FINAL REPORT

RESEARCH INTO THE HIGH FREQUENCY BROADCASTING SERVICE

BY
John B. Black
Library and Department of Political Studies
The University of Guelph

For

Department of Communications, Ottawa, Ontario

Under

Department of Supply and Services Contract
Serial Number 03SU.36100-1-0256

Contract in Force April 1, 1981 to March 31, 1982

ABSTRACT

The forthcoming two session World Administrative Radio Conference for the Planning of HF (High Frequency) Bands Allocated to the Broadcast Service now scheduled for Geneva in 1984 and 1986 provides the community of nations with an opportunity to bring order to the existing chaos in these bands. This report outlines some of the areas of potential conflict during the WARC, comments briefly on the Canadian preparatory process to date, and indicates reasons why it is important that the Conference succeed.

The future nature and effectiveness of high frequency broadcasting throughout the world will depend largely on the outcome of the World Administrative Radio Conference for the Planning of HF (High Frequency) Bands Allocated to the Broadcasting Service now scheduled for two sessions to be held in Geneva in 1984 and 1986. The fundamental question facing this WARC is whether or not the international community can agree to some form of "planning" for those segments of the radio spectrum allocated to the broadcasting service. Past attempts have failed and the result has been a situation which today is near chaos in most of the high frequency broadcasting bands. If this conference also fails, an occurrence within the realm of possibility, then the outlook for the future of this service is indeed bleak.

The initial steps towards a rationalization of the contemporary use of the high fequency broadcasting bands was taken by the 1979 World Administrative Radio Conference when it approved a forty per cent increase in the spectrum allocated to this service but made these new allocations "subject to provisions to be established by the World Administrative Radio Conference for the planning of HF bands allocated to the broadcasting service". (1) In simple terms, to gain access to the new spectrum allocations "planning" must be achieved.

Thus, the stakes are considerable, for if the two sessions of the WARC in 1984 and 1986 do not result in agreement then movement of the broadcasting service into these new bands will not be sanctioned and the chaos in the existing bands will no doubt grow worse. Some cynical observers have suggested that certain states approved the 1979 WARC resolutions in this area with the full expectation (and, indeed, perhaps the hope) that the proposed conference would fail, as had earlier attempts to "plan" these services. Nonetheless, the opportunity for success is present and the effect of failure will be great.

A number of areas of potential conflict during the WARC (and the preparatory period to preceed it) can be identified in discussions of this subject to date and in observations of existing practice. These conflict areas or themes include:

(1) developing country vs developed country requirements

(2) national vs international requirements

(3) large vs small, have vs have nots (in broadcasting terms)

(4) prior consent

(5) jamming

(6) unofficial broadcasters

Developed vs developing country interests: the nature, requirements and application of high frequency broadcasting services highligh a number of fundamental differences in needs, priorities and technological possibilities between many "developed" and "developing"

nations. High frequency spectrum is viewed by many developing countries as a means of providing affordable and attainable national fixed radio services since the technological requirements are well within their grasp and the cost requirements are significantly lower than those of higher technology services such as satellites. Thus, there is a often a reluctance on the part of some countries to abandon existing (or proposed) fixed services in the high frequency bands to make this spectrum available for what many of these countries view as purely "political" or "propaganda" purposes.

National vs international broadcasting requirements: While a large proportion of the existing use of the high frequency broadcasting bands (especially above 9.5 MHz) is for international broadcasting (ie. the intended audience is outside the borders of the country transmitting the broadcast) significant use of these bands is required to meet national broadcasting (ie domestic) requirements, particularly in tropical areas and in nations with very large land areas to be covered. The Radio Regulations do not distinguish between national and international broadcasting in this context since there is no mention of "international" broadcasting per se. The need to accomodate these sometimes conflicting requirements in the planning process will be an important factor for some nations and will have to be considered by all.

