration, type 2 continuity shall be applied when this corresponds to equipment constraints. However, in other cases, type 2 continuity could be applied to the extent possible. Paragraph 3.4 above applies to type 2 continuity.

III.2.4.3 Continuity of types 3, 4 and 5 shall be applied to the extent possible when requested by the administration.

III.3 Planning steps

III.3.1 The planning method is based on the concept of the Maximum Group of Incompatible Requirements (MGIR) which is the largest set of requirements in a given hour/band which are incompatible one with the others irrespective of their respective service area.

III.3.2 The planning process consists in identifying in each hour/band the MGIR and compare it to the number of channels available in the band under consideration with the view to evaluate congestion of the band.

III.3.3 When in a given hour/band no congestion is found the requirements concerned shall be entered in a file of requirements (file of resolved cases) for which a frequency to be assigned shall be identified.

III.3.4 When a congestion in a given hour/band is identified by means of a MGIR, the requirements included in the MGIR will have their protection ratio reduced by a 3 dB value with the view to resolve the congestion. If, following this action, the congestion is not resolved, another MGIR is identified and a new attempt is made with the view to resolve the congestion. The process is repeated until it will not be possible to find a solution with a protection ratio [of 17 dB]. Requirements appearing in an hour/band that can be resolved in this manner are entered in the "file of resolved cases".

III.3.5 When following the action taken in accordance with [3], a new MGIR is identified, requirements of the same administration in the band under consideration with the same service area are identified. The planning process then suspends for further consideration a number of such requirements in order to resolve the congestion. With the view to identify the requirements to be first suspended, administrations having requirements in the MGIR are sorted in the decreasing order of the number of such requirements. The process is repeated as many times as necessary until the congestion is resolved or the number of such requirements becomes equal to one per administration. Requirements appearing in an hour/band that can be resolved in this manner are entered in the "file of resolved cases".

III.3.6 Following the application of [4], all requirements of a given administration appearing in a MGIR have different service areas, some of them having common quadrants. More suspensions may be required with the view to resolve the congestion; they shall be made by having recourse to the identification of the quadrant which appear very often in the requirements of a given administration in the hour/band under consideration. Once this quadrant is identified, administrations having it in their requirements are sorted in a decreasing order with the view to suspend requirements containing the quadrant which appear very often. The MGIR is verified and the process is repeated as many times as possible until the congestion is resolved or the number of such requirements become one for all administrations concerned. This suspension rule

shall be applied in such a way that any quadrant notified by an administration in the band/hour under consideration appear at least once in the plan. Requirements appearing in an hour/band that can be resolved in this manner are entered in the "file of resolved cases".

III.3.7 If the congestion is not resolved following the application of [5] the same rule is applied taking account of the requirements in all the bands with the view to identify the requirements containing the quadrant that appear very often. Requirements appearing in an hour/band that can be resolved in this manner are entered in the "file of resolved cases".

III.3.8 If the congestion is not resolved following the application of [6], the requirements appearing in the MGIR are verified with the view to identify those which appear in two or three bands due to their low BBR. Such requirements may be suspended if they are present in another band with a better BBR. Requirements appearing in an hour/band that can be resolved in this manner are entered in the "file of resolved cases".

III.3.9 If the congestion is not resolved following the application of [8], the requirements included in the MGIR shall have their protection ratio reduced by 3 dB. Following which action another MGIR is identified, and the 3 dB reduction shall be applied to requirements appearing in the new MGIR not yet affected by this reduction. The process is repeated until all attempts to resolve the congestion by a 3 dB reduction are exhausted. Additional reductions of the protection ratio by steps of 3 dB are made in the same manner until all the remaining requirements are entered in the "file of resolved cases". However, all requirements which, as a result of the previous steps, have not been suspended, have been placed in a "file of resolved requirements". This file contains, therefore, all the requirements which will always enter in the "Tentative Plan". This will be the case of requirements with a protection ratio less than [17 dB]. However, some of them will be the subject of consultation with administrations before their entry in this file.

III.3.10 Following the application of the above steps for the resolution of incompatibilities, frequencies shall be identified for its requirements appearing in the file of "resolved requirements". In this process the following shall be applied:

- requirements with a single preset frequency shall be assigned this frequency;
- requirements with more than one preset frequency shall be assigned that frequency that has the least degree of incompatibility;
- if two requirements have the same preset frequency, which after analysis results in an incompatibility, the case is referred to the administration(s) concerned;
- requirements with a preferred frequency, attempts shall be made to assign them this frequency.

III.3.11 Requirements which have been suspended following the application of [4], [5], [6], [7] are reinserted in the plan on the condition that they do not adversely affect the requirements already entered in the plan. In applying this provision a requirement already entered in the plan with a protection ratio exceeding [17 dB] is deemed to be adversely affected if its protection ratio is reduced below [17 dB]. A requirement already entered in the plan with a protection ratio lower than [17 dB] is deemed to be adversely affected if its protection ratio is reduced by more than [0.1 dB], [1 dB].

III.3.12 Requirements received by the IFRB after the beginning of the planning exercise [after the deadline for submission of requirements] are entered in the plan under the conditions stipulated in [9].

IV. ASSESSMENT OF PERFORMANCE CRITERIA

IV.1 Reliability¹

IV.1.1 Calculation of basic circuit reliability (BCR)

The process for calculating basic circuit reliability is indicated in Table C-2. The median value of field strength for the wanted signal at step (1) is determined by the field strength prediction method. The upper and lower decile values (2) through (5) are also determined, taking account of long-term (day-to-day) and short-term (within the hour) fading. The combined upper and lower deciles of the wanted signal are then calculated in steps (6) and (7) in order to derive the signal levels exceeded for 10% and 90% of the time at steps (8) and (9).

The wanted signal probability distribution, assumed to be log-normal, is illustrated in Figure C-1 which indicates the signal level (in decibels) versus the probability that the value of signal level is exceeded (plotted on a normal probability scale). This distribution is used to obtain the basic circuit reliability (11), which is the value of probability corresponding to the minimum usable field strength (10).

