FIRST VOLUME

OF

PROPOSALS

for suitable methods of bringing the entire Atlantic City Frequency Allocation Table into operation

(Administrative Council Resolutions Nos. 199 and 200)

INTERNATIONAL TELECOMMUNICATION UNION
GENEVA, 1951

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INTRODUCTION

In Resolution No. 199 (Fifth Session, September 1950), concerning preparation for the Extraordinary Administrative Radio Conference to meet in Geneva on 16 August 1951, the Administrative Council requested :

" . . . . . .

" pending the meeting of the Conference and in order to facilitate and shorten its work ;

" a) the active assistance of the IFRB (in accordance with paragraph c) of the Atlantic City Resolution relating to the participation in the PFB of Members of the IFRB) and of all Members of the Union in studying and making proposals for suitable methods of bringing the entire Atlantic City Table of Frequency Allocations into operation as soon as possible ;

" b) the IFRB to assemble and collate all . . . . . proposals and to circulate them to Members of the Union at least two months before the Conference."

In addition, the Administrative Council, in its Resolution 200, laid down the programme of preparation for the Extraordinary Administrative Radio Conference.

The present volume contains the proposals received by the IFRB up to 1st March 1951. They have been classed in the chronological order in which they were sent, and those proposals despatched on the same date have been placed in the alphabetical order of the names of the Members of the Union from which they come.

Further proposals received will be published later in one or more volumes.

PROPOSAL N° 1

UNITED STATES OF AMERICA

(Letter TD of 18 December 1950)

I enclose fourteen copies of a report of December 5, 1950 entitled "Exploratory Studies Undertaken by the United States with Respect to Implementation of the Radio Frequency Bands Below 27,500 Kilocycles" which constitute the initial comments of the United States on implementation in connection with preparations for the Extraordinary Administrative Radio Conference.

Note : The Administration of the United States of America sent 6 February 1951, the following telegram :

Request report entitled "Exploratory Studies Undertaken by the United States with Respect to Implementation of the Radio Frequency B Bands Below 27 500 KC December 5, 1950" be circulated all administrations for comment soonest.

December 5, 1950

EXPLORATORY STUDIES UNDERTAKEN BY THE UNITED STATES WITH RESPECT TO IMPLEMENTATION OF THE RADIO FREQUENCY BANDS BELOW 27, 500 KILOCYCLES

INTRODUCTION

These studies were undertaken in preparation for The Hague Conference and have been reviewed and revised to take into account the resolution adopted by the Administrative Council of the International Telecommunication Union in September 1950 which contemplated the development of alternative approaches to the problem of implementing the Atlantic City Table of Frequency Allocations below 27,500 kilocycles.

The preparation of these studies proceeded with the knowledge that any final decisions regarding specific methods of implementation must await the actions of the Extraordinary Administrative Radio Conference on agenda items 1, 2a and 2b, but with full recognition that many of the operating and administrative problems to be met in the conversion to the Atlantic City Table of Frequency Allocations will not be affected by the actions of the Conference. Therefore, it is anticipated that preliminary discussions may be undertaken and tentative decisions reached on agenda items 2b, 2c, 3 and 5 during the early proceedings of the Conference.

Operational factors affecting each of the major services of the United States have been studied and summarized under their individual headings which follow the "General Considerations" set forth in this paper.

GENERAL CONSIDERATIONS

Because of the large number of active assignments and the crowded conditions in many of the frequency bands below 27,500 kilocycles it would appear to be essential that specific procedures be adopted by the Conference which would provide for a method for implementing the Atlantic City Table of Frequency Allocations and enumerating therewith, a sequential order of events with a view toward minimizing disruptions and interference to all active radio services during the transition period.

In determining the time and manner for establishing new assignments below 27,500 kilocycles, careful consideration should be given to the wide variation in problems which depend largely on the nature and purpose for which communications are desired. Consideration should also be given to such factors as geography and the time of year, as well as the capabilities and limitations of each Administration, in order that a mutually acceptable agreement may be reached.

It is believed that the individual and collective problems of all services will require the adoption of certain general principles, such as those contained in the following list. (The order in which these principles appear has no chronological significance).

1) The use of frequencies below 27,500 kilocycles must be brought into conformity with the Atlantic City Table of Frequency Allocations at the earliest possible date.

2) The Conference should establish the earliest possible date for bringing into force the Atlantic City Table for those frequencies below 27,500 kilocycles.

3) The Conference should prescribe necessary interim instructions for the IFRB so that it may be of maximum assistance to the Administrations in the over-all implementation program during the period between the close of the Conference and the effective date in (2) above.

4) As soon as the objectives in (1) and (2) above have been met, the IFRB then should begin to function and assume the regular duties prescribed in the Radio Regulations of Atlantic City.

5) The Conference should establish a sequence of events for the over-all implementation and a schedule of dates therefor.

6) A notice period, as short as practicable, should elapse between the end of the Conference and the date set for the beginning of the implementation program, which is referred to hereafter as Date 1.

After consideration of the operational problems involved in the full implementation of the Atlantic City service allocations, it would appear that a complete and instantaneous changeover of assignments is not practical for all services. However, an implementation program does appear to be practicable if it is divided into two distinct phases each having definite beginning and ending dates.

Using this procedure, the first phase should begin on Date 1 and end on Date 2. The second phase should begin on Date 2 and end on Date 3.

The first-phase preparations would consist of making as many frequency adjustments as can be made without creating harmful interference. Such adjustments could be facilitated in some instances by cooperative arrangements between administrations. On the completion of the first phase, or Date 2, all administrations would terminate all out-of-band assignments, and henceforth throughout the second phase, all frequency adjustments which had not been accomplished by Date 2, would be dealt with in blocks of spectrum space, to be accomplished by Date 3.

With respect to the second phase, it is believed that reassignments should begin at 27,500 kilocycles and continue downward in sequential progression. Among the advantages to be gained from this procedure, is that small segments in a relatively uncrowded portion of the spectrum would be reassigned at one time and the further advantage that displaced operations will tend to be slightly upward in frequency rather than downward. This would minimize the number of disruptions to current operations and therefor such a course of action would seem both logical and practical.

The Administrative Council's resoltuion of September 1950 which considered all frequencies below 4000 kc/s as one category is not believed to be a practical division of the radio frequency spectrum. It is suggested, therefore, that implementation should begin at 27,500 kc/s and progress downward to 2000 kc/s in order that some space for the aeronautical mobile

bands (R) (now between 2850 and 3500 kc/s) may be made available on higher frequencies as a result of the downward progression (see paragraph 6, Study "A"). Frequencies below 2000 kc/s may then be treated as a separate category and without regard to the implementation schedule for those frequencies above 2000 kc/s.

In developing the "downward progression" plan of implementation, consideration was given to the amount of spectrum space that might be considered at any one time during the implementation period. These studies indicate that such divisions of spectrum space should be in "blocks of frequencies" that are small enough to permit reasonably rapid treatment, in order to minimize the period of time during which the various active services may be inconvenienced. These "blocks" should be large enough, however, to permit inter-service and intra-service reassignments at any one order of frequencies. On the basis of these considerations it is believed that a division of the spectrum space into nine "blocks" as shown in the following table, would be entirely suitable for establishing a practical sequence of events.

Starting with Block No. 1 would make space available for those assignments migrating upward from Block 2 which in turn would provide space for migrations from Block 3 and so on down through and including Block 7.

Division of Spectrum					
	Block No. 1	27,500	-	21,450	kc/s
	Block No. 2	21,450	-	15,450	kc/s
	Block No. 3	15,450	-	11,000	kc/s
	Block No. 4	11,000	-	6,765	kc/s
	Block No. 5	6,765	-	5,250	kc/s
	Block No. 6	5,250	-	3,500	kc/s
	Block No. 7	3,500	-	2,000	kc/s
	Block No. 8	2,000	-	150	kc/s
	Block No. 9	150	-	10	kc/s

SEQUENCE OF EVENTS

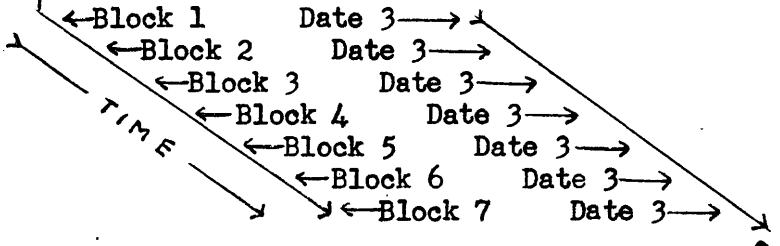
All Dates will begin as determined by the Conference. The Conference should insure that a period of time will elapse between the close of the Conference and Date 1, which will be sufficient for the Administrations to prepare for the implementation program.

Frequencies between 27,500 - 2000

(1) Close of Conference.
All Administrations prepare for implementation.

(2) Phase One — Date 1. All Administrations make as many adjustments as possible between 27,500 and 2000 kc/s without regard to "Blocks of Frequencies", and without creating harmful interference.

(3) Phase Two — Date 2. Discontinue all out-of-band operations. Continue adjustments by "Block of Frequencies".



