



Documents of the Regional Administrative Radio Conference to establish a plan for the broadcasting service in the band 1605-1705 kHz in Region 2 (1st session) (RARC BC-R2(1))
(Geneva, 1986)

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- This PDF includes Document DT No. 1 - 35.
- The complete set of conference documents includes Document No. 1 - 122, DL No. 1 - 16, DT No. 1 - 35.

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PLENARY MEETING

DRAFT
CONFERENCE STRUCTURE

FIRST SESSION OF THE REGIONAL ADMINISTRATIVE RADIO CONFERENCE
TO ESTABLISH A PLAN FOR THE BROADCASTING SERVICE IN
THE BAND 1 605 - 1 705 kHz IN REGION 2 - BC-R2(1)
(Geneva, 1986)

The agenda of the Conference appears in Resolution No. 913 which was adopted by the Administrative Council at its 39th Session (Geneva, 1984).

Bearing in mind Nos. 464 to 479 inclusive of the International Telecommunication Convention, Nairobi, 1982, the following committees with their terms of reference are suggested. These terms of reference have been drawn up within the framework of the Convention, the Conference Agenda and in the light of experience at previous conferences.

Committee 1 - Steering Committee

Terms of Reference :

To coordinate all matters connected with the smooth execution of work and to plan the order and number of meetings, avoiding overlapping wherever possible in view of the limited number of members of some delegations (Nos. 468 and 469 of the International Telecommunication Convention, Nairobi, 1982).

Committee 2 - Credentials Committee

Terms of Reference :

To verify the credentials of delegations and to report on its conclusions to the Plenary Meeting within the time specified by the latter (Nos. 390 and 471 of the International Telecommunication Convention, Nairobi, 1982).

Committee 3 - Budget Control Committee

Terms of Reference :

To determine the organization and the facilities available to the delegates, to examine and approve the accounts of expenditure incurred throughout the duration of the First Session of the Conference and to report to the Plenary Meeting the estimated total expenditure of the First Session as well as the estimated costs entailed by the execution of the decisions of the First Session of the Conference (Nos. 476 to 479 inclusive of the International Telecommunication Convention, Nairobi, 1982 and Nairobi Resolution 48).



Committee 4 - Technical Criteria Committee

Terms of Reference :

To establish the technical criteria for the basis of the preparation by the Second Session of the Conference of a plan for the broadcasting service in Region 2 in the band 1 605 - 1 705 kHz, taking into account the following non-exhaustive list of items :

- definitions (agenda item 2.1.1);
- propagation data (agenda item 2.1.2);
- modulation standards (agenda item 2.1.3);
- the effect of receiver characteristics upon AM broadcast standards (agenda item 2.1.4);
- protection ratios, required values for the usable field strength and for the nominal usable field strength (agenda item 2.1.5);
- transmitting antenna characteristics and transmitter powers (agenda item 2.1.6), and

taking into account the report of the concerned CCIR Study Groups, prepared in response to Recommendation 504 of the WARC-79.

To establish the technical criteria, as appropriate, for the sharing of the band 1 625 - 1 705 kHz between the broadcasting service and other services in Region 2, taking into account Nos. 419 and 481 of the Radio Regulations (agenda item 2.2).

Committee 5 - Planning Criteria Committee

Terms of Reference :

To establish the planning methods and guidelines for the preparation by the Second Session of the Conference of the Agreement and associated Plan for the broadcasting service in Region 2 in the band 1 605 - 1 705 kHz (agenda item 2.1.7).

If necessary, to establish and identify specific guidelines for preparatory work, including computer software development, to be carried out before the Second Session of the Conference, and to set dates for the completion of this work (agenda item 2.3).

To specify the manner in which broadcasting requirements for inclusion in the Plan should be submitted to the IFRB and to fix the date by which they should be submitted (agenda item 2.4).

Committee 6 - Editorial Committee

Terms of Reference :

To perfect the form of the texts prepared in the various committees of the First Session of the Conference, without altering the sense, for submission to the Plenary Meeting (Nos. 473 and 474 of the International Telecommunication Convention, Nairobi, 1982).

Working Group of the Plenary

Terms of Reference :

To establish a draft agenda for the Second Session of the Conference, relating to the establishment of an agreement and associated plan, to be submitted to the Administrative Council (agenda item 2.5).

DRAFT

AGENDA

OF THE

FIRST PLENARY MEETING

Monday, 14 April 1986, at 1430 hrs

(Room II)

Document No.

1. Approval of the agenda	-
2. Opening of the Conference	-
3. Election of the Chairman of the Conference	-
4. Election of the Vice-Chairmen of the Conference	-
5. Address by the Secretary-General	-
6. Conference Structure	DT/1
7. Election of the Chairmen and Vice-Chairmen of the Committees	-
8. Composition of the Conference Secretariat	-
9. Allocation of documents to Committees	DT/3
10. Participation requests submitted by international organizations	9
11. Date by which the Credentials Committee must submit its conclusions	-
12. Working hours of the meetings of the Conference	-
13. Financial responsibilities of administrative conferences	12
14. Other business	

R.E. BUTLER
Secretary-General

PROJET / DRAFT / PROYECTO

Note du Secrétaire général / Note by the Secretary-General
Nota del Secretario GeneralATTRIBUTION DES DOCUMENTS / ALLOCATION OF DOCUMENTS
ATRIBUCION DE LOS DOCUMENTOS

<u>Séance plénière</u>	
<u>Plenary Meeting</u>	: 1, 9, 10
<u>Sesión Plenaria</u>	
C2 - <u>Pouvoirs</u>	
<u>Credentials</u>	: 2
<u>Credenciales</u>	
C3 - <u>Budgétaire</u>	
<u>Budget</u>	: 5, 6, 12, 18
<u>Presupuesto</u>	
C4 - <u>Technique</u>	: 3 + Add.1, 4, 7, 8, 11, 14(CHL), 16(PRG), 21(CUB),
<u>Technical</u>	22(CUB), 24(ARG)
<u>Técnica</u>	
C5 - <u>Planification</u>	: 7, 8, 11, 13(CHL), 16(PRG), 20(CUB), 23(ARG),
<u>Planning</u>	24(ARG)
<u>Planificación</u>	
<u>GT de la Plénière</u>	
<u>WG of the Plenary</u>	: 7, 11
<u>GT de la Plenaria</u>	

R.E. BUTLER
Secrétaire général

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<u>Séance plénière</u> <u>Plenary Meeting</u> <u>Sesión Plenaria</u>	: 1, 9, 10
C2 - <u>Pouvoirs</u> <u>Credentials</u> <u>Credenciales</u>	: 2
C3 - <u>Budgétaire</u> <u>Budget</u> <u>Presupuesto</u>	: 5, 6, 12, 18
C4 - <u>Technique</u> <u>Technical</u> <u>Técnica</u>	: 3 + Add.1, 4, 7, 8, 11, 14, 16
C5 - <u>Planification</u> <u>Planning</u> <u>Planificación</u>	: 7, 8, 11, 13, 16
<u>GT de la Plénière</u> <u>WG of the Plenary</u> <u>GT de la Plenaria</u>	: 7, 11

R.E. BUTLER
Secrétaire général

COMMITTEE 4

DRAFT NOTE FROM THE
CHAIRMAN OF COMMITTEE 4

On the basis of the terms of reference of Committee 4 adopted by the first Plenary Meeting (Document DT/1), it is proposed that two Working Groups be set up with the following terms of reference:

Working Group 4A

Propagation data (item 2.1.2 of the agenda of the Conference: Document 1).

Documents 3, 4, 7, 8, 14, 16, 22.

Working Group 4B

- definitions (agenda item 2.1.1);
- modulation standards (agenda item 2.1.3);
- the effect of receiver characteristics upon AM broadcast standards (agenda item 2.1.4);
- protection ratios, required values for the usable field strength and for the nominal usable field strength (agenda item 2.1.5);
- transmitting antenna characteristics and transmitter powers (agenda item 2.1.6).

Documents 3, 4, 7, 8, 11, 14, 16, 21, 24.

The question of technical criteria for the sharing of the band 1 625 - 1 705 kHz between the broadcasting service and other services in Region 2, taking into account Nos. 419 and 481 of the Radio Regulations (agenda item 2.2) will be considered by Committee 4 at a later stage. A further Working Group 4C may be set up for the purpose.

M.L. PIZARRO
Chairman of Committee 4

DRAFT CHAPTER ON
GROUNDWAVE PROPAGATION1. Ground conductivity

For groundwave propagation calculations in the band 1605-1705 kHz, the Atlas of Ground Conductivity should be used which contains information communicated to the IFRB in connection with the first and second sessions of the Regional Administrative MF broadcasting conference (Region 2), Buenos Aires (1980) and Rio de Janeiro (1981), and subsequent revisions.

The following provisions should also be included.

- a) When an administration notifies to the IFRB data intended to modify the Atlas, the IFRB shall so inform all administrations of Region 2. After 90 days from the date on which this information is communicated by the IFRB, the IFRB shall modify the Atlas and communicate the modifications to all administrations.
- b) No assignment in the Plan shall at any time be required to be modified as a result of the incorporation of these data.
- c) A proposal to modify the Plan shall be evaluated on the basis of the values in the Atlas on the date the proposal was received by the IFRB.

2. Field strength curves for groundwave propagation

The curves shown on Graph \sqrt{A} are to be used for determining groundwave propagation in the frequency range of 1 605 - 1 705 kHz; these curves are computed for 1 655 kHz.

The curves are labelled with ground conductivities in millisiemens/metre. All curves, except the 5000 mS/m (sea water) curve, are derived for a relative dielectric constant of 15. The sea water curve is derived for a dielectric constant of 80.

3. Calculation of groundwave field strength

Using the Atlas of Ground Conductivity, the relevant conductivity or conductivities for the chosen path are determined. If only one conductivity is representative, the method for homogeneous paths is used. If several conductivities are involved, the method for non-homogeneous paths is used.

3.1 Homogeneous paths

The vertical component of the field strength for a homogeneous path is represented in Graph 3.1 as a function of distance, for various values of ground conductivity.

The distance in kilometres is shown on a logarithmic scale on the abscissa. The field strength is shown on a linear scale on the ordinate in decibels above 1 uV/m. The graph is standardized for a characteristic field strength of 100 mV/m corresponding to an effective monopole radiated power (e.m.r.p.) of -9.5 dB relative to 1 kW. The straight line marked "100 mV/m at 1 km" is the field strength on the assumption that the antenna is erected on a surface of perfect conductivity.

For omnidirectional antenna systems having a different characteristic field strength, correction must be made according to the following equations:

$$E = E_0 \times \frac{E_c}{100} \times \sqrt{P} \quad \text{if field strengths are expressed in mV/m, and}$$
$$E = E_0 + E_c - 100 + 10 \log P \quad \text{if field strengths are expressed in dB (uV/m)}$$

For directional antenna systems, the correction must be made according to the following equations:

$$E = E_0 \times \frac{E_R}{100} \quad \text{if field strengths are expressed in mV/m, and}$$
$$E = E_0 + E_R - 100 \quad \text{if field strengths are expressed in dB (uV/m).}$$

Where E : resulting field strength

E_0 : field strength read from Graph 3.1

E_R : actual radiated field strength at a particular azimuth at 1 km

E_c : characteristic field strength

P : station power in kW.

The pair of scales following Graph [B] can be used in conjunction with that Graph. One scale is labelled in decibels and the other in millivolts per metre. These scales can be cut out and trimmed as a unit to be used as sliding ordinate scales. The scales allow graphical conversion between decibels and millivolts per metre, and are used to make graphical determinations of field strengths. Other methods of making calculations on the graph may be used, including the use of dividers to adjust for values of E_R that differ from 100 mV/m at 1 km. However, any method used will follow steps similar to those discussed below.

For both omnidirectional and directional antenna systems the value of E_R must be found. For omnidirectional systems E_R can be determined by using the following equations:

$$E_R = E_C \sqrt{P} \text{ if field strengths are expressed in mV/m, and}$$

$$E_R = E_C + 10 \log P \text{ if field strengths are expressed in dB (uV/m).}$$

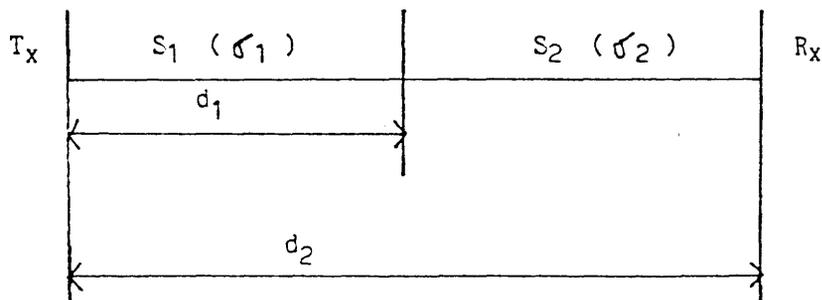
To determine the field strength at a given distance, the scale is placed at the given distance with the 100 dB (uV/m) point of the scale resting on the appropriate conductivity curve. The value of E_R is then found on the scale; the point on the underlying graph (which lies underneath the E_R point of the scale) yields the field strength at the given distance.

To determine the distance at a given field strength, the E_R value is found on the sliding scale and that point is placed directly at the level of the given field strength on the graph. The scale is then moved horizontally until the 100 dB (uV/m) point of the scale coincides with the applicable conductivity curve. The distance may then be read from the abscissa of the underlying graph.

3.2 Non-homogeneous paths

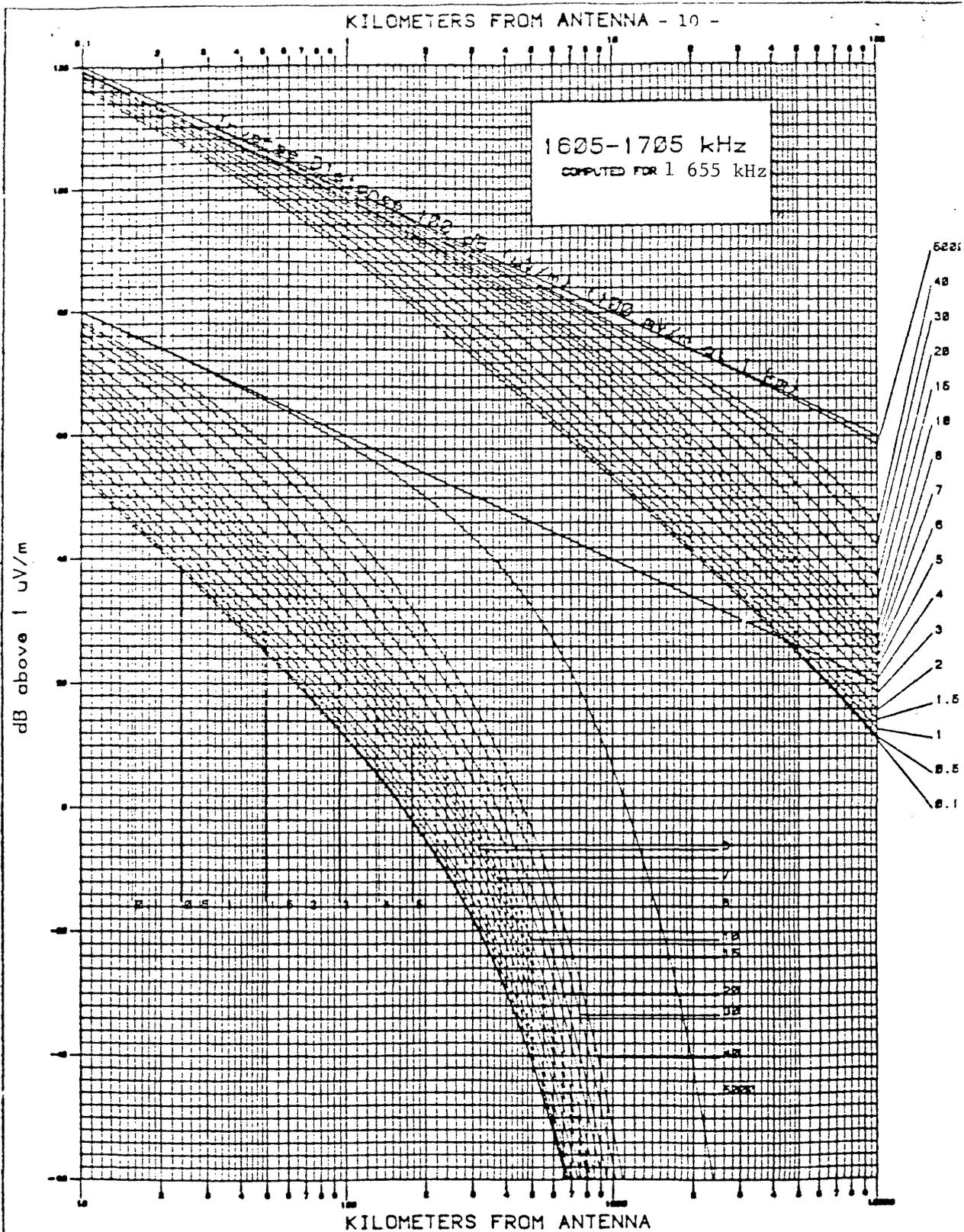
In this case, the equivalent distance or Kirke method is to be used. To apply this method, Graph 3.1 can also be used.

Consider a path whose sections S_1 and S_2 have endpoint lengths corresponding to d_1 and $d_2 - d_1$, and conductivities σ_1 and σ_2 respectively, as shown on the following figure:

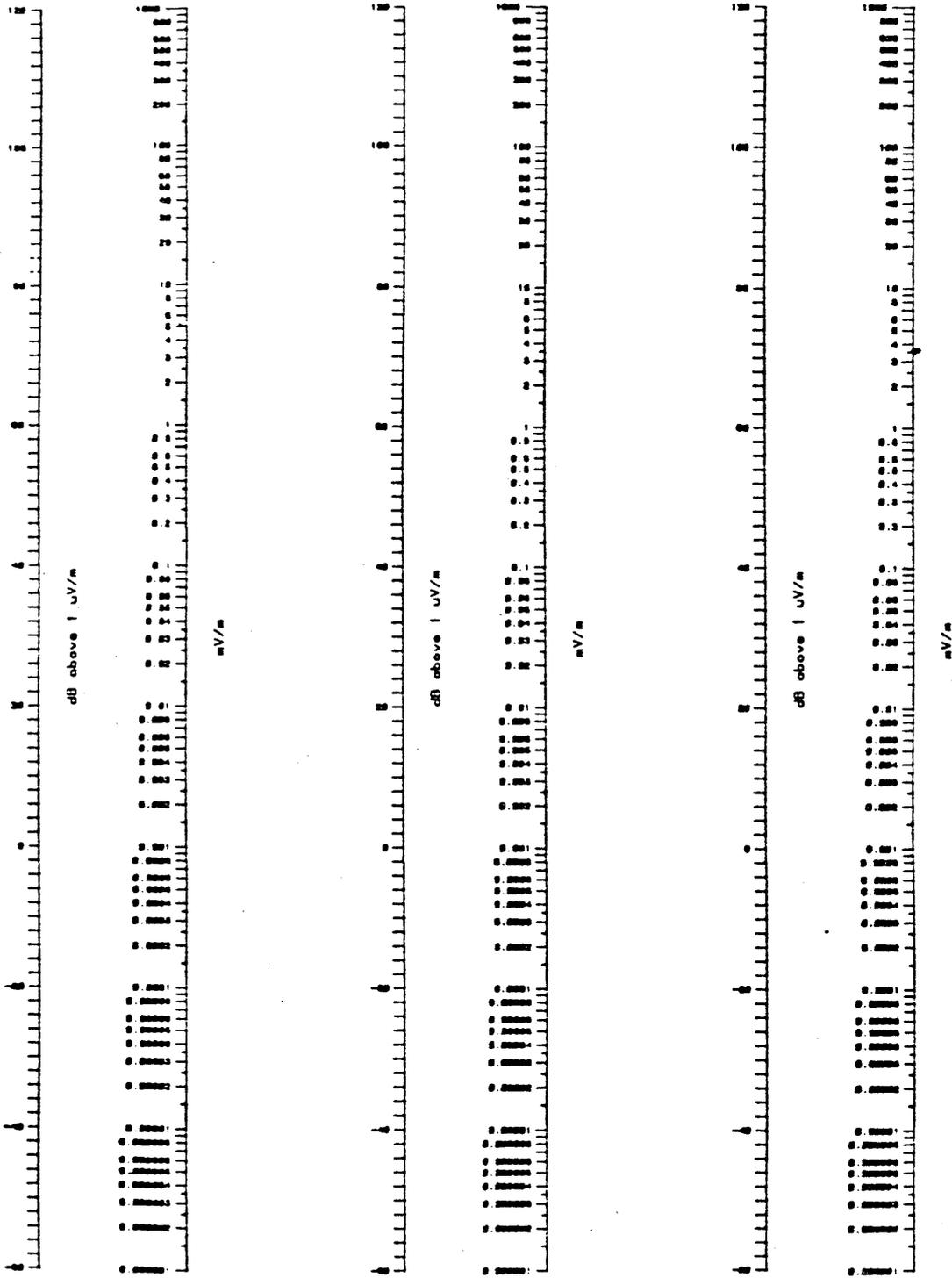


The method is applied as follows:

- a) Taking section S_1 first, we read the field strength corresponding to conductivity σ_1 at distance d_1 on the graph.
- b) As the field strength remains constant at the soil discontinuity, the value immediately after the point of discontinuity must be equal to that obtained in a) above. As the conductivity of the second section is σ_2 , the curve corresponding to conductivity σ_2 gives the equivalent distance to that which would be obtained at the same field strength arrived at in a). This equivalent distance is d . Distance d is larger than d_1 when σ_2 is larger than σ_1 . Otherwise d is less than d_1 .
- c) The field strength at the real distance d_2 is determined by taking note of the corresponding curve for conductivity σ_2 similar to that obtained at equivalent distance $d + (d_2 - d_1)$.
- d) For successive sections with different conductivities, procedures b) and c) are repeated.



GRAPH [A] - Ground-wave field strength versus distance
(for a characteristic field strength of 100 mV/m)



- Scale for use with ground-wave field strength graph [B]

J.C.H. WANG
Chairman of Working Group 4-A

DRAFT CHAPTER []
ON SKYWAVE PROPAGATION

The calculation of skywave field strength shall be conducted in accordance with the provisions which follow.

1. *List of symbols*

- d : short great-circle path distance (km)
 E_c : characteristic field strength, mV/m at 1 km for 1 kW
 $f(\theta)$: radiation as a fraction of the value $\theta = 0$ (when $\theta = 0$, $f(\theta) = 1$)
 f : frequency (kHz)
 F : unadjusted annual median skywave field strength, in dB(μ V/m)
 F_c : field strength for a characteristic field strength of 100 mV/m at 1 km
 $F(50)$: skywave field strength, 50% of the time, in dB(μ V/m)
 P : station power (kW)
 θ : elevation angle from the horizontal (degrees)
 a_T : geographic latitude of the transmitting terminal (degrees)
 a_R : geographic latitude of the receiving terminal (degrees)
 b_T : geographic longitude of the transmitting terminal (degrees)
 b_R : geographic longitude of the receiving terminal (degrees)
 ϕ_T : geomagnetic latitude of the transmitting terminal (degrees)
 ϕ_R : geomagnetic latitude of the receiving terminal (degrees)
 ϕ : average geomagnetic latitude of a path under study (degrees)

Note: North and east are considered positive, south and west negative.

2. *General procedure*

Radiation in the horizontal plane of an omnidirectional antenna fed with 1 kW (characteristic field strength, E_c) is known either from design data or, if the actual design data are not available, from Fig. 1.

Elevation angle θ is given by

$$\theta = \arctan \left(0.00752 \cot \frac{d}{444.54} \right) - \frac{d}{444.54} \quad \text{degrees} \quad (1)$$

$$0^\circ \leq \theta \leq 90^\circ$$

Alternatively, Table 1 or Fig. 2 may be used.

It is assumed that the Earth is a smooth sphere with an effective radius of 6,367.6 km and that reflections occur from an ionospheric height of 96.5 km.

The radiation $f(\theta)$ expressed as a fraction of the value at $\theta = 0$ at a pertinent elevation angle θ can be determined from Fig. 3 or Table II.