The brodcasting "haves" and "have nots": the existing assignment process has operated de facto on a "first come first served" principle and thus those nations which have been active users of the high frequency broadcasting bands have built up significant claims to a very large proportion of the available frequencies. Appendix II gives some indication of the scale of the situation by showing the number of "programme hours per week" being broadcast by major international broadcasters (their national activities are not included). This, however, is only the tip of the frequency use iceberg since many of these program hours will be broadcast simultaneously on several frequencies (possibily from several locations and often with very high power) thus increasing the actual frequency usage several time over. New entrants or smaller broadcasters seeking to add new services are faced with an extremely difficult task when trying to find an "open" frequency for their use. In spite of the comment above, developing countries are indeed seeking to enter the high frequency broadcasting arena, often with a view to presenting their perspectives to the "outside world". For example, when a new transmitter complex was commissioned for the Voice of Nigeria its purpose was to enable that broadcaster to be heard louder and clearer throughout the world. (2) Similarly, when the Voice of Kenya announced that it was to get an new external broadcasting station the purpose was to promote national development, and to assist Kenya to share her experiences with the rest of the world. (3) New entrants will demand the opportunity to be heard.

Prior consent of the receiving state has never been an accepted precondition of high frequency broadcasting activity and, although some nations will probably raise the subject in the discussions preceeding and during the WARC, it is unlikely that there will be a broad base of support for introducing this concept into the planning process. One of high frequency broadcasting's most valuable attributes is the fact that it is the only mass medium that can directly penetrate international frontiers and enable one nation to speak to the peoples of other nations. While some view this attribute as a threat, most nations will support its continuance, either tacitly or explicitly.

Jamming (or the deliberate interference with a broadcast signal) has been an oft used method to counter the lack of control by nations over incoming high frequency broadcasts. Jamming activities have been a "feature" of international broadcasting activities over the years and have varied considerably in scale and intensity, largely dependant on current international political tensions. The existence of jamming has a number of political and technical consequences both for present day high frequency broadcasting operations and for the future possibilities of being able to develop a philosophy and methodology for "planning" the spectrum allocated to these broadcast services. Large numbers of high frequency braodcast channels are rendered useless by these activities and others are taken up by redundant or extra high powered transmissions

used to attempt to counter these measures. Jamming is an unfortunate fact of international political life that will probably not be directly addressable in the Conference negotiations and yet will be a factor underlying or behind many of the discussions.

"Clandestine" broadcasting will not be a major factor in either the negotiations or any resultant planning process since by their very nature these stations are not represented by any government and, in global terms, their broadcasting activities are only a very small percentage of the total demands on the high frequency broadcasting bands. Nonetheless, their existence could complicate the planning process in certain areas of the world where they operate in fairly large numbers. Appendix III gives some indication of the scale of ths activity in the form of a listing of forty one such stations monitored by the BBC Monitoring Service during 1981. Some operate with the regularity, "schedules" and transmission quality of recognized broadcasters, but most are on the air intermittently with drifting freuencies and constantly changing physical locations. Virtually all carry programs with a high level of political content and are operated by individuals, groups or organizations with strong political objectives.

Regardless of the many specific issues, problems or tensions which may surface in the context of the forthcoming WARC, it is clear that to a greater degree than in many other areas of international relations, the use of

the radio spectrum (and high frequency bands in particular) is an activity in which all nations are very much "in the same boat" and all potentially suffer if this Conference (and others like it in the years ahead) does not succeed. While "new technologies", particularly direct broadcast satellites, are seen by some as diminishing the need for high frequency broadcasting, it is unlikely that such alternatives will have much of an impact before the end of the century, if then. Particularly in terms of "international broadcasting", there are no alternative systems offering the same mix of relative low cost, "simple technology", world wide coverage and freedom from transborder controls.