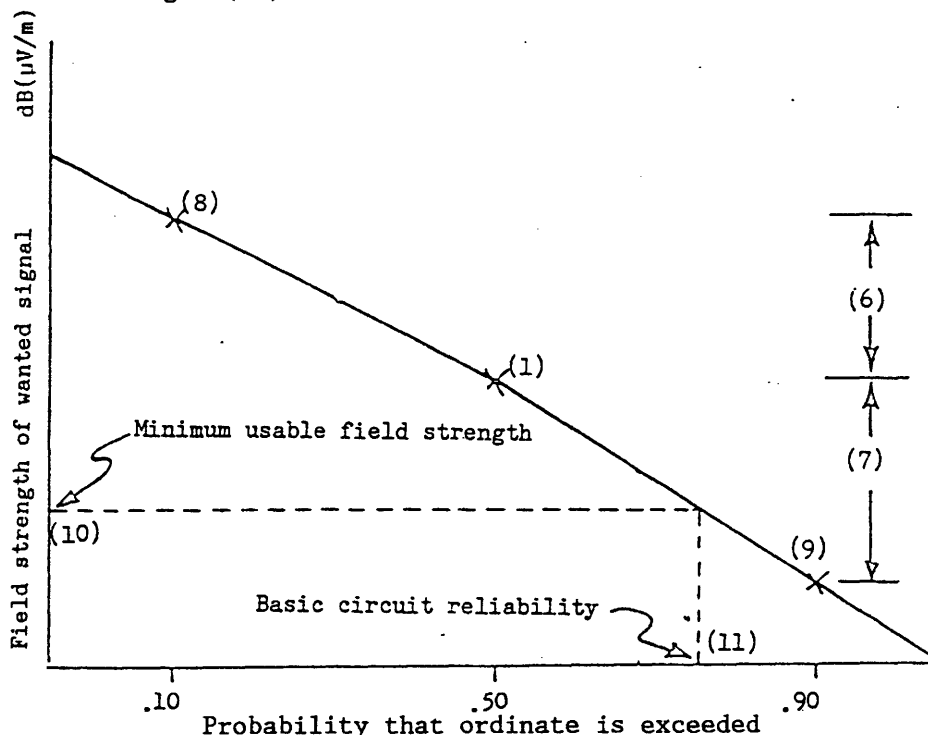


FIGURE C-1

Parameters used to compute basic circuit reliability

(Figures appearing in brackets refer to step numbers as shown in Table C-2.)

¹ Abbreviations of the English terms are used in the formulae throughout the three languages in order to facilitate the practical implementation of the methods described in this section.

TABLE C-2

Parameters used to compute basic circuit reliability

| STEP | PARAMETER | DESCRIPTION | SOURCE |
|------|------------------------------|------------------------------------------------------|-------------------------------|
| (1) | $E_w(50)$ dB(μ V/m) | Median field strength of wanted signal ¹ | IFRB Technical Standards |
| (2) | $D_U(S)$ dB | Upper decile of slow fading signal (day-to-day) | IFRB Technical Standards |
| (3) | $D_L(S)$ dB | Lower decile of slow fading signal (day-to-day) | IFRB Technical Standards |
| (4) | $D_U(F)$ dB | Upper decile of fast fading signal (within the hour) | IFRB Technical Standards |
| (5) | $D_L(F)$ dB | Lower decile of fast fading signal (within the hour) | IFRB Technical Standards |
| (6) | $D_U(E_w)$ dB | Upper decile of wanted signal | $\sqrt{D_U(S)^2 + D_U(F)^2}$ |
| (7) | $D_L(E_w)$ dB | Lower decile of wanted signal | $\sqrt{D_L(S)^2 + D_L(F)^2}$ |
| (8) | $E_w(10)$ dB (μ V/m) | Wanted signal exceeded 10% of the time | $E_w + D_U(E_w)$ |
| (9) | $E_w(90)$ dB (μ V/m) | Wanted signal exceeded 90% of the time | $E_w - D_L(E_w)$ |
| (10) | E_{min} dB (μ V/m) | Minimum usable field strength | IFRB Technical Standards |
| (11) | BCR | Basic circuit reliability | Expression (1), Figure C-1 |

Note 1 - In the calculation of BCR at the test points within the required service areas of synchronized transmitters, the field strength value to be used is calculated by the method of root sum square of the contributing field strengths in volts/metre.

The basic circuit reliability is given by the expression:

$$BCR = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\gamma} \exp(-\tau^2/2) d\tau \quad (1)$$

when $E_W \geq E_{min}$

$$\gamma = \frac{E_W - E_{min}}{\sigma_L}$$

$$\sigma_L = D_L(E_W)/1.282$$

when $E_W < E_{min}$

$$\gamma = \frac{E_W - E_{min}}{\sigma_U}$$

$$\sigma_U = D_U(E_W)/1.282$$

IV.1.2 Calculation of [overall/interference] circuit reliability [(OCR) (ICR)]

The method is outlined in Table C-3. In step (1), the median wanted signal level is computed by the signal strength prediction method.

In step (2), the median field strength levels (E_i) of each interfering source are obtained from the prediction method. In step (3), for a single source of interference the predicted median field strength is used; for multiple sources of interference the median field strength is calculated as follows: the field strengths of the interfering signals E_i are listed in decreasing order. Successive r.s.s. additions of the field strengths E_i are computed, stopping when the difference between the resultant field strength and the next field strength is greater than 6 dB. In step (3), the resultant field strength I is taken as the last computed value.

The values of the wanted signal and interference determined in steps (1) and (3) are combined in step (4) to derive the median signal-to-interference ratio. The 10% and 90% fading allowances are included in steps (5) and (6) in order to derive the signal-to-interference ratio exceeded for 10% and 90% of the time in steps (7) and (8).

The probability distribution for the signal-to-interference ratio may now be determined as shown in Figure C-2. The ratios are presented in decibels on a linear scale versus the probability that the value of the signal-to-interference ratio is exceeded on a normal probability scale. In Figure C-2, the value of probability corresponding to the required signal-to-interference ratio (9) is the circuit reliability in the presence of interference only (ICR). [The overall circuit reliability (OCR, step (12)) is the minimum value of either ICR (step (10)) or BCR (step (11)), whichever produces the lower value.]

The mathematical treatment of the calculation of ICR can be given in terms of the probability density distribution of the protection ratio. These functions are taken to be log normal, as is the resulting distribution of the signal-to-interference ratio.