The product $E_c f(\theta) \sqrt{P}$ is thus determined for an omnidirectional antenna. For a directional antenna, $E_c f(\theta) \sqrt{P}$ can be determined from the antenna radiation pattern. $E_c f(\theta) \sqrt{P}$ is the field strength at 1 km at the appropriate elevation angle and azimuth.

The unadjusted skywave field strength F is given by:

$$F = F_c + 20 \log \frac{E_c f(\theta) \sqrt{P}}{100} \quad \text{dB(uV/m)} \quad (2)$$

F_c is given by:

$$F_c = (95 - 20 \log d) - (2\sqrt{d} + 4.95 \tan^2 \phi) (d/1000)^{1/2} \text{ dB (uV/m)} \quad (3)$$

Figure 4 and Table III show F_c for selected latitudes. If $|\phi|$ is greater than 60 degrees, equation (3) is evaluated for $|\phi| = 60$ degrees. If d is less than 200 km, equation (3) is evaluated for $d=200$ km. However, the actual great-circle distance is to be used in determining elevation angle. See section 4 for calculation of great-circle distance and conversion from geographic latitude to geomagnetic latitude.

Note: Values of F are normalized to 100 mV/m at 1 km corresponding to an effective monopole radiated power (e.m.r.p.) of -9.54 dB(kW).

3. Skywave field strength, 50% of the time

This is given by:

$$F(50) = F \quad \text{dB(uV/m)} \quad (4)$$

4. Path parameters

Refer to section b-1. The great-circle distance d (km) is given by:

$$d = 111.18 \text{ arc cos}[\sin a_T \sin a_R + \cos a_T \cos a_R \cos (b_R - b_T)] \quad (5)$$

The geomagnetic latitude of the transmitting terminal, ϕ_T , is given by:

$$\phi_T = \text{arc sin} [\sin a_T \sin 78.5^\circ + \cos a_T \cos 78.5^\circ \cos (69^\circ + b_T)] \quad (6)$$

ϕ_R can be determined in a similar manner. And,

$$\phi = \frac{1}{2} (\phi_T + \phi_R) \quad (7)$$

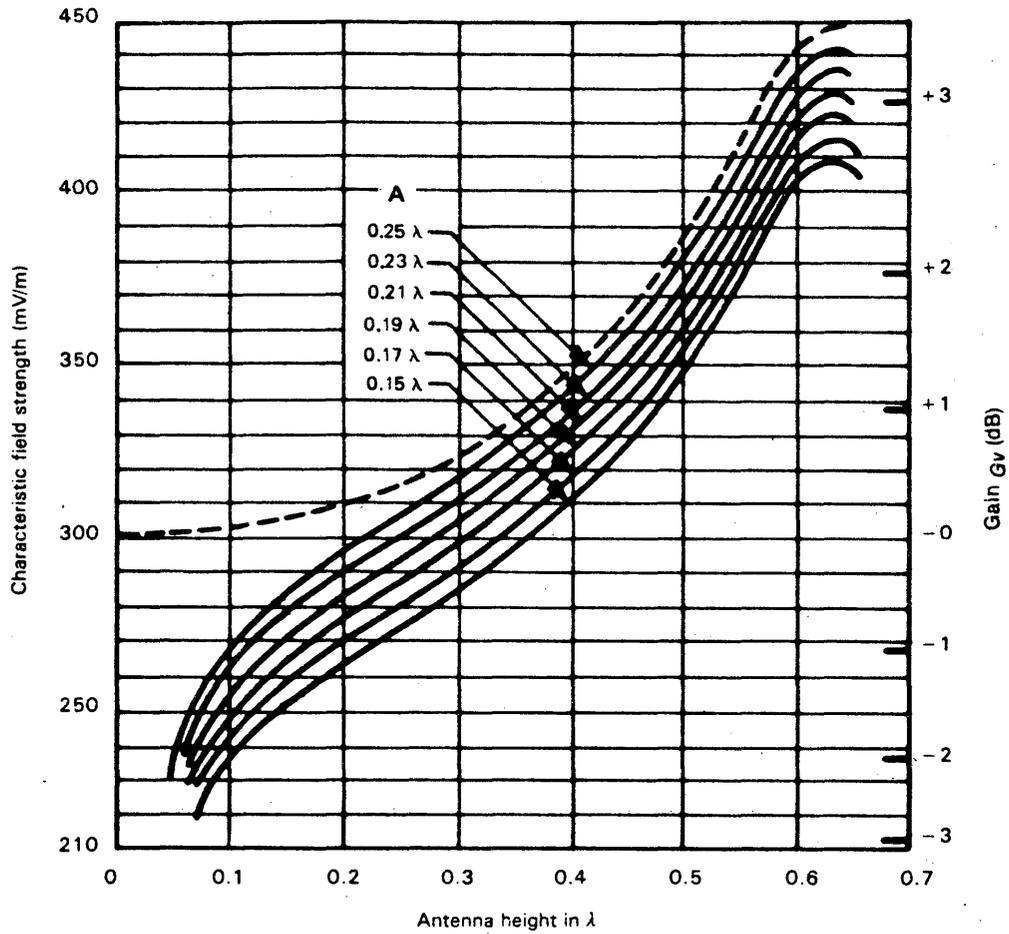
Alternatively, Figure 5 may be used.

5. Nocturnal variation of skywave field strength

Hourly median skywave field strengths vary during the night and at sunrise and sunset. Figure 6 shows the average variation referred to the value at 2 hours after sunset at the path midpoint. This variation applies to field strengths occurring for 50% of the nights.

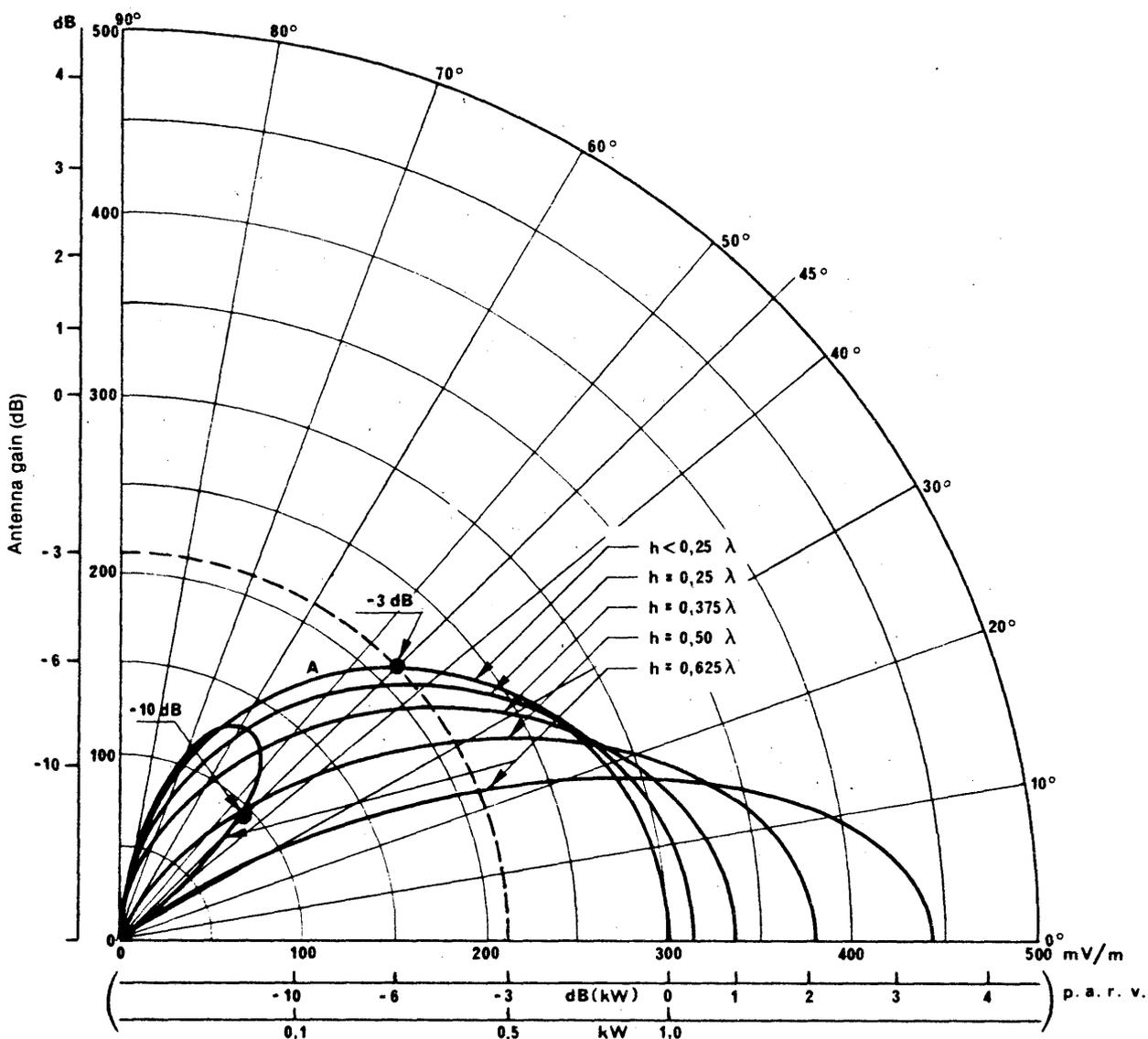
6. Sunrise and sunset time

To facilitate the determination of the local time of sunrise and sunset, Fig. 7 gives the times for various geographical latitudes and for each month of the year. The time is the local meridian time at the point concerned and should be converted to the appropriate standard time.



A: Radius of ground system
 Full lines: Real antenna correctly designed
 Dashed line: Ideal antenna on a perfectly conducting ground

FIGURE 1 - Characteristic field strengths for simple vertical antennas, using 120-radial ground systems



A: Short vertical antenna

FIGURE 1a - Effective monopole radiated power (e.m.r.p.) and field strength at a distance of 1 km as a function of elevation angle, for different heights of vertical antennas assuming a transmitter power of 1 kW

TABLE I - *Elevation angle vs distance*

Distance (km)	Elevation angle (degrees)
50	75.3
100	62.2
150	51.6
200	43.3
250	36.9
300	31.9
350	27.9
400	24.7
450	22.0
500	19.8
550	18.0
600	16.3
650	14.9
700	13.7
750	12.6
800	11.7
850	10.8
900	10.0
950	9.3
1000	8.6
1050	8.0
1100	7.4
1150	6.9
1200	6.4
1250	5.9
1300	5.4
1350	5.0
1400	4.6
1450	4.3
1500	3.9
1550	3.5
1600	3.2
1650	2.9
1700	2.6
1750	2.3
1800	2.0
1850	1.7
1900	1.5
1950	1.2
2000	1.0
2050	0.7
2100	0.5
2150	0.2
2200	0.0
2250	0.0
2300	0.0
2350	0.0
2400	0.0

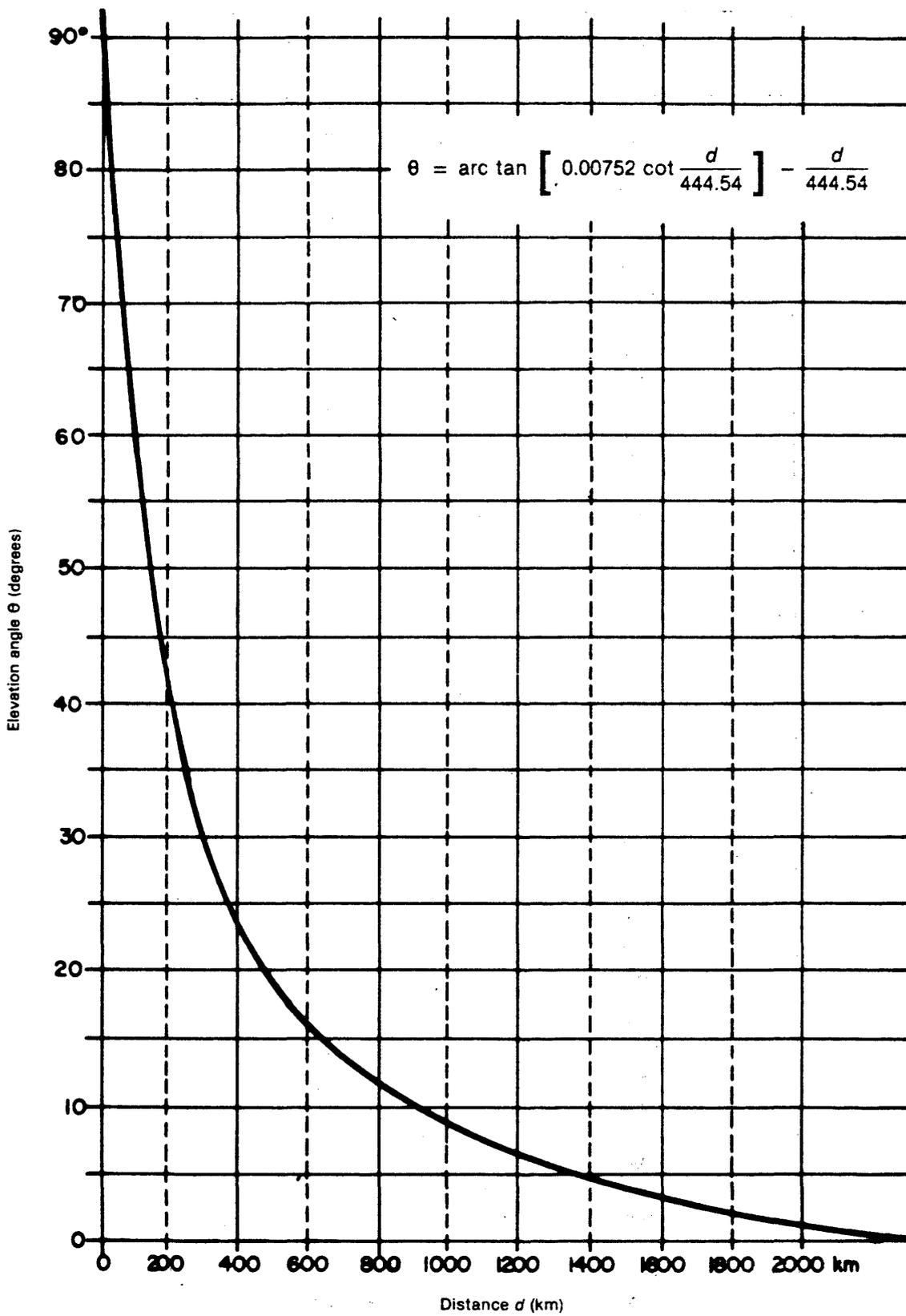


FIGURE 2 - Elevation angle vs distance

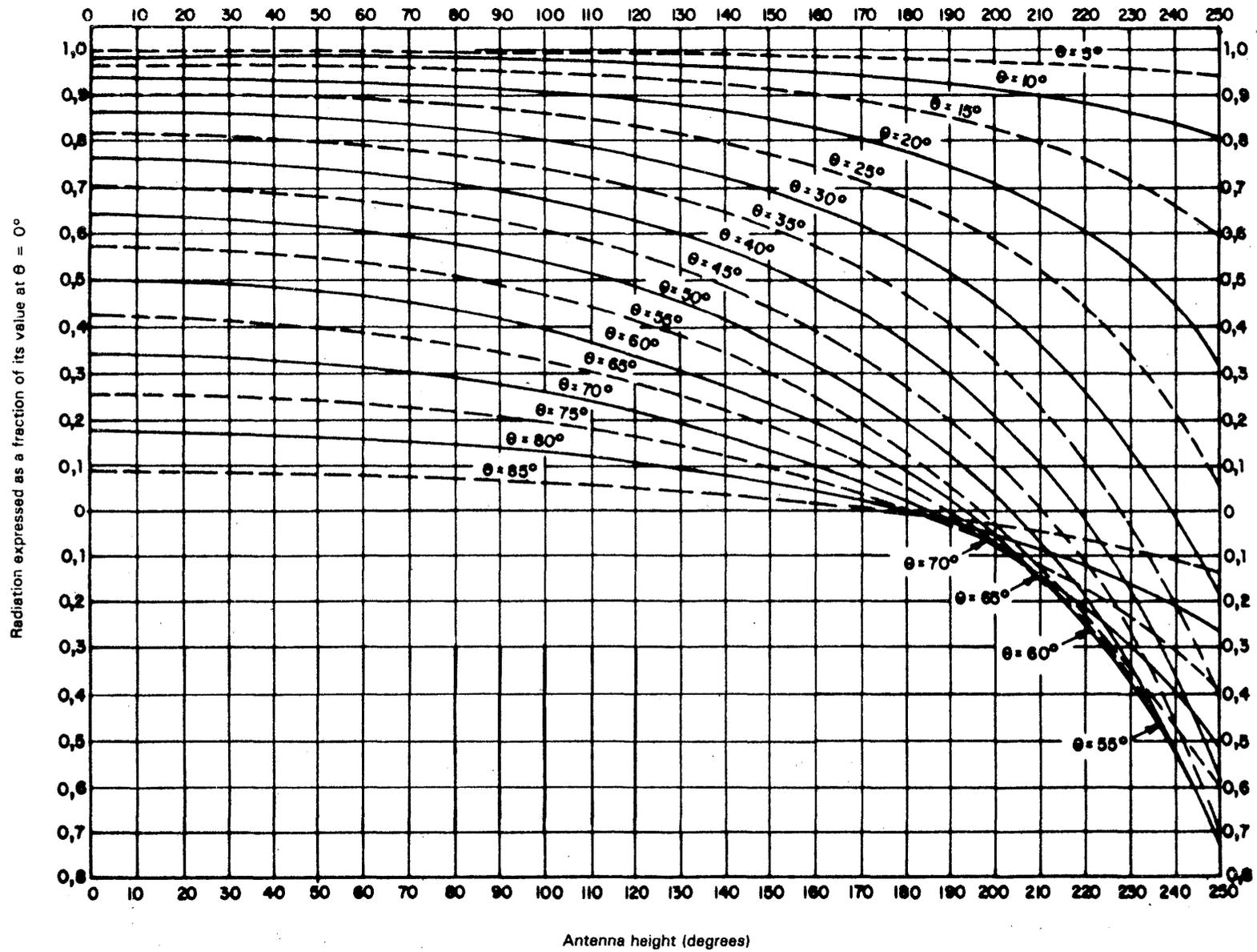


FIGURE 3 - Vertical plane radiation of simple vertical antennas as a function of electrical tower height for various values of elevation angle (θ)

TABLE II - $f(\theta)$ values for simple vertical antennas

Elevation angle (degrees)	$f(\theta)$					
	0.11 λ	0.13 λ	0.15 λ	0.17 λ	0.19 λ	0.21 λ
0	1.000	1.000	1.000	1.000	1.000	1.000
1	1.000	1.000	1.000	1.000	1.000	1.000
2	0.999	0.999	0.999	0.999	0.999	0.999
3	0.999	0.998	0.998	0.998	0.998	0.998
4	0.997	0.997	0.997	0.997	0.997	0.997
5	0.996	0.996	0.996	0.995	0.995	0.995
6	0.994	0.994	0.994	0.993	0.993	0.993
7	0.992	0.992	0.991	0.991	0.991	0.990
8	0.989	0.989	0.989	0.988	0.988	0.987
9	0.987	0.986	0.986	0.985	0.985	0.984
10	0.984	0.983	0.983	0.982	0.981	0.980
11	0.980	0.980	0.979	0.978	0.977	0.976
12	0.976	0.976	0.975	0.974	0.973	0.971
13	0.972	0.972	0.971	0.969	0.968	0.967
14	0.968	0.967	0.966	0.965	0.963	0.961
15	0.963	0.962	0.961	0.959	0.958	0.956
16	0.958	0.957	0.956	0.954	0.952	0.950
17	0.953	0.952	0.950	0.948	0.945	0.943
18	0.947	0.946	0.944	0.942	0.940	0.937
19	0.941	0.940	0.938	0.935	0.933	0.930
20	0.935	0.933	0.931	0.929	0.926	0.922
22	0.922	0.920	0.917	0.914	0.911	0.907
24	0.907	0.905	0.902	0.898	0.894	0.890
26	0.892	0.889	0.885	0.882	0.877	0.872
28	0.875	0.872	0.868	0.864	0.858	0.852
30	0.857	0.854	0.849	0.844	0.839	0.832
32	0.838	0.834	0.830	0.824	0.818	0.811
34	0.819	0.814	0.809	0.803	0.795	0.789
36	0.798	0.793	0.788	0.781	0.774	0.766
38	0.776	0.771	0.765	0.758	0.751	0.742
40	0.753	0.748	0.742	0.735	0.725	0.717
42	0.730	0.724	0.718	0.710	0.702	0.692
44	0.705	0.700	0.693	0.685	0.676	0.666
46	0.680	0.674	0.667	0.659	0.650	0.639
48	0.654	0.648	0.641	0.633	0.623	0.612
50	0.628	0.621	0.614	0.606	0.596	0.585
52	0.600	0.594	0.587	0.578	0.568	0.557
54	0.572	0.566	0.559	0.550	0.540	0.529
56	0.544	0.537	0.530	0.521	0.512	0.501
58	0.515	0.508	0.501	0.493	0.483	0.472
60	0.485	0.479	0.472	0.463	0.454	0.443

TABLE II (continued)

Elevation angle (degrees)	$f(\theta)$					
	0.23λ	0.25λ	0.27λ	0.29λ	0.311λ	0.35λ
0	1.000	1.000	1.000	1.000	1.000	1.000
1	1.000	1.000	1.000	1.000	1.000	1.000
2	0.999	0.999	0.999	0.999	0.999	0.999
3	0.998	0.998	0.998	0.998	0.998	0.997
4	0.997	0.996	0.996	0.996	0.996	0.995
5	0.995	0.994	0.994	0.994	0.993	0.992
6	0.992	0.992	0.991	0.991	0.990	0.989
7	0.990	0.989	0.988	0.988	0.987	0.985
8	0.987	0.986	0.985	0.984	0.983	0.980
9	0.983	0.982	0.981	0.980	0.978	0.975
10	0.979	0.978	0.977	0.975	0.973	0.969
11	0.975	0.973	0.972	0.970	0.968	0.963
12	0.970	0.968	0.966	0.964	0.962	0.955
13	0.965	0.963	0.961	0.958	0.955	0.949
14	0.959	0.957	0.955	0.952	0.948	0.941
15	0.953	0.951	0.948	0.945	0.941	0.932
16	0.947	0.944	0.941	0.937	0.933	0.924
17	0.941	0.937	0.934	0.930	0.925	0.914
18	0.934	0.930	0.926	0.921	0.916	0.904
19	0.926	0.922	0.918	0.913	0.907	0.894
20	0.919	0.914	0.909	0.904	0.898	0.883
22	0.902	0.897	0.891	0.885	0.877	0.861
24	0.885	0.879	0.872	0.865	0.856	0.837
26	0.866	0.859	0.852	0.843	0.833	0.811
28	0.846	0.833	0.830	0.820	0.809	0.795
30	0.825	0.816	0.807	0.797	0.784	0.758
32	0.803	0.794	0.784	0.772	0.759	0.729
34	0.780	0.770	0.759	0.747	0.732	0.701
36	0.756	0.746	0.734	0.721	0.705	0.671
38	0.732	0.720	0.708	0.694	0.677	0.642
40	0.706	0.695	0.681	0.667	0.649	0.612
42	0.681	0.668	0.654	0.639	0.621	0.582
44	0.654	0.641	0.627	0.611	0.593	0.552
46	0.628	0.614	0.600	0.583	0.564	0.523
48	0.600	0.587	0.572	0.555	0.536	0.494
50	0.573	0.559	0.544	0.527	0.507	0.465
52	0.545	0.531	0.515	0.498	0.479	0.436
54	0.517	0.503	0.487	0.470	0.451	0.408
56	0.488	0.474	0.459	0.442	0.423	0.381
58	0.460	0.446	0.431	0.414	0.395	0.354
60	0.431	0.418	0.403	0.387	0.368	0.328

TABLE II (end)

Elevation angle (degrees)	$f(\theta)$					
	0.40λ	0.45λ	0.50λ	0.528λ	0.55λ	0.625λ
0	1.000	1.000	1.000	1.000	1.000	1.000
1	1.000	1.000	0.999	0.999	0.999	0.999
2	0.998	0.998	0.998	0.997	0.997	0.995
3	0.997	0.996	0.995	0.994	0.993	0.989
4	0.994	0.992	0.990	0.989	0.988	0.981
5	0.991	0.988	0.985	0.983	0.981	0.970
6	0.986	0.983	0.979	0.975	0.972	0.957
7	0.982	0.977	0.971	0.967	0.962	0.941
8	0.976	0.970	0.962	0.957	0.951	0.924
9	0.970	0.963	0.953	0.945	0.938	0.904
10	0.963	0.954	0.942	0.933	0.924	0.882
11	0.955	0.945	0.930	0.919	0.909	0.859
12	0.947	0.934	0.917	0.905	0.893	0.834
13	0.938	0.923	0.903	0.889	0.875	0.807
14	0.929	0.912	0.889	0.872	0.857	0.773
15	0.918	0.899	0.873	0.855	0.837	0.748
16	0.908	0.886	0.857	0.836	0.815	0.717
17	0.897	0.873	0.840	0.817	0.795	0.684
18	0.885	0.859	0.823	0.797	0.772	0.651
19	0.873	0.844	0.804	0.776	0.749	0.617
20	0.860	0.828	0.785	0.755	0.726	0.582
22	0.833	0.796	0.746	0.710	0.677	0.510
24	0.805	0.763	0.705	0.665	0.625	0.436
26	0.776	0.728	0.663	0.618	0.574	0.363
28	0.745	0.692	0.621	0.570	0.522	0.290
30	0.714	0.655	0.577	0.522	0.470	0.219
32	0.682	0.619	0.534	0.475	0.419	0.151
34	0.649	0.582	0.492	0.428	0.368	0.085
36	0.617	0.545	0.450	0.383	0.321	0.025
38	0.584	0.509	0.409	0.340	0.275	-0.031
40	0.552	0.473	0.370	0.298	0.231	-0.083
42	0.519	0.438	0.332	0.258	0.190	-0.129
44	0.488	0.405	0.296	0.221	0.152	-0.170
46	0.457	0.372	0.262	0.187	0.117	-0.205
48	0.427	0.341	0.230	0.155	0.085	-0.235
50	0.397	0.311	0.201	0.126	0.056	-0.259
52	0.369	0.283	0.174	0.099	0.031	-0.278
54	0.341	0.257	0.149	0.076	0.009	-0.291
56	0.315	0.232	0.126	0.055	-0.010	-0.300
58	0.289	0.208	0.105	0.037	-0.026	-0.304
60	0.265	0.186	0.087	0.021	-0.039	-0.304
62				0.003	-0.049	-0.300
64				-0.003	-0.056	-0.292
66				-0.011	-0.062	-0.281
68				-0.017	-0.064	-0.267
70				-0.022	-0.065	-0.250
72				-0.025	-0.064	-0.231
74				-0.026	-0.061	-0.210
76				-0.026	-0.056	-0.138
78				-0.024	-0.051	-0.163
80				-0.022	-0.044	-0.138

Note - When the negative sign (-) appears in the Table, it signifies only the existence of a secondary lobe having the opposite phase from the main lobe in the vertical radiation pattern. In order to perform the calculation, ignore the negative (-) and use only the absolute value $f(\theta)$ from the Table.