Most nations do not appear to have proceeded very far with their preparations for the 1984 and 1986 Conference sessions, as least as far as one can glean from public discussion of the subject. At the same time, it must be recognized that few other countries share the Canadian practice of providing for extensive public involvement in the preparatory process for such international negotiations. On the basis of observation of this process, it is possible to confirm the preliminary comments made in the Interim Report (4) regarding Canadian preparations for this World Administrative Radio Conference:

(1) Canadian preparations for the 1984/1986 WARC are considerably further advanced than other nations. As a result, many other administrations are taking a close interest in the developing Canadian position as they

begin their own preparatory activities. Canadian input has already been received by such diverse international groups as CITEL, CCIR, the European Broadcasting Union and the International Insitute of Communications.

(2) The Canadian preparatory process is working well. Central to this process is the Canadian Interdepartmental Committee which meets on a frequent, regular basis and has developed into efficient team coming to grips with the wide range of complex technical, political, legal and social issues involved.

(3) In general terms, Canada's status in the international telecommunications regulatory process is considerably greater than what one might expect based on measures such as national size, political power or economic activity. In the particular case at hand, Canada's influence on the developing international discussions regarding the 1984/1986 WARC goes far beyond that which might be expected based on this nation's relatively limited involvement in high frequency broadcasting.

Some critical phases of the preparatory process will be seen in the coming year. These include, in particular, the drafting of the initial formal Canadian proposals for the first session of the Conference, extensive work on the technical aspects of these proposals (especially the computer systems to support them), on going consultations with other nations and a continuing assessement of the plans, policies, statements and proposals of others.

The legacy of the failure of past high frequency conferences to some extent hangs over this whole process in the apparent "expectation" of some observers that the forthcoming WARC will also fail. In Canadian terms, it is important that it succeed for many reasons including the need

(1) to provide for the most effective use of this scarce international resource --- the high frequency spectrum.

(2) to allow Canada to maximize its relatively limited involvement in high frequency broadcasting in order to make the most effective use of our limited expenditures and technical resources in this area. As a nation, we are <u>not</u> a major player in the international broadcasting scene, but nonetheless the broadcasting we do has significant interest and impact which a successful WARC will help protect and maximize.

(3) to protect our future position should we wish to expand our high frequency broadcasting services, coverage, etc.

(4) to recognize the potential "spin off" effects on other services and other pending World and Regional Administrative Radio Conferences in the next few years. The precedent of failure could be disasterous.

The basic, underlying thrust of the Canadian preparations to date has been the concept of developing a dynamic planning system based on "broadcast" requirements (5) rather than specific frequency requirements. Hopefully this approach will provide a realistic opportunity for success where past attempts have failed.

NOTES

(1) World Administrative Radio Conference, Geneva, 1979, Final Acts, Footnote 531 and Resolution 508.

(2) World Broadcasting Information, June 25, 1981, 25:A5

(3) World Broadcasting Information, March 12, 1981, 10:A5

(4) Interim report, (April 1 to September 30, 1981), Research into the High Frequency (HF) Broadcasting Service, by John B. Black, for Department of Communications, Ottawa, under Department of Supply and Services Contract Serial No. OSU81-1-00256.

(5) A "broadcast requirement" can be defined as the requirement to broadcast a particular program service or network from a given transmitter location to a particular reception zone or zones. An outline of an early Canadian presentation of this approach is given in Appendix IV.

APPENDIX I

Under the terms of this contract the author has been able to participate actively in the Canadian preparations for the 1984/1986 WARC as well as observe other related developments on the international scene. Some indication of the range of this participation can be seen for the following list of activities:

--- participated in the regular meetings of the Canadian Interdepartmental Committee

--- attended the Preparatory Seminar for the 1983 Regional Administrative Radio Conference on Broadcast Satellite Planning Principles and Methodology, (Ottawa, May 1981)

--- served as an adviser to the International Relations Branch, Department of Communications at the First Joint Meeting of Permanent Technical Committees II and III of the Inter-American Telecommunications Conference (Ottawa, May 1981)

--- co-authored a paper on the developing Canadian position and assisted in its presentation at the annual meeting of the International Institute of Communications (Strasbourg, September 1981)

--- prepared documents and research materials for the CIC

--- began the development of sample broadcast requirements data base to be used for testing the computer programs and models required to support the Canadian position for the WARC.