The parameter ICR is given by the following expression:

$$ICR = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} \gamma \exp(-\tau^2/2) d\tau \quad (2)$$

when for $E_W - I \geq RSI$

$$\gamma = \frac{E_W - I - RSI}{\sigma_L}$$

$$\sigma_L = D_L(SIR)/1.282$$

and for $E_W - I < RSI$

$$\gamma = \frac{E_W - I - RSI}{\sigma_U}$$

$$\sigma_U = D_U(SIR)/1.282$$

Values of the various parameters in the above expressions are found in steps indicated below, Table C-3.

E_W step (1)

I step (3)

$D_U(SIR)$ step (5)

$D_L(SIR)$ step (6)

RSI step (9)

TABLE C-3

Parameters used to compute overall circuit reliability

| STEP | PARAMETER | DESCRIPTION | SOURCE |
|------|----------------------|----------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 1 | E_w dB(μ V/m) | Median field strength of wanted signal | IFRB Technical Standards |
| 2 | E_i dB(μ V/m) | Median field strength of interfering signals $E_1, E_2, \dots E_n$ | IFRB Technical Standards |
| 3 | I dB(μ V/m) | Resultant field strength of interference | 1) $I = 20 \log_{10} \sqrt{\sum_{i=1}^n 10^{\left(\frac{E_i + \alpha}{10}\right)}}$ |
| 4 | SIR(50)dB | Median signal to interference ratio | $E_w - I$ |
| 5 | D_U (SIR)dB | 10% fading allowance | 10 dB(<60°), 14 dB(\geq 60°)2) |
| 6 | D_L (SIR)dB | 90% fading allowance | 10 dB(<60°), 14 dB(\geq 60°)2) |
| 7 | SIR(10)dB | Subjective signal-to-interference ratio exceeded 10% of the time | SIR(50) + D_U (SIR) |
| 8 | SIR(90)dB | Subjective signal-to-interference ratio exceeded 90% of the time | SIR(50) - D_L (SIR) |
| 9 | RSI dB | Required RF protection ratio 3) | IFRB Technical Standards |
| 10 | ICR | Circuit reliability in presence of interference only (without noise) | Expression (2), Figure C-2 |
| 11 | BCR | Basic circuit reliability | Expression (1), Figure C-1 |
| 12 | OCR | Overall circuit reliability | Min(ICR, BCR) |

Note 1 - α is the appropriate relative protection ratio corresponding to the carrier frequency separation between the wanted and each unwanted signal.

Note 2 - i) If any point on that part of the great circle which passes through the transmitter and the receiver and which lies between control points located 1,000 km from each end of the path reaches a corrected geomagnetic latitude of 60° or more, the values for $\geq 60^\circ$ have to be used.

[ii) The value of 14 dB applies for overall circuit reliabilities not exceeding 80%. In other cases the value of 10 dB applies.]

- iii) These values relate to the path of the wanted signal only.
- iv) For synchronized transmissions, the fading allowance associated with the predominant wanted signal is to be used. For those conditions where the contributing wanted field strengths are equal and Note 2 i) applies to at least one of the paths, the value of 14 dB is to be used for $D_U(\text{SIR})$ and $D_L(\text{SIR})$.

Note 3 - In these calculations a single value of the co-channel protection ratio must be used.

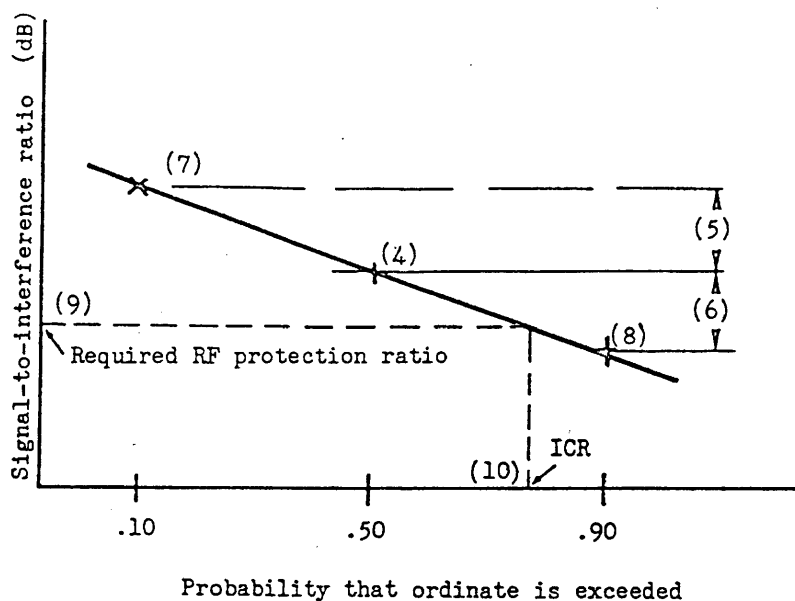


FIGURE C-2

Parameters used to compute overall circuit reliability

(Figures appearing in brackets refer to step numbers as shown in Table C-3.)

IV.1.3 Basic reception reliability (BRR)

The method for computing basic reception reliability is outlined in Table C-4. With a single frequency, basic reception reliability (BRR) is the same as the basic circuit reliability (BCR) defined in section 1.7.1.1. With multiple frequencies, the interdependence between propagation conditions at different frequencies leads to the computation method given in Table C-4. In steps (4) and (6), BCR (n) is the basic circuit reliability for frequency n, where $n = F_1, F_2$, etc. The basic reception reliability is obtained in step (2) for a single frequency, in step (4) for a set of two frequencies and in step (6) for a set of three frequencies.

IV.1.4 Overall reception reliability (ORR)

The method for computing overall reception reliability is outlined in Table C-5. With a single frequency, overall reception reliability (ORR) is the same as the overall circuit reliability (OCR) defined in section 1.7.1.2. With multiple frequencies, the interdependence between propagation conditions at different frequencies leads to the computation method given in Table C-5. In steps (4) and (6), OCR (n) is the overall circuit reliability for frequency n, where $n = F_1, F_2$, etc. The overall reception reliability is obtained in step (2) for a single frequency, in step (4) for a set of two frequencies and in step (6) for a set of three frequencies.