(4) Date 3.→—(final)→

Frequencies between 150 - 2000 kc/s

It is believed that the bands between 150 and 2000 kc/s may be implemented on a regional basis, either before or after the implementation above 2000 kc/s ; and further that the administrations affected within each separation region should agree on the dates and methods for implementing these bands.

The special arrangements already consummated in Region 2 under the provisions of paragraph 1076.1 of the Radio Regulations could serve as a basis for a detailed program of implementation. It appears that each of the bands 1605-2000, 535-1605, 415-535 and 150-415 kc/s presents a slightly different problem.

It is felt that the 415-535 kc/s band should be implemented first on a specific date, and should be accomplished simultaneously with the adjustments to be made on those assignments now in use between 355 and 550 kc/s. The specified date should be approximately six months after the new lists of frequency assignments involved have been finally coordinated.

Gradual implementation of the future band of 150-415 kc/s is considered practical, the only requirements being (a) coordination in adjustments of specific frequency assignments between the countries directly concerned, (b) agreement on a date by which the table of frequency allocations for this band shall become effective. The effective date for 150-415 kc/s could be the same as the effective date for the 415-535 kc band. Agreement should be reached on the earliest possible effective implementation dates for the 1605-2000 and 535-1605 kc bands. However, the effective date for 535-1605 kc should not be earlier than the effective date for the 150-535 kc, or the 1605-2000 kc bands.

Frequencies between 10-150 kc/s

In as much as the present fixed service assignments within the 10-150 kc band are in-band with respect to the Atlantic City Table, and with the belief that it may take two or three years to complete necessary reassignments from bands above 150 kc and then make all necessary readjustments within the 10-150 kc band, it would appear that all Administrations concerned should begin immediately after the Conference to make individual adjustments on specific dates by special arrangement between the Administrations concerned. However, this should not preclude the possibility for bringing into force the Atlantic City Table of Frequency Allocations as of Date 3 for Block 7 of the spectrum.

Preparation of Master International Frequency Register : 10-27,500 Kilocycles

Based upon the preceding program of implementation, it is believed that the Conference should authorize the I.F.R.B. to prepare the Master International Frequency Register for all of the bands between 10 and 27,500 kc/s in accordance with the following procedures :

A. Approved Frequency Lists

For those bands and services where the Conference approves lists of specific frequency assignments to stations, the following procedure shall be employed :

Registration or notification shall be accorded by the IFRB for all bands and services having lists of specific frequencies which have been approved by the Extraordinary Administrative Radio Conference. All such registrations or notifications shall bear retroactive dates which coincide with the date on which the Final Acts of the Conference were signed and shall become a part of the Register.

Changes in any "Block" which are made subsequent to the approval of the lists and before Date 3 of any particular block involved, shall be accepted by the IFRB on a notification basis only. These changes, and all subsequent notifications shall be reviewed by the IFRB after Date 3 of the particular Block involved. All reviews shall be in accordance with the procedures stipulated in the Atlantic City Radio Regulations.

B. Approved Allotment Plans

Allotment plans, such as those adopted by the Aeronautical Mobile Service, which have been approved by the Conference shall be accepted by the I.F.R.B.; and administrations shall notify the IFRB of individual assignments made under such allotment plans. Such notification of assignments will be received by the IFRB at any time prior to Date 3 for the particular block within which the assignment falls; and on the Date 3 applicable to any assignment so received, it will be accorded registration or notification whichever is appropriate. Each such registration or notification shall bear an identical date which will be retroactive to the date of signing of the Final Acts of the Conference.

Any assignment which is brought into operation and is not in accordance with approved allotment plans, shall be accepted on a notification basis only and shall bear a date based on its date of receipt by the Board. After Date 3 for the block involved, the IFRB shall take appropriate action on such assignments and on all other subsequent notifications, in accordance with the procedures stipulated in the Radio Regulations.

It should be noted that this procedure is not intended to prevent the inclusion of an appropriate provision in the Final Acts of the Conference, which would allow for the implementation of paragraph 7 (a-f inclusive) of Resolution 6 of the International Administrative Aeronautical Radio Conference, Geneva, 1949.

C. No Lists or Allotment Plans

In those bands and services where no lists or allotment plans are accepted by the Conference, the IFRB shall prepare the Register in the following manner.

1. (Category 1) Each Administration shall notify the IFRB, prior to Date 1, of the assignment particulars of all active frequency usage projected over a sunspot cycle, for actual communication services or circuits being maintained as of the end of this Conference which :

a. Do not require adjustments in frequencies as the result of bringing into force all the provisions of the Radio Regulations (except the cooperative adjustment suggested in paragraph C, 3, b) and

b. The Administrations intend to continue in operation, and

c. The Administrations consider necessary to include in the new International Frequency List.

The IFRB shall assume that all these operations so notified can continue to operate satisfactorily, even though certain limitations may exist which will require continued cooperation between the Administrations concerned.

2. (Category 2) Each Administration having, on the final day of the Conference, any additional active operating frequency assignments not covered by Category 1, may begin to adjust such frequency assignments on Date 1 in order that such operation shall not be in conflict with the Radio Regulations. The particulars of all such adjusted frequency assignments shall be made available to the IFRB by not later than Date 2 for the "Block" involved.

Where such frequency adjustments are not feasible, the operation may continue on its present frequency until Date 2 for the Block involved, providing that each Administration concerned will resolve any cases of interference resulting from such operations.

3. The particulars of all assignments in both categories 1 and 2 shall be entered in the Register by the IFRB. As of Date 3 for any Block concerned, the IFRB shall enter a date in the notification column for each entry in either category. This date shall be the same as the date of signing of the Final Acts of the Conference. As of Date 3 for Block 7, the IFRB shall accord registration status to those assignments which are in conformity with the Table of Frequency Allocations. Those assignments that are involved in cases of harmful interference which are pending before the Board shall receive notification status and shall remain in the notification column until such interference has been satisfactorily resolved. The dates for all such assignments shall be the same as the date of the signing of the Final Acts of the Conference. The Administrations concerned should take the following steps to insure the minimum disruption and interference to all active radio operations :

(a) Every effort should be made to share the available spectrum space so that harmful interference is avoided.

(b) All practicable measures should be taken by Administrations so that operations which are in-band as of Date 1 may be readjusted whenever this will facilitate the accommodation of out-of-band uses in category 2.

(c) No operation which is out-of-band as of Date 1 will be shifted in-band prior to Date 2 for the Block concerned if such shift creates harmful interference.

(d) All uses which are in-band as of Date 1 will be reviewed with the objective of eliminating as many as possible before Date 2 for the block involved, so that only those operations which are essential need be considered after Date 2.

Notices of assignments in these bands received by the Board which do not fall in either category 1 or 2 above shall be entered in the Register with the dates of receipt in the notification column only and these dates may, after Date 3 for Block 7, be transferred from the notification column to the registration column in accordance with the provisions of the Radio Regulations.

4. Notices of operations activated after Date 2 for the Block involved will be handled by the IFRB in accordance with the procedure stipulated in the Radio Regulations.

D. For the Regional Frequency Bands Below 4000 Kc/s

In these "regional" frequency bands a procedure should be developed at the Conference whereby at least the following objectives will be attained:

(a) Registration and notification dates, as appropriate, for operations active as of the end of the Conference which are to be made retroactive to the date of signing of the Final Acts.
(b) Coordination of any inter-regional interference problems.
(c) Integration of these assignments into the Register.

E. Interference

In any cases of temporary harmful interference which may arise between Date 1 and Date 3 for Package 7, the Administrations concerned shall make every effort to effect a solution of such temporary interference cases on a mutually satisfactory basis, but may, in the event such agreement cannot be reached within a reasonable period of time, refer particular cases

of harmful interference to the IFRB for handling in accordance with the procedures stipulated in the Radio Regulations.

Studies describing the implementation problems of the several services of the United States :

A - Aeronautical Mobile
B - Amateur
C - Broadcasting
D - Fixed
E - Land Mobile
F - Maritime Mobile

STUDY "A"

AERONAUTICAL MOBILE SERVICE

PART I - Aeronautical Mobile (R) Service

The following comments relate to the problem of shifting out-of-band operations to specific frequencies provided by the IAARC Allotment Plan, Geneva-1949, in the following Aeronautical Mobile (R) bands :

2850-3025	8815-8965
3400-3500	10005-10100
4650-4700	11275-11400
5450-5480 (Region 2)	13260-13360
6525-6685	17900-17970

These comments are based on conditions as they are known to exist today and within the foreseeable future.

It should be noted that the AeM(R) frequencies presently used domestically within the USA are not the same as those in the IAARC Allotment Plan. It will, therefore, be necessary to change all frequencies presently installed aboard aircraft operating within the domestic USA. In addition, it is estimated that few, if any, of the presently used international route frequencies are the same as those provided by the IAARC Allotment Plan for the routes concerned and, accordingly, it is anticipated that all presently installed frequencies aboard USA international aircraft will be replaced in implementing the IAARC Allotment Plan.