External Broadcasting

Estimated total programme hours per week of some external broadcasters

	1950	1955	1960	1965	1970	1975	1976	1977	1978	1979
USSR	533	656	1015	1417	1908	2001	2019	2006	2010	2020
United States of America	497	1274	1495	1832	1907	2029	1775	1799	1813	1845
Voice of America	497	843	640	831	863	789	796	810	804	828
Radio Free Europe	—	431	444	523	547	554	554	555	554	555
Radio Liberty	-	416	411	478	497	686	425	434	455	462
Warsaw Pact Countries	386	783	1009	1215	1264	1449	1473	1492	1479	1520
Other than USSR										
East Germany	—	9	185	308	274	342	349	352	331	371
Poland	131	359	232	280	334	340	340	335	338	337
Czechoslovakia	119	147	196	189	202	253	254	254	254	254
Bulgaria	30	60	117	154	164	197	206	226	234	233
Romania	30	109	159	163	195	190	197	198	195	198
Hungary	76	99	120	121	105	127	127	127	127	127
Chinese People's Republic	66	159	687	1027	1267	1423	1438	1438	1427	1390
German Federal Republic	-	105	315	671	779	767	770	796	789	798
United Kingdom (BBC)	643	558	589	667	723	719	706	708	711	712
North Korea	-	53	159	392	330	455	455	590	602	597
Albania	26	47	63	154	487	490	501	501	564	557
Egypt	—	100	301	505	540	635	636	559	542	542
India	116	117	157	175	271	326	330	340	342	389
Cuba	...	...	—	325	320	311	321	326	326	382
Australia	181	226	257	299	350	379	336	333	333	333
Netherlands	127	120	178	235	335	400	402	281	285	287
Japan	—	91	203	249	259	259	259	259	259	259
Spain	68	98	202	276	251	312	258	240	254	242
Portugal	46	102	133	273	295	190	187	207	210	210
Israel	-	28	91	92	158	198	193	201	204	184
Italy	170	185	205	160	165	170	171	170	170	170
Nigeria	-	-	—	63	62	61	61	68	68	170
South Africa	-	127	63	84	150	141	140	140	167	166
Sweden	28	128	114	142	140	154	161	161	159	159
Canada	85	83	80	81	98	159	140	135	140	138
France	198	191	326	183	200	108	102	91	110	119
Yugoslavia	80	46	70	78	76	82	82	79	79	79

i) The figures are for December (or the nearest available month).
ii) The list includes fewer than half the world's external broadcasters. Among those excluded are Taiwan, Vietnam, South Korea, and various international commercial and religious stations, as well as clandestine radio stations. Certain countries transmit part of their domestic output externally on shortwaves; these broadcasts are mainly also excluded.

External Broadcasting Audience Research, March 1980

BBC Annual Report and Handbook 1981, London, British Broadcasting Corporation, 1980, p. 58.

APPENDIX III

List of "Unofficial Radio Stations" (World Broadcasting Information, BBC Monitoring Service, Jan. 7, 1982)

First August Radio
(Ba yi)

Free Voice of Iran

Islamic War Radio

National Voice of Iran

Radio Antorcha Martiana

Radio Farabundo Marti

Radio 15th September

Radio Free Afghanistan/
Kabul

Radio Free Cuba

Radio Free and Unified
Lebanon

Radio Homeland (Vatan)

Radio Iran

Radio Liberation

Radio Mambi

Radio Maubere

Radio Unidad

Radio Venceremos

Our Radio

Voice of Alpha 66

Voice of al-Qadisiyah
from Ahvaz

Voice of the Broad Masses
of Eritrea

Voice of the Communist
Party of Turkey

Voice of Democratic
Kampuchea

Voice of the Egyptian
People

Voice of the Eritrean
Revolution

Voice of Free Africa

Voice of Iran

Voice of Iranian
Kurdistan

Voice of the Iraqi
Islamic Revolution

Voice of Iraqi Kurdistan

Voice of Iraqi People

Voice of the Iraqi
Revolution

Voice of Malayan
Democracy

Voice of the Malayan
Revolution

Voice of the
Mojahedin-e Khalq

Voice of Palestine,
Voice of the Palestine
Revolution

Voice of the People of
Malaya

Voice of the People of
Thailand

Voice of the Revolutionary
Party for Reunification

Voice of the Tigre
Revolution

Voice of the United Muslim
Fighters of Afghanistan

APPENDIX IV

ANNUAL CONFERENCE
INTERNATIONAL INSTITUTE OF COMMUNICATIONS (ITC)