TABLE C-4

Basic reception reliability

The following parameters are involved:

Single-frequency operation

| STEP | PARAMETER | DESCRIPTION | SOURCE |
|------|----------------------------|--------------------------------------------------------|-----------------------|
| (1) | BCR (F ₁) % | Basic circuit reliability for frequency F ₁ | Step 11, Table C-2 |
| (2) | BRR (F ₁) % | Basic reception reliability | BCR (F ₁) |

Two-frequency operation¹

| | | | |
|-----|----------------------------------------------|--------------------------------------------------------|----------------------------------------------------------|
| (3) | BCR (F ₂) % | Basic circuit reliability for frequency F ₂ | Step 11, Table C-2 |
| (4) | BRR (F ₁) (F ₂) % | Basic reception reliability | F ₂ 1 - Π (1 - BCR(n)) n=F ₁ |

¹ The two frequencies F₁ and F₂ shall be situated in different HF bands allocated to the broadcasting service.

TABLE C-4 (continued)

Basic reception reliability

Three-frequency operation¹

| STEP | PARAMETER | DESCRIPTION | SOURCE |
|------|----------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------|
| (5) | BCR (F ₃) % | Basic circuit reliability for frequency F ₃ | Step 11, Table C-2 |
| (6) | BRR (F ₁) (F ₂) (F ₃) % | Basic reception reliability | F ₃ 1- Π (1-BCR(n)) n=F ₁ |

¹ The three frequencies F₁, F₂ and F₃ shall be situated in different HF bands allocated to the broadcasting service.

TABLE C-5

Overall reception reliability

The following parameters are involved:

Single-frequency operation

| STEP | PARAMETER | DESCRIPTION | SOURCE |
|------|----------------------------|----------------------------------------------------------|-----------------------|
| (1) | OCR (F ₁) % | Overall circuit reliability for frequency F ₁ | Step 12, Table C-3 |
| (2) | ORR (F ₁) % | Overall reception reliability | OCR (F ₁) |

Two-frequency operation¹

| | | | |
|-----|----------------------------------------------|----------------------------------------------------------|-------------------------------------------------------|
| (3) | OCR (F ₂) % | Overall circuit reliability for frequency F ₂ | Step 12, Table C-3 |
| (4) | ORR (F ₁) (F ₂) % | Overall reception reliability | F ₂ 1- Π (1-OCR(n)) n=F ₁ |

¹ The two frequencies F₁ and F₂ shall be situated in different HF bands allocated to the broadcasting service.

TABLE C-5 (continued)

Overall reception reliability

Three-frequency operation¹

| STEP | PARAMETER | DESCRIPTION | SOURCE |
|------|-------------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------------|
| (5) | OCR (F ₃) % | Overall circuit reliability for frequency F ₃ | Step 12, Table C-3 |
| (6) | ORR (F ₁) (F ₂) (F ₃) % | Overall reception reliability | F ₃ 1 - Π (1 - OCR(n)) n = F ₁ |

¹ The three frequencies F₁, F₂ and F₃ shall be situated in different HF bands allocated to the broadcasting service.

IV.1.5 Basic and [overall/interference] broadcast reliability

The determination of basic broadcast reliability involves the use of test points within the required service area. The basic broadcast reliability is an extension of the basic reception reliability concept to an area instead of a single reception point. The method for computing basic broadcast reliability is outlined in Table C-6. In step (1), the basic reception reliabilities BRR (L₁), BRR (L₂), --- BRR (L_N) are computed as described in Table C-4 at each test point L₁, L₂ --- L_N. These values are ranked in step (2) and the basic broadcast reliability is the value associated with a percentile [X] of the test points.

In a similar way, the [overall/interference] broadcast reliability is computed as described in Table C-7 and it is the value associated with a percentile [X] of the test points.

Broadcast reliability is associated with the expected performance of a broadcast service at a given hour. For periods longer than an hour, computation at one-hour intervals is required.

IV.2 Proportionally Reduced Protection (PRP)

PRP is a margin (M) by which the RF protection ratio to be applied at a test point is reduced under the following specified conditions:

- 1) the BBR < [80%], and
- 2) only one frequency band is given by the planning system, and
- 3) at the test point considered the field strength E_w is less than E_{min} and greater than or equal to $E_{min} - [Z]$.

In these conditions M is determined as: $M = E_{min} - E_w$.

In such cases the proportionally reduced protection ratio is used in the evaluation of S/I at the test point considered. For all the remaining points within the required service area, full protection as determined by the relevant protection ratio is given when $E_w \geq E_{min}$ and no protection is given when $E_w < E_{min} - [Z]$.

In cases where PRP is not applicable, full protection as determined by the relevant protection ratio is afforded when $E_w \geq E_{min}$ and no protection is afforded when $E_w < E_{min}$.

IV.3 Maximum number of frequencies required for broadcasting the same programme to the same zone

IV.3.1 Introduction

Wherever possible, only one frequency should be used to broadcast a particular programme to a given reception area. In certain special circumstances, it may be found necessary to use more than one frequency per programme, i.e.:

- over certain paths, e.g. very long paths, those passing through the auroral zone, or paths over which the MUF is changing rapidly;
- areas where the depth of the area extending outwards from the transmitter is too great to be served by a single frequency;
- when highly directional antennas are used to maintain satisfactory signal-to-noise ratios, thereby limiting the geographical area covered by the station concerned.

TABLE C-6

Basic broadcast reliability

The following parameters are involved:

| STEP | PARAMETER | DESCRIPTION | SOURCE |
|------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| (1) | BRR (L ₁), BRR (L ₂), --- BRR (L _N) % | Basic reception reliability at all test points considered in the required service area | Step (2), (4) or (6), as appropriate, from Table C-4 |
| (2) | BBR (X) % | Basic broadcast reliability associated with percentile [X] | Any percentile chosen from the values ranked from (1) of this table |

TABLE C-7

Overall broadcast reliability

The following parameters are involved:

| STEP | PARAMETER | DESCRIPTION | SOURCE |
|------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| (1) | ORR (L ₁), ORR (L ₂), --- ORR (L _N) % | Overall reception reliability at all points considered in the required service area | Step (2), (4) or (6), as appropriate, from Table C-5 |
| (2) | OBR (X) % | Overall broadcast reliability associated with percentile [X] | Any percentile chosen from the values ranked from (1) of this table |

The decision to use more than one frequency per programme should be made on the merits of the particular case concerned.

Use of synchronized transmitters should be encouraged whenever possible with a view to minimizing the need for additional frequencies.