TABLE III - Skywave field strength vs distance (200 to 10 000 km)
for a characteristic field strength of 100 mV/m.

DIST- TANCE (km)	FIELD STRENGTH FOR INDICATED MEAN GEOMAGNETIC LATITUDE									
	0 degrees		15 degrees		30 degrees		45 degrees		60 degrees	
	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m
0-200	46.17	203.4574	46.01	199.7683	45.43	186.8867	43.96	157.6842	39.53	94.7147
250	43.90	156.6680	43.72	153.4954	43.07	142.4722	41.42	117.8230	36.47	66.6392
300	42.02	126.1266	41.82	123.3314	41.11	113.6631	39.30	92.3093	33.88	49.4450
350	40.40	104.7304	40.19	102.2257	39.43	93.5977	37.47	74.7566	31.62	38.0894
400	38.98	88.9709	38.76	86.6981	37.94	78.8988	35.85	62.0462	29.59	30.1752
450	37.72	76.9207	37.48	74.8381	36.61	67.7174	34.40	52.4825	27.76	24.4320
500	36.58	67.4351	36.33	65.5120	35.41	58.9589	33.08	45.0689	26.08	20.1307
550	35.53	59.7930	35.27	58.0059	34.31	51.9358	31.86	39.1832	24.52	16.8266
600	34.57	53.5183	34.29	51.8487	33.29	46.1953	30.74	34.4183	23.07	14.2352
650	33.68	48.2840	33.39	46.7172	32.35	41.4276	29.69	30.4974	21.70	12.1669
700	32.84	43.8589	32.54	42.3829	31.46	37.4139	28.70	27.2260	20.42	10.4915
750	32.06	40.0746	31.75	38.6794	30.63	33.9955	27.77	24.4640	19.20	9.1169
800	31.32	36.8059	31.00	35.4833	29.84	31.0547	26.89	22.1079	18.04	7.9764
850	30.62	33.9579	30.29	32.7007	29.10	28.5022	26.06	20.0797	16.93	7.0208
900	29.95	31.4572	29.62	30.2595	28.39	26.2696	25.26	18.3198	15.87	6.2133
950	29.32	29.2464	28.98	28.1030	27.71	24.3030	24.50	16.7818	14.85	5.5255
1000	28.72	27.2798	28.36	26.1861	27.07	22.5601	23.77	15.4291	13.87	4.9356
1050	28.14	25.5207	27.77	24.4729	26.45	21.0066	23.07	14.2325	12.92	4.4265
1100	27.58	23.9394	27.21	22.9339	25.85	19.6150	22.39	13.1684	12.01	3.9845
1150	27.05	22.5115	26.67	21.5451	25.28	18.3625	21.74	12.2177	11.12	3.5988
1200	26.53	21.2165	26.14	20.2866	24.73	17.2306	21.11	11.3645	10.27	3.2607
1250	26.04	20.0378	25.64	19.1418	24.19	16.2036	20.50	10.5958	9.43	2.9628
1300	25.56	18.9609	25.15	18.0967	23.68	15.2685	19.91	9.9007	8.63	2.6995
1350	25.09	17.9741	24.68	17.1396	23.18	14.4142	19.34	9.2699	7.84	2.4657

Continued . . .

BC-R2(1)/DT/6-E

TABLE III - Skywave field strength vs distance (200 to 10 000 km)
for a characteristic field strength of 100 mV/m

DIST- TANCE (km)	FIELD STRENGTH FOR INDICATED MEAN GEOMAGNETIC LATITUDE									
	0 degrees.		15 degrees		30 degrees		45 degrees		60 degrees	
	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m
1400	24.64	17.0669	24.22	16.2603	22.69	13.6313	18.79	8.6958	7.07	2.2574
1450	24.21	16.2306	23.78	15.4503	22.22	12.9119	18.25	8.1716	6.32	2.0713
1500	23.78	15.4577	23.35	14.7021	21.76	12.2490	17.72	7.6916	5.60	1.9045
1550	23.37	14.7416	22.93	14.0094	21.32	11.6367	17.21	7.2512	4.88	1.7544
1600	22.97	14.0766	22.52	13.3665	20.88	11.0698	16.71	6.8459	4.19	1.6192
1650	22.58	13.4577	22.12	12.7687	20.46	10.5438	16.22	6.4722	3.50	1.4970
1700	22.20	12.8806	21.74	12.2115	20.05	10.0547	15.74	6.1268	2.84	1.3862
1750	21.83	12.3415	21.36	11.6913	19.64	9.5991	15.28	5.8071	2.18	1.2857
1800	21.46	11.8369	20.99	11.2046	19.25	9.1739	14.82	5.5104	1.54	1.1942
1850	21.11	11.3638	20.63	10.7487	18.87	8.7763	14.38	5.2347	0.91	1.1107
1900	20.76	10.9196	20.27	10.3208	18.49	8.4041	13.94	4.9780	0.29	1.0345
1950	20.43	10.5018	19.93	9.9186	18.12	8.0549	13.51	4.7386	-0.31	0.9648
2000	20.09	10.1084	19.59	9.5401	17.76	7.7270	13.09	4.5151	-0.91	0.9008
2050	19.77	9.7373	19.26	9.1832	17.41	7.4185	12.68	4.3060	-1.49	0.8421
2100	19.45	9.3869	18.94	8.8465	17.06	7.1280	12.28	4.1102	-2.07	0.7880
2150	19.14	9.0555	18.62	8.5282	16.72	6.8540	11.88	3.9265	-2.64	0.7382
2200	18.83	8.7419	18.30	8.2271	16.38	6.5953	11.49	3.7541	-3.19	0.6923
2250	18.53	8.4446	18.00	7.9419	16.06	6.3508	11.11	3.5919	-3.74	0.6499
2300	18.24	8.1626	17.70	7.6714	15.73	6.1194	10.73	3.4393	-4.28	0.6106
2350	17.95	7.8947	17.40	7.4147	15.42	5.9002	10.36	3.2955	-4.82	0.5743
2400	17.66	7.6400	17.11	7.1708	15.11	5.6923	9.99	3.1599	-5.34	0.5405
2450	17.38	7.3977	16.83	6.9388	14.80	5.4949	9.63	3.0318	-5.86	0.5092
2500	17.11	7.1669	16.54	6.7179	14.50	5.3075	9.28	2.9107	-6.37	0.4801
2550	16.84	6.9468	16.27	6.5075	14.20	5.1292	8.93	2.7962	-6.88	0.4530

Continued . . .

TABLE III - Skywave field strength vs distance (200 to 10 000 km)
for a characteristic field strength of 100 mV/m

Page 3 of 8

DIST- TANCE (km)	FIELD STRENGTH FOR INDICATED MEAN GEOMAGETIC LATITUDE									
	0 degrees		15 degrees		30 degrees		45 degrees		60 degrees	
	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m
2600	16.57	6.7369	16.00	6.3068	13.91	4.9594	8.59	2.6877	-7.38	0.4278
2650	16.31	6.5364	15.73	6.1152	13.62	4.7978	8.25	2.5849	-7.87	0.4042
2700	16.05	6.3448	15.46	5.9323	13.34	4.6436	7.91	2.4873	-8.35	0.3823
2750	15.79	6.1616	15.20	5.7574	13.06	4.4966	7.59	2.3948	-8.83	0.3617
2800	15.54	5.9862	14.95	5.5901	12.78	4.3562	7.26	2.3068	-9.31	0.3425
2850	15.30	5.8183	14.70	5.4299	12.51	4.2220	6.94	2.2231	-9.77	0.3246
2900	15.05	5.6573	14.45	5.2765	12.24	4.0937	6.62	2.1435	-10.24	0.3077
2950	14.81	5.5029	14.20	5.1295	11.98	3.9709	6.31	2.0677	-10.69	0.2919
3000	14.57	5.3547	13.96	4.9884	11.72	3.8534	6.00	1.9955	-11.15	0.2771
3050	14.34	5.2125	13.72	4.8530	11.46	3.7408	5.70	1.9267	-11.59	0.2632
3100	14.11	5.0758	13.48	4.7230	11.20	3.6328	5.39	1.8610	-12.04	0.2501
3150	13.88	4.9444	13.25	4.5981	10.95	3.5293	5.10	1.7982	-12.47	0.2379
3200	13.66	4.8180	13.02	4.4779	10.71	3.4299	4.80	1.7383	-12.91	0.2263
3250	13.44	4.6963	12.79	4.3624	10.46	3.3345	4.51	1.6810	-13.34	0.2154
3300	13.22	4.5792	12.57	4.2512	10.22	3.2428	4.22	1.6262	-13.76	0.2051
3350	13.00	4.4663	12.35	4.1441	9.98	3.1546	3.94	1.5738	-14.18	0.1954
3400	12.78	4.3575	12.13	4.0409	9.74	3.0698	3.66	1.5236	-14.60	0.1863
3450	12.57	4.2526	11.91	3.9414	9.51	2.9883	3.38	1.4755	-15.01	0.1776
3500	12.36	4.1514	11.70	3.8455	9.28	2.9097	3.10	1.4294	-15.42	0.1695
3550	12.16	4.0537	11.49	3.7529	9.05	2.8341	2.83	1.3852	-15.82	0.1618
3600	11.95	3.9593	11.28	3.6636	8.82	2.7611	2.56	1.3428	-16.22	0.1545
3650	11.75	3.8682	11.07	3.5773	8.60	2.6909	2.29	1.3021	-16.62	0.1476
3700	11.55	3.7801	10.87	3.4940	8.38	2.6231	2.03	1.2631	-17.01	0.1410
3750	11.35	3.6949	10.66	3.4134	8.16	2.5577	1.77	1.2255	-17.40	0.1348

Continued . . .

BC-R2(1)/DT/6-E

TABLE III - Skywave field strength vs distance (200 to 10 000 km)
for a characteristic field strength of 100 mV/m

DIST- TANCE (km)	FIELD STRENGTH FOR INDICATED MEAN GEOMAGNETIC LATITUDE									
	0 degrees		15 degrees		30 degrees		45 degrees		60 degrees	
	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m
3800	11.16	3.6125	10.46	3.3356	7.94	2.4945	1.51	1.1894	-17.79	0.1289
3850	10.96	3.5328	10.26	3.2602	7.72	2.4335	1.25	1.1547	-18.18	0.1234
3900	10.77	3.4556	10.07	3.1873	7.51	2.3746	0.99	1.1214	-18.56	0.1181
3950	10.58	3.3808	9.87	3.1168	7.30	2.3177	0.74	1.0892	-18.93	0.1131
4000	10.39	3.3084	9.68	3.0485	7.09	2.2627	0.49	1.0583	-19.31	0.1083
4050	10.21	3.2383	9.49	2.9823	6.89	2.2094	0.24	1.0286	-19.68	0.1038
4100	10.02	3.1702	9.30	2.9182	6.68	2.1580	0.00	0.9999	-20.05	0.0995
4150	9.84	3.1043	9.12	2.8560	6.48	2.1081	-0.24	0.9722	-20.41	0.0954
4200	9.66	3.0403	8.93	2.7958	6.28	2.0599	-0.49	0.9456	-20.78	0.0915
4250	9.48	2.9782	8.75	2.7373	6.08	2.0132	-0.73	0.9199	-21.13	0.0878
4300	9.30	2.9179	8.56	2.6806	5.88	1.9679	-0.96	0.8951	-21.49	0.0842
4350	9.13	2.8594	8.38	2.6255	5.68	1.9240	-1.20	0.8711	-21.85	0.0808
4400	8.95	2.8026	8.21	2.5721	5.49	1.8815	-1.43	0.8480	-22.20	0.0776
4450	8.78	2.7474	8.03	2.5202	5.30	1.8403	-1.66	0.8257	-22.55	0.0746
4500	8.61	2.6937	7.85	2.4698	5.11	1.8003	-1.89	0.8041	-22.89	0.0717
4550	8.44	2.6416	7.68	2.4208	4.92	1.7615	-2.12	0.7833	-23.24	0.0689
4600	8.27	2.5909	7.51	2.3732	4.73	1.7239	-2.35	0.7632	-23.58	0.0662
4650	8.10	2.5415	7.34	2.3269	4.54	1.6873	-2.57	0.7437	-23.92	0.0637
4700	7.94	2.4936	7.17	2.2819	4.36	1.6518	-2.79	0.7249	-24.26	0.0613
4750	7.77	2.4469	7.00	2.2381	4.18	1.6174	-3.02	0.7066	-24.59	0.0589
4800	7.61	2.4014	6.83	2.1955	3.99	1.5839	-3.24	0.6890	-24.93	0.0567
4850	7.45	2.3572	6.67	2.1541	3.81	1.5513	-3.45	0.6719	-25.26	0.0546
4900	7.29	2.3141	6.50	2.1137	3.64	1.5197	-3.67	0.6554	-25.58	0.0526
4950	7.13	2.2721	6.34	2.0744	3.46	1.4890	-3.88	0.6394	-25.91	0.0506

Continued . . .

TABLE III - Skywave field strength vs distance (200 to 10 000 km)
for a characteristic field strength of 100 mV/m

DIST- TANCE (km)	FIELD STRENGTH FOR INDICATED MEAN GEOMAGNETIC LATITUDE									
	0 degrees		15 degrees		30 degrees		45 degrees		60 degrees	
	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m
5000	6.97	2.2313	6.18	2.0362	3.28	1.4591	-4.10	0.6239	-26.23	0.0488
5050	6.81	2.1914	6.02	1.9989	3.11	1.4300	-4.31	0.6089	-26.56	0.0470
5100	6.66	2.1526	5.86	1.9626	2.93	1.4017	-4.52	0.5943	-26.88	0.0453
5150	6.51	2.1147	5.70	1.9272	2.76	1.3741	-4.73	0.5802	-27.19	0.0437
5200	6.35	2.0778	5.54	1.8927	2.59	1.3473	-4.94	0.5665	-27.51	0.0421
5250	6.20	2.0418	5.39	1.8591	2.42	1.3212	-5.14	0.5532	-27.83	0.0406
5300	6.05	2.0067	5.23	1.8263	2.25	1.2958	-5.35	0.5404	-28.14	0.0392
5350	5.90	1.9724	5.08	1.7943	2.08	1.2711	-5.55	0.5279	-28.45	0.0378
5400	5.75	1.9389	4.93	1.7631	1.92	1.2470	-5.75	0.5157	-28.76	0.0365
5450	5.60	1.9063	4.77	1.7326	1.75	1.2235	-5.95	0.5040	-29.06	0.0352
5500	5.46	1.8744	4.62	1.7029	1.59	1.2006	-6.15	0.4925	-29.37	0.0340
5550	5.31	1.8433	4.47	1.6739	1.42	1.1783	-6.35	0.4814	-29.67	0.0328
5600	5.17	1.8129	4.33	1.6456	1.26	1.1565	-6.55	0.4706	-29.97	0.0317
5650	5.02	1.7832	4.18	1.6180	1.10	1.1353	-6.74	0.4602	-30.27	0.0306
5700	4.88	1.7542	4.03	1.5909	0.94	1.1146	-6.94	0.4500	-30.57	0.0296
5750	4.74	1.7259	3.89	1.5646	0.78	1.0944	-7.13	0.4401	-30.87	0.0286
5800	4.60	1.6982	3.74	1.5388	0.63	1.0747	-7.32	0.4304	-31.16	0.0277
5850	4.46	1.6711	3.60	1.5136	0.47	1.0555	-7.51	0.4211	-31.46	0.0267
5900	4.32	1.6446	3.46	1.4890	0.31	1.0367	-7.70	0.4120	-31.75	0.0259
5950	4.18	1.6187	3.32	1.4649	0.16	1.0184	-7.89	0.4031	-32.04	0.0250
6000	4.05	1.5934	3.18	1.4414	0.00	1.0005	-8.08	0.3945	-32.33	0.0242
6050	3.91	1.5686	3.04	1.4184	-0.15	0.9831	-8.27	0.3861	-32.62	0.0234
6100	3.78	1.5444	2.90	1.3959	-0.30	0.9660	-8.45	0.3780	-32.90	0.0226
6150	3.64	1.5207	2.76	1.3739	-0.45	0.9494	-8.63	0.3700	-33.19	0.0219

Continued . . .

TABLE III - Skywave field strength vs distance (200 to 10 000 km)
for a characteristic field strength of 100 mV/m

DIST- TANCE (km)	FIELD STRENGTH FOR INDICATED MEAN GEOMAGETIC LATITUDE									
	0 degrees		15 degrees		30 degrees		45 degrees		60 degrees	
	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m
6200	3.51	1.4975	2.62	1.3524	-0.60	0.9331	-8.82	0.3623	-33.47	0.0212
6250	3.37	1.4748	2.49	1.3314	-0.75	0.9172	-9.00	0.3548	-33.75	0.0205
6300	3.24	1.4525	2.35	1.3108	-0.90	0.9017	-9.18	0.3475	-34.03	0.0199
6350	3.11	1.4308	2.22	1.2906	-1.05	0.8865	-9.36	0.3403	-34.31	0.0193
6400	2.98	1.4095	2.08	1.2709	-1.19	0.8717	-9.54	0.3334	-34.59	0.0186
6450	2.85	1.3886	1.95	1.2515	-1.34	0.8571	-9.72	0.3266	-34.86	0.0181
6500	2.72	1.3682	1.82	1.2326	-1.48	0.8429	-9.90	0.3200	-35.14	0.0175
6550	2.59	1.3481	1.69	1.2141	-1.63	0.8291	-10.07	0.3135	-35.41	0.0170
6600	2.47	1.3285	1.55	1.1960	-1.77	0.8155	-10.25	0.3073	-35.68	0.0164
6650	2.34	1.3093	1.42	1.1782	-1.91	0.8022	-10.42	0.3012	-35.95	0.0159
6700	2.21	1.2905	1.29	1.1608	-2.06	0.7892	-10.60	0.2952	-36.22	0.0154
6750	2.09	1.2720	1.17	1.1437	-2.20	0.7765	-10.77	0.2894	-36.49	0.0150
6800	1.97	1.2539	1.04	1.1270	-2.34	0.7641	-10.94	0.2837	-36.76	0.0145
6850	1.84	1.2362	0.91	1.1106	-2.48	0.7519	-11.11	0.2782	-37.02	0.0141
6900	1.72	1.2188	0.78	1.0946	-2.62	0.7400	-11.28	0.2728	-37.29	0.0137
6950	1.60	1.2017	0.66	1.0788	-2.75	0.7283	-11.45	0.2675	-37.55	0.0133
7000	1.47	1.1850	0.53	1.0634	-2.89	0.7169	-11.62	0.2624	-37.82	0.0129
7050	1.35	1.1686	0.41	1.0483	-3.03	0.7057	-11.79	0.2573	-38.08	0.0125
7100	1.23	1.1525	0.29	1.0334	-3.16	0.6947	-11.96	0.2524	-38.34	0.0121
7150	1.11	1.1367	0.16	1.0189	-3.30	0.6840	-12.12	0.2477	-38.60	0.0118
7200	0.99	1.1212	0.04	1.0046	-3.43	0.6735	-12.29	0.2430	-38.85	0.0114
7250	0.88	1.1060	-0.08	0.9906	-3.57	0.6632	-12.45	0.2384	-39.11	0.0111
7300	0.76	1.0911	-0.20	0.9769	-3.70	0.6531	-12.62	0.2340	-39.37	0.0108
7350	0.64	1.0765	-0.32	0.9634	-3.83	0.6432	-12.78	0.2296	-39.62	0.0104

Continued . . .

TABLE III - Skywave field strength vs distance (200 to 10 000 km)
for a characteristic field strength of 100 mV/m

DIST- TANCE (km)	FIELD STRENGTH FOR INDICATED MEAN GEOMAGNETIC LATITUDE									
	0 degrees		15 degrees		30 degrees		45 degrees		60 degrees	
	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m
7400	0.52	1.0621	-0.44	0.9502	-3.97	0.6335	-12.94	0.2254	-39.87	0.0101
7450	0.41	1.0480	-0.56	0.9372	-4.10	0.6240	-13.10	0.2212	-40.13	0.0099
7500	0.29	1.0341	-0.68	0.9245	-4.23	0.6147	-13.26	0.2172	-40.38	0.0096
7550	0.18	1.0205	-0.80	0.9120	-4.36	0.6055	-13.42	0.2132	-40.63	0.0093
7600	0.06	1.0072	-0.92	0.8997	-4.49	0.5966	-13.58	0.2093	-40.88	0.0090
7650	-0.05	0.9941	-1.03	0.8877	-4.62	0.5878	-13.74	0.2055	-41.12	0.0088
7700	-0.16	0.9812	-1.15	0.8759	-4.74	0.5792	-13.90	0.2018	-41.37	0.0085
7750	-0.28	0.9685	-1.27	0.8643	-4.87	0.5707	-14.06	0.1982	-41.62	0.0083
7800	-0.39	0.9561	-1.38	0.8529	-5.00	0.5625	-14.21	0.1947	-41.86	0.0081
7850	-0.50	0.9439	-1.50	0.8417	-5.12	0.5543	-14.37	0.1912	-42.11	0.0078
7900	-0.61	0.9319	-1.61	0.8307	-5.25	0.5464	-14.53	0.1878	-42.35	0.0076
7950	-0.72	0.9201	-1.73	0.8198	-5.38	0.5385	-14.68	0.1845	-42.59	0.0074
8000	-0.83	0.9085	-1.84	0.8092	-5.50	0.5309	-14.83	0.1813	-42.84	0.0072
8050	-0.94	0.8971	-1.95	0.7988	-5.62	0.5233	-14.99	0.1781	-43.08	0.0070
8100	-1.05	0.8859	-2.06	0.7885	-5.75	0.5159	-15.14	0.1750	-43.32	0.0068
8150	-1.16	0.8749	-2.18	0.7785	-5.87	0.5087	-15.29	0.1720	-43.55	0.0066
8200	-1.27	0.8641	-2.29	0.7686	-5.99	0.5016	-15.44	0.1690	-43.79	0.0065
8250	-1.38	0.8535	-2.40	0.7588	-6.12	0.4946	-15.59	0.1661	-44.03	0.0063
8300	-1.48	0.8430	-2.51	0.7493	-6.24	0.4877	-15.74	0.1632	-44.27	0.0061
8350	-1.59	0.8327	-2.62	0.7399	-6.36	0.4810	-15.89	0.1604	-44.50	0.0060
8400	-1.70	0.8226	-2.73	0.7306	-6.48	0.4743	-16.04	0.1577	-44.74	0.0058
8450	-1.80	0.8127	-2.83	0.7215	-6.60	0.4678	-16.19	0.1550	-44.97	0.0056
8500	-1.91	0.8029	-2.94	0.7126	-6.72	0.4615	-16.34	0.1524	-45.20	0.0055
8550	-2.01	0.7933	-3.05	0.7038	-6.84	0.4552	-16.49	0.1499	-45.43	0.0053

Continued . . .