SEPTEMBER 7 - 10, 1981

STRASBOURG

CANADA'S APPROACH TO THE PLANNING OF HIGH FREQUENCY (HF) SHORTWAVE BROADCASTING

DR. JOHN BLACK
UNIVERSITY OF GUELPH

GABRIEL WARREN
DIRECTOR GENERAL OF
INTERNATIONAL RELATIONS
DEPARTMENT OF COMMUNICATIONS
OTTAWA

INTRODUCTION

The International Telecommunication Union (ITU) will hold a World Administrative Radio Conference (WARC), starting in 1984, to plan HF broadcasting. Is there any reason to believe that this conference will succeed in ending the "law of the jungle" which now characterizes HF broadcasting, when past attempts have failed to do so?

HF broadcasting permits governments to transmit programs to individuals in other countries without the "prior consent" of the government of the receiving state. This is both its strength and its most controversial aspect. It is, however, an essential activity which must continue, albeit in a less chaotic manner.

Some governments fear this two-edged sword. If they could wipe the slate clean, they would prefer there to be no international HF broadcasting. If it is going to continue to be used, they would like it to be subject to the "prior consent" of the receiving state. Since this would be unacceptable to most broadcasting states, however, they engage in it vigorously themselves (including broadcasting "out-of-band" and "jamming", which adds to the chaos). Some developing countries have no interest in the activity, others engage in it actively, and others vehemently oppose the reception of "propaganda" from abroad.

These cross-currents and ambivalent attitudes have resulted in an international situation beset by congestion, increasingly excessive power levels, redundant use of frequencies, international interference ("jamming"), and "out-of-band" transmissions. Broadcasters have increased their arsenals as they have struggled to maintain services. New entrants have compounded the confusion as they have attempted to penetrate the over-crowded bands. The resulting noise levels have rendered the HF bands largely unusable in some parts of the world and have prevented their full use in other areas.

The 1979 General World Administrative Radio Conference (WARC) approved a 40% increase in allocations of spectrum to shortwave broadcasting. But this re-allocation from "fixed" (i.e. point-to-point) services to broadcasting is "subject to provisions to be established by the World Administrative Radio Conference for the planning of HF bands allocated to the broadcasting service". (FNA) This re-allocation, accordingly, depends upon the success of the WARC starting in 1984. A further complicating factor is that at the 1979 WARC 44 Administrations (including Canada) filed reservations stating that insufficient allocations had been made to broadcasting below 10MHz (many developing countries had opposed further allocations since, they claimed, they had a continuing primary requirement for "fixed" services below 10MHz).

FNA: World Administrative Radio Conference, Geneva, 1979, Final Acts Footnote 531 and Resolution 508.

One wonders whether some countries went along with the "package at the 1979 WARC (increased allocations tied to a future planning conference) in the expectation that the planning conference, like past attempts, would fail. But if it fails, will the developing countries stop using the new broadcasting bands for "fixed" services?

Canada is not preparing for the future planning conference in the cynical expectation that it will fail. A study of past conferences and current practices certainly produces cynicism or, at least, healthy skepticism. But Canada is actively searching for a planning approach which would improve, rather than compromise, shortwave broadcasting by eliminating some of the anarchic current features.