IV.3.2 Use of additional frequencies

The number of frequencies needed to achieve the specified level of basic broadcast reliability shall be determined by the method given below. If the calculated basic broadcast reliability for a single frequency does not reach the adopted value, it is necessary to consider whether the BBR could be improved by additional frequencies in separate bands and whether the improvement would justify the use of additional frequencies.

IV.3.3 Determination of additional frequency bands

In cases where the BBR¹ for the first band, based on all test points in the required service area, is between 50% and 80%, an additional band shall be tested as follows.

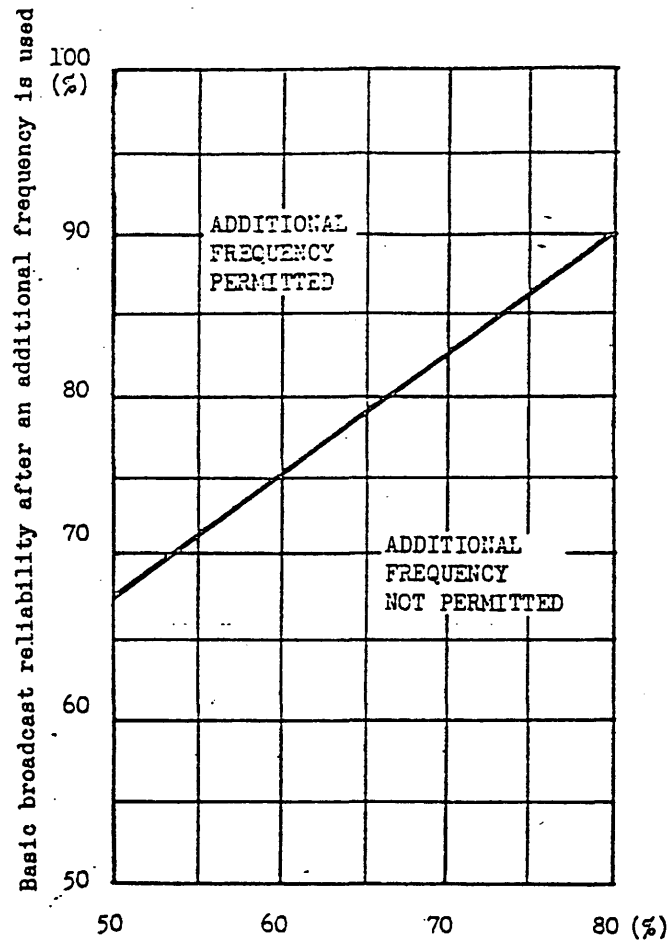
Those test points whose basic circuit reliability BCR is less than or equal to the BBR are identified and only these points are used to determine the second band. For each band, the minimum value of BCR (BCR_{min}) at these points is determined and that band having the highest BCR_{min} value is selected. If more than one band has this value, the highest frequency band is selected. The two-band BBR, taking account of the BRR at all test points in the required service area is then computed and if it exceeds the limit specified in Figure 3-14² then the second band is permitted. In those special cases where the two-band BBR is less than 80% then a third band shall be tested as follows.

The BBR for each of the remaining bands is computed considering all test points in the required service area. Of these bands, that band having the highest BBR is selected as the third band. If more than one band has this value the highest frequency band is selected. If the resulting three-band BBR taking account of the BRR at all test points exceeds the limit specified in Figure C-3, the third band is permitted.

¹ For calculation of the basic broadcast reliability, see paragraph 4.5.

² The contents of this figure can be expressed by the following equation:

| | |
|--------------------------------------------|-------------------------------------|
| $BBR (after) > 30 + .75 * BBR (before)$ | additional frequency permitted |
| $BBR (after) \leq 30 + .75 * BBR (before)$ | additional frequency not permitted. |



Basic broadcast reliability before an additional frequency is to be used

FIGURE C-3

Limits for use of an additional frequency

COMMISSION 5
COMMITTEE 5
COMISION 5

PROJET DE MANDAT DU GROUPE AD HOC 5

Compte tenu

- des renseignements d'ordre général contenus dans les Documents DT/41 et DT/59,
- de la déclaration du Président de la Conférence à la sixième séance plénière (Document 133)

ainsi que des discussions à ce sujet et de tout document jugé pertinent, suggère:

- 1) des éléments d'une solution globale de compromis,
- 2) un programme d'action pour la mise en oeuvre du système de planification HFBC.

DRAFT TERMS OF REFERENCE FOR 5 AD HOC

Taking into account

- the background information given in Documents DT/41 and DT/59,
- the statement by the Chairman of the Conference at the sixth Plenary Meeting (Document 133)

and the discussions thereon and any relevant document, to suggest:

- 1) elements of the package,
- 2) programme of actions towards implementation of the HFBC Planning System.

PROYECTO DE MANDATO DEL GRUPO AD HOC 5

Habida cuenta

- de las informaciones de orden general consignadas en los Documentos DT/41 y DT/59;
- de la declaración del Presidente de la Conferencia en la sexta sesión plenaria (Documento 133);

así como de las deliberaciones sobre esta materia y de todo documento que venga al caso; el Grupo deberá sugerir:

- 1) elementos de una solución transaccional global;
- 2) un programa de actividades para la puesta en práctica del sistema de planificación HFBC.

Le Président de la Commission 5
C.T. NDIONGUE

DRAFTING GROUP 6-2

ARTICLE 17 [REVISED]

Section [1] Requirements file

1. Administrations shall submit to the IFRB, their operational and projected broadcasting requirements in the bands allocated exclusively to the broadcasting service between 5 950 and 26 100 kHz. These requirements shall be entered in the HFBC requirements file¹ which shall contain:

- requirements which are to be used within the next [] years;
- all requirements taken into account in the preparation of a seasonal schedule or plan or during its operation;
- requirements used during the preceding [5] year period.

2. An entry in the HFBC requirements file shall be defined as a requirement indicated by an administration to provide a broadcasting service at specified periods of time to a specified reception area from a particular transmitting station.

3. Each requirement listed in the HFBC requirements file shall contain at least the basic characteristics listed in Appendix 2 together with the indication of the season(s) in which the requirement was or will be used.

4. Each seasonal schedule or seasonal plan to be established in accordance with [] shall cover one of the seasonal propagation periods indicated below. The month shown in the parentheses indicates the month to be used for the propagation prediction:

- Season D - November - February (January);
- Season M - March - April (April);
- Season J - May - August (July);
- Season S - September - October (October).