1. EQUIPMENT

1.1 To provide an approximate picture of the scope of the impact upon equipment aboard USA air-carrier aircraft the following table has been prepared showing the number of aircraft, receivers, transmitters and crystals involved in the shift of frequencies from the present to the new (IAARC) :

	No.A/C	No. XMTRS	No. XMTR XTALS	No. Rcvrs	No. Rcvr XTALS
Scheduled aircraft authorized for domestic service only....1)	633	949	9490	949	9490

	No.A/C	No. XMTRS	No. XMTR XTALS	No. Rcvrs	No. Rcvr XTALS
Scheduled aircraft authorized for International service only . . . . . 2)	219	657	13140	657	13140
Scheduled aircraft authorized for both Domestic and International service only	302				
(1/2 to meet International requirements . . . . . 2)	151	453	9060	453	9060
1/2 to meet Domestic requirements . . . . . 1)	151	226	2260	226	2260
Total	1154	2285	33950	2285	33950

1) Domestic : One ten channel receiver, one ten channel transmitter, plus 50% spares.

2) International : Two twenty channel receivers, two twenty channel transmitters plus 50% spares.

1.2 Domestically, it is anticipated that in preparation for Date 2 operations will be integrated on the fewest practicable number of presently used frequencies to permit removal of all but an absolute minimum of these frequencies, thus permitting installation of the maximum number of the new (IAARC) frequencies. After operations have been shifted to the new frequencies on Date 2 for the Block concerned, further modification will then be effected as soon thereafter as practicable in order to remove the remainder of the presently used frequencies and to install the remaining new frequencies. In addition, it is anticipated that, to a limited extent, new equipment capable of providing a greater number of channels will be purchased.

1.3 Internationally it is anticipated the two methods outlined under 1.2 will be applied. In addition, consideration is being given for the major part to modification of existing equipment permitting use of a greater number of channels ranging upward to 60 and 74 channels.

1.4 It is estimated that approximately 2500 crystals will be required for transmitters and receivers at ground station locations.

1.5 It is estimated that several hundred of the receivers presently used at ground locations will have to be replaced in order to reduce intolerable adjacent channel interference anticipated under the reduced channel spacing of the IAARC Allotment Plan.

1.6 In general, the problems associated with implementation from an equipment stand-point may be broken down under three headings as follows:

1.61 Assessment of equipment. This is believed to be self-explanatory. It is anticipated that no operating agency will require a period in excess of two months after firm commitment to the plan/s to determine the

equipment required to effect the necessary modifications in accordance with 1.2 and 1.3, above.

1.62 Establishment of procedures. The procedures to be used for the modification or removal of the presently used frequencies and installation of the new frequencies in aircraft receiving and transmitting equipment are the most complex part of the problem facing the USA aircarriers of implementing the Atlantic City AeM(R) bands. These procedures are of great importance since they will control the length of time required to effect the change. These procedures involve three major variables as follows :

Availability of aircraft at the modification point/s for a sufficient length of time for the modification to be made. In some of the smaller operations, aircraft return daily to the point where the modification is to be made, while in some of the larger operations this period may extend to two months.

Spare equipment at points along the routes must be modified at the same time the equipment aboard the aircraft is modified.

Scheduling of work in aircraft radio maintenance shops, in conjunction with availability of aircraft so that routine maintenance work of aircraft radio equipment will not be disrupted.

1.63 Procurement of equipment. This phase, which can be carried out concurrently with establishment of procedures is primarily one of finances and time. The financial aspect, which is basic, has been treated under 2, below. Orders for equipment would not be placed until arrangements for the necessary funds had been completed. It is estimated that after orders had been placed for the necessary materials, a maximum of four months would be required for these orders to be filled.

2. Budgetary Consideration

2.1 It is estimated that the cost of modifying transmitting and receiving equipment aboard U.S.A. aircraft, both domestic and international, to remove presently used frequencies and install the IAARC AeM(R) frequencies, would be approximately two million dollars (based on cost levels existing as of June 1950). This does not include the cost of shifting aeronautical stations from presently used frequencies to the IAARC AeM(R) frequencies.

3. Time Required between Date 1 and Date 2

As a result of the preceding aviation study it is believed that the needs of the Industry can be met if the following sequence of events leading up to complete implementation of the Atlantic City Allocation Table can be approximately maintained :

3.1 Notice Required

It is anticipated that between Date 1 and Date 2, the following actions will be taken :

Determine the equipment required aboard aircraft and at aeronautical stations.

Establish equipment maintenance, etc., procedures for effecting the frequency changes.

Make the necessary budgetary arrangements.

Procure equipment to make the changes.

Reduce to an absolute minimum the number of frequencies presently installed aboard aircraft and at aeronautical stations, both domestically and internationally, and voluntarily install as many as possible of the new (IAARC) frequencies in preparation for initial operation on Date 2 for the Block concerned.

These considerations indicate that approximately twelve months should be provided between Date 1 and Date 2.

4. Time Required Between Date 2 and Date 3

It is anticipated that between Date 2 for Block 2 and Date 3 for Block 7, the following actions will be taken :

On Date 2 for the Block concerned, discontinue operations on the frequencies presently assigned, both domestically and internationally. Even though it may not be possible for all air carriers to begin operation on the new IAARC frequencies, operations will begin on the new frequencies wherever installations have been completed between Date 1 and Date 2.

Complete the modifications from present to new frequencies, for aircraft and aeronautical stations, and begin operations on the new frequencies as soon thereafter as practicable.

Allowing approximately ten days for each Block (2 through 7), it is estimated that the total processing time between Date 2, Block 2 and Date 3, Block 7 would be about two months.

5. Because instrument flight is required most often during the winter months, and consequently the safety of flight operations is most dependent on communications during this period of the year ; it would appear to be particularly advantageous to have the transition of operations begin (as of Date 2 for Block 1) on or about June 1 and end by September in order that the transition may be carried out during a good weather period.

6. Whole or in Part

6.1 The Block plan which permits shifting of loads between the various megacycle orders between Date 2 and Date 3 is considered practical. This flexibility is necessary as concerns the international operations and is an absolute necessity as concerns the domestic operations, where a large percentage of all present air-ground communications will have to be shifted upwards from the 5-6 megacycle band to the 8-12 megacycle band, and from the 2850-3500 kilocycle band to the 4-6 megacycle band.

6.2 In order to provide the necessary degree of safety and to permit coordination of operations, all operations on any specific route must be shifted simultaneously, domestically, as well as internationally.

The considerations enumerated above apply equally to all types of aviation service to be conducted in the AeM(R) bands.

PART II - Aeronautical Mobile (OR) Service

While the operational problems of the (OR) service vary somewhat from these of the (R) service, the same time factors, from the point of view of implementation, appear practical.

STUDY "B"

AMATEUR SERVICE

No implementation problems involving operational considerations are encountered in the Amateur Service.

STUDY "C"

BROADCASTING SERVICE

The physical plant facility problems of the Broadcasting service are similar to those of the fixed service, and the time factors involved for the fixed service apply equally to the Broadcasting service.

STUDY "D"

FIXED SERVICE

1. This study is based on certain premises and assumptions, it sets forth the position of operating agencies in respect to the more significant questions or considerations which apply to the fixed services in a program of implementation (i.e., of adjusting U.S. frequency uses) in conformance with the provisions of the Atlantic City Frequency Allocation Table. Specific information is set out as a guide bearing upon the necessity and length of an advance notice period, the duration of the change-over period, whether change-over should be made in whole throughout all bands in one step or broken down to several steps in different frequency ranges, and the time (season and year) when change-over should occur.

1.1 It has been assumed that :

1.11 An over-all procedure or basis for frequency utilization and/or specific frequency plans in respect to certain services or for certain frequency bands will be agreed upon at the forthcoming Extraordinary Administrative Radio Conference (EARC) of the ITU ;

1.12 A program, including specific Dates and covering certain important phases of the implementation program, will be established at the conference ;

1.13 In general, the specific frequencies on which operations are to be conducted under the new procedure or frequency plan in accordance with the Atlantic City Allocation Table will be known in advance of the preliminary period required for notification purposes.

1.14 The performance of available equipment will meet the minimum operational limitations required.

2. The implementation problems and the time required for adjusting operations into conformance with the Atlantic City Frequency Allocation Table, will be materially affected by the procedure or method of approach adopted by the Extraordinary Administrative Radio Conference.

2.1 The minimum figures cited below as to time requirements and impact on operations, are based on the continuation of in-band operations on present frequencies and adjusting out-of-band operations to in-band frequencies.

3. An advance notification period will be required in order that voluntary changes may be made, and a date must be set for the discontinuance of out-of-band operations. These requirements are consistent with the overriding need for holding communication disruptions and confusion to a minimum during the implementation period by :

3.1 Permitting voluntary changes to be made prior to the change-over period scheduled by the Conference.

3.2 Providing time during which advance planning and arrangements for necessary material and personnel can be completed, to the end that all actual frequency uses may be adjusted, where necessary, in accordance with the agreed program, and may proceed expeditiously without undue delays from the standpoint of necessary administrative action and physical adjustment of all equipment involved ;

3.3 Providing a definite terminal date by which out-of-band operations in any frequency band must be discontinued permitting the full availability of each frequency band by Services as provided in the Atlantic City Allocation Table without harmful interference from out-of-band operations.