BACKGROUND

Accommodation of the divergent, complex and often conflicting spectrum requirements of the HF broadcasting service has been a continuing problem in international telecommunications regulation for several decades. Past attempts to bring some degree of order to this generally chaotic situation have been doomed to failure as coherent planning of the spectrum allocated to the HF broadcasting service in the ITU's Table of Frequency Allocations has largely eluded those involved in the development of international telecommunications policy. Nonetheless, the need to succeed in this endeavour is greater today than at any time in the past, a fact that was recognized by the 1979 WARC in its Resolution No. 508. In the words of the Resolution, "...the existing situation in the HF bands allocated exclusively to the broadcasting service is not satisfactory" and, further, "it is important to ensure that all countries are guaranteed free and equal rights to the use of these bands". (FNB)

Although the history of the attempts to develop frequency assignment plans for HF broadcasting goes back to international conferences held between the two world wars, it was in the years immediately after World War II that particularly concentrated efforts were made to bring about a plan for the stations operating in this service. Prior to World War II, the number of nations with operating stations was relatively small, but political and technical developments considerably altered this situation during the course of World War II. In the post-war period demands for frequency assignments for HF broadcasting grew dramatically.

The first conference convened specifically to attempt the assignment of specific HF broadcasting frequencies and program hours, was the International High Frequency Broadcasting Conference which met for its first session in Mexico City beginning in October 1948. Nearly two years of intensive international negotiations followed, concluding unsuccessfully in August 1950. Some initial success was made in the first session of the Conference but, in the end, in spite of the concentrated efforts applied during, and between, the sessions and supporting technical meetings, no frequency assignment plan of any sort was created.

The intensive activity included the following meetings:

-High Frequency Broadcasting Planning Committee:
Geneva, March 22 - June 10, 1948,
Mexico City, September 13 - October 21, 1949.

-First Session:
Mexico City, October 22, 1948 - April 10, 1949.

-Technical Plan Committee:
Paris, June 15 - December 5, 1949
Florence, March 1 - March 31, 1950.

-Second Session:
Florence/Rapallo, April 1 - August 19, 1950.(FNC)

FNB: World Administrative Radio Conference, Geneva, 1979, Final Acts Resolution No. 508.

FNC: Report on the International High Frequency Broadcasting Extraordinary Administrative Radio Conference, Florence/Rapallo, April 1, 1950 to August 19, 1950, Montreal (CBC), September 12, 1951, pp. 2-3.

At the end of the first session, fifty nations (but not including the United States nor East European countries) had signed the Mexico City International High Frequency Broadcasting Agreement. This agreement included a "basic plan" for channel hour assignments during an intermediate level of sunspot activity, along with the acceptance of certain technical standards and principles. Unfortunately, the high hopes of those who completed this agreement were not realized as the subsequent work to improve and then implement the plan failed at the second session in August 1950. (FND)

In essence, however, the central problem of that Conference can be summarized in a few words familiar, then as now, to all involved in HF broadcasting: the requirements submitted far exceeded the frequencies available in the bands allocated to the HF broadcasting service. What had been attempted was the development of a plan to assign discrete (i.e. specific) frequencies to meet the requirements submitted by administrations, whether or not these requirements were appropriate, realistic or usable. (FNE)

An Extraordinary Administrative Radio Conference (EARC) was convened in August 1951 in an effort to pull together what could be saved from the work of the various regional and service conferences (like the one on HF broadcasting) in the previous two or three years. Three articles of the Final Acts of that EARC deal specifically with HF broadcasting. Article 11 directed the ITU's International Frequency Registration Board (IFRB) to draw up draft plans based on the Mexico City conference plan, the subsequent work of the Technical Plan Committee, and up-to-date requirements from administrations. Article 28 empowered the IFRB to communicate to administrations what "voluntary reductions in requirements might be necessary to accommodate a plan". This article also invited the ITU Administrative Council to "...consider whether a High Frequency Broadcasting Conference is necessary for the consideration of these draft plans". (FNF) Such a conference has been a long time coming!

At the 1959 General WARC in Geneva, the concept of developing a long term plan for the HF broadcasting service was set aside and a coordination procedure for frequency requirements was created as Article 10 (now Article 17) of the Radio Regulations. This remains the basic governing procedure up to the present time.