Each seasonal [plan or seasonal] schedule shall be implemented at 0100 UTC on the first Sunday of the season concerned.

¹ The initial establishment of the requirements file will be in accordance with Resolution [COM5/1] and will not contain any history of frequency use prior to the establishment of the file.

5. Administrations shall notify the Board, using Appendix 2, of any addition, modification or deletion of a requirement in the HFBC requirements file. Additions, modifications or deletions notified to the Board for a given season shall be taken into account provided that following their examination by the Board they are considered complete.

6. Upon receipt of notices pursuant to paragraph 5 above, the Board shall ensure that the basic information listed in Appendix 2 is given and is correct and shall request the notifying administration to notify the correct or missing information. Following this examination the Board shall indicate those incompatibilities which can be identified without the need for detailed calculations and shall inform the administrations concerned of the results obtained together with any recommendation that may assist in avoiding this incompatibility.

7. After the end of each seasonal period, the Board shall enter into the requirements file for each requirement the frequency or frequencies used, together with any indication from administrations on the actual use of the requirement. Requirements already used shall be kept in the HFBC requirement file for a period of five years. No priority shall be derived from this history of use.

8. (See DL/18(Rev.1).)

S.M. CHALLO
Chairman of Drafting Group 6-2

Committee 6 has referred Note 21) of Appendix 7 of the Radio Regulations back to Committee 4 for reconsideration. A proposed revised wording would be as follows:

Note 21) - It is suggested that administrations avoid carrier frequency differences of a few hertz, which cause degradations similar to periodic fading. * This could be avoided if the frequency tolerance were 0.1 Hz, a tolerance which would be suitable for both double- and single-sideband emissions.

* The World Administrative Radio Conference for the Planning of the HF Bands Allocated to the Broadcasting Service (Geneva, 1987) has drawn attention to the fact that the above-mentioned degradation occurs when the field strengths of the wanted and interfering signals are of the same order of magnitude."

PLENARY MEETING

DRAFT

TERMS OF REFERENCE OF THE PLEN AD HOC 1 WORKING GROUP

As directed by the Plenary, to consider any remaining technical matters resulting from the work of the Committees 5 and 6.

K. BJÖRNSJÖ
Chairman

Source: Document 199

DRAFTING GROUP 6-1
DRAFTING GROUP 6-2

NOTE FROM THE CHAIRMAN OF COMMITTEE 6

The attached annex contains a draft text for the establishment of the revised parts of Appendix 2 of the Radio Regulations relating to data to be entered in the requirements file. The texts in square brackets have not been adopted by Committee 5 who reserves the possibility to discuss them again.

R. BLOIS
Chairman of Committee 6

Annex: 1

ANNEX

Guidelines for the establishment of Appendix 2

**Information Relating to the Broadcasting Service
in the Exclusive HFBC Bands**

1. Notifying administration

The notifying administration shall be indicated using the symbols given in Table ... of the Preface to the International Frequency List.

2. Name of transmitting station.

3. Symbol of the country or geographical area in which the transmitting station is located.

4. Geographical coordinates of the transmitting station

When two or more transmitting stations are almost co-located, the administration shall indicate, as far as possible, the same coordinates.

5. Required service areas

In specifying the required service area, reference shall be made to a combination of:

- CIRAF zones,
- quadrants of CIRAF zones,
- a part of a quadrant specified by the set of test points contained within that part.

Where it is necessary to specify a required service area which is smaller than an entire zone or quadrant, this may be done by specifying the boundaries of the area as two azimuths and two ranges from the transmitter location.

The set of test points listed in the IFRB Technical Standards shall be used to represent the CIRAF zones and quadrants for planning purposes.

Where a required service area is defined as set out in paragraph 5.2 above and where such an area does not include a test point, the IFRB shall generate a new test point and include it within the Technical Standards. Such additions to the Technical Standards will be distributed to administrations (Nos. 1001 and 1001.1 of the Radio Regulations).

6. Season

The season or seasons during which the requirement is intended to be operated. When the requirement is not intended to be used on a daily basis, the days during which it will be operated shall be indicated.

7. Hours of operation (UTC)
 - [7.1 Indication on legal clock time changes.]
8. Indication on temporary interruption of broadcasting services due, for example, to natural disasters.
9. Transmitting antenna characteristics
 - a) For all types of antennas indicate:
 - 9.1. The type of antenna to be used with the specific reference of the antenna type appearing in the IFRB Technical Standards.
 - 9.2 The azimuth of maximum radiation in degrees from true North in closewise direction.
 - 9.3 The maximum gain (isotropic, G_i , dB) if different from that associated with the relevant pattern in the reference antenna set. In the case of slewed horizontal dipole arrays this maximum gain is the gain in the slewed mode.
 - 9.4
 - a) The lowest and highest frequency bands (in MHz) for multi-band antennas, or the band for single band antennas.
 - b) For horizontal dipole arrays indicate in addition to the above parameters:
 - 9.5 Type of radiator, end-fed or centre-fed dipole elements.
 - 9.6 Type of reflector (tuned dipoles or aperiodic screen).
 - c) For multi-band horizontal dipole arrays indicate in addition to the above parameters:
 - 9.7 Design frequency, in MHz. If not indicated, the design frequency will be assumed as the arithmetic mean of the centre frequencies of the lowest and highest frequency bands covered by the antenna.
 - d) For slewed horizontal dipole arrays indicate in addition to the above parameters the:
 - 9.8 Azimuth of the normal to the plane of the radiating elements in degrees from true North in clockwise direction.
10. Transmitter power (dBW)
 - 1) For DSB transmissions indicate the carrier power in dBW.
 - 2) For SSB indicate the peak envelope power in dB/W.
 - 3) Indicate the range of available power capabilities.

11. Type of modulation

Indicate if it is a double sideband transmission or a single sideband transmission with a reduced carrier of 6 dB or 12 dB.

11.1 Indicate if the transmitter can operate with two modes (DSB, SSB).

12 Assigned frequencies [under Article 17]

- a) For a double sideband transmission, the assigned frequency shall be expressed in kHz terminating by 0 or 5.
- b) For a single sideband transmission, the assigned frequency shall correspond to the middle of the channel. Consequently, the assigned frequency shall be expressed in kHz terminating by 2.5 or 7.5*.