TABLE III - Skywave field strength vs distance (200 to 10 000 km)
for a characteristic field strength of 100 mV/m

DIST- TANCE (km)	FIELD STRENGTH FOR INDICATED MEAN GEOMAGNETIC LATITUDE									
	0 degrees		15 degrees		30 degrees		45 degrees		60 degrees	
	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m	dB(uV/m)	uV/m
8600	-2.12	0.7838	-3.16	0.6952	-6.95	0.4490	-16.63	0.1474	-45.66	0.0052
8650	-2.22	0.7745	-3.26	0.6867	-7.07	0.4430	-16.78	0.1449	-45.89	0.0051
8700	-2.32	0.7653	-3.37	0.6783	-7.19	0.4370	-16.92	0.1425	-46.12	0.0049
8750	-2.43	0.7563	-3.48	0.6701	-7.31	0.4312	-17.07	0.1401	-46.35	0.0048
8800	-2.53	0.7474	-3.58	0.6620	-7.42	0.4254	-17.21	0.1378	-46.58	0.0047
8850	-2.63	0.7387	-3.69	0.6540	-7.54	0.4198	-17.36	0.1356	-46.81	0.0046
8900	-2.73	0.7301	-3.79	0.6462	-7.65	0.4142	-17.50	0.1334	-47.03	0.0044
8950	-2.83	0.7216	-3.90	0.6385	-7.77	0.4088	-17.64	0.1312	-47.26	0.0043
9000	-2.93	0.7133	-4.00	0.6309	-7.88	0.4034	-17.78	0.1291	-47.48	0.0042
9050	-3.03	0.7051	-4.10	0.6235	-8.00	0.3982	-17.93	0.1270	-47.71	0.0041
9100	-3.13	0.6970	-4.21	0.6161	-8.11	0.3930	-18.07	0.1249	-47.93	0.0040
9150	-3.23	0.6891	-4.31	0.6089	-8.23	0.3879	-18.21	0.1229	-48.15	0.0039
9200	-3.33	0.6813	-4.41	0.6018	-8.34	0.3829	-18.35	0.1210	-48.38	0.0038
9250	-3.43	0.6736	-4.51	0.5948	-8.45	0.3780	-18.49	0.1190	-48.60	0.0037
9300	-3.53	0.6660	-4.61	0.5879	-8.56	0.3731	-18.63	0.1171	-48.82	0.0036
9350	-3.63	0.6585	-4.72	0.5811	-8.67	0.3684	-18.76	0.1153	-49.04	0.0035
9400	-3.73	0.6511	-4.82	0.5744	-8.79	0.3637	-18.90	0.1135	-49.26	0.0034
9450	-3.82	0.6439	-4.92	0.5678	-8.90	0.3591	-19.04	0.1117	-49.47	0.0034
9500	-3.92	0.6368	-5.02	0.5613	-9.01	0.3546	-19.18	0.1099	-49.69	0.0033
9550	-4.02	0.6297	-5.12	0.5549	-9.12	0.3501	-19.31	0.1082	-49.91	0.0032
9600	-4.11	0.6228	-5.21	0.5486	-9.23	0.3457	-19.45	0.1065	-50.12	0.0031
9650	-4.21	0.6160	-5.31	0.5424	-9.33	0.3414	-19.59	0.1049	-50.34	0.0030
9700	-4.30	0.6092	-5.41	0.5363	-9.44	0.3372	-19.72	0.1033	-50.55	0.0030
9750	-4.40	0.6026	-5.51	0.5303	-9.55	0.3330	-19.86	0.1017	-50.77	0.0029
9800	-4.49	0.5961	-5.61	0.5244	-9.66	0.3289	-19.99	0.1001	-50.98	0.0028
9850	-4.59	0.5896	-5.70	0.5186	-9.77	0.3248	-20.12	0.0986	-51.19	0.0028
9900	-4.68	0.5833	-5.80	0.5128	-9.87	0.3209	-20.26	0.0971	-51.41	0.0027
9950	-4.78	0.5770	-5.90	0.5072	-9.98	0.3169	-20.39	0.0956	-51.62	0.0026
10000	-4.87	0.5709	-5.99	0.5016	-10.09	0.3131	-20.52	0.0942	-51.83	0.0026

BC-R2(1)/DT/6-E

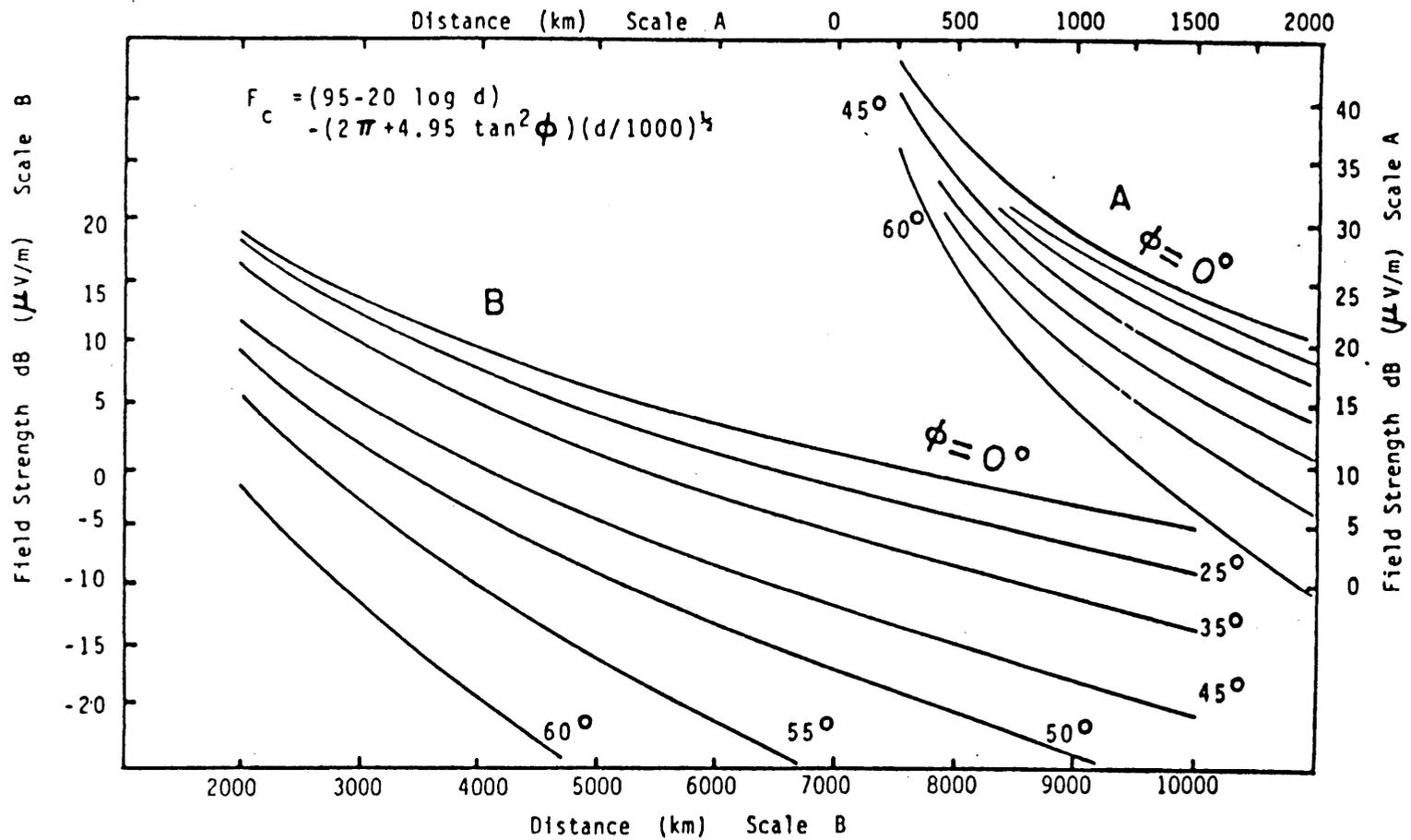


FIGURE 4 - Skywave field strength vs distance (for a characteristic field strength of 100 mV/m at 1 km, 50%, 2 hours after sunset)

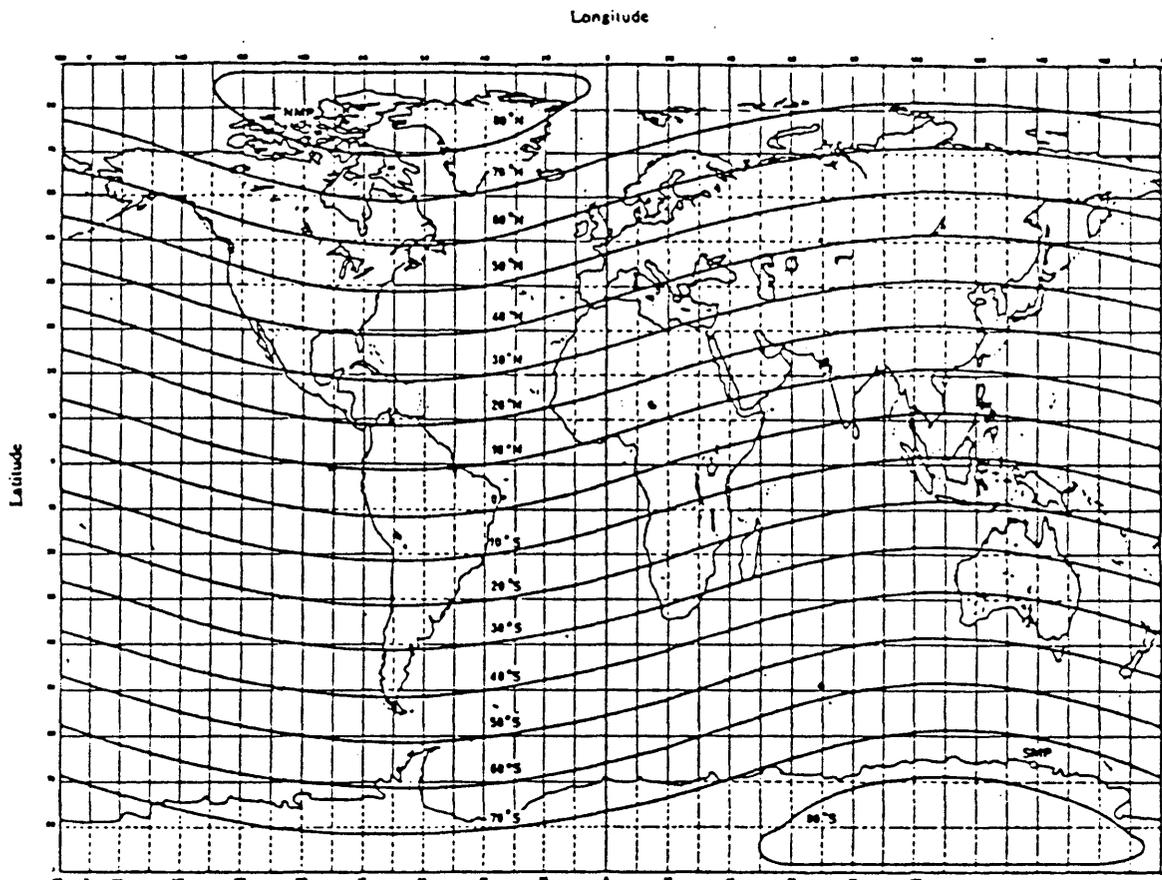


FIGURE 5

Geomagnetic latitudes

ϕ_T or ϕ_R are the geomagnetic latitudes of the transmitter or receiver. They are given by the equation:

$$\phi_T \text{ or } \phi_R = \text{arc sin} \left[\sin a \sin 78.5^\circ + \cos a \cos 78.5^\circ \cos (69^\circ + b) \right] *$$

where a_T or a_R and b_T or b_R are the latitude and longitude, in degrees, of the terminal respectively; b is positive east of the Greenwich meridian.

The geomagnetic latitudes at the transmitter and receiver are determined by assuming an Earth-centred dipole field model with northern pole at 78.5° N, 69° W geographic co-ordinates. ϕ_T and ϕ_R are taken as positive in the northern hemisphere and negative in the southern hemisphere.

* From the CCIR Report to the First Session of the Regional Administrative MF Broadcasting Conference (Region 2), Geneva, 1979, paragraph 2.4.6.

Average variation (dB) of the
hourly median field strength

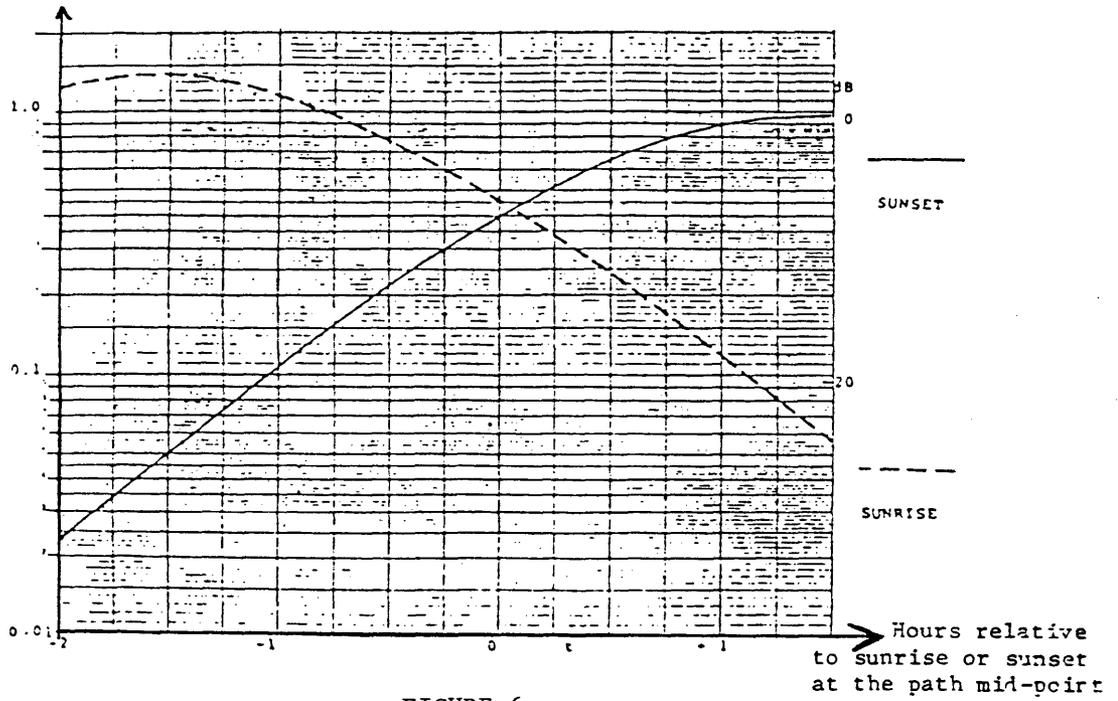


FIGURE 6
Diurnal Curves for the 1605-1705 kHz band
Calculated at 1655 kHz

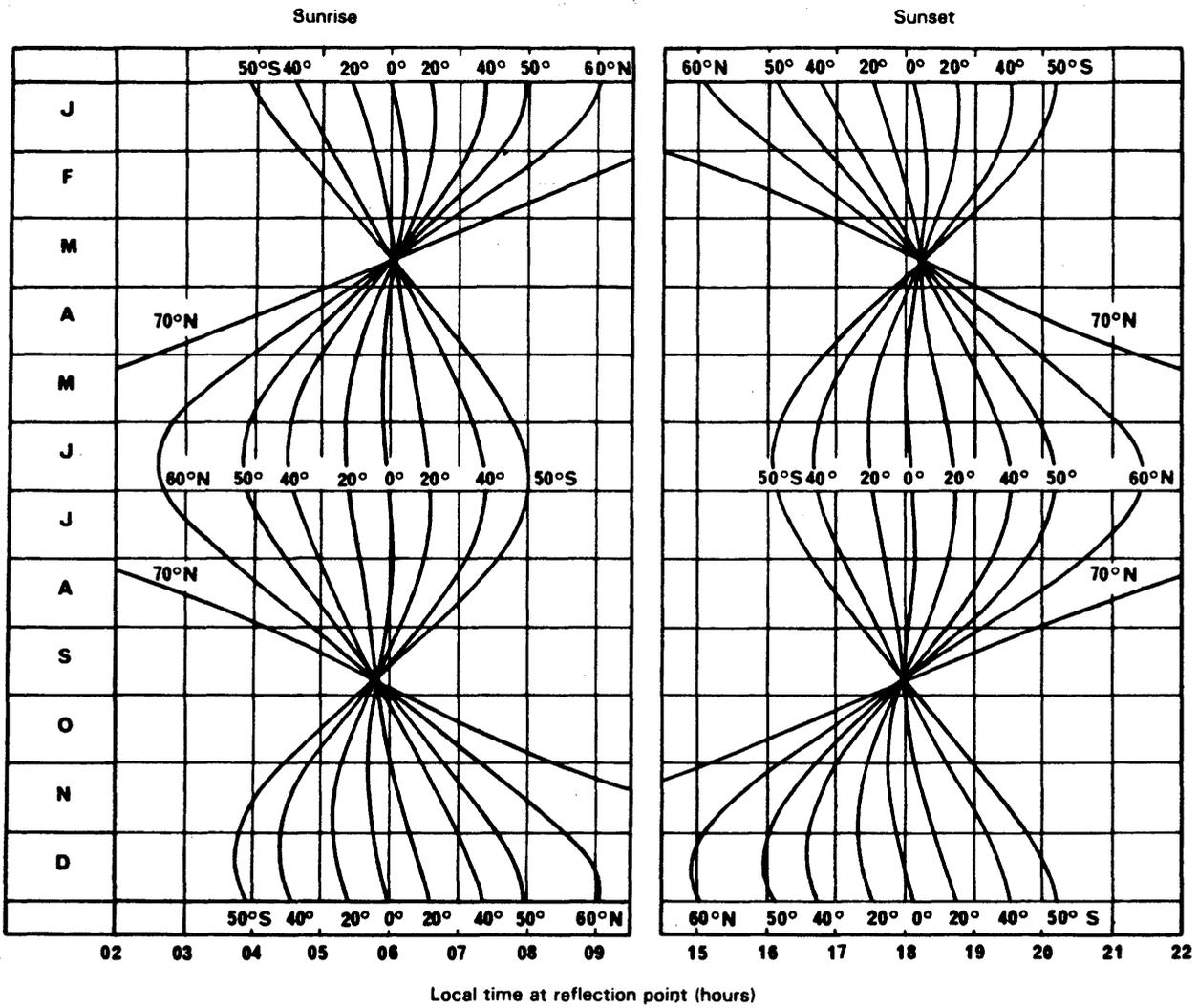


FIGURE 7 - Times of sunrise and sunset for various months and geographical latitudes

DRAFT

FIRST REPORT OF COMMITTEE 5 TO THE PLENARY

1. It is the understanding of the Committee 5 that the first paragraph of its Terms of Reference (Conference Document 25) contains two separate tasks, the adoption of a planning method and the establishment of guidelines for the agreement.
2. Committee 5 has considered the following Documents 7, 8, 11, 13, 16, 19, 20, 23, 24 and 40 relating to the planning approach to be used by Region 2 in the band 1 605 - 1 705 kHz. As a result of the discussions on these documents the following approach has been decided on for use in the planning of this band for the Broadcasting Service:
 - a) the Plan for the Broadcasting Service will contain both allotments and assignments;
 - b) the Plan will not be based on requirements submitted by administrations;
 - c) the Plan will be based on the use of standard parameters for the allotments;
 - d) the First Session will develop one or more standard distance(s) for the separation of the co-channel allotments and for the separation of adjacent channel allotments in border areas;
 - e) the planning method will consist of two steps:
 - firstly, the development of a region wide allotment plan;
 - secondly, for those administrations so wishing, they may convert at the Second Session their allotments into assignments using the specified planning criteria and these assignments will also appear in the Plan;
 - f) the associated procedures will specify the details for converting the allotments into assignments in the border areas and shall be contained in the guidelines to the Second Session;
 - g) administrations may, in a specified area, use channels not allotted to them under the conditions to be specified in the guidelines to the Second Session.
3. The details of the planning approach and the guidelines for the associated procedures will be prepared in Working Group(s) of Committee 5.

M.M. FERNANDEZ-QUIROZ
Chairman of Committee 5

Working Group 4-B

BROADCASTING STANDARDS AND PROTECTION RATIOS

BROADCASTING STANDARDS

4.1 Channel spacing

The Plan shall be based on a channel spacing of 10 kHz and carrier frequencies which are integral multiples of 10 kHz, beginning at 1 610 kHz.

4.2 Class of emission

The Plan shall be based on double-sideband amplitude modulation with full carrier A3E.

Classes of emission other than A3E could also be used on condition that the energy level outside the necessary bandwidth does not exceed that normally expected in A3E emission, for instance to accommodate stereophonic systems.

CAN/7/38 4.3 Bandwidth of emission

The Plan shall be based on a necessary bandwidth of 10 kHz for which only 5 kHz audio bandwidth can be obtained. [While this might be an appropriate value within some administrations, others may wish to employ wider bandwidth systems with necessary bandwidths of the order of 20 kHz. However,] The protection ratios selected allow operation with 20 kHz occupied bandwidth without an appreciable increase in interference.

USA/4/50 Frequency tolerance

As indicated in the Radio Regulations, the frequency tolerance shall be 20 parts in 10^6 for powers of 10 kW or less, and 10 Hz for powers greater than 10 kW.

4.9 Protection ratios

4.9.1 Co-channel protection ratio

The co-channel protection ratio shall be 26 dB.

4.9.2 Adjacent channel protection ratio

- protection ratio for the first adjacent channel: 0 dB
- protection ratio for the second adjacent channel:
-29.5 dB

4.9.3 Synchronized networks

In addition to the standards specified in this Report, the following additional standard shall apply to synchronized networks.

For the purpose of determining interference caused by synchronized networks, the following procedure shall be applied. If any two transmitters are less than 400 km apart, the network shall be treated as a single entity, the value of the composite signal being determined by the quadratic addition of the interfering signals from all the individual transmitters in the network. If the distances between all the transmitters are equal to or greater than 400 km, the network shall be treated as a set of individual transmitters.

For the purpose of determining sky-wave interference received by any one member of a network, the value of the interference caused by the other elements of the network shall be determined by the quadratic addition of the interfering signals from all of those elements. In any case, where ground-wave interference is a factor it shall be taken into account.

The co-channel protection ratio between stations belonging to a synchronized network shall be 8 dB.

T.M. BEILER
Chairman of Working Group 4-B

DRAFT CHAPTER []

DEFINITIONS

In addition to the definitions given in the Radio Regulations, the following definitions and symbols apply.