4. The more significant equipment considerations which must be evaluated in establishing the implementation program are :

4.1 <u>Antennas</u>

4.11 Rhombic type transmitting and receiving antenna installations predominate in the fixed service within the high frequency portion of the spectrum. Frequency characteristics of such antennas are generally broad enough that frequency changes of the order to be anticipated will not pose serious difficulties. The consensus of opinion of operating agencies is that adjustments of such antennas to new operating frequencies will not require any increase in the length of the advance notification or actual change-over period beyond that dictated by crystal replacement (see 4.2 below).

4.12 A relatively small number of special antenna arrays are employed on high frequencies on certain international operations. Such arrays, in certain instances, are critically designed as to operating frequency and have very limited effective frequency coverage. Frequency adjustments in excess of about plus or minus 5% will require material adjustment of these installations, which may involve a quite expensive and lengthy adjustment program. If frequency adjustments, on circuits where these arrays are employed, beyond the effective range of the antennas are required, they may be accomplished without further extension of the notification and change-over periods by temporary utilization of less effective alternative antenna installations until such time as array installations may be conveniently altered. This temporary arrangement would result in an appreciable degradation of the signals now radiated from the aspect of desired and undesired directivity ratios.

4.13 In the low frequency range 10-150 kc and the associated regional band (150-200 kc), frequency changes may be of an order to require the installation of new antennas and also new transmitter equipment. Such installations, as the frequency is progressively lowered, become increasingly significant. Procurement and installation may require many months and possibly several years for over-all completion. In such instances, it may be found necessary to provide for interim operating arrangements pending ultimate completion of long term installation projects.

4.2 Crystals

4.21 One of the controlling factors in determining the length of the advance notification period is the amount of time required to procure, through normal commercial channels, and deliver crystals for both transmitting and receiving equipment to distant terminals which in some instances may be relatively inaccessible. Normal procurement delays may be seriously aggravated due to the accumulation of simultaneous demands from many agencies and for different operating Services. It appears that, on the basis of current practices in respect to the accuracy of frequency assignment maintenance, a minimum period of 3 to 6 months will be essential in advance of the change-over period in order to allow for the procurement and delivery of crystals to circuit terminals.

4.22 Should it be necessary, incidental to a reduction in adjacent frequency channel separations, to maintain operating frequencies substantially closer to assigned values than is current practice on international circuits, the crystal processing and replacement problem would be aggravated. This would result from the need for replacing many additional crystals and from increased time for processing individual crystals.

4.3 Transmitters

4.31 New frequency assignments in the high frequency range may in certain instances fall above the upper limit of existing transmitter tuning ranges. A limitation on transmitter tuning range in a few instances such that the highest frequency of a circuit complement is unuseable immediately should be of relatively little concern at this time in view of the decreasing importance of such frequencies of a circuit complement in maintaining satisfactory service since the peak of the solar activity cycle has passed and, beginning about 1952, low solar activity may be expected for the next few years. Therefore, it does not appear that such situations should be a factor in delaying implementation.

4.32 In the low frequency range (10-150 kc) special circumstances may require extensive replacement of transmitter equipment. This may make special treatment of implementation necessary in the range as noted in sub-paragraph 4.13 above.

4.33 Tuning coils for transmitters, particularly in the case of those having very limited tuning adjustment flexibility may have to be replaced. Transmitting stations generally are provided with adequate tuning coils to permit adjustment of transmitter frequencies over the foreseeable range of frequency variation. Some additional flexibility may be needed to permit operation on revised frequencies under plans adopted by the Conference. As soon as revised frequencies are known, it is believed that concurrent action to provide additional coils needed can be accomplished within the period established as required for the provision of crystals.

4.34 In the case of SSB transmitters, it is noted that procurement of new tuning units through normal commercial channels may require 3 to 6 months time.

4.4 Receiving Systems

4.41 New frequency assignments in the high frequency range may in certain instances, as in the case of transmitters, fall above the upper limit of the receiver tuning range. Such situations present less of a problem in the case of receivers than in the case of transmitters. The same general remarks, as outlined in section 4.31 above, seem appropriate.

4.42 Tuning coils of receivers, as in the case of transmitters, may have to be replaced. (see 4.33 and 4.34 above).

4.43 Selectivity characteristics of present radio telegraph receiving systems (excluding multichannel SSB systems) are, in many instances, inadequate from a performance standpoint even on the basis of present practices as to adjacent channel separations for transmissions in the same interference area. With present adjacent channel separations, operational problems will expand in proportion with the degree of departure from present conditions in respect to frequency usage in any particular area. The extent to which material reductions are made in adjacent channel separations in any new frequency assignment plans will materially increase the resulting operational problems. The solution to such difficulties arising from inadequate selectivity characteristics of receiving systems appears to require the development and procurement of improved receiving equipment which is not currently available. Consequently, it appears that frequency plans, to be implemented within the next year or two, must be based on present

equipment and must conform generally with present operating practices in respect to frequency tolerances and separation of adjacent frequency channels.

5. Personnel

5.1 Increased demands will be placed upon available operating and technical personnel generally as a result of any program to implement large numbers of frequency changes. The length of the advance notice period and also of the change-over period must be gauged with the limitation as to the reasonable number of changes that can be handled by personnel. Generally, it is believed that present personnel would have to suffice to carry the workload involved. This factor may be more significant in determining the minimum length of the change-over period rather than the advance notification period particularly if a very short change-over period is to be considered in any frequency band.

6. Program Costs

6.1 The costs of the implementation program, in the case of operating agencies having large responsibilities in respect to the number of circuits and radio terminals operated, will be very substantially based on crystal procurement alone without including major equipment adjustments such as receiver, transmitter, or antenna installation adjustments or replacements. Absorption of expenses as routine maintenance costs would be facilitated if the over-all program is spread over a period in excess of one year. If an evolutionary procedure for establishing fixed service usage of the Atlantic City fixed bands is adopted by the Conference, the total cost of implementation would be materially less than if all fixed station assignments were changed, as would be required by a PFB type of fixed service list.

7. Change-Over in Whole or in Part

Some of the operating agencies involved considered that it was acceptable during the change-over period to effect changes in whole during one period or in several parts during several periods based either on different frequency ranges or individual circuit complements or even frequency by frequency. The most practical plan suggested was to divide the task taking several consecutive frequency ranges and several periods of relatively short duration rather than effecting the change-over throughout the entire frequency range in one period. Estimates of the duration of the final change-over periods varied, for each of these ranges, up to a maximum of several months.

8. Change-Over Time of Year Preferred and Actual Time

8.1 Some agencies considered that the time of year was not significant in connection with the implementation program. However, a viewpoint was expressed that least impact on communication services generally would result if the bulk of frequency changes were effected during a relatively stable period of ionospheric conditions. During such a period, there is less divergence between maximum and minimum frequencies used on any circuit and generally fewer frequencies used on any circuit. Consequently, during such a period, fixed operations can be accommodated on less actual frequency space in terms of frequency hours per day, facilitating the rapid adjustment of fixed service operations to release bands allocated to other services. The period after the spring equinox and before the fall equinox from approximately 1 May to 15 August in the

northern hemisphere, is recognized by propagation specialists as most desirable in respect to stability of ionospheric conditions.

8.2 Provided essential time is allowed in the notification period to prepare for implementation and make such changes as can be accomplished on a voluntary basis, and in the actual change-over period to effect changes which must be completed before that period's terminal date, it appears that if the Atlantic City Allocation Table is to be made effective there is no compelling reason from the standpoint of the fixed service for undue deferment.

Based on the assumption stipulated herein, it appears that implementation from the viewpoint of the fixed service, could be accomplished within a period of not less than one year beginning with Date 1.