A further step taken at the 1959 Conference was the establishment of an international Panel of Experts to analyze the use of the HF bands and to make recommendations on steps that should be taken to relieve pressure on this part of the spectrum. The Panel's final report was published in 1963 and recommended that attempts be made to reduce use of these bands wherever possible. A contemporary commentary on the Panel of Experts report stated: "The high-frequency spectrum is the only part suited for long-distance broadcasting and every effort should be made to conserve the HF broadcasting bands for this purpose. It is unlikely, however, that an internationally acceptable frequency plan can be devised for HF broadcasting until solutions can be found

---

FND: Report on the International High Frequency Broadcasting Extraordinary Administrative Radio Conference - Florence/Rapallo, April 1, 1950 to August 19, 1950, Montreal, (CBC), September 12, 1951, p. 5.

FNE: ibid, pp. 1, 24-25.

FNF: Extraordinary Administrative Radio Conference, Geneva, 1951, Final Acts, Articles 11, 12, 28.

for certain of the world's political problems." (FNG)

Nearly two decades later, we are still facing much the same mix of political/technical problems. Even in this era of global satellite television broadcasting, world-wide computer communications systems, extensive domestic medium wave and VHF broadcasting networks and other new communication technologies, HF broadcasting remains cost-effective and an attainable technology for use by all states in pursuit of their national and international political, social and cultural objectives.

The existing procedure contained in Article 10 (now Article 17) of the Radio Regulations is based upon the "first-come, first-served" principle. While that method of spectrum allocation does appeal to some, it has increasingly been viewed in negative terms by many administrations. This procedure has created particular problems for those administrations seeking to initiate new broadcast transmissions or to expand their limited existing services, and it is seen by many states as having outlived its usefulness.

Resolution 508 of the 1979 WARC gives the future WARC on HF Broadcasting a strong mandate to do something about the current unsatisfactory situation in the HF broadcast bands. It states that the HF broadcasting allocations should be "the subject of planning" by the WARC. The first session of the Conference, scheduled for January 1984, is asked to "establish the technical parameters to be used for planning and the principles governing the use of the HF bands allocated to the broadcasting service" and to "decide the planning principles to be used and the method of planning to be adopted by the second session". (FNH) The second session, tentatively scheduled for January 1986, is to "carry out the planning according to the principles and the methods established at the first session". (FNI)

FNG: Joint Technical Advisory Committee of the Institute of Electrical and Electronics Engineers and the Electronic Industries Association, Radio Spectrum Utilization: A Program for the Administration of the Spectrum,
FNH: WARC, 1979, Final Acts, op. cit.
FNI: ibid.

CANADA'S APPROACH

Canada's approach to the planning of HF broadcasting is an effort to provide a means of breaking clear of the straight-jacket of the past by facilitating a new cooperative approach to the subject. The approach concentrates upon the prime concern of HF broadcasters --- the delivery of program services. The model based upon this approach shifts the focus from "frequency requirements" to "broadcast requirements". (FNJ)

Some of the main features of the new approach are:

- the process guarantees free and equal rights to use the HF broadcasting bands by dealing with all broadcasting requirements on an equal basis prior to the beginning of each broadcasting season;
- it avoids the issue of "prior consent" of the receiving states, by permitting broadcasting states to state their requirements to broadcast to CIRAF zones (i.e. the geographical zones for broadcasting worked out in Mexico City in 1945); (FNK)
- the completely automated system uses the latest planning methods and propagation information in order to maximize the use of the frequency bands and, to the greatest extent possible, to avoid interference between stations using the same assigned frequency;
- the plan would operate in a dynamic fashion with broadcast requirements being revised on a regular basis and the assignment of actual operating frequencies to meet these requirements being made in advance of each new broadcast season.