13. Preset frequencies (in kHz) (see).

14. Preferred frequency (in kHz) (see).

15. Preferred frequency band (in MHz) (see).

16. Number of frequency bands that can be used simultaneously

Indicate the number of transmitters that can be used simultaneously and the associated bands for a possible use in case it is necessary to use more than one frequency to reach the required BBR.

17. Requested types of frequency continuity (see).

18. Lowest value of BBR to be used for this requirement (see paragraph 3 of 4.2.3.4.4, Document 157).

19. Indication on the use of synchronized transmitters.

20. Indicate equipment limitations (see the form for submission of requirements, Document 3).

21. Indication if consultations are required when the co-channel protection ratio is less than 17 dB.

[22. Nature of requirement (national or international).]

[23. Nature of requirement (see Document 134)].

24. Postal and telegraphic addresses of administrations responsible for the station (see column 12b of Appendix 2-5).

* Literally, as the occupied bandwidth is 4.5 kHz, the assigned frequency shall normally terminate in 2.25 or 7.25. Committee 6 may adopt either of the two solutions.

DRAFTING GROUP 6-1

DRAFT

[ARTICLE 17(Rev.)]

Procedure for the Bands Allocated Exclusively to the
Broadcasting Service Between [5 950 and 26 100 kHz]

Section [1] Principles

Section [2] Requirement files (Document DL/17(Rev.))

Section [3] Procedures based on consultations
(Documents DL/16(Rev.2) and DL/30)

Section [4] Procedures based on planning (6 Drafting 2)

Section [5] Record of seasonal usage (step 23 of Document 177)

Section [6] Annual HF Broadcasting Frequency List [RR 1769]
(Document DL/30)

Section [7] Miscellaneous provisions (Document DL/30)

J.F. BROERE
Chairman of Drafting Group 6-1

DRAFTING GROUP 6-1

8A. The Board shall also send to administrations, along with the draft seasonal schedule, its recommendations to remove the incompatibilities. In preparing its recommendations to the administrations, the Board shall take into account monitoring observations and all other available data.

9. Administrations shall endeavour, bilaterally or multilaterally, to resolve the remaining incompatibilities in the draft seasonal schedule. In this coordination, the administrations will take into consideration the principles stated in section []. If required, the assistance of the Board may be requested. [Box 15]

10. Changes in the transmission characteristics resulting from these consultations or decided unilaterally by the administration, with the view to eliminate or reduce the incompatibilities, shall be notified to the Board as soon as possible but no later than [] weeks following the date of publication of the draft seasonal schedule. [Box 16]

11. Administrations may at the same time notify additional requirements which shall be taken into account in the preparation of the seasonal schedules. [The Board shall examine these additional requirements in accordance with [6].] [Box 17]

12. Using the information received in application of [10] and [11] the Board shall apply the calculation procedure described in [7] and shall prepare for publication the seasonal schedule to be issued to the administrations not later than [x] months before the beginning of the season. [Box 18]

13. Changes in the seasonal schedule shall be notified to the Board as soon as they can be forecast. [Box 21]

14. For changes notified in accordance with [13], the Board shall apply the same procedure as that specified in [6]. Such revisions to the seasonal schedules shall be published in the IFRB weekly circulars. [Box 22]

Section [] Record of Seasonal Usage

15. After the end of each seasonal period, the Board shall prepare the [final seasonal schedule], which shall reflect the seasonal schedule as amended by all the changes notified to the Board in accordance with [13]. [Box 23]

16. A copy of the [final seasonal schedule], or part thereof, shall be made available [on a magnetic tape] to any administration that may so request. [Box 23]

17. The [final seasonal schedule] shall be maintained by the Board for [] years. [Box 23]

Section [] Annual High Frequency List

18. A recapitulative High Frequency Broadcasting Frequency List shall be published annually and shall include all frequency assignments which appear in the final seasonal schedules. This list shall be issued as a supplement to the International Frequency List and shall include symbols to indicate seasonal periods during which each assignment was used.