STUDY "E"

LAND MOBILE SERVICE

1. Facts bearing on the Situation :

a. Land Mobile operations are generally of a domestic rather than an international nature in that communication is generally between stations within a particular country or territorial division thereof. Most of the land mobile operations of the United States are conducted on frequencies above 27 500 kc, but certain operations require, for reasons of frequency propagation, the use of frequencies below 27 500 kc. This study considers only this latter category.

b. Comparatively low radiated powers are generally employed in Land Mobile communications. Thus their interference impact upon other countries is primarily regional in extent, however, Land Mobile operations are generally as susceptible to interference from regional and international transmissions as operations in other services.

c. Due to the essential need for stability together with ease and rapidity of frequency adjustment in Land Mobile communications, crystal control of equipment is predominant. In particular operations a large number of equipments may be involved which must have flexibility to permit operation on many different frequencies. This results in a large number of crystals being required for individual mobile equipments and the total number of crystals utilized in the Land Mobile service is very substantial.

d. Certain mobile equipments are designed to permit operation alternatively with crystal or master oscillator frequency control in order to provide maximum flexibility. In the case of such equipments, implementation of revised frequency assignments would be facilitated in that initially, at least, operation on new frequencies could be established with master oscillator control without time delays. In the case of some equipments, however, crystal control only of transmitters is provided.

e. In the regional bands below 4000 kc, while several exclusive bands have been established for Aeronautical and Maritime Mobile services, such as 2065-2105, 2850-3025, 3025-3155, and 3400-3500 kc, the major portion of this space from 1605 to 4000 kc is still available for Land Mobile service on a shared basis. Thus, certain operations will have to be adjusted to clear these relatively small exclusvie bands. Certain in-band operations may have to be adjusted to new in-band frequencies, but a large portion of present Land Mobile operations may continue on in-band frequencies now in use. Adjustments of this nature generally will not pose serious problems other than the need for replacement of crystals and readjustment of transmitters and receivers. The same comments apply in the case of the bands above 20,000 kc except that even fewer frequency changes appear to be required.

f. In the case of the bands from 4000 to 20000 kc, there have been very substantial changes in the provision for Land Mobile operation under the allocation table of Atlantic City from the provision under the Cairo Table. Under Cairo the shared bands 4000-5500, 8550-8900, 12825-13350, 17100-17750, as well as the mobile bands 5500-5640, 6200-6675, 8200-8550, 11000-11400, 12300-12825, and 16400-17100 kc were generally available for possible Land Mobile utilization. In practice, there has been little actual utilization of frequencies for Land Mobile operations between 7000 and 20000 kc. The major portion of activity has been concentrated in the band 4000-5500 kc. Under Atlantic City, within Region 2, Land Mobile service is only provided for in the three bands 4438-4650 (212 kc), 4850-4995 (145 kc), and 5250-5450 kc (200 kc) between 4000 and 20000 kc. The above allocations are on a shared basis with Fixed service in the band 5250-5450, shared with Fixed and Broadcasting in the case of the band 4850-4995, and shared with Fixed and other Mobile except Aeronautical Mobile (R) in the case of the band 4438-4650 kc.

g. In view of the substantial changes in allocations for Land Mobile operations, it is obvious that substantial adjustments must be made to the present frequency assignments. It is assumed, however, that frequency adjustments for Land Mobile operations will not require a major adjustment of present frequency ranges of equipment.

2. Assurming that, by some process, frequency assignments suitable to accommodate Land Mobile operations are determined as of a certain date, the problems facing the Land Mobile service in implementation of such new frequencies appear to be as follows :

a. Crystals must be purchased for new frequencies.

b. These must be distributed and installed by appropriate field service agencies. Simultaneously, it may be necessary to recalibrate and retune transmitters and receivers.

c. Since replacement of crystals and recalibration of equipment will require bringing the actual equipments into servicing shops, it appears essential that all frequency changes on individual equipments should be completed as one operation at one time rather than successive treatment in different frequency ranges at different times.

d. Pertinent instructions and information must be furnished in advance of implementation to all operating personnel.

e. Provision to permit absorption of the cost of such an implementation program must be included in budget estimates together with any supplemental needs in replacing crystal stocks which in certain instances may be an appreciable factor. Replacement of such stocks, however, would not necessarily have to be effected within the actual implementation period.

3. In the light of the above facts and considerations bearing on Land Mobile operations, it is estimated that a period of not less than one year should be allowed, from the time that new frequency assignments become known and after all controlling decisions in respect to implementation have been reached, before a complete change-over of all equipment to new frequencies can be effected in the Land Mobile service.

STUDY "F"

MARITIME MOBILE SERVICE

PART I - High Frequency Ship Telegraph Bands

Objectives :

(1) Bring the use of frequencies allocated to the Maritime Mobile Service below 27 500 kc into conformity with the Atlantic City Table of Frequency Allocations at the earliest possible date.

(2) The EARC Conference should establish the earliest possible date, and a method of procedure for implementation, taking into account the considerations of the Maritime Mobile Service.

(3) In effecting over-all implementation of the bands between 4000 and 27 500 kc, while some interim harmful interference and degradation of all services may be unavoidable, it must be kept to a minimum both in time and magnitude.

Considerations :

(1) Between the close of the EARC Conference and Date 1, all affected operating agencies and licensees will be informed by their Administrations of the specific frequencies assigned to each ship telegraph station pursuant to Article 33 and Appendix 10 of the Atlantic City Radio Regulations together with implementation details and such administrative directives as may be necessary.

(2) For reasons of economy and the low rate of availability of many ships at service ports, the complete equipage, calibration, and tune-up of each ship should be done in a single job. Double transitions of either ships or coast stations are economically and operationally impractical.

(3) The minimum period of time required to completely equip and calibrate all ship H.F. telegraph transmitters designed for Master Oscillator - Power Amplifier (MOPA) and/or crystal operation pursuant to Article 33 and Appendix 10 (frequencies) is calculated to be 13 months from Date 1. If 24 or more months is provided in the plan adopted by the Conference, it would be operationally and economically desirable to equip the ships concerned at the same time the foregoing adjustments are made so that they can, on a voluntary basis, meet the conditions in paragraph 592 of the Radio Regulations and in column 3 of the tolerance table in Appendix 3.

(4) Contingent upon appropriate preparation, transition from the Cairo Table to the Atlantic City Table can be effected in all bands simultaneously and instanteously. However, if necessary to harmonize the transition with any over-all implementation plan on a successive block basis, this can be done, but may not be the most desirable from the viewpoint of the ship telegraph service.

(5) Implementation of any given band will not be practical until transmissions of other services capable of causing harmful interference have ceased in the band in question.

(6) Simultaneous guarding by coast stations of duplicate Cairo and Atlantic City ship sub-bands at a given order of frequency is not desirable, but, if unavoidable, should be kept to an absolute minimum period of time.

(7) Because of the world-wide nature of the H.F. Maritime Mobile Radiotelegraph Service, it is necessary that a single, universal, implementation procedure be employed for this service.

Plans for Implementation :

Any plan of implementation should provide for the following actions :

(1) Prior to Date 1, each Administration shall notify all operating agencies and licensees concerned of the specific frequencies assigned to each H.F. ship telegraph station pursuant to Article 33 and Appendix 10 of the Atlantic City Radio Regulations together with implementation details and such administrative directives as may be necessary.

(2) On or before Date 1, operating agencies, licensees and other affected parties shall proceed with the preparation of ship telegraph stations in accordance with the implementation plan adopted. Enumerated below are 3 plans of implementation each of which is related to the amount of time that the Conference allows for the preparation of H.F. ship telegraph stations.

Plan 1 : Twenty-four month Allowance for Preparation

All ship telegraph stations, including those that are not now equipped with crystal controlled transmitters, can be prepared for complete transition in all bands with crystal controlled transmitters by instantaneous or block-by-block plan on any date which is 24 months or more after Date 1. This plan would afford sufficient time for ships to be equipped, on a voluntary basis, to meet the conditions in paragraph 592 of the Radio Regulations and in column 3 of Appendix 3 thereto.

Plan 2 : Thirteen-month Allowance for Preparation

All ship telegraph stations can be prepared and ready for complete frequency transition (primarily MOPA) by instantaneous or block-by-block plan on any date which is 13 months or more after Date 1. This plan differs from Plan 1 in that sufficient time would not be afforded for all ships to be equipped, on a voluntary basis, to meet the conditions in paragraph 592 of the Radio Regulations and in Column 3 of Appendix 3 thereto.

Plan 3 : Six Months plus Allowance for Preparation

(1) Six months after Date 1, ship telegraph stations which have been prepared and are ready for immediate frequency transition (primarily MOPA) can shift (represents approximately 50% of United States ships affected).

(2) Beginning six months after Date 1, all ship telegraph stations shall cease using Atlantic City out-of-band frequencies.

(3) Between Date 1 plus six months and Date 1 plus thirteen months, the remaining ship telegraph stations shall be prepared and shifted on a ship-by-ship basis.

Plan Preferences :

(1) Plan 1 is preferred to Plans 2 and 3 because it affords sufficient time to prepare completely, pursuant to considerations (2) and (3), all United States H.F. ship telegraph stations before any transition takes place, and thus, most economically, permits full implementation of the Atlantic City H.F. ship telegraph frequencies, and, at the same time, voluntary meeting of the conditions in 592 RR and Column 3 of Appendix 3 RR.

(2) Plan 2 represents the minimum time required to implement the Atlantic City frequencies, but is less desirable than Plan 1 because it does not afford sufficient time, on the basis of one overhaul per ship, to meet, on a voluntary basis, the conditions in 592 RR and Column 3 of Appendix 3 RR.

(3) Plan 3, while offering the advantage of an earlier date for the commencement of implementation, nevertheless contains the following serious disadvantages which would occur during at least part of the transition period :

(a) Two different sets of operating regulations would be in effect ;
(b) Coast Stations would be required to guard two calling sub-bands per band ;
(c) Intra-service interference problems would be created, particularly in the passenger ship working sub-bands.
(d) During the period of transition, unshifted ships would have a materially reduced number of working frequencies.

PART II - Coastal Telegraph Bands

The problem of modifying the transmitting and receiving equipment for coastal telegraph stations is the same as for the Fixed Service (Study D) and the same approximate time factors appear to be involved.