Broadcasting channel (AM)

A part of the frequency spectrum, equal to the necessary bandwidth of AM sound broadcasting stations, and characterized by the nominal value of the carrier frequency located at its centre.

Objectionable interference

Interference caused by a signal exceeding the maximum permissible field strength within the protected contour, in accordance with the values derived from this [].

Protected contour

Continuous line that delimits the service area which is protected from objectionable interference.

Service area

The area delimited by the contour within which the calculated level of the ground-wave field strength is protected from objectionable interference in accordance with the provisions of Chapter [4].

Nominal usable field strength (E_{nom})

Agreed minimum value of the field strength required to provide satisfactory reception, under specified conditions, in the presence of spheric noise, man-made noise and interference from other transmitters. The value of nominal usable field strength has been employed as the reference for planning.

Usable field strength (E_u)

Minimum value of the field strength required to provide satisfactory reception under specified conditions in the presence of atmospheric noise, man-made noise, and interference in a real situation (or resulting from a frequency [assignment] [allotment] plan).

Audio-frequency (AF) signal-to-interference ratio (Recommendation 447-2)

The ratio (expressed in decibels) between the values of the voltage of the wanted signal and the voltage of the interfering signal, measured under specified conditions, at the audio-frequency output of the receiver. These specified conditions include various parameters such as the frequency separation between the desired carrier and the interfering carrier, the emission characteristics (type and percentage modulation etc.), levels of input and output of the receiver and its characteristics (selectivity, sensitivity to intermodulation, etc.).

Audio-frequency (AF) protection ratio

Agreed minimum value of the audio-frequency signal-to-interference ratio corresponding to a subjectively defined reception quality. This ratio may have different values according to the type of service desired.

Radio-frequency (RF) wanted-to-interfering signal ratio (Recommendation 447-2)

The ratio (expressed in decibels) between the values of the radio-frequency voltage of the wanted signal and the interfering signal, measured at the input of the receiver under specified conditions. These specified conditions include various parameters such as the frequency separation between the desired carrier and the interfering carrier, the emission characteristics (type and percentage modulation etc.), levels of input and output of the receiver and its characteristics (selectivity, sensitivity to intermodulation, etc.).

Radio-frequency (RF) protection ratio

The desired radio-frequency signal-to-interference ratio which, in well-defined conditions, makes it possible to obtain the audio-frequency protection ratio at the output of a receiver. These specified conditions include various parameters such as the frequency separation between the desired carrier and the interfering carrier, the emission characteristics (type and percent modulation, etc.), levels of input and output of the receiver and its characteristics (selectivity, sensitivity to intermodulation, etc.).

Class B station

A station intended to provide coverage over one or more population centres and the contiguous rural areas located in its service area and which is protected against objectionable interference, accordingly.

Class C station

A station intended to provide coverage over a city or town and the contiguous suburban areas located in its service area and which is protected against objectionable interference, accordingly.

Daytime operation

Operation between the times of local sunrise and local sunset.

Night-time operation

Operation between the times of local sunset and local sunrise.

Synchronized network

Two or more broadcasting stations whose carrier frequencies are identical and which broadcast the same programme simultaneously. In such a synchronized network the difference in carrier frequency between any two transmitters in the network shall not exceed 0.1 Hz. The modulation delay between any two transmitters in the network shall not exceed 100 μ s, when measured at either transmitter site.

Station power

Unmodulated carrier power supplied to the antenna.

Ground-wave

Electromagnetic wave which is propagated along or near the surface of the Earth and which has not been reflected by the ionosphere.

Sky wave

Electromagnetic wave which has been reflected by the ionosphere.

L. OLSON
Chairman of Drafting Group 4-B-1

WORKING GROUP 4-B

Organization of work

In its first and second meetings, Working Group 4-B created two Drafting Groups and two Sub-Working Groups as follows:

Drafting Group 4B-1: Mr. L.M. Frota (B)

Review and improve the drafting of the broadcasting standards.

Drafting Group 4B-1 has completed its task.

Drafting Group 4B-2: Chairman - Mr. L. Olson (USA)

Review and improve the drafting of the definitions.

Sub-Working Group 4B-3: Chairman - Mr. P. Mangat (G)

Study the correlation between physical height and electrical height of an antenna, and prepare a report for the next Working Group meeting.

Sub-Working Group 4B-4: Chairman - Mrs. T.M. Beiler (B)

Study the proposals on noise zones and nominal usable field strength and report to the next meeting.

T.M. BEILER
Chairman of Working Group 4-B

COMMITTEE 3

DRAFT REPORT OF AD HOC GROUP OF COMMITTEE 5
ON THE RELATION BETWEEN THE BC SERVICE IN REGION 2 AND
THE OTHER SERVICES TO WHICH THE BAND 1 605 - 1 705 kHz IS ALLOCATED

1. As the planning of the band shall be based on allotments, and as the exact location and characteristics of the broadcasting stations are not known, it is not practical to assess the compatibility between the allotments and the assignments to the other services to which the band is allocated. For this reason, the allotment plan shall be established without taking into account the stations of other services.
2. The draft agenda of the second session should contain an item that permits it to adopt a procedure to be applied by administrations wishing to implement their allotments with respect to non-broadcasting stations of the other contracting members. Such procedures will provide for the continued operation of designated non-broadcasting stations provided it does not have an adverse effect upon the implementation of the Plan.
3. The first session should adopt a Recommendation to administrations in order to no longer assign frequencies to stations of the other services to which the band is allocated and to urge them to take steps for the suppression of the existing assignments from the MIFR. Such a Recommendation should be applicable as of the date of its adoption by the first session.
4. The first session should adopt a Resolution requesting the Board to review the situation in the planned band and to request administrations to take action for the deletion from the Master Register of their assignments to stations of other services with appropriate reference to the Recommendation referred to above.

E. DuCHARME
Chairman of Ad hoc Group
of Committee 5

DISCUSSION ITEMS ON

GUIDELINES FOR THE AGREEMENT AND THE PROCEDURES TO BE CONSIDERED

1. RELATING TO THE MODIFICATION OF THE PLAN
 - a) Will there be a procedure for modifying the allotments or assignments that are included in the plan at the second session or for adding new allotments to the Plan?
 - b) Will there be a procedure for the modifying the plan after the second session to add to the plan those assignments that are brought into use after the second session?
2. RELATING TO THE NOTIFICATION OF BROADCASTING ASSIGNMENTS
 - a) the agreement should contain procedures specifying how administrations will notify BC assignments (using Art. 12 of the Radio Regulations) and the necessary procedures for administrations to coordinate the assignments on adjacent channel allotments in adjacent allotment areas.
 - b) the procedures should specify the criteria that the Board is to use in examining BC notices to ensure their conformity with the Regional agreement and the procedures for the examination of the notices and their recording in the MIFR.
 - c) the procedures should specify the necessary details on how assignments to stations using parameters different than the standardized parameters are to be notified and the technical criteria that the Board shall use in examining such notices to ensure their conformity with the agreement.
 - d) there should be procedures specifying the conditions under which administrations can use channels in areas that are not allotted to them in that area.
 - e) should there be procedures specifying the criteria to be used by the Board in examining BC notices against Fixed and Mobile assignments that are recorded in the MIFR?
3. RELATING TO THE NOTIFICATION OF FIXED AND MOBILE STATIONS
 - a) should there be procedures indicating how the Board will examine notices of the Fixed and Mobile services against the BC allotments and assignments that are in the plan and against BC, Fixed, and Mobile assignments recorded in the MIFR.

J. Lussio
Chairman Working Group 5B

REPORT OF SUB-WORKING GROUP 4-B-3 TO WORKING GROUP 4-B

Sub-Working Group 4-B-3 has reached the following conclusions:

It was agreed that the theoretical method was used at present for determining the electrical height of the antenna be adopted. (Removal of text and graph within square brackets on pages 6 and 7 of Document 52.)

Sub-Working Group 4-B-3 also decided that there is a need for administrations to undertake further studies in order to establish the relationship between the physical and the electrical height of the antennas. Furthermore, it was decided that the findings of the studies be submitted to the relevant CCIR Study Group[s] in the form of specific contributions so that these could be considered at the next interim meeting.

The CCIR should be invited to prepare a report to the Second Session based on the contributions submitted by the administrations. This study should be carried out within the normal framework of the CCIR activity.

P. MANGAT
Chairman of Sub-Working Group 4-B-3

WORKING GROUP 4-BDraftREPORT FROM SUB-WORKING GROUP 4-B-4
TO WORKING GROUP 4-B

At its first meeting Sub-Working Group 4-B-4 reached an agreement on the adoption of two noise zones, in accordance with the Final Acts of RARC-81.

Sub-Working Group 4-B-4 however, was not able to reach a unanimous decision on the values of nominal usable field strength.

In the case of daytime operation E_{nom} , six administrations were in favour of the adoption of the same values as in the RJ81 Agreement, namely, 0.5 mV/m for Noise Zone 1 and 1.25 mV/m for Noise Zone 2. Two administrations were in favour of a value varying from 0.9 to 1.6 mV/m for Noise Zone 1 and 0.9 to 2.5 mV/m for Noise Zone 2.

In the case of night-time operation, the following values of E_{nom} would be acceptable for five administrations for the time being:

Noise Zone 1

Noise Zone 2

[3.3 mV/m]

[6 mV/m]

Two administrations would accept these values, provided that no RSS should be applied.

One administration mentioned that it could accept these values, provided that RSS should be applied.

Two administrations mentioned that if Sub-Working Group 4-B-4 adopted these values, they would reserve their right to revert to the subject at a later stage.

T.M. BEILER
Chairman of Sub-Working Group 4-B-4

WORKING GROUP 4-B

Draft

RECOMMENDATION [COM4/1]

The First Session of the Regional Administrative Conference to establish a plan for the Broadcasting Service in the band 1 605 - 1 705 kHz in Region 2 (Geneva, 1986),

considering that information relating to the relationship between physical antenna height and electrical antenna height of a tower would be useful to every administration when establishing assignments in the MF band;

recommends administrations in Region 2 within the limits of their possibilities, to carry out measurements to define this relationship and submit the relevant data to the concerned CCIR Study Group at its Interim Meeting (November, 1987);

requests the CCIR

- a) to prepare, on the basis of the contributions submitted by administrations, a Report to the Second Session of the Conference;
- b) to complete the above report [not later than the end of 1987] and distribute it not later than [six] months before the beginning of the Second Session of the Conference;
- c) to carry out these studies within the normal framework of the CCIR Study Groups' activity.

T.M. BEILER
Chairman of Working Group 4-B

Draft

RECOMMENDATION COM5/2

Continuation of studies concerning sharing criteria for
services using the band 1 625 - 1 705 kHz in Region 2

The Regional Administrative Radio Conference to Establish a Plan for
the Broadcasting Service in the Band 1 605 - 1 705 kHz in Region 2 (First
Session, Geneva, 1986),

considering

- a) that the World Administrative Radio Conference (Geneva, 1979), in its Recommendation No. 504, invited the CCIR to perform the necessary technical studies related to convening a conference for Region 2;
- b) that the Administrative Council, in its Resolution No. 913 establishing the agenda for this Conference, invited the CCIR to prepare a report on the necessary technical bases;
- c) that the CCIR, in response to those requests, has drawn up a report on the technical bases, which includes a chapter on compatibility with other services, while recognizing that the problem of criteria for sharing between the broadcasting service and the other services has not yet been fully investigated;
- d) that more varied and more detailed data are required for a better understanding of the subject and for confirmation of the values provisionally proposed in Chapter 6 of this report;

recommends that administrations cooperate urgently and to the fullest extent possible with the CCIR, by sending the latter contributions on the above-mentioned subject, taking account of the CCIR working schedule;

invites the CCIR

1. to continue its studies on sharing criteria for services using the band 1 625 - 1 705 kHz in Region 2;
2. to prepare a new report for the Second Session of the Conference on the basis of those studies;

and invites the Second Session of the Conference to reconsider the relevant parts of Chapter 6 of the Report of the First Session in the light of the CCIR's new report and, if necessary, to modify the values proposed in that chapter.

J.M. BOILARD
Chairman of Working Group 4-C

DraftWORKING GROUP 4CRECOMMENDATION No. [COM4/3]

TECHNICAL CRITERIA FOR INTERREGIONAL SHARING

The Regional Administrative Radio Conference to establish a plan for the broadcasting service in the band 1 605 - 1 705 kHz in Region 2, Geneva, 1986,

considering

- a) that under the terms of Resolution No. 913 of the Administrative Council, this Conference adopted technical criteria for inter-service sharing between the broadcasting service and other services in Region 2, in the band 1 625 - 1 705 kHz;
- b) that, in accordance with numbers 1001 and 1454 of the Radio Regulations, the IFRB develops Technical Standards and Rules of Procedure for internal use by the Board in the exercise of its functions, based inter alia upon the relevant provisions of the Radio Regulations and the Appendices thereto, the decisions of administrative radio conferences, as appropriate, and the Recommendations of the CCIR;

considering further

that compatibility problems and sharing criteria between the broadcasting service and other services are not fully investigated, although a comprehensive study is being carried out in the CCIR;

noting

- a) that, in conformity with the provisions of number 56 of the Convention, the decisions of a regional administrative conference must in all circumstances be in conformity with the provisions of the Radio Regulations and that such a conference may give instructions to the IFRB, provided that such instructions do not conflict with the interests of the two other Regions;
- b) that the Regional Administrative Radio Conference for the Maritime Mobile Service and Aeronautical Radionavigation Service in certain parts of the MF band in Region 1 (RARC MM-R1, Geneva, 1985) adopted technical criteria for the protection of the maritime mobile service in the bands 1 606.5 - 1 625 kHz and 1 635 - 1 800 kHz;

recommends

that the IFRB should take account of the guidelines set out in the Annex to this Recommendation when adopting its technical standards for the purpose of calculations of interregional interference.

ANNEX

to Recommendation No. [COM4/3]

Calculation of field strengths in the case of interregional interference

- 1) In calculating interregional interference, the field strengths shall be determined by taking the arithmetic mean of the signal strengths, expressed in dB(μ V/m) for a specified e.m.r.p., calculated both by the method described in Annex 1 to CCIR Recommendation 435-3 and by the method used within Region 2. Signal strengths calculated by the Region 2 method should be increased by 2.5 dB to allow for the different reference hours of the two methods. The value determined in accordance with the above shall be applied when it is midnight at the mid-point of the interregional path, provided that the entire path is in darkness. Signal strengths at other times are unlikely to exceed this value.
- 2) Protection in accordance with the criteria defined in Chapter 6 is to be given within [the national boundary and/or sub-national zone for priority channels and within the service contours for non-priority channels.]

J.M. BOILARD
Chairman of Working Group 4C

WORKING GROUP 5-A

Note from the Chairman of Working Group 5-A

PLANNING BASES

1.1 Definitions

An allotment is an entry in the plan of a designated frequency channel for use by an administration for the broadcasting service in an allotment area under the conditions specified in the [Plan and/or Agreement]. Each allotment included in the Plan may be [used for] [converted into] one or more assignments using the technical criteria specified in [].

An allotment area is a [specifically defined] geographical area [specifically determined by the Plan] within a country to which one or more channels are allotted.

6.1 Planning bases

I. Allotment method

The following are the principles agreed for use in preparing a[n allotment] plan for the broadcasting service in Region 2 in the band 1 605 - 1 705 kHz:

- a) the Plan for the broadcasting service will contain allotments and [may contain] assignments;
- b) the Plan will not be based on requirements submitted by administrations;
- c) an allotment area is determined on the basis of the standardized distance(s) specified in Table [];
- d) where the separation distance between the allotment area of one administration and those of a number of other administrations is less than the standardized distance(s), the minimum number of channels allotted to that area will depend on the number of administrations involved as indicated in Table [];
- e) where the separation distance between the allotment area of one administration and those of all other administrations is greater than the standardized distance(s), all ten channels are allotted to that area;

- f) the Plan will be based on the use of standardized parameters. However, the possibility should be left open for the case where a group of countries may decide to develop subregionally at the Conference part of the Plan, consistent with the Regional Plan, based on a transmitter power less than the standardized parameters;
- g) an administration may make assignments on channels not allotted to it in a particular allotment area provided that it protects the allotments and assignments of other countries in accordance with Annex [1]. Such assignments shall not restrict standardized parameter use of allotments;
- h) in cases where neighbouring countries have allotments on adjacent channels, procedures to be followed before bringing into use assignments from allotments in border areas are specified in Chapter [];
- i) administrations may bring into use assignments with parameters different from the standardized parameters provided the assumption of equivalency given in [] is met;

II. Assignment method

- a) For the assignment method, the same technical parameters shall be applied as those used for the allotment method;
- b) the allotment areas of other countries, as determined by the allotment method, shall be respected;
- c) parameters different from those standardized for the allotment method may be used for the assignment method, provided that the protections established with the allotment method are complied with;
- d) in order to ensure greater flexibility for the location of assignments in the future, greater co-channel distances may be used than the standardized distances;
- e) assignment coordinations shall be required only in the geographical coordination fringe equivalent to the allotment area of the neighbouring country or countries;
- f) assignments arrived at by the assignment method shall comply with the provisions of the Radio Regulations and the conclusions derived therefrom.

D. JOHNSON
Chairman of Working Group 5-A

WORKING GROUP 4-C

DRAFT FIRST REPORT OF WORKING GROUP 4-C

TO COMMITTEE 4

1. Working Group 4-C has considered the proposals in Documents 3, 7, 29 and 34 relating to the technical criteria for interservice sharing (item 2.2 of the Agenda). As a result of the discussions on these documents:

DRAFT CHAPTER ON TECHNICAL CRITERIA FOR INTERSERVICE SHARING

is proposed (see Annex).

2. It is the opinion of Working Group 4-C that the administrations of Region 2 should be invited to carry out studies and make measurements, within the limits of their possibilities, to define, on the basis of the principle of an equivalent service quality between the broadcasting and the other services sharing the same band, the steady state protection ratio values as requested. These studies should be carried out within the normal framework of the CCIR Study Group activity. The concerned administrations are therefore invited to submit their findings to the relevant CCIR Study Group at its Interim Meeting. In this connection, a draft Recommendation [COM4/2] is proposed.
3. In addition, Working Group 4-C touched on the question of interregional sharing, being aware that it is opportune to give some guidelines concerning this issue. An appropriate draft Recommendation [COM4/3] has been drafted.

J.M. BOILARD
Chairman of Working Group 4-C

Annex

ANNEX

Draft

CHAPTER 6 - TECHNICAL CRITERIA FOR INTERSERVICE SHARING

In accordance with Article 8, of the Radio Regulations, the fixed and mobile services become permitted services at a time to be established by the Conference. The intention was to facilitate the preparation of the broadcasting Plan without restrictions from other services. Thus in drawing up the Plan, broadcasting will have prior choice of frequency and does not have to protect the other services. The sharing criteria developed in this section are designed to apply to the permitted services in order to protect broadcasting services in the Plan and give protection to these permitted services. According to the specific cases the protection ratio value is given for co-channel interference (CO) or for off-channel interference (OC).

[6.1] Protection of the broadcasting service

The broadcasting service in Region 2 may be subject to potential inter-service interference from services sharing the sub-band 1 625 - 1 705 kHz such as the fixed, mobile and radiolocation services.

Protection in accordance with the criteria in § [6.1.1] is to be given within the national boundary and/or sub-national zone for priority channels and within the service contours for non-priority channels.

A value of 26 dB has been indicated in [3.8.X] for co-channel protection ratio between broadcasting emissions, hence allowing a given quality of service, and the same quality criteria has been applied to derive the figures given in the case where interfering services other than broadcasting are considered.

[6.1.1] Protection ratio criteria

As noted in CCIR Report to the Conference, "Compatibility problems and sharing criteria between the broadcasting service and the other services are not fully investigated...". Additional limited information has been developed since that document was prepared. However, it is recognized that further information is necessary before administrations are in a position to agree on the values to be used in establishing protection criteria for use in sharing of the extended band. As a result, administrations are encouraged to make further studies of this subject during the intersessional period. In addition, it would be desirable for the CCIR to assist in the final preparation of a responsive document to be submitted to the Second Session. (See Recommendation COM4/2).

The proposed co-channel (zero frequency carrier spacing) radio-frequency protection from a J3E emission is 28 dB. With respect to an F1B type of emission, the off-channel (1 kHz) radio-frequency protection ratio required to protect the broadcasting service is 45 dB. The radio-frequency protection ratio curves (median values) appearing in Figures [6.1] and [6.2] are used to determine protection for various carrier spacings.

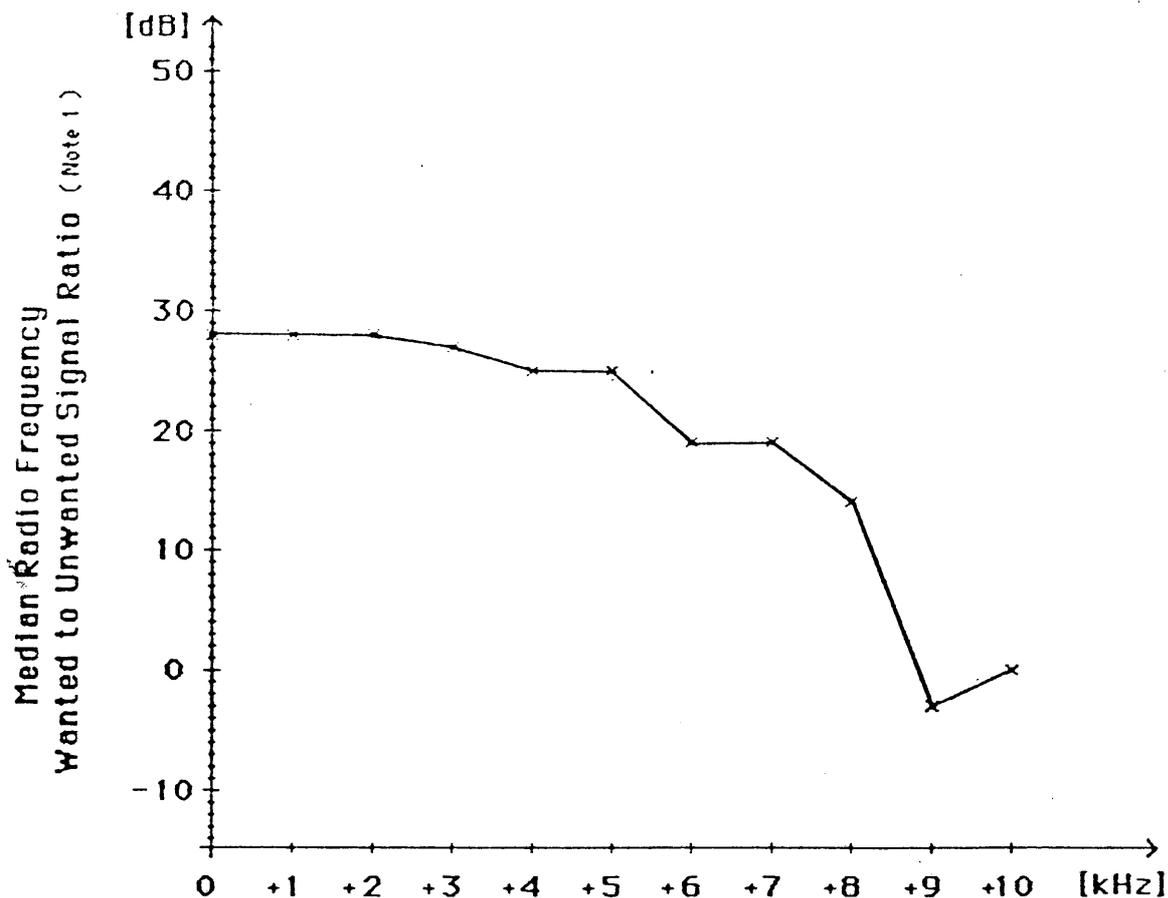
The protection ratio values for other types of modulations that can be used by the services sharing this band are given in Table [6.1] hereafter.

6.2 Protection of the permitted services

The protection ratio values to protect the permitted services when implementing the Plan are also given in Table [6.1].