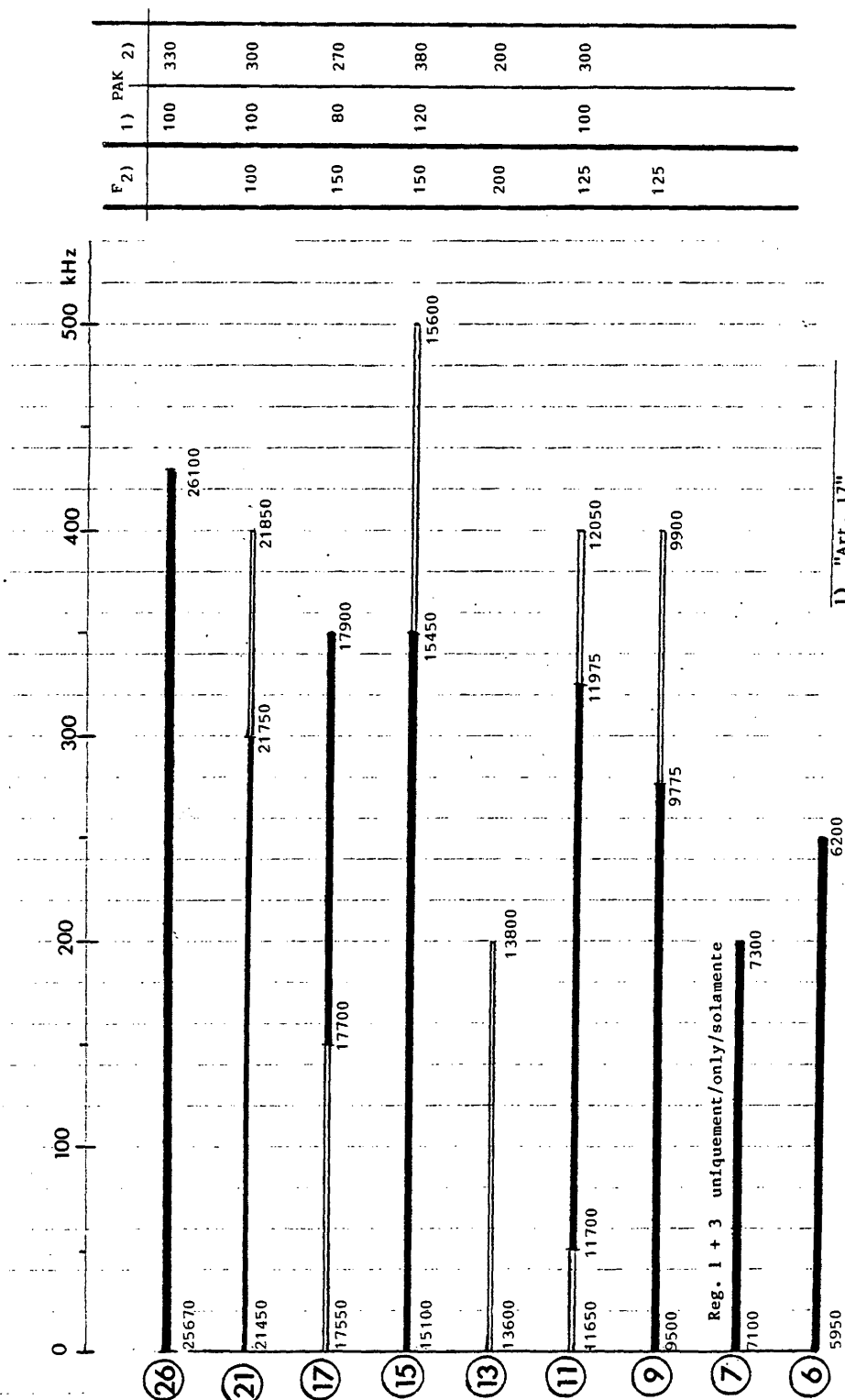
Section [] Miscellaneous Provisions

19. The technical standards used by the Board when applying the provisions of this Article shall be based on Appendix [] and Recommendation [], taking into account the application of Resolution COM6/1.

20. In resolving problems of harmful interference which may arise in frequency usage in accordance with the procedures of this Article, the administrations shall exercise utmost goodwill and mutual cooperation by giving due consideration to the relevant technical and operational factors involved.

J.F. BROERE
Chairman of Drafting Group 6-1

GRUPE 5 AD HOC
5 AD HOC GROUP
GRUPO 5 AD HOC



1) "Art. 17"
2) "Système HFBC" / "HFBC System" / "Sistema HFBC"

Avant CAMR 79 / Before WARC 79 / Antes CAMR 79
Après CAMR 79 / After WARC 79 / Después CAMR 79

C.T. NDIONGUE
Président du Groupe 5 Ad Hoc
Chairman of 5 Ad Hoc Group
Presidente del Grupo 5 Ad Hoc

AD HOC GROUP
OF THE PLENARY

DRAFT TEXT RELATIVE TO SIGNAL-TO-INTERFERENCE RATIO

The signal-to-interference ratio (SIR) used within the planning method shall be determined as follows.

1. When one frequency band is permitted:
 - the SIR is the lowest value of S/I determined at 80% of test points with the greatest BCR values;
 - when the provisions for proportionally reduced protection apply, the margin M is added to the S/I value determined at each of the test points subject to PRP. In such a case, an indication that PRP has been used shall be given in the Plan.
2. When two or three frequency bands are permitted:
 - the S/I value for each band is determined at 80% of test points with the greatest BRR values, and the higher or highest value of S/I at each point is selected;
 - the SIR is the lowest of these selected values of S/I.

Note - In the assessment of performance of requirements which have been included in a plan or processed by coordination, interference broadcast reliability (IBR) is a useful parameter to be listed by the IFRB amongst the other parameters given in the Annex to Document 145. IBR is calculated in an identical way to OBR except that ICR is used instead of OCR.

J. RUTKOWSKI
Chairman of the ad hoc Group of the Plenary

AD HOC GROUP PLENARY

DRAFT NOTE FROM THE CHAIRMAN OF THE DRAFTING GROUP ON S/I

1. At the Drafting Group meeting it was decided not to provide text relating to the method of calculating S/I when determining compatibilities between requirements. This is to be left to the IFRB Technical Standards.
2. Document 243, Section VIII, "performance assessment" was redrafted (see Annex 1).

There was considerable discussion concerning "OBR" and "IBR". It was decided to delete these terms but to add a new footnote.
3. In consequence of deleting "OBR" a number of other changes are needed. These are listed in Annex 2.
4. It was decided to retain section 3.3 of Recommendation [COM6/C] since this may aid further studies.

Annexes: 2

ANNEX 1

Insert in the Attachment to section 3, Part C, Section VIII, of Document 243:

"VIII. Performance assessment*

In order to assess the performance of a requirement, the following values should be given for each 15 minute period, each hour, or for the duration of the requirement, as appropriate:

- 1) BBR - basic broadcast reliability at 80th percentile of all test points;
- 2) percentages of test points for each frequency band where field strength is equal to or exceeds E_{min} , and $(E_{min} - 10)$ where proportionally reduced protection applies;
- 3) SIR (dB) - signal-to-interference value (see Section V.2) at 80th percentile of test points where the field strength is equal to or exceeds E_{min} , or $(E_{min} - 10)$ where proportionally reduced protection applies. If economically, practical it would be desirable to indicate the test points which have been used in determining the signal to interference ratio.**
- 4) TP (%) - percentage of test points for each frequency band where both the field strength is equal to or exceeds E_{min} , or $(E_{min} - 10)$ where proportionally reduced protection applies, and the signal to interference value as computed above is equal to or exceeds 17 dB."

* The IFRB may develop additional values for assessing performance.

** The IFRB pointed out that the requirement to indicate the test points may add significantly to the computer memory required and to the volume of the reports.

ANNEX 2

Amendments to texts

Document 243

Section V.2

- 1) Change title to read:
"Calculation of median signal to interference ratio".
- 2) Retain paragraphs 1 and 2 and paragraph 3, sentence 1.
- 3) Delete paragraph 3, sentence 2, and the remainder of the section.

Table C-3

- 1) Change title to read:
"Calculation of median signal to interference ratio".
- 2) Delete steps 5-12 and Note 2.

Figure C-2

Delete

Section V-4

Delete

Table C-5

Delete

Section V-5

Title: Delete "and [overall/interference]".

Delete paragraph 2.

Table C-7

Delete

In Section V-5 and Table C-6 replace [X] by 80.

Document 235

Note b)

Replace by:

"The value of 14 dB applies for time percentages less than 80%. In other cases the value of 10 dB applies".

Note d)

Replace "D_u(SIR) and D_L(SIR) by "for the decile values".

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