PART III - Ship Telephone Bands

Periods ranging up to 15 to 19 months must be allowed for the procurement of crystals and other components and the adjustment of ship telephone transmitters, depending, in part, upon the time of year agreed for obligatory implementation. If such a time period is agreed, no other major implementation problems will occur for ship telephone stations. In some cases, actual frequency shifts will be made aboard vessels at sea.

PART IV - Coastal Telephone Bands

The problems of implementation for coastal telephone stations are, in general, comparable to those of coastal telegraph stations but actual frequency shifts, for operational reasons should be made at the same time as the corresponding changes for the ship telephone stations which they serve.

PROPOSAL N° 2

NEW ZEALAND

(Extract of letter P & T 1950/3085 of 18 December 1950)

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7. General (In relation to (c) of invitation of Resolution 200 of Administrative Council).

The New Zealand Administration adheres to the principle of an orderly development of use of the Radio Frequency Spectrum, and believes that the progress made to date, being substantial, cannot lightly be jettisoned. It is considered that the engineering rules developed by the P.F.B. if wisely used can produce a more economical frequency usage system. In our own case we have 242 Berne registrations for fixed circuits on frequencies higher than 3.9 mc/s. The P.F.B. procedure with an application of stringent consolidation of circuits and frequencies gives 194 frequencies, a saving of 48 frequencies or about 20%. Consequently, there is no inflation either in registration or in the engineering procedure.

It is our view that there can be no progress without some sacrifice, and while we recognise that countries must protect their important circuits, nevertheless we believe that it is the desire of the majority of countries to have order rather than confusion. If, to achieve this objective, it is necessary to restrict for the time being frequency demands, then this should be done.

We believe that there is greater room for consolidation of requirements on the part of all countries. We have 123 fixed circuits using frequencies above 3.9 mc/s. The P.F.B. rules have given 388 frequencies by stright application. With consolidation 194 frequencies are obtained. We are unable to go further at this stage, but we think, having reduced by 20% our Berne list filings for a small number of circuits, that countries having large numbers of circuits can at least reach this figure, there being more possibilities of reduction.

We find that cases of harmful interference are on the increase. Reports from stations under the control of this Administration indicate that congestion of the spectrum is not mere fantasy. Shifting fixed circuits into a narrower spectrum space will not decrease the effect but obviously will increase it. Consequently, for a proper approach we must limit the assignments being made. Administrations must, therefore, if satisfaction is to be attained, reduce their demands then our services will be sacrificed by interference. The picture is very clear.

We are prepared to adopt any reasonable policy which will provide an orderly approach to the problem backed up by further consolidation and restriction. We fully realise that equipment

design must play an important part in any such approach. The development will prove expensive. The time-sharing of circuits requires reconsideration.

It is our desire that the Aeronautical Plan be introduced at the earliest possible moment. This could not be accomplished frequency by frequency, since the frequencies for the Aeronautical Plan - and for the Maritime Mobile Plans - are not necessarily the same as exist today for other circuits occupying the adjacent spectrum space. With fast flying national and international aircraft depending upon a planned communications system, both mobile and fixed, we would not be able to agree with any move which may tend to leave any other circuits operating in the bands over any period of time. Therefore, we would require to shift frequencies band by band. As it would appear that any Aeronautical Mobile Plan must be introduced simultaneously world-wide, to provide for M.W.A.R.A. similarly any Maritime Mobile Plan - it must then follow that all changes must be made in a relatively short period.

If this is to be done, then we feel that all fixed circuit frequencies must be negotiated in advance, which means negotiation at the Extraordinary Conference, and which in turn means an earnest endeavour to prepare an orderly and co-ordinated International Frequency List.

Summarising, we advocate the following approach to the existing problem.

1. The acceptance of existing plans as far as possible - Regional, Aeronautical and Maritime Mobile and Fixed, as suggested by the Administrative Council.

2. The development of an orderly approach to the problem of the fixed bands based on a greater reduction of demands in the first instance.

3. The containing of international high frequency broadcasting services in the appropriate bands - preferably on a planned basis but in any case with limitation to the appropriate bands.

4. The implementation of services possessing frequencies lying above 3.9 mc/s within a restricted period.

5. The implementation of services possessing frequencies lying below 3.9 mc/s in a restricted period, not necessarily, but preferably at the same time as in 4.

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PROPOSAL N° 3

BELGIUM

(Letter 131 RV of 22 January 1951)

Further to your request for information relative to paragraphs c) and d) of Administrative Council Resolution No. 200, the Belgian Administration has certain suggestions to make, in view of the fact that application by Belgian telecommunication services of the frequency assignments above 4000 kc/s as determined by the Provisional Frequency Board would present serious drawbacks, and also in view of the need to accelerate implementation of the Atlantic City plan. These suggestions are as follows :

A) In the case of frequencies below 4000 kc/s, we could accept the assignments proposed by the special and service conferences held since 1948, and those evolved by the Provisional Frequency Board, without major amendment (see my letter No. 131 RV, of 8 December 1950, in reply to paragraphs a) and b) of the above-mentioned resolution).

B) In the case of frequencies between 4000 and 27,500 kc/s, there would seem to be but little hope of obtaining, in any foreseeable future, a new frequency assignment list based on sound technical principles. Hence we are of the opinion that the best practical temporary solution, and one which would chiefly be to the advantage of the security services, would be for each administration to consider using, for its fixed services, only those frequencies which it is now using in accordance with the Berne List, provided they fall within the bands reserved for the fixed service by the Atlantic City Regulations. This would mean that services other than the fixed service should discontinue use of frequencies outside the special allocations made to them.

As a second step, in order to ensure that the frequencies remaining available to the fixed services were employed to the fullest possible extent, each administration would be asked to provide the IFRB with the following information :

1) a list of those frequencies which experience has shown to be the best for the requirements of that administration's essential services ;

2) a list of frequencies which for one reason or another cannot be used in the normal way. Against each frequency would be indicated the frequency requested in exchange. It would be for the IFRB to decide on the exchanges to be made.

No solution of the frequency assignment problem seems possible without a very substantial reduction in the requirements hitherto recorded. The above procedure would appear to offer a possibility of implementing the Atlantic City Plan, a matter of concern to all the various services.

During the transitional period research would be continued on ways and means whereby the new frequency list might be evolved in accordance with the Radio Regulations.

PROPOSAL N° 4

FRANCE

(Letter 2/452 CR of 30 January 1951)

I have the honour to send you herewith the contribution from the French Administration to the study of the problem set by the Administrative Council in its Resolution No. 200, namely :

> ".... proposals relating to new methods of bringing into effect those parts of the Atlantic City Table for which the Extraordinary Administrative Radio Conference is unlikely to establish a frequency list."

We are of the opinion that there is no point in going into great detail before the methods we are advocating have been discussed with other administrations, so that the following paper is couched in very general terms.

1. We are convinced that as regards the bands between 4 and 27.5 Mc/s, the Extraordinary Administrative Radio Conference will be unable to prepare a new frequency list in the form and according to the methods decided upon at Atlantic City. This conviction is based on the fact that the Provisional Frequency Board, applying technical rules of excessive complexity - rules which, our knowledge being what it is, are insufficiently precise - failed to draw up a new list based on the circuit requirements notified by administrations.

2. We are, nevertheless, of the opinion that, to implement the Atlantic City Frequency Allocation Table, a new list will have to be prepared. Since this Table constitutes a major re-arrangement of the Cairo one, it has become essential to coordinate the frequency transfers which will result from its application, if indescribable chaos is to be avoided.

3. There can be no doubt that the major difficulty in preparing a new list lies in the need to fit all the fixed service frequencies - by far the most numerous - into a spectrum space which has been cut down in relation to that which was allocated at Cairo. Hence it follows that rigorous observance by all other services of the special bands allocated to them at Atlantic City is a prerequisite of any attempt to draw up a new list.

This presupposes that the problem abandoned by the Florence-Rapallo High Frequency Broadcasting Conference will be solved, that the plans produced by the International Administrative Aeronautical Radio Conference are acceptable, and that the Provisional Frequency Board's draft plans for the maritime mobile service can be used as a basis for the preparation of a final plan.

4. This assumption being made, the problem is reduced to one of transferring the fixed service from the bands allocated to this service by the Cairo Regulations, but allocated to others at Atlantic City.

There can be no question, we think, of upsetting the state of affairs existing in the bands allocated to this service by the Cairo Regulations and still allocated to it in the Atlantic City ones. Hence we consider that the new list should be built up on the model of the existing list, so that :

a) only frequency requirements should be considered ; and

b) the list of circuit requirements drawn up by the Provisional Frequency Board in accordance with the directives issued by the Atlantic City Conference should be ignored.

c) An equitable means should be found of making allowance for priority in notification.

Such a procedure would give a document which at the outset would be identical with the existing one, but would be open to judicious improvement, notably by the inclusion of reception points.

5. How then, are we to draw up a list of the frequency transfers to be made ?

We are of the opinion that this must be done by reference to an official Union document. In this case, it would seem wise to take the lists of frequency transfers to be made, as submitted by administrations in response to Administrative Council Resolution No. 200, and to check whether the frequencies therein included are also shown in the 16th edition of the list being prepared by the ITU General Secretariat. This latter list will include all frequency notifications made up to 1 March 1951.