Without getting involved in the technical details, the process can be illustrated by a simple flow-chart (attached as an Annex). The first block of the flow-chart represents the Plan which comprises entries of "broadcasting requirements". A "broadcasting requirement" does not refer to frequencies. An example of an entry might be as follows:

Canada CIRAF 27 and 28 18-20 UTC (Universal Coordinated Time)

This means that Canada has a continuing requirement to broadcast to CIRAF zones 27 and 28 (Western Europe) at 18-20 hours UTC each day. The plan would consist of several such entries listing all of Canada's continuing broadcasting requirements. There will be similar entries for all administrations with broadcasting requirements. There would also be procedures for adding or deleting entries in the Plan according to changing requirements. The initial plan of broadcasting requirements would be established at the second Session of the WARC for HF Broadcasting. The second and third blocks in the flow-chart represent computer programs that would be used, prior to each broadcasting season, by the IFRB to translate the plan of broadcasting requirements into a seasonal frequency

---

FNJ: A "broadcast requirement" may be defined as the need, as determined by an individual administration, to provide a broadcast service to a specified reception area from a particular transmitter location during a specified time period.

FNK: CIRAF is the acronyn for International Conference on High Frequency Radio Communications

assignment plan. The second block represents a computer program, based on the ITU's latest International Radio Consultative Committee (CCIR) Recommendations, which will determine: the optimum frequency band or bands required to implement the broadcasting requirement, the required transmitter power, and the calculated reliability that can be achieved. The third block represents the computer program which will select a discrete (i.e. specific) frequency assignment for each frequency need identified by the propagation analysis. Each assigned frequency so selected must be compatible with all other users of the same frequency. The computer program, therefore, will also have to access the propagation analysis program. The end product is the Seasonal Frequency Plan. This Plan would be similar to the Seasonal Frequency Schedule currently prepared by the IFRB under the terms of the current Article 17 of the ITU Radio Regulations.

The role of the IFRB would be to:

1) administer the plan by operating the two computer programs;

2) confirm, prior to the preparation of the Seasonal Frequency Plan, that each broadcasting requirement in the plan is expected to be operational during the forthcoming season;

3) where a frequency has been assigned against a particular broadcast requirement but monitoring indicates that the frequency is not in fact being used, to apply a "default mechanism" procedure whereby the frequency will not be assigned to meet that particular broadcasting requirement, unless a special request is made confirming the requirement.

This type of approach is capable of satisfying the maximum possible number of requirements, but it cannot produce miracles. Once this maximum has been accommodated, there are two alternatives for dealing with any remaining unsatisfied requirements:

1) all administrations can agree to an arbitrary reduction in the quality of service to allow the accommodation of more requirements; or

2) all administrations can agree to reduce the number of their requirements.

Both of these alternatives would require a certain degree of self-restraint, a quality notable in the past by its absence. For any planning approach to be successful, there will have to be procedures based upon the premise that all administrations will "suffer equally" (otherwise known as "misery loves company"). Moreover, any intentional interference ("jamming") or out-of-band transmissions will have to cease.

CONCLUSION

The Canadian approach is an attempt to introduce a measure of order into what has been a chaotic régime. It accepts the fact that certain governments are going to continue to broadcast to individuals in other countries and will not subject these broadcasts to the "prior consent" of the receiving state. It would, however, call upon all administrations to be realistic in submitting their "broadcasting requirements" and to accept the computer's decisions on the compatible technical parameters for implementing them.

It would, of course, require all administrations to live by the rules and not to resort to escalations of transmitting powers, redundancies of frequencies, intentional interference ("jamming") or out-of-band transmissions.

It is clear that the success of this type of approach will require a new spirit of mutual restraint. We shall know only at the 1984/86 WARC itself whether Canadian preparations, based on this type of approach, were a waste of time or actually contributed to a workable solution.

Are we naively deluding ourselves that the main protagonists will be willing to take a more constructive approach? Perhaps. But if the Conference is going to succeed, all sides will have to give a little. Canada intends to continue exploring the middle ground in the hope that it does not prove to be a swamp.

FLOW CHART OF PROCEDURE FOR ASSIGNING FREQUENCIES IN HF (SHORTWAVE) BROADCASTING SERVICE