In the wanted fixed service case, values are indicated for just usable (JU), marginally commercial (MC) and good commercial (GC) quality and in the telegraph communication case they should be specified for a character error ratio, P_E of 10^{-2} , 10^{-3} and 10^{-4} , but since the protection ratios do not significantly vary for P_E values up to 10^{-6} , a single figure is suggested by the CCIR.

Wanted (Note 1).....	A3E (Broadcasting)
Unwanted.....	J3E (Radiotelephony)
LPF at Rx.....	10 kHz
Grade of impairment.....	4 (as per CCIR Rec. 562-1)



Carrier Frequency Separation

(unwanted relative to wanted)

Figure 6.1- Median value of the radio frequency wanted (A3E) to unwanted (J3E) signal ratio as a function of the carrier frequency separation.

Note 1 - The signal ratio is defined as the ratio of the peak envelope power of the wanted signal to the peak envelope power of the unwanted signal.

Wanted (Note 1).....	A3E	(Broadcasting)
Unwanted.....	F1B	(Narrow-band direct printing telegraphy or selective digital calling)
LPF at Rx.....	10 kHz	
Grade of impairment.....	4	(as per CCIR Rec. 562-1)

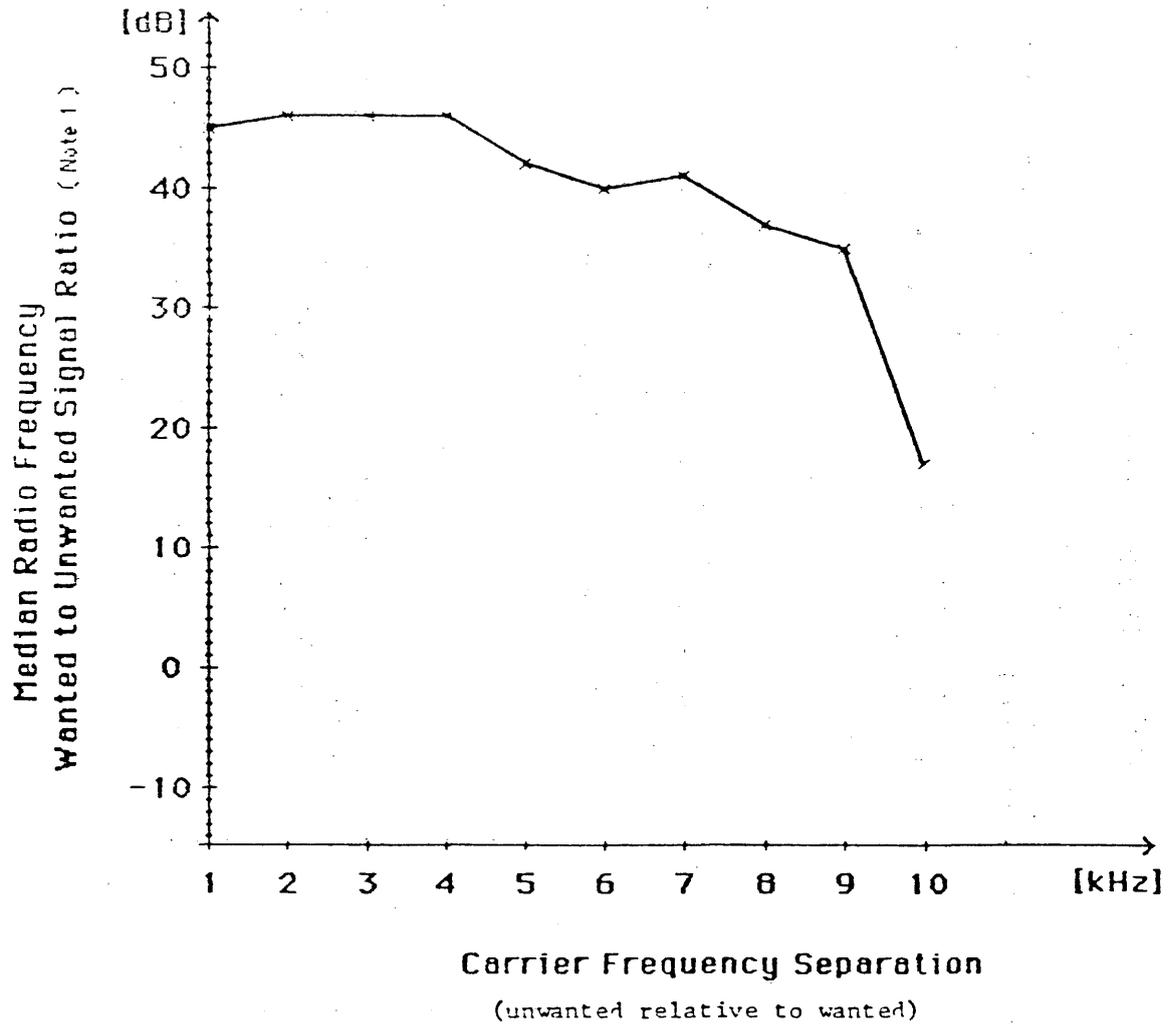


Figure 6.2 Median value of the radio frequency wanted (A3E) to unwanted (F1B) signal ratio as a function of the carrier frequency separation.

Note 1 - The signal ratio is defined as the ratio of the peak envelope power of the wanted signal to the mean power of the unwanted signal.

TABLE 6.1

Steady-state protection ratios (dB)*

Interfering signal \ Wanted signal		A3E (BC)		A3E (fixed)		A2A/A2B		F1B		J2B		J3E		H2A/H2B		Class of emission
		CO	OC	CO	OC	CO	OC	CO	OC	CO	OC	CO	OC	CO	OC	Interfering condition ¹⁾
A3E (BC)		26		26		31		41	45		43		28		37	
A3E (fixed)	JU MC GC	-7 5 26		<p>* Ratio of wanted-to-interfering signals whose powers are expressed in terms of p.e.p. (PX) (see Recommendation 240-3 (MOD I)). If protection ratios are to be expressed for interference signal level from median level to a level exceeded for [10%] of the time, a [7] dB factor should be added for fading allowances.</p> <p>1) CO (co-channel interference) and OC (off-channel interference) are the cases when the frequency separation between the assigned frequency of the wanted signal and that of the interfering signal is approximately zero and about 1.4 kHz respectively.</p> <p>2) Administrations are urged to discontinue, in the fixed service, the use of double-sideband radiotelephone (class A3E) transmissions (see RR 2700).</p>												
A2A/A2B	$P_E < 10^{-6}$	5														
F1B	$P_E < 10^{-6}$	-3														
J2B	$P_E < 10^{-6}$		5													
J3E	JU MC GC		-19 -7 14													
H2A/H2B	$P_E < 10^{-6}$		-1													
Class of emission	Service grade															

6.3 Principles used for the application of interregional sharing criteria
(See Recommendation COM4/3)

6.3.1 Application of RR 346

In the application of the interregional sharing criteria the basic principle is the equality of rights between the regions, as contained in RR 346.

6.3.2 Application of the IFRB technical standards

The relevant IFRB technical standards govern the matter concerning the interregional sharing.

J.M. BOILARD
Chairman of Working Group 4-C

WORKING GROUP 5-A

NOTE FROM THE CHAIRMAN OF WORKING GROUP 5-A

1.1 Definitions

An allotment is an entry in the plan of a designated frequency channel for use by an administration for the broadcasting service in an allotment area under the conditions specified in the [Plan and/or Agreement]. Each allotment included in the Plan may be used for one or more assignments using the technical criteria specified in [A].

An allotment area is a specifically defined geographical area within a country to which one or more channels are allotted.

6.1 Basis for planning

The plan for the broadcasting service in Region 2 in the band 1 605 - 1 705 kHz is based on the following:

- a) the Plan for the broadcasting service will contain allotments and may contain assignments;
- b) the Plan will not be based on requirements submitted by administrations;
- c) an allotment plan shall be established without taking into account the stations of other services;
- d) an allotment area is determined on the basis of the standardized distance(s) specified in Table [B];
- e) where the separation distance between the allotment area of one administration and those of a number of other administrations is less than the standardized distance(s), the minimum number of channels allotted to that area will depend on the number of administrations involved as indicated in Table [C];
- f) where the separation distance between the allotment area of one administration and those allotment areas of all other administrations is greater than the standardized distance(s), all ten channels are allotted to that area;
- g) the Plan will be based on the use of standardized parameters. However, the possibility should be left open for the case where a group of countries decide subregionally to develop at the Conference part of the Plan, consistent with the Regional Plan, based on a transmitter power less than the standardized parameters;

- h) an administration may make assignments on channels not allotted to it in a particular allotment area provided that it protects the allotments and assignments of other countries in accordance with Annex [1]. Such assignments shall not restrict standardized parameter use of allotments;
- i) in cases where neighbouring countries have allotments on adjacent channels, procedures to be followed before bringing into use assignments from allotments in border areas are specified in Chapter [D];
- j) administrations may bring into use assignments with parameters different from the standardized parameters provided the conditions given in [E] are met;
- k) for those administrations so wishing, they may convert at the second session their allotments into assignments using the specified planning criteria and these assignments will also appear in the Plan;
- l) for the case mentioned in k) above, where neighbouring countries have allotments in adjacent channels, the procedures mentioned in i) must be followed.

D. JOHNSON
Chairman of Working Group 5-A

WORKING GROUP
OF THE PLENARY

At the second meeting of the Working Group, the following draft Recommendation was prepared:

Draft

RECOMMENDATION [PLEN/A]

Draft Agenda and Duration of the Second Session of the Conference

The Regional Administrative Radio Conference to Establish a Plan for the Broadcasting Service in the Band 1 605 - 1 705 kHz in Region 2, (First Session, Geneva, 1986),

considering

- a) Resolution No. 1 of the Plenipotentiary Conference, Nairobi, 1982, relating to Future Conferences of the Union;
- b) Recommendation No. 504 of the 1979 WARC, relating to the Preparation of a Broadcasting Plan in the Band 1 605 - 1 705 kHz in Region 2;
- c) that, in accordance with RR 480 of the Radio Regulations, the use of the band 1 605 - 1 705 kHz by stations of the broadcasting service shall be subject to a plan to be established by a regional administrative radio conference;
- d) that the Table of Frequency Allocations provides for other services in the frequency band 1 625 - 1 705 kHz;
- e) that the agenda for the First Session contained in Resolution No. 913 of the Administrative Council, 1984, provides for the First Session to establish a draft agenda for the Second Session of the Conference, relating to the establishment of an agreement and an associated plan, to be submitted to the Administrative Council;
- f) the Report of the First Session;
- g) that the Second Session will need to consider the report of the IFRB on the work carried out during the intersessional period based on the decision of the First Session;
- h) that the Second Session will need to consider technical information made available by the CCIR as a result of studies carried out;
- i) that administrations will submit proposals to the Second Session;

recognizing

that the frequency band 1 605 - 1 705 kHz is shared with other services;

recommends to the Administrative Council

1. the following draft agenda for the Second Session on the basis of the Report of the First Session and taking account of the material identified in consideranda [g], [h] and i;

1.1 to draw up an agreement which includes regulatory procedures, appropriate technical standards, an associated frequency allotment plan and possibly assignments derived therefrom for the use of the band 1 605 - 1 705 kHz by the broadcasting service in Region 2;

1.2 to establish the regulatory procedures to govern the use of the band 1 625 - 1 705 kHz by other services in Region 2;

1.3 to establish a date or dates in accordance with RR 481 and a schedule for the introduction of the broadcasting service in the band 1 605 - 1 705 kHz;

1.4 to review and revise relevant Resolutions and Recommendations;

1.5 to adopt a procedure to be applied by administrations wishing to implement their allotments with respect to non-broadcasting stations of the other contracting members. Such procedures will provide for the continued operation of designated non-broadcasting stations provided it does not have an adverse effect upon the implementation of the Plan.

2. to consider with a view to its reduction, the time allocation of four weeks for the Second Session of the Conference in 1988.

E.D. DuCHARME
Chairman of the Working Group of the Plenary

WORKING GROUP
OF THE PLENARY

At the first meeting of the Working Group, the following draft Recommendation was prepared:

Draft

RECOMMENDATION [PLEN/A]

Agenda and Duration of the Second Session of the Conference

The Regional Administrative Radio Conference to Establish a Plan for the Broadcasting Service in the Band 1 605 - 1 705 kHz in Region 2, (First Session, Geneva, 1986),

considering

- a) Resolution No. 1 of the Plenipotentiary Conference, Nairobi, 1982, Future Conferences of the Union;
- b) Recommendation No. 504 of the 1979 WARC, Relating to the Preparation of a Broadcasting Plan in the Band 1 605 - 1 705 kHz in Region 2;
- c) that, in accordance with RR 480 of the Radio Regulations, the use of the band 1 605 - 1 705 kHz by stations of the broadcasting service shall be subject to a plan to be established by a regional administrative radio conference;
- d) that the agenda for the First Session contained in Resolution No. 913 of the Administrative Council, 1984, provides for the First Session to establish a draft agenda for the Second Session of the Conference, relating to the establishment of an agreement and an associated plan, to be submitted to the Administrative Council;
- e) the Report of the First Session;
- f) that the Second Session will need to consider the report of the IFRB on the work carried out during the intersessional period based on the decision of the First Session;
- g) that the Second Session will need to consider technical information made available by the CCIR as a result of studies carried out;
- h) submissions from administrations;

recognizing

that the frequency band 1 605 - 1 705 kHz is shared with other services;

recommends to the Administrative Council

1. the following draft agenda for the Second Session on the basis of the Report of the First Session and taking account of the material identified in consideranda f), g) and h);

1.1 to draw up an agreement which includes regulatory procedures and appropriate technical standards and an associated frequency allotment plan and possibly assignments derived therefrom for the use of the band 1 605 - 1 705 kHz by the broadcasting service in Region 2;

1.2 to establish the regulatory procedures to govern the use by other services of this band;

1.3 to establish a date or dates in accordance with RR 481 and a schedule for the introduction of the broadcasting services;

1.4 to review and revise relevant Resolutions and Recommendations;

1.5 to adopt a procedure to be applied by administrations wishing to implement their allotments with respect to non-broadcasting stations of the other contracting members. Such procedures will provide for the continued operation of designated non-broadcasting stations provided it does not have an adverse effect upon the implementation of the Plan;

2. to consider with a view to its reduction, the time allocation of four weeks for the Second Session of the Conference in 1988.

E.D. DuCHARME
Chairman of the Working Group of the Plenary

COMMITTEE 5

Draft

RESOLUTION No. [COM5/1]

**Updating of the Master International Frequency Register with
Regard to Assignments to Stations of the Fixed, Mobile,
Aeronautical Radionavigation and Radiolocation Services
in the Frequency Band 1 605 - 1 705 kHz in Region 2**

The Regional Administrative Radio Conference to Establish a Plan for
the Broadcasting Service in the Band 1 605 - 1 705 kHz in Region 2 (First
Session, Geneva 1986),

considering

- a) that, by RR 481 in Article 8 of the Radio Regulations until [date of coming into force of the Plan], the band 1 605 - 1 705 kHz is allocated to the fixed, mobile and aeronautical radionavigation services on a primary basis and to the radiolocation service on a secondary basis,
- b) that, by RR 480 in the Article 8 of the Radio Regulations and as of [date of coming into force of the Plan], the band 1 605 - 1 625 kHz is allocated exclusively to the broadcasting service and the band 1 625 - 1 705 kHz is allocated to the broadcasting service on a primary basis, to the fixed and mobile services on a permitted basis and to the radiolocation service on a secondary basis;
- c) that the planning of the band shall be based upon allotment and that the exact location and characteristics of broadcasting stations are not known;
- d) that it is not practical to assess the compatibility between the allotments and assignments to the other services to which the band is also allocated;
- e) that, in view of the difficulties to evaluate the compatibility between allotments of the Plan and assignments to other services, the Conference established a Plan not taking into account existing stations of the non-broadcasting services;
- f) Recommendation No. [COM5/1];

resolves

1. that, within [90] days of the end of the First Session of the present Conference, the IFRB shall send to each administration of Region 2 the list of assignments to its stations of the fixed, mobile, aeronautical radionavigation and radiolocation services recorded in the Master Register in the bands concerned, requesting them to review these assignments with a view to cancelling those assignments which are no longer in use;
2. that administrations shall, within a period of [90] days following the receipt of the list referred to in paragraph 1 above, return the copy of the list indicating those assignments to be deleted from the Master Register as well as such modifications to other assignments, which will assist in implementing the Plan;
3. that administrations wishing to maintain in operation non-broadcasting stations in application of [paragraph 2 of Document DT/11] shall indicate the estimated date at which the station in question shall cease operation.
4. that the IFRB shall submit a report to the second session of the Conference on all deletions of and modifications to assignments to non-broadcasting stations in the band 1 605 - 1 705 kHz recorded in the Master Register on behalf of administrations in Region 2.

urges administrations

1. having assignments in the fixed, mobile, aeronautical radionavigation and/or radiolocation services, which are potentially incompatible with the Plan to take all necessary measures to eliminate the potential incompatibility bearing in mind that, in general, the non-broadcasting services have more flexibility to modify their characteristics, including the frequency;
2. to take all possible action with a view to achieving the objectives of this Resolution;

requests the IFRB

to provide administrations with all the necessary assistance in the implementation of the provisions of this Resolution.

R. BLOIS
Chairman of Ad Hoc Committee 5

COMMITTEE 5

Draft

RECOMMENDATION No. [COM5/1]

**Relating to the Use of the Band 1 605 - 1 705 kHz in Region 2
by the Non-Broadcasting Services and the Development
and Implementation of the Region 2 Broadcasting Plan**

The Regional Administrative Radio Conference to Establish a Plan for the Broadcasting Service in the Band 1 605 - 1 705 kHz in Region 2 (First Session, Geneva 1986),

considering

- a) that, by RR 481 in Article 8 of the Radio Regulations until [date of coming into force of the Plan], the band 1 605 - 1 705 kHz is allocated to the fixed, mobile and aeronautical radionavigation services on a primary basis and to the radiolocation service on a secondary basis,
- b) that, by RR 480 in the Article 8 of the Radio Regulations and as of [date of coming into force of the Plan], the band 1 605 - 1 625 kHz is allocated exclusively to the broadcasting service and the band 1 625 - 1 705 kHz is allocated to the broadcasting service on a primary basis, to the fixed and mobile services on a permitted basis and to the radiolocation service on a secondary basis;
- c) that the operation of non-broadcasting services in this band by the administrations of Region 2 could hinder the implementation of the Plan for the broadcasting service in the band 1 605 - 1 705 kHz;

recommends

- a) that, effective immediately, administrations of Region 2 shall refrain from using the band 1 625 - 1 705 kHz for their stations in the non-broadcasting service which might inhibit the implementation of the Plan;
- b) that when using frequencies in the band 1 605 - 1 705 kHz for stations in the non-broadcasting services, administrations shall take all necessary measures to ensure that the full implementation of the Plan adopted by the Conference is not compromised.

R. BLOIS
Chairman of Ad Hoc Committee 5

COMMITTEE 3

Draft

REPORT OF THE BUDGET CONTROL COMMITTEE
TO THE PLENARY MEETING

The Budget Control Committee held meetings during the Conference and examined the questions arising from its terms of reference.

Under Nos. 475 to 479 of the International Telecommunication Convention (Nairobi, 1982), the Committee's terms of reference are:

- a) to determine the organization and the facilities available to delegates;
- b) to examine and approve the accounts for expenditure incurred throughout the duration of the Conference;

1. Determination of the organization and facilities available to delegates

As there were no comments by delegations on the subject, Committee 3 concluded that the organization and the facilities to delegates were satisfactory.

2. Budget of the Conference

The Committee noted the budget of the Conference as approved by the 40th session of the Administrative Council (1985) and as adjusted under Administrative Council Resolution No. 647 to allow for changes in the common system of salaries and allowances of the United Nations and the specialized agencies. This budget is contained in Annex 1 to this report.

3. Situation of conference expenditure

Under No. 478 of the Convention, the Budget Control Committee has to submit a report to the Plenary Meeting showing, as accurately as possible, the estimated total expenditure of the Conference.

Accordingly, Annex 2 contains a statement showing the budget of the Conference, together with a breakdown of credits among the budget subheads and items, as well as the actual expenditure incurred as at . There is also an indication of the expenditure committed up to that date and an estimate of expenditure up to the date of closure of the Conference.

The statement shows that the total amount is estimated at Swiss francs, i.e., Swiss francs less than the credit allocated by the Administrative Council and adjusted in accordance with its Resolution No. 647.

4. Recognized private operating agencies and international organizations not exempted

Under Article 16 of the Financial Regulations of the Union, the report of the Budget Control Committee to the Plenary Meeting must include a list of the recognized private operating agencies and international organizations which are required to contribute to the expenses of the Conference. To this shall be added a list of the international organizations which have been exempted from payment under No. 548 of the Convention.

This list is contained in Annex 4 hereto.

5. Sharing of conference expenditure

This Conference being a regional conference within the meaning of No. 50, Article 7 of the Nairobi Convention (1982), the expenditure arising from it must be borne by all the Members of Region 2 and the Members of other Region taking part in the Conference according to the class of contribution they have chosen. Annex 3 hereto lists the members required to bear the costs of the Conference.

According to the statement of account in Annex 2 hereto, total expenditure is estimated at Swiss francs. On the basis of the number of contributory units of the Members required to bear the cost of the Conference, the amount of the contributory units may be estimated at Swiss francs.

Under Article 28 of the Financial Regulations of the Union, interest is payable on regional conference accounts after a period of 60 days from the date of their dispatch. Since invoices can probably be sent to participants on 30 June 1986, they should be settled not later than 31 August 1986. From 1 September 1986 they will be subject to interest at 3% for the first 180 days and at 6% thereafter.

6. Additional expenditure to be envisaged for implementation of the decisions of the Conference

The Plenipotentiary Conference, Nairobi (1982) decided, inter alia, that the budget control Committees of the various conferences should submit a report estimating the costs that may be entailed by the execution of the decisions adopted by such Conference.

In accordance with No. 479 of the Convention, this report will be transmitted to the Secretary-General, together with any comments by the plenary meeting, for referral to the Administrative Council at its next annual session.

The plenary meeting is requested to approve this report.

E.D. DuCHARME
Chairman of the Budget
Control Committee

Annexes: 6

ANNEX 1

Budget of the BC-R2 Conference

Item number	1986 budget	1986 accounts
	- Swiss francs -	
<u>I - Preparatory work</u>		
20.611 IFRB preparatory work	200,000	200,000
<u>II - Staff expenses</u>		
20.621 Salaries and related expenses of the Conference Secretariat staff	365,000	370,800
20.622 Salaries and related expenses of the translation, typing and reproduction services staff	336,000	338,200
20.623 Travel (recruitment)	14,000	14,000
20.624 Insurance	46,000	46,000
	761,000	769,000
<u>III - Travel expenses</u>		
20.631 Subsistence costs at Conference venue	-	-
20.632 Travel to Conference venue and back	-	-
20.633 Transport of material to Conference venue and back	-	-
	-	-
<u>IV - Premises and equipment</u>		
20.641 Premises, furniture, machines	35,000	35,000
20.642 Document production	20,000	20,000
20.643 Office supplies and overheads	20,000	20,000
20.644 Postage, telephone calls, telegrams	15,000	15,000
20.645 Technical installations	5,000	5,000
20.646 Sundry and unforeseen	10,000	10,000
	105,000	105,000
<u>V - Other expenses</u>		
20.651 Interest credited to the ordinary budget	37,000	37,000
<u>VI - Final Acts</u>		
20.661 Report to the Second Session	20,000	20,000
Total of Section 20.6	1,123,000	1,131,000

ANNEX 2

Situation of the Conference Expenditure

at

(to be completed later)

ANNEX 3

Contributions by Members of the Union
towards defraying the expenses of the regional Conference

Under No. 115 of the International Telecommunication Convention (Nairobi, 1982), expenses incurred by regional administrative conferences are borne by the Members of the regions concerned. These are as follows:

Members of Region 2:

	<u>Contributory units</u>
1. Argentina (Republic of)	3
2. Bahamas (Commonwealth of the)	1/2
3. Barbados	1/4
4. Belize	1/8
5. Bolivia (Republic of)	1/4
6. Brazil (Federal Republic of)	3
7. Canada	18
8. Chile	1
9. Colombia (Republic of)	1
10. Costa Rica	1/4
11. Cuba	1/2
12. Denmark	5
13. Dominican Republic	1/2
14. El Salvador (Republic of)	1/4
15. Ecuador	1/2
16. United States of America	30
17. France	30
18. Grenada	1/8
19. Guatemala (Republic of)	1/4
20. Guyana	1/4
21. Haiti (Republic of)	1/8
22. Honduras (Republic of)	1/4
23. Jamaica	1/4
24. Mexico	1
25. Nicaragua	1/2
26. Panama (Republic of)	1/2
27. Paraguay (Republic of)	1/2
28. Netherlands (Kingdom of the)	10
29. Peru	1/4
30. United Kingdom of Great Britain and Northern Ireland	30
31. Saint Vincent and the Grenadines	1/8
32. Suriname (Republic of)	1/4
33. Trinidad and Tobago	1
34. Uruguay (Eastern Republic of)	1/2
35. Venezuela (Republic of)	2

142
=====

ANNEX 4

Recognized private operating agencies and
international organizations taking part in the Conference

Number of contributory
units

1. Recognized private operating agencies

None

2. International organizations

To be completed from list of participants

Proposal by the Chairman

[DRAFT]

Introduction

When it allocated the band 1 605 - 1 705 kHz to the broadcasting service in Region 2, the World Administrative Radio Conference (WARC-79, Geneva, 1979) stated in its Recommendation No. 504 that the use of the band by the new service was subject to a broadcasting plan to be established by a regional administrative radio conference and recommended that such a conference be convened for Region 2.