6. It would be pointless, we feel, to attempt such frequency transfers during the Extraordinary Administrative Radio Conference ; the agenda of the conference does not include this task. We are of the opinion that the conference could do no more than lay down a method whereby such transfers could be made ; we make the following broad suggestions :

In those parts of the spectrum allocated to the fixed service by the Atlantic City Regulations, each administration would seek an opportunity for transferring all the frequencies used by it and notified up to 1 March 1951, when these frequencies were in bands allocated to the fixed service by the Cairo Regulations but since then allocated to other services. Administrations would then submit proposals to the Union.

Cases would no doubt occur of several administrations all desirous of making transfers to a frequency left temporarily unoccupied by other administrations notifying it. It would be for the IFRB to examine the requests put forward and to suggest possible solutions based on any information it may have collected from the international monitoring service. It would draw up a general plan for frequency transfers which would subsequently be submitted to a radio conference in a form to be decided on at the Extraordinary Administrative Radio Conference itself.

Such a procedure could of course begin to show tangible results only after a considerable period ; we hold, nevertheless, that it is the only practicable one.

If it proves impossible to make the transfers, it would be better to keep the Cairo Frequency Allocation Table or to modify the Atlantic City one, in order to avoid major changes in the frequency bands allocated to the various services.

PROPOSAL N° 5

CANADA

(Letter 1226-72 of 31 January 1951)

I have the honour to refer to Administrative Council Resolutions No. 199 and 200, dealing with the convening of the Extraordinary Administrative Radio Conference and the preparation for that Conference.

Resolution No. 199 invites Administrations to make proposals relating to suitable methods of bringing the entire Atlantic City Table of Frequency Allocations into operation as soon as possible and Resolution No. 200 requests Administrations to supply to the I.F.R.B. by January 31, 1951 proposals relating to new methods of bringing into effect those parts of the Atlantic City Table for which the Conference is unlikely to establish a frequency list.

The complex problem of implementing the Atlantic City Frequency Allocation Table below 27,500 kc/s has been given considerable study by this Administration. Of particular concern to the Canadian Administration is the difficulty of reaching agreement with regard to the Fixed Service allocations.

I am enclosing a paper prepared as a result of this study, which outlines one procedure, "Controlled Approach", which would appear to warrant further detailed investigation by the I.F.R.B. and other administrations. Briefly, this "Controlled Approach" is based on a contraction of the channel spacing which has generally been followed in the past.

This paper should be regarded at present as being merely for technical study and should not be considered as a formal proposal of the Canadian Administration. In fact further detail study by the Canadian Administration of the "Controlled Approach" procedure outlined in this paper between now and the holding of the Conference may result in such a procedure not receiving any support by the Canadian Delegation to the Conference.

The "Controlled Approach" appears to have some merit and we came to the conclusion that the results of our study should be made available to the I.F.R.B. and other administrations, with the feeling that it might stimulate studies along this or other lines prior to the Conference.

CANADIAN STUDY CONCERNING THE IMPLEMENTATION OF THE ATLANTIC CITY FREQUENCY ALLOCATION TABLE BELOW 27500 KILOCYCLES/SECOND

INTRODUCTION

1. The Canadian Administration has completed a study of some methods by which a new International frequency list could be compiled in conformity with the Atlantic City Allocation Table.

2. The study has produced one procedure which appears to merit consideration by other administrations.

GENERAL SITUATION

3. The work carried out by the International Telecommunication Union and particularly the work of the Provisional Frequency Board, has emphasized that one of the major difficulties involved in preparing an acceptable international frequency list in conformity with the Atlantic City Allocation Table is the problem of accommodating the Fixed Service in its reduced spectrum space.

4. The Canadian Administration has studied several methods, and in particular:

(a) The PFB approach based on the application of technical principles to accommodate the circuit requirements submitted by all Administrations in 1947 ;

(b) A modified PFB approach in which each Administration would present a "circuit priority list" of which approximately the first thirty percent of the circuits would be accommodated by registration in a properly engineered list. Of the remainder, as many as possible would be properly engineered into the list, and the unaccommodated residue would operate on a "notification" or non-interference basis to the registered circuits ;

(c) An "evolutionary" approach, based on the International Frequency List (published by the Secretary General of the I.T.U., and hereafter referred to as the ITU List) of some date yet to be decided. Under this method "out of band" circuits would be shifted into the appropriate service bands under arrangements made individually or multilaterally by the various administrations.

5. The study of the PFB approach leads to the conclusion that, while the plans produced by the PFB are generally acceptable to Canada, it is apparent that most of these plans are unacceptable to a substantial number of administrations, and therefore are unlikely to be adopted. Furthermore, the Canadian Administration is most concerned that the PFB was unable to prepare plans for the band of frequencies between 5 - 9 Mc/s (which is of vital importance to Canadian circuits). There appears to be little possibility of producing a generally acceptable list by this method mainly

because of the difficulty of obtaining an accurate list of circuit requirements from each administration, and because the technical approach tends to increase rather than reduce the number of frequencies which must be assigned to the circuits.

6. The modified PFB approach based on a circuit priority list is likely to meet the same difficulties as the PFB method due to the difficulty of obtaining an accurate list of requirements on an equitable scale from each administration. The disadvantage due to the inflationary tendency of the application of technical principles still remains. It seems unlikely that administrations will be willing to devote more time and money to this type of approach after the experience of the PFB.

7. The evolutionary approach has the considerable merit that it is based on a more realistic list of circuit requirements (i.e. the ITU List) and due to the probability that administrations are not likely to waste time and effort in obtaining unnecessary frequencies by their own action for non-existent or unimportant circuits. However, at present no detailed procedure has been indicated by which this process would be controlled. Furthermore there is no way of indicating to each administration how it will fare under this method. There is danger of serious dislocation if each administration attempts to secure "in band" frequencies by its own efforts.

PROCEDURE SUGGESTED FOR FURTHER STUDY

8. The procedure developed as a result of the investigation by the Canadian Administration is to be regarded at present as merely a technical study. It is not to be considered as a formal proposal and will not necessarily be supported by the Canadian Administration. For purpose of reference in this paper the procedure will be referred to as the "controlled approach", since the whole operation is closely controlled by the ITU List.

9. The "controlled approach" is based on contraction of the channel spacing of the ITU List. The ITU List reflects a 5 Kc/s basic channel spacing, with a relatively small number of registrations on "interspersed" channels, usually half-way between the discrete 5 Kc/s channels. The Canadian Administration, after investigating the registrations up to Annex 3 inclusive (i.e. to 31 December, 1949) found that the Fixed Service registrations could be accommodated within the appropriate Atlantic City bands by adoption of the following reduced spacings between existing 5 Kc/s channels of the ITU List :

(a) For Atlantic City fixed service bands between 4000-4995 Kc/s: 3.0 Kc/s
(b) For Atlantic City fixed service bands between 5005-5450 Kc/s: 3.5 Kc/s
(c) For Atlantic City fixed service bands between 5730-21000 Kc/s: 4.0 Kc/s
(d) For Atlantic City fixed service bands between 21750-27500 Kc/s: 5.0 Kc/s (no change)

10. It is apparent that the ITU List channel spacing bears no relation to present day channel spacing standards. There is considerable wasted space in some cases, such as where two adjacent A1 emissions are separated by 5 Kc/s. There is also considerable overlap, such as where two adjacent A3 operations (each requiring 7.0 Kc/s protected bandwidth) are separated by 5 Kc/s, and presumably operate satisfactorily since the registrations have not been cancelled. It must be assumed that in the cases of apparent overlap, the circuits continue to work.

(a) Because the overlap is not sufficient to produce harmful interference ;
(b) Because the stations are sufficiently separated geographically;
(c) Because the hours of use of the frequency are different; or
(d) Because one of the circuits is not in operation on the frequency.

This being the case, it is reasonable to conclude that the present spacing can be reduced without seriously disrupting the present sharing pattern or increasing interference between stations.

11. The "controlled approach" has the advantage that all concerned can see at once how their interests are affected, and can assess from past and present operation whether the assignments are workable. Furthermore the basic arrangement of the new list is achieved with very little work. Once the basic layout is derived by the "controlled approach" method, individual cases of potential interference can be dealt with in detail.

12. One apparent disadvantage is the fact that practically every fixed service circuit would be required to change frequency if the "controlled approach" method were adopted. However, the average change involved would be only of the order of 250 Kc/s, and the largest change would be of the order of 800 Kc/s. Furthermore, in cases where a change is absolutely unacceptable, the administration concerned could negotiate to retain its present registration, by making bilateral arrangements with other interested administrations.