The Plenipotentiary Conference (Nairobi, 1982) in its Resolution No. 1 decided that the Conference for Region 2 would be held in two sessions.

In conformity with that Resolution, the Administrative Council, at its 39th session in 1984, after consulting the Region 2 members, adopted Resolution No. 913 establishing the agenda, date and duration of the first session of the Conference.

Consequently, the First Session of the Regional Administrative Radio Conference to Establish a Plan for the Broadcasting Service in the Band 1 605 - 1 705 kHz in Region 2 was held in Geneva from 14 April to [2 May] 1986.

In conformity with its terms of reference, the First Session decided:

- to adopt the present report for submission to the Second Session;
- that the Plan for the broadcasting service would contain allotments and might contain assignments;
- that the Plan would not be based on requirements submitted by administrations;
- that the Plan would be based on the use of standardized parameters;
- to adopt Resolutions ... and Recommendations ... annexed to the present report.

The technical criteria and planning method have been prepared in accordance with the above basic principles.

Apart from the technical criteria specific to the broadcasting service (such as propagation, technical standards, etc.), the First Session, under item 2.2 of its agenda, considered the problems of compatibility with the other services in the same band [and provisionally defined sharing criteria.]

E.D. DuCHARME
Chairman of the Working Group
of the Plenary

WORKING GROUP
OF THE PLENARY

PROPOSAL BY THE CHAIRMAN

Draft

RESOLUTION [PLEN/1]

Report of the First Session

The Regional Administrative Radio Conference to Establish a Plan for the Broadcasting Service in the Band 1 605 - 1 705 kHz in Region 2, (First Session, Geneva, 1986),

considering

the mandate entrusted to it by Resolution No. 913 of the Administrative Council;

resolves

to approve the report of this session of the Conference;

instructs

1. the Chairman of this session of the Conference to transmit under his signature the Report of the First Session to the Second Session of the Conference;
2. the Secretary-General to transmit this report to all Members of the Union and to the organizations which have participated in the First Session of the Conference.

E.D. DuCHARME
Chairman of the
Working Group of the Plenary

Draft

REGIONAL AGREEMENT FOR THE USE OF THE
BAND 1 605 - 1 705 kHz IN REGION 2

PREAMBLE

Noting No. 480 of the Radio Regulations, which provides:

"In Region 2, the use of the band 1 605 - 1 705 kHz by stations of the broadcasting service shall be subject to a plan to be established by a regional administrative radio conference ...";

fully respecting the sovereign right of each country to regulate within its territory the use of the frequency band 1 605 - 1 705 kHz, and to reach special arrangements regarding such service with such countries as it may consider appropriate, without prejudice to other administrations;

seeking to facilitate mutual understanding and cooperation among the Members of Region 2 in achieving a satisfactory broadcasting service in the medium-frequency band 1 605 - 1 705 kHz;

recognizing that all countries have equal rights, and that, in the application of the Plan and its Provisions, the needs of each country, in particular those of developing countries, shall be fulfilled as far as possible, and

acknowledging that the protection of each other's broadcasting service is a major objective for all countries, in order to bring about better coordination and the use of more efficient facilities;

the delegates of the Members of the International Telecommunication Union meeting in [Geneva] at a regional administrative conference convened under the provisions of the International Telecommunication Convention (Nairobi 1982), have adopted, subject to approval by the competent authorities of their respective countries, the following provisions relating to the broadcasting service in Region 2 for the frequency band between 1 605 and 1 705 kHz.

ARTICLE 1

Definitions

For the purposes of the Agreement, the following terms shall have the meanings defined below.

Union: The International Telecommunication Union.

Secretary-General: The Secretary-General of the Union.

IFRB: The International Frequency Registration Board.

CCIR: The International Radio Consultative Committee.

Convention: The International Telecommunication Convention.

Radio Regulations: The Radio Regulations supplementing the provisions of the Convention.

Region 2: The geographical area defined in No. 394 of the Radio Regulations, Geneva, 1979.

Master Register: The Master International Frequency Register.

Provisions: The Provisions adopted herein that are associated with the Plan.

Agreement: ...

Plan: ...

Administration: Any governmental department or service responsible for discharging the obligations undertaken in the Convention and the RR.

Contracting Member: Any member of the Union which has approved the Agreement or acceded to it.

[Affected Administration: An administration within whose territory the signal of a proposed assignment of another administration exceeds that prescribed in Annex [A].]

An allotment is an entry in the plan of a designated broadcasting channel for use by an administration for the broadcasting service in an allotment area under the conditions specified in the Agreement. Each allotment included in the Plan may be used for one or more assignments using the technical criteria specified in [A].

An allotment area is a specifically defined geographical area within a country to which one or more channels are allotted.

ARTICLE 2

Frequency Band

The provisions of the Agreement shall apply to the frequency band 1 605 - 1 705 kHz as allocated to Region 2 under Article 8 of the Radio Regulations.

ARTICLE 3

Execution of the Agreement

3.1 The Contracting Members shall adopt for their stations in Region 2 in the frequency band which is the subject of the Agreement the technical characteristics and standards which are in conformity with the Agreement.

3.2 The Contracting Members shall not bring into use frequency assignments, except under the conditions set out in Article 4 of the Agreement.

3.3 The Contracting Members undertake to study and, in common agreement and to the extent possible, to put into practice the measures necessary to avoid or to reduce any harmful or objectionable interference that might result from the application of the Agreement.

ARTICLE 4

**Implementation of the Plan and Notification of Frequency Assignments
in the Broadcasting Service**

4.1 Assignments corresponding to an allotted channel

4.1.1. An administration may at any time make assignments corresponding to any of its allotments, at one or more locations within the respective allotment area, provided that:

4.1.1.1 - its characteristics are within the standardized parameters given in Annex [A];

4.1.1.2 - where necessary, the agreements required for protection of adjacent channels have been successfully concluded (Annex [B]);
and

4.1.1.3 - its characteristics exceed the values of the standardized parameters provided the criteria of [] are met.

4.2 Assignments corresponding to channels not allotted to the area

4.2.1 An administration may at any time make an assignment on a channel not allocated to it provided its characteristics satisfy the criteria set forth in Annex [A] with respect to:

- 4.2.1.1 - the use of the channel or channels by the administration(s) to which it is allotted in the Plan; and
- 4.2.1.2 - any broadcasting station of another administration of Region 2 previously recorded in the Master Register with a favourable finding.

4.2.2 An administration may make an assignment on a channel not allotted to it or with the characteristics which do not satisfy the conditions set forth in 3.2.1.1 and 3.2.1.2 provided such use has been successfully coordinated with the administration(s) concerned.]

4.3 When an administration proposes to bring into use an assignment in conformity with the Agreement, it shall notify it to the IFRB in accordance with the provisions of Article 12 of the Radio Regulations¹. Any such assignment recorded in the Master Register as a result of application of the provisions of Article 12 of the Radio Regulations shall bear a special symbol under the Remarks Column and a date in Column 2a or in Column 2b.

4.4 Whenever the IFRB receives an assignment notice which is not in conformity with the Agreement, it shall return the notice to the notifying administration.

4.5 If the notifying administration resubmits the notice with or without modification and insists on its reconsideration and if the Board's finding remains unfavourable, the notice is returned to the notifying administration.

ARTICLE 4bis

**Procedure Applicable to New Assignments in
the Non-Broadcasting Services**

[to be developed]

ARTICLE 5

Special Arrangements

In order to supplement the procedures provided for under these Provisions, or to facilitate the coordination foreseen by Article 4, administrations may conclude or continue special arrangements in conformity with the applicable provisions of the Convention and the Radio Regulations.

ARTICLE 6

Plan

<u>Column 1</u>	<u>Column 2</u>	<u>Column 3</u>
Allotted Frequency (channel number)	Area	Observation

(to be edited and eventually transferred as an annex to the Agreement)

ARTICLE 7

Scope of Application of the Agreement

[to be developed]

ARTICLE 8

Approval of the Agreement

The signatory Members shall notify the Secretary-General of their approval of this Agreement as soon as possible by depositing an instrument of approval; the Secretary-General shall immediately inform the other Members of the Union.

ARTICLE 9

Accession to the Agreement

9.1 Any Member of the Union in Region 2 which has not signed the Agreement may at any time deposit an instrument of accession with the Secretary-General, who shall immediately inform the other Members of the Union. Accession shall apply to the Plan as it stands at the time of accession and shall be made without reservations.

9.2 Accession to the Agreement shall become effective on the date on which the instrument of accession is received by the Secretary-General.

ARTICLE 10

Denunciation of the Agreement

10.1 Any Contracting Member may denounce the Agreement at any time by a notification sent to the Secretary-General, who shall inform the other Members of the Union.

10.2 Denunciation shall become effective one year after the date on which the Secretary-General receives the notification of denunciation.

ARTICLE 11

Entry into Force of the Agreement

The Agreement shall enter into force on [] at 0800 hours UTC.

ARTICLE 12

Duration of the Agreement

The Agreement shall remain in force until revised by a competent administrative radio conference.

J. DAVID
Chairman of Drafting Group of Working Group 5-B

Draft

REGIONAL AGREEMENT FOR THE USE OF THE
BAND 1 605 - 1 705 kHz IN REGION 2

PREAMBLE

The delegates of the following Members of the International Telecommunication Union, having participated in the present Regional Administrative Radio Conference to Establish a Plan for the Broadcasting Service in the Band 1 605 - 1 705 kHz in Region 2;

[Signatory Countries, in French alphabetical order]

noting No. 480 of the Radio Regulations, which provides:

"In Region 2, the use of the band 1 605 - 1 705 kHz by stations of the broadcasting service shall be subject to a plan to be established by a regional administrative radio conference ...";

fully respecting the sovereign right of each country to regulate within its territory the broadcasting service in the medium frequency band 1 605 - 1 705 kHz, and to reach special arrangements regarding such service with such countries as it may consider appropriate, without prejudice to other administrations;

seeking to facilitate mutual understanding and cooperation among the Members of Region 2 in achieving a satisfactory broadcasting service in the medium-frequency band 1 605 - 1 705 kHz;

recognizing that all countries have equal rights, and that, in the application of the Plan and its Provisions, the needs of each country, in particular those of developing countries, shall be fulfilled as far as possible, and

acknowledging that the protection of each other's broadcasting service is a major objective for all countries, in order to bring about better coordination and the use of more efficient facilities;

have adopted, subject to approval by the competent authorities of their respective countries, the following provisions relating to the broadcasting service in Region 2 for the frequency band between 1 605 - 1 705 kHz as well as [to effectuate No. 480 of the Radio Regulations].

ARTICLE 1

Definitions

For the purposes of the Plan and these Provisions, the following terms shall have the meanings defined below.

Union: The International Telecommunication Union.

Secretary-General: The Secretary-General of the Union.

IFRB: The International Frequency Registration Board.

CCIR: The International Radio Consultative Committee.

Convention: The International Telecommunication Convention.

Radio Regulations: The Radio Regulations supplementing the provisions of the Convention.

Region 2: The geographical area defined in No. 394 of the Radio Regulations, Geneva, 1979.

Master Register: The Master International Frequency Register.

Provisions: The Provisions adopted herein that are associated with the Plan.

[Plan: The Plan comprising Article 6 and these Provisions.]

Administration: Any governmental department or service responsible for discharging the obligations undertaken in the Convention. Unless the context indicates otherwise, the term "administration" as used herein refers to the administration of a Member of the Union responsible for its broadcasting assignments in Region 2.

Member: A Member of the Union as indicated in Article 1 of the Convention.

Contracting Member:

Assignment in Conformity with the Plan: An assignment on an allotment and which meets all applicable technical criteria.

Affected Administration: An administration within whose territory the signal of a proposed assignment of another administration exceeds that prescribed in Annex [A].

Broadcasting Station: A station in the broadcasting service having an assigned frequency in the band 1 605 - 1 705 kHz.

Assignment: A frequency assignment by an administration to a broadcasting station.

An allotment is an entry in the plan of a designated broadcasting channel for use by an administration for the broadcasting service in an allotment area under the conditions specified in the [Plan and/or Agreement]. Each allotment included in the Plan may be used for one or more assignments using the technical criteria specified in [A].

An allotment area is a specifically defined geographical area within a country to which one or more channels are allotted.

ARTICLE 2

Use of the Frequency Band 1 605 - 1 705 kHz in Region 2

The provisions of the Agreement shall apply to the frequency band 1 605 - 1 705 kHz as allocated to Region 2 under Article 8 of the Radio Regulations.

ARTICLE 3

Execution of the Agreement

3.1 The Contracting Members shall adopt for their stations in Region 2 in the frequency band which is the subject of the Agreement the technical characteristics and standards specified in the Plan.

3.2 The Contracting Members shall not bring into use assignments in conformity with the Agreement, change the technical characteristics of stations specified in the Plan, introduce new assignments in the Plan, or bring new stations into use, except under the conditions set out in Article 4 of the Agreement.

3.3 The Contracting Members undertake to study and, in common agreement and to the extent possible, to put into practice the measures necessary to avoid or to reduce any harmful or objectionable interference that might result from the application of the Agreement.

ARTICLE 4

Implementation of the Plan and Notification of Frequency Assignments in the Broadcasting Service

4.1 An administration at any time without the need for coordination may make assignments on any of its allotments, at one or more locations within each allotment area and outside the coordination area, provided each such assignment does not exceed the standardized parameters set forth in Annex [B]. Successful coordination with affected administrations is required for any proposed assignment that does not meet all of the above requirements.

4.2 An administration, at any time, may make an assignment on a channel not allotted to it at that location without the need for coordination with other administrations, provided that each such assignment meets the technical criteria, both co-channel and adjacent channel, set forth in Annex [A] with respect to any other administration's allotment and any broadcast station previously recorded in the Master Register with a favourable finding. Successful coordination with affected administrations is required for any proposed assignment that does not meet all of the above requirements.

4.3 When an administration proposes to bring into use an assignment in conformity with the Agreement, it shall notify it to the IFRB in accordance with the provisions of Article 12 of the Radio Regulations¹. Any such assignment recorded in the Master Register as a result of application of the provisions of Article 12 of the Radio Regulations shall bear a special symbol under the Remarks Column and a date in Column 2a or in Column 2b.

4.4 Whenever the IFRB receives an assignment notice which is not in conformity with the Agreement, it shall return the notice to the notifying administration.

4.5 If the notifying administration resubmits the notice with or without modification and insists on its reconsideration and if the Board's finding remains unfavourable, the notice is returned to the notifying administration.

ARTICLE 5

Special Arrangements

In order to supplement the procedures provided for under these Provisions, or to facilitate the coordination envisioned by Article 4, administrations may conclude or continue special arrangements in conformity with the applicable provisions of the Convention and the Radio Regulations.

ARTICLE 6

Plan

<u>Column 1</u>	<u>Column 2</u>	<u>Column 3</u>
Allotted Frequency (channel number)	Area	Observation

[to be edited and eventually transferred as an annex to the Agreement]

ARTICLE 7

Scope of Application of the Agreement

ARTICLE 8

Approval of the Agreement

The signatory Members shall notify the Secretary-General of their approval of this Agreement as soon as possible by depositing an instrument of approval; the Secretary-General shall immediately inform the other Members of the Union.

ARTICLE 9

Accession to the Agreement

9.1 Any Member of the Union in Region 2 which has not signed the Agreement may at any time deposit an instrument of accession with the Secretary-General, who shall immediately inform the other Members of the Union. Accession shall apply to the Plan as it stands at the time of accession and shall be made without reservations.

9.2 Accession to the Agreement shall become effective on the date on which the instrument of accession is received by the Secretary-General.

ARTICLE 10

Denunciation of the Agreement

10.1 Any Contracting Member may denounce the Agreement at any time by a notification sent to the Secretary-General, who shall inform the other Members of the Union.

10.2 Denunciation shall become effective one year after the date on which the Secretary-General receives the notification of denunciation.

10.3 On the date on which the denunciation becomes effective, the IFRB shall delete from the Plan the assignments appearing in the name of the Member that has denounced the Agreement.

ARTICLE 11

**Entry into Force and Duration of the Plan
and These Provisions**

The Plan and these Provisions shall enter into force on []
and shall remain in force until revised by a competent administrative radio
conference.

J. DAVID
Chairman of Drafting Group of Working Group 5-B

REPORT TO WORKING GROUP 5-A

TABLE C

Minimum number of allotted channels

Total number of administrations	Minimum number of allotted channels	Remaining channels
1	10	0
2	5	0
3	3	1
4	2	2
5	2	0
6-10	1	4-0

The remaining channels may be used during the Second Session to increase the number of allotments to adjacent countries, on the basis of conditions to be adopted at that session.

S. SELWYN
Chairman of Drafting Group of
Working Group 5-A

ANNEX E

Equivalence

The Plan is based on a station power of 1 kW and a 90° non-directional antenna. Higher radiated power may be used by an administration provided that the field strength within any co-channel or adjacent channel allotment area of another administration does not exceed, at the standard distances from the border of the originating administration's allotment area, the highest field strength of a station in the originating country established in accordance with the Plan.

NOTE FROM THE CHAIRMAN OF WORKING GROUP 5-A

7.2 Planning Method

The following is a general description of the steps to be taken in developing the Plan based on the planning method that has been adopted.

7.2.1 Step 1 consists in using the co-channel standardized distance and identifying within each country the areas to which a minimum number of channels will be allotted. The method to be used is as follows.

7.2.1.1 Taking a geographical map covered with a sufficiently small grid and using a template having a circle with a radius equal to the appropriate standardized distance, determine for any point of the grid the number of countries within this circle; write the number on the map.

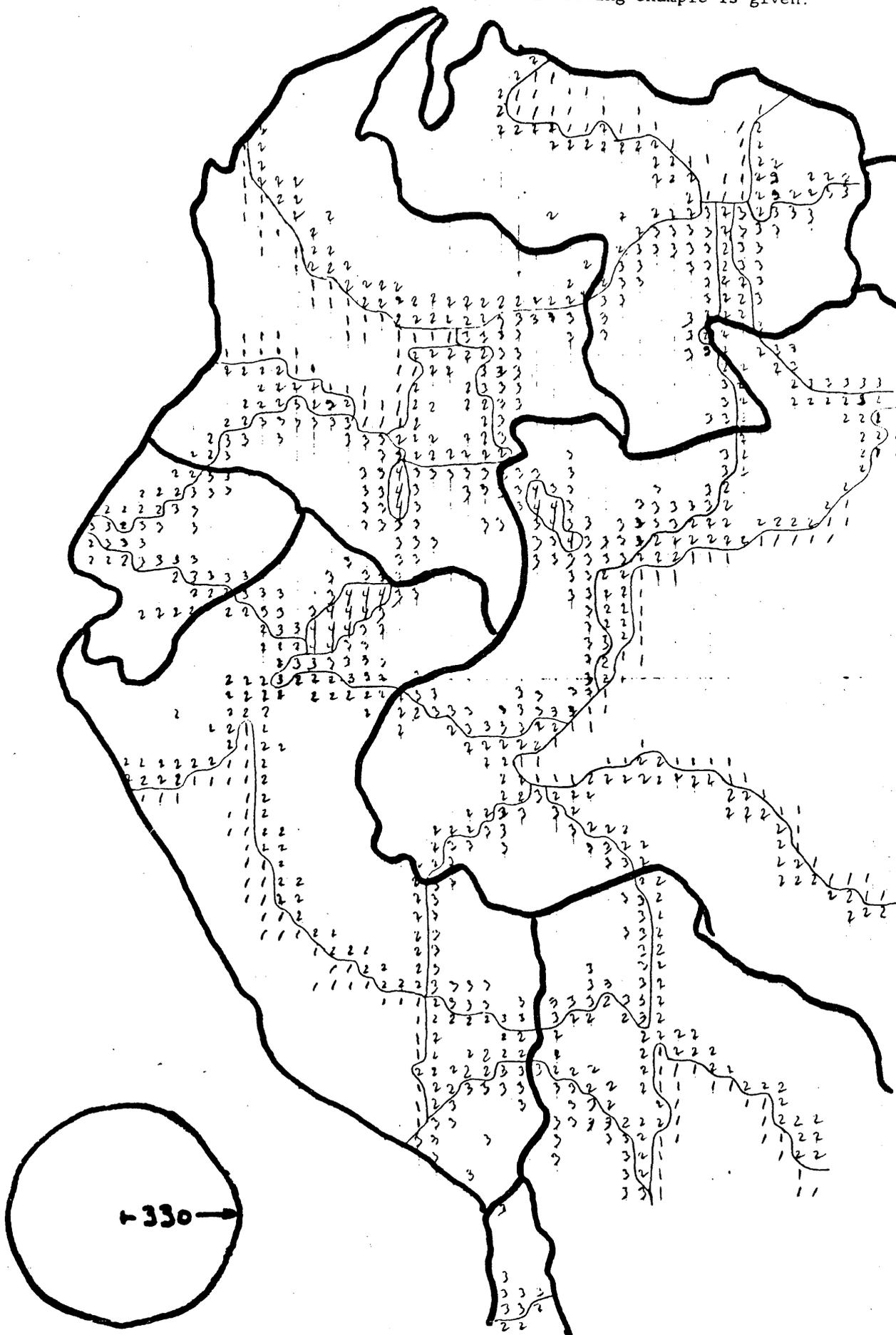
7.2.1.2 Move to another point on the grid and repeat § 7.2.1.1.

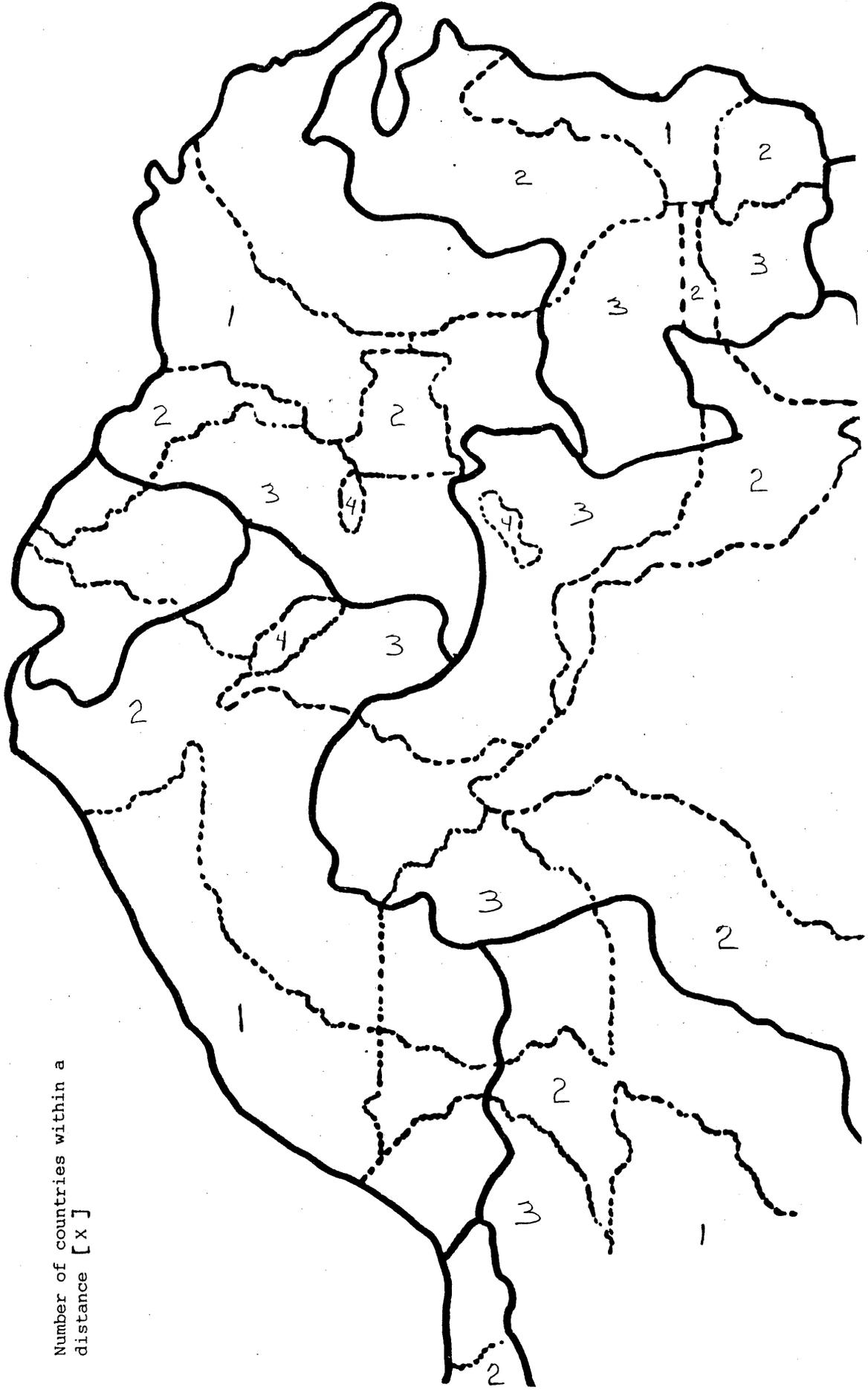
7.2.1.3 Having processed all the points on the grid, draw the boundaries around all the numbers with the same value.

7.2.1.4 Taking into account the borders between countries, describe each allotment area using these borders and/or geographical coordinates from the boundaries defined in § 7.2.1.3.

7.2.1.5 Identify each allotment area with a unique code based on the geographical area symbols contained in Table [] of the Preface to the IFL.

As an illustration of the method, the following example is given:





Number of countries within a distance [X]

7.2.2 Step 2 consists in identifying a number of channels to be allotted to each of the area identified in Step 1.

1. To each of the area identified in Step 1 is associated a number corresponding to the number of countries within a distance [X].
2. Using Table [C] determine the minimum number of channels to be allotted to each area.

TABLE C

Minimum number of allotted channels

Total number of administrations	Minimum number of allotted channels	remaining channels
1	10	0
2	5	0
3	3	1
4	2	2
5	2	0
6-10	1	4-0

7.2.3 Step 3 consists in allotting the minimal number of channels taking account of the need to avoid adjacent channel interference.

The allotment of the minimal number of channels shall be made in such a way that the potential adjacent channel interference is eliminated where possible.

7.2.4 Step 4 consists in allotting the left over channels.

The left over channels shall be allotted to the countries concerned equitably on the basis of conditions to be adopted at the second session.

7.2.5 Step 5 consists in permitting neighbouring countries to carry out bilateral or multilateral negotiations.

The second session should adopt any rule that may be needed during the second session for bilateral or multilateral negotiations concerning:

- alternative arrangements of the channels and areas allotted to them;
- the delimitation of allotment areas on the basis of tolerances to be defined;
- the assignments within their allotments.

D. JOHNSON
Chairman of Working Group 5-A

COMMITTEE 5-A

BORDER AREA CONSIDERATIONS

For an efficient use of the band to be planned, the adjacent channel interference should be evaluated at the stage of assigning frequencies to stations; in some cases, this will require coordination among the administrations concerned. In order to limit the need for such coordination, the following steps should be taken.

1. At the first stage in the development of the Plan, allotments to neighbouring allotment areas shall be made with a view to minimising adjacent channel problems, particularly in the case of allotment areas with only one or two channels.
2. The guidelines for the procedure to be followed before bringing into use assignments from allotments in border areas should contain the following:
 - a) for any situation, an appropriate adjacent channel standardized distance should be adopted beyond which no coordination of adjacent channel assignments is required (definition and value to be determined);
 - b) if the field strength from a proposed assignment situated at lesser distances exceeds the nominal field strength in the neighbouring adjacent channel allotment area, coordination is required.
3. The procedure to be applied for such coordination should be adopted at the Second Session. The following may be considered in developing such procedures:
 - a) the Second Session should consider provisions to resolve cases where despite the cooperative effort in the search for a solution, coordination is not reached;
 - b) [any other considerations].

S. SELWYN

Chairman of Drafting Group of Committee 5A

COMMITTEE 2

DRAFT

REPORT OF COMMITTEE 2 TO THE PLENARY MEETING
(CREDENTIALS)

1. Terms of reference of the Committee

The terms of reference of the Committee are set out in Document 25.

2. Meetings

The Committee met twice, on 15 and 28 April 1986.

At its first meeting, it set up a Working Group consisting of the Chairman and Vice-Chairman of the Committee and one delegate from Canada to verify delegations' credentials in accordance with Article 67 of the International Telecommunication Convention, Nairobi (1982).

3. Conclusions

The conclusions reached by the Committee are reproduced in the Annex attached hereto and submitted to the Plenary Meeting for approval.

4. Final remark

The Committee recommends that the Plenary Meeting authorize the Chairman and the other members of the Working Group to verify the credentials received after the date of the present Report and to submit their conclusions to the Plenary Meeting on the matter.

S.E. MONTANARO CANZANO

Chairman of Committee 2

Annex : 1

ANNEX

1. Credentials found to be in order, deposited by the delegations of countries having the right to vote

(In French alphabetical order)

Canada
Chile
Cuba
United States of America
France
Mexico
Paraguay (Republic of)
United Kingdom of Great Britain and Northern Ireland
Trinidad and Tobago

Conclusion : The delegations of these countries are entitled to vote.

2. Provisional credentials found to be in order, deposited by the delegations of countries having the right to vote (see No. 383 of the Convention)

Colombia (Republic of)
Uruguay (Eastern Republic of)

Conclusion : The delegations of these countries are entitled to vote.

3. Credentials found to be in order, deposited by the delegations of countries which do not have the right to vote (see Document 10)

Argentine Republic
Brazil (Federative Republic of)
Costa Rica
Ecuador
Guyana
Honduras (Republic of)

Conclusion : The delegations of these countries are not entitled to vote.

4. Delegations attending the Conference which have not deposited credentials

* Barbados
Peru
Suriname (Republic of)

Conclusion : The delegations of these countries are not entitled to vote.

* Appears in the list of countries which have lost their right to vote (see Document 10)

Draft

RECOMMENDATION No. [...]

**Relating to the Incorporation into the Radio Regulations of the Allotment
Plan and the Associated Provisions for the Broadcasting Service
in the Band 1 605 - 1 705 kHz in Region 2**

The Regional Administrative Radio Conference to Establish a Plan for
the Broadcasting Service in the Band 1 605 - 1 705 kHz in Region 2 (First
Session, Geneva, 1986),

considering

- a) that, on the basis of RR480 of the Radio Regulations, the Conference was empowered to establish a plan for all the Region;
- b) that the Conference decided to prepare such a plan on the basis of objective criteria equally applied to all the countries of the Region;
- c) that the plan will be an allotment plan limited to a channelling arrangement, the delimitation of the allotment areas and standardized parameters;
- d) that the standardized parameters adopted for the establishment of the plan should not lead to any inter-regional difficulties between the services to which the band is allocated;
- e) Recommendation No. PLEN/... relating to the agenda of the Second Session of this Conference;

recommends the Administrative Council place on the agenda of [an appropriate World Administrative Radio Conference/the Second Session of the WARC ORB in 1988]

1.1 the consideration of consequential changes to RR480 and RR481 of Article 8 of the Radio Regulations in this frequency band in Region 2;

1.2 the consideration of the question of incorporation into the Radio Regulations in the appropriate form the Allotment Plan and the associated provisions to be prepared for the Broadcasting Service in the band 1 605 - 1 705 kHz in Region 2.

J. DAVID

Chairman of Drafting Group of Working Group 5B

DraftSECOND REPORT FROM THE CHAIRMAN OF WORKING GROUP 5-A
TO COMMITTEE 57.2 Planning method

The following is a general description of the steps to be taken in developing the Plan based on the planning method that has been adopted.

7.2.1 Step 1 consists of using the appropriate co-channel standardized distance and identifying within each country the areas to which a minimum number of channels will be allotted. A possible method to be used is as follows.

7.2.1.1 Taking a geographical map covered with a sufficiently small grid and using a template having a circle with a radius equal to the appropriate standardized distance, determine for any point of the grid the number of countries within this circle; write the number on the map.

7.2.1.2 Move to another point on the grid and repeat § 7.2.1.1.

7.2.1.3 Having processed all the points on the grid, draw the boundaries around all the numbers with the same value.

7.2.1.4 Taking into account the borders between countries, describe each area using these borders and/or geographical coordinates from the boundaries defined in § 7.2.1.3.

7.2.1.5 Identify each area with a unique code based on the geographical area symbols contained in Table [] of the Preface to the IFL.

7.2.2 Step 2 consists of identifying the minimum number of channels to be allotted to each of the areas identified in Step 1.

1. To each of the areas identified in Step 1 is associated a number corresponding to the number of countries within a distance [X].
2. Using Table [C] determine the minimum number of channels to be allotted to each area.

TABLE C

Minimum number of allotted channels

Total number of administrations	Minimum number of allotted channels	remaining channels
1	10	0
2	5	0
3	3	1
4	2	2
5	2	0
6-10	1	4-0

7.2.3 Step 3 consists of allotting in each case the channels that constitute the minimum number of channels taking account of the need to minimize adjacent channel interference.

At this stage the minimum number of allotments to neighbouring allotment areas shall be made with a view to minimizing adjacent channel problems as much as possible, particularly in the case of allotment areas with only one or two channels.

7.2.4 Step 4 consists of allotting the remaining channels.

The remaining channels may be used during the Second Session to increase the number of allotments to neighbouring countries, on the basis of conditions to be adopted at that Session.

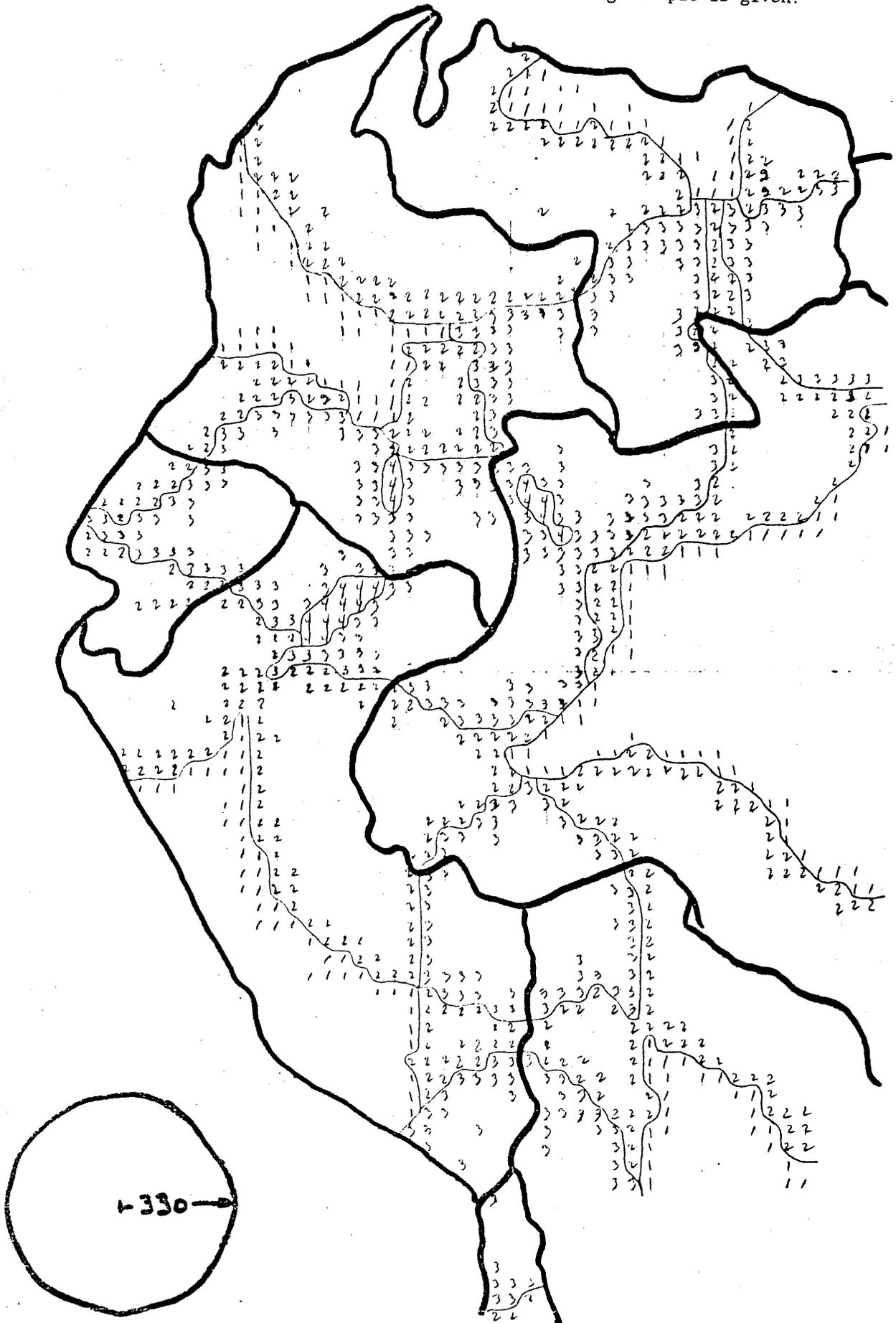
7.2.5 Step 5 consists in neighbouring countries to carry out bilateral or multilateral negotiations if they so desire.

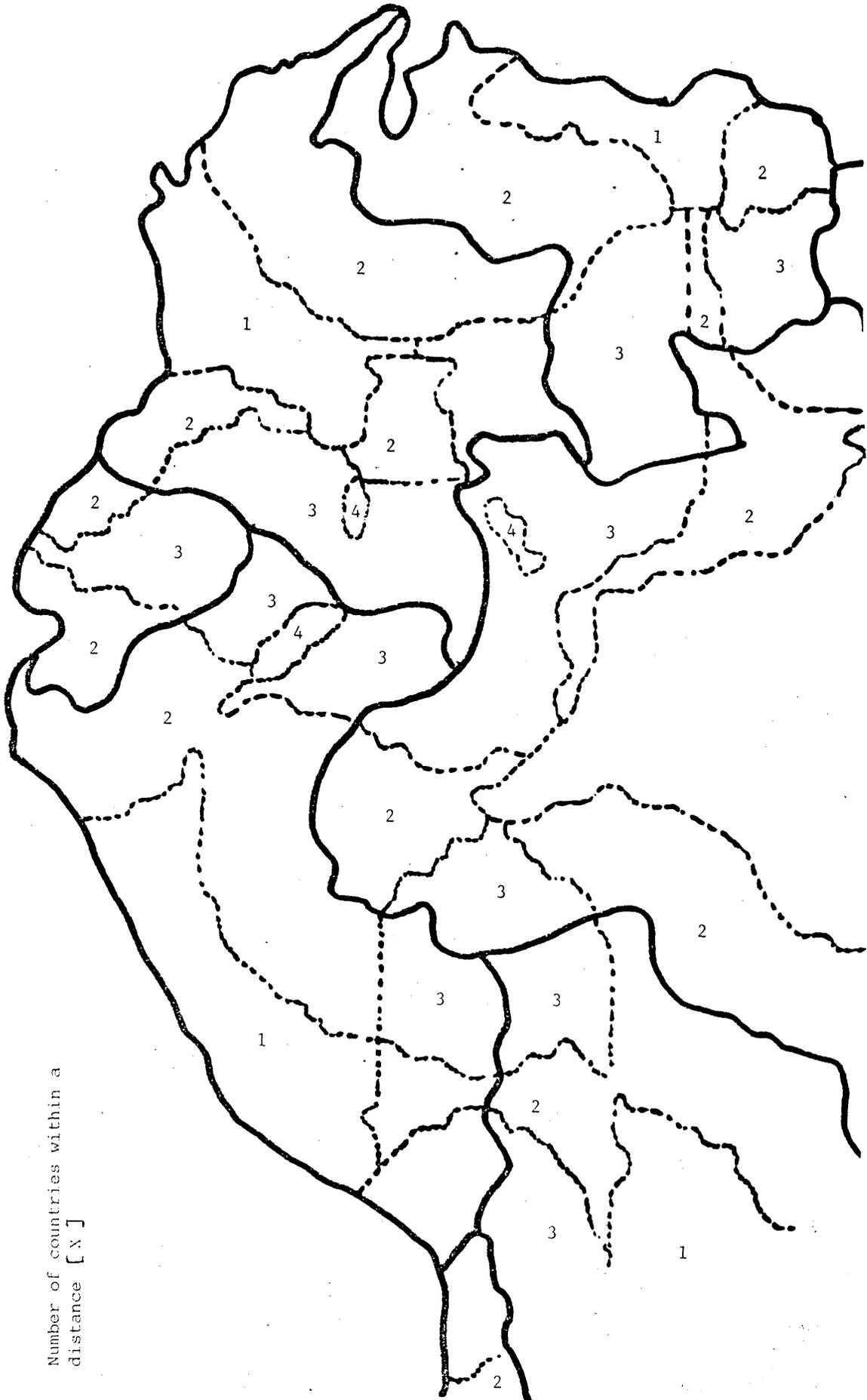
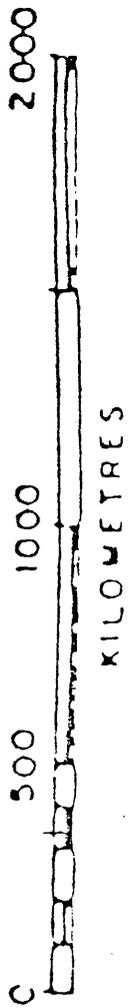
The Second Session should adopt any rule that may be needed during the Second Session for these negotiations concerning:

- alternative arrangements of the channels and areas allotted to them;
- the delimitation of allotment areas on the basis of tolerances to be defined;
- [converting their allotments to assignments in the Plan if they wish to do so.]

7.2.6 At this stage for those administrations so wishing, they may use the allotments resulting from steps 3 and 4 above and specify the locations and parameters of assignments which are to be included in the Plan that will appear in the Regional Agreement. These assignments will be examined using the criteria of [] to ensure that the allotments of other administrations are not affected.

As an illustration of the method, the following example is given:





Number of countries within a
distance [X]

7.3 Planning criteria

7.3.1 Standardized parameters

The allotment plan shall be based on the following standard parameters for day and night and for noise zones 1 and 2.

Station power: 1 kW

Antenna: omnidirectional with 90° electrical height

7.3.2 Co-channel standardized distance

The standardized distance shall be:

- for noise zone 1 land path: 330 km;
- for noise zone 2 land path: 120 km;
- for noise zone 1 sea path: [];
- for noise zone 2 sea path: [];
- for mixed path: (to be developed if required).

7.3.3 Use of different parameters

7.3.3.1 In no case shall the power be greater than [5 kW] [10 kW].

7.3.3.2 Higher radiated power may be used by an administration provided that the field strength produced by a standard parameters station situated at the most critical point of the border of the original allotment area is not exceeded:

- in any co-channel allotment area of another administration, at the appropriate standardized distance from the border of the originating administration's allotment area;
- at any point in the allotment area of another administration to which an adjacent channel is allotted.

7.3.3.3 In recognition of the special problems caused by the low ground conductivity of the Caribbean islands situated in noise zone 2, the concept of equivalence is extended as follows.

- a) A reference situation is established in which a station with standardized parameters is located at the limit of the allotment area of such an island. The resulting field strength to the allotment areas of other administrations is calculated assuming an all-sea path.
- b) Before an island administration may bring into use an assignment with higher radiated power than that associated with a standardized station, the resulting field strength to the allotment areas of other administrations is calculated taking into account the actual ground traversed over the island, the path otherwise being sea.
- c) Such field strengths referred to in b) must not exceed those in a).

This special provision applies only to the daytime situation.

7.3.4 Border area considerations for adjacent channels

For an efficient use of the band to be planned, the adjacent channel interference should be evaluated at the stage of assigning frequencies to stations; in some cases, this will require coordination among the administrations concerned. In order to limit the need for such coordination, the following steps should be taken.

7.3.4.1 The guidelines for the procedure to be followed before bringing into use assignments from allotments in border areas should contain the following.

- a) An administration proposing to assign a frequency to a station shall coordinate this assignment with any other administration if the field strength produced by the proposed assignment in the neighbouring adjacent allotment area of that administration exceeds the nominal field strength.
- b) In order to easily identify the administrations with which the above coordination is required, the following distances shall be used:
 - ground path in noise zone 1: 53 km
 - sea path in noise zone 1: 310 km
 - ground path in noise zone 2: 35 km
 - sea path in noise zone 2: 160 km

Beyond the above appropriate distance, coordination is not required.

7.3.4.2 The procedures to be applied for such coordination should be adopted at the Second Session. The following may be considered in developing such procedures:

- a) provisions to resolve cases where despite the cooperative effort in the search for a solution, coordination is not reached;
- b) the need to avoid overlapping the appropriate contours for nominal frequency separation of 10 kHz, 20 kHz and 30 kHz;
- c) the concept that, for protection purposes, the boundary of a country should be deemed to encompass only its land area, including islands.

R. ZEITOUN
Chairman of Working Group 5-A

PLENARY MEETING

REPORT FROM COMMITTEE 5 AD HOC 2

CHAPTER [9] - PREPARATORY WORK FOR THE SECOND SESSION OF THE CONFERENCE

[9.1] IFRB Inter-Sessional Work

[9.1.1] Planning Method

- a) establish a map of the Region identifying within each country areas to which the minimum number of channels will be allotted (i.e. 7.2.1.1, 7.2.1.2, 7.2.1.3) in accordance with the guidelines/decisions of the Conference and as shown in Figures [1] and [2] of Document 96. This task shall be completed by [September 1986] and the results communicated to all administrations of Region 2;
- b) develop the necessary computer software for a microcomputer that will permit the analysis of a limited number of actual groundwave situations using the Atlas of Ground Conductivities. This task could be restricted to deal with only part of the Region, at any one time;
- c) make available the computer software for a microcomputer that will permit the calculation of skywave field strengths by Administrations;
- d) make available the computer software for a microcomputer that will permit the calculation of groundwave field strengths based on the distances and ground conductivities being a manual input.

[9.1.2] Updating of the Master Register

(See Resolution [COM5/1])

[9.2] Technical Studies

(Information to be supplied by Committee 4)

E. DuCHARME
Chairman of Committee 5 Ad Hoc 2

PLENARY MEETING

REPORT OF COMMITTEE 5 AD HOC 1

The ad hoc Group has reached the following agreement on § 7.3.2 of the report:

Sea-path in noise zones 1 and 2: 450/600 km.1)2)

Mixed-paths: if the ground portion is less than 10%:

same distance as for sea path.

In all other cases, calculations shall be made in accordance with § 2.1 of section 2.

Note 1 - One of these two distances shall be selected by the second session on the basis of a planning exercise to be carried out during the intersessional period for the Caribbean area.

Note 2 - When deciding on the distance to be used for the establishment of the Plan, consideration should be given to the need to avoid adjacent channel interference in allotment areas to which only 1 channel is allotted, and to minimize it elsewhere (see § 7.3.4).

M.L. PIZARRO
Chairman of Committee 5 ad hoc 1