13. It is emphasized that the "controlled approach" envisages two distinct phases :

(a) First, the achievement of the basic arrangement by means of a general reassignment procedure ;
(b) Second, the detailed rearrangement to overcome individual objections;

14. (a) Appendix "A" to this paper shows one arrangement of the basic re-assignment plan. Other arrangements are possible, and this is merely an illustration. It will be noted that this arrangement provides some spare (unused) space ;
(b) Appendix "B" shows the affect of this re-assignment on other services which under the Atlantic City Table, share bands with the Fixed Service. The services thus dealt with are :

(i) Land Mobile
(ii) Tropical Zone broadcasting
(iii) Maritime Mobile (example)
(iv) Aeronautical Mobile (example)

15. This investigation dealt primarily with the Fixed Service registrations contained in the 1947 ITU List and annexes 1, 2 and 3 (to 31 Dec 49). Annex 4, published since the completion of the initial study, is estimated to increase the problem very slightly. Only those Fixed Service registrations which were on frequencies allocated to the Fixed Service in the Cairo Table were considered.

<u>The general procedure employed was as follows:</u>

(a) All Fixed Service registrations in the Fixed Service Cairo bands were listed in columns, one column per channel; the registrant country and emission were indicated; in the case of international circuits the indicated correspondent country was also listed;

(b) All registrations within 1 Kc/s of the main channel were treated as being on the main channel (main channels are those whose nominal frequency is a multiple of 5 Kc/s);

(c) All registrations more than 1 Kc/s from a main channel were listed under the frequency falling midway between the main channels;

(d) All registrations of Services entitled under the Cairo Table to share with the Fixed Service registrations listed above, were included in the appropriate column, but were separated from the Fixed Service registrations. The registrant country, service and emission were shown ;

(e) The foregoing procedure made it possible to analyse the main list and the three annexes at once, and clearly indicated the channel loading;

(f) Calculations were then made to determine the reduction in channel spacing necessary to accommodate the Fixed Service registrations within the Atlantic City Bands;

(g) The new frequency, based on the reduced channel spacing, was written in the appropriate column under the existing ITU List frequency;

(h) The effect on services which share the Atlantic City Bands with the Fixed Service circuits was then assessed. With the exception of Land Mobile and Tropical Zone Broadcasting these services have also been provided with exclusive bands, under the Atlantic City Allocation Table.

16. On first consideration, it may appear that the reduction of channel spacing is unworkable. It is considered that any such criticism applies equally to the existing spacing which also appears to be too close theoretically in many cases. However, if the reduction of channel spacing is envisaged as a first step, to obtain a basic rearrangement, and if this phase is followed by a process of individual adjustment, it is considered that the procedure is practical and should, if adopted, result in production of a workable list.

OTTAWA
January, 1951.

SAMPLE BASIC REASSIGNMENT PLAN

CAIRO BAND	BERNE LIST FREQ.	FREQ. AFTER COMPRESSION	ATLANTIC CITY BAND
	4000 Kc/s	4002 Kc/s	
	4005 Kc/s	4005 Kc/s	
	4010 Kc/s	4008 Kc/s	World-wide Fixed (4000-4063 Kc/s)
	4015 Kc/s	4011 Kc/s	
	through	through	
	4095 Kc/s	4059 Kc/s	
	4097.5 Kc/s	4060.5 Kc/s	
			World-wide Maritime Mobile (4063-4438 Kc/s)
	4100 Kc/s	4440 Kc/s	Region 1 - Fixed
	4105 Kc/s	4443 Kc/s	Region 2 - Fixed and Mobile except AeM(R)
	4110 Kc/s	4446 Kc/s	
			Region 3 - Fixed and Mobile except AeM
	through	through	
	4445 Kc/s	4647 Kc/s	(4438-4650 Kc/s)
			World-wide AeM(R) and AeM(OR) (4650-4750 kc/s)
	4450 Kc/s	4752 Kc/s	AeM(OR) Broadcasting
	4455 Kc/s	4755 Kc/s	
	4460 Kc/s	4758 Kc/s	Region 1 Fixed, Land Mobile
	4465 Kc/s	4761 Kc/s	
Fixed and Mobile (4000-4770 Kc/s)			Regions 2 and 3 Broadcasting Fixed (4750-4850 Kc/s)
	Through	Through	
Fixed, Mobile and Broadcasting (4770-4965 Kc/s)	4850 Kc/s	4992 Kc/s	Broadcasting
	4852 Kc/s	4993.5 Kc/s	World-wide Fixed Land Mobile (4850-4995 Kc/s)
Fixed and Mobile (4965-5500 Kc/s) (The band 4480-4530 Kc/s is not open to public correspondence in Europe)			World-wide Standard Frequency (4995-5005 Kc/s)
	4855 Kc/s	5006.5 Kc/s	Broadcasting
	4860 Kc/s	5010 Kc/s	World-wide Fixed (5005-5060 Kc/s)
	4865 Kc/s	5013.5 Kc/s	
	4870 Kc/s	5017 Kc.s	World-wide Fixed
	through	through	Regions 1 and 3 Fixed Land Mobile (5250-5430 Kc/s)
	4930 Kc/s	5059 Kc/s (Spare space not assigned)	
	4932 Kc/s	5076 Kc/s	Region 2 Fixed Land Mobile (5250-5450 Kc/s)
	4935 Kc/s	5077.5 Kc/s	
	4940 Kc/s	5081 Kc/s	
	through	through	(Note - 5060 to 5075 Kc/s Not Assigned)
	5465 Kc/s	5448.5 Kc/s	

CAIRO BAND	BERNE LIST FREQ.	FREQ. AFTER COMPRESSION	ATLANTIC CITY BAND
			AeM(OR), Fixed, Land Mobile (5430 to 5480 Kc/s) Region 1 and 3; AeM(R) Region 2 (Note - No "Fixed" Registrations for Regions 1 and 3 have been transferred into this band - it is therefore available for additional ones)
			World-wide AeM(R) and AeM(OR) (5480-5730 Kc/s)
	5467.5 Kc/s 5470 Kc/s 5475 Kc/s through 5500 Kc/s	5732 Kc/s 5734 Kc/s 5738 Kc/s through 5758 Kc/s	World-wide Fixed (5730-5930 Kc/s)
Mobile - (5500-5640 Kc/s) Aero - (5640-5700 Kc/s)			
	5700 Kc/s 5705 Kc/s through 5930 Kc/s 5932.5 Kc/s	5762 Kc/s 5766 Kc/s through 5946 Kc/s 5948 Kc/s	
			World-wide Broadcasting (5950-6200 Kc/s)
			World-wide Maritime Mobile (6200-6525 Kc/s)
ixed (5700-6000 Kc/s)			
			World-wide AeM(R) and AeM(OR) (6525-6765 Kc/s)
	5935 Kc/s 5940 Kc/s 5945 Kc/s through 6000 Kc/s	6768 Kc/s 6772 Kc/s 6776 Kc/s through 6820 Kc/s	World-wide Fixed (6765-7000 Kc/s)
roadcasting (6000-6200 Kc/s obile (6200-6675 Kc/s)			
	6675 Kc/s 6680 Kc/s through 6890 Kc/s 6892.5 Kc/s	6824 Kc/s 6828 Kc/s through 6996 Kc/s 6998 Kc/s	
ixed (6675-7000 Kc/s)			
			World-wide Amateur (7000-7100 Kc/s)

CAIRO BAND	BERNE LIST FREQ.	FREQ. AFTER COMPRESSION	ATLANTIC CITY BAND
Fixed (Contd) (6675-7000 Kc/s)			Regions 1 and 2 Amateur Broadcasting (7100-7150 Kc/s) Regions 1 and 2 Broadcasting (7150-7300 Kc/s) Region 2 Amateur (7100-7300 Kc/s)
	6895 Kc/s 6900 Kc/s 6905 Kc/s through 7000 Kc/s	7304 Kc/s 7308 Kc/s 7312 Kc/s through 7388 Kc/s	
Amateurs (7000-7200 Kc/s)			
Amateurs Broadcasting (7200-7300 Kc/s)			
Fixed (7300-8200 Kc/s)	7300 Kc/s 7305 Kc/s 7310 Kc/s through 8200 Kc/s	7392 Kc/s 7396 Kc/s 7400 Kc/s through 8112 Kc/s	World-wide Fixed (7300-8195 Kc/s)
Mobile - (8200-8550 Kc/s)			
Fixed and Mobile (8550-8900 Kc/s)	8550 Kc/s 8555 Kc/s through 8645 Kc/s	8116 Kc/s 8192 Kc/s	World-wide Maritime Mobile (8195-8815 Kc/s)
			World-wide AeM(R) and AeM(OR) (8815-9040 Kc/s)
	8650 Kc/s 8655 Kc/s through 9215	9044 Kc/s 9048 Kc/s through 9496 Kc/s	World-wide Fixed (9040-9500 Kc/s)
			World-wide Broadcasting (9500-9775 Kc/s)
Fixed (8900-9500 Kc/s)	9220 Kc/s 9225 Kc/s 9230 Kc/s through 9490 Kc/s	9777 Kc/s 9781 Kc/s 9785 Kc/s through 9993 Kc/s	World-wide Fixed (9775-9995 Kc/s)
			World-wide Standard Frequency (9995-10005 Kc/s)
			World-wide AeM(R) (10005-10100 Kc/s)

CAIRO BAND	BERNE LIST FREQ.	FREQ. AFTER COMPRESSION	ATLANTIC CITY BAND
Fixed (contd.) (8900-9500 Kc/s)	9495 Kc/s 9500 Kc/s	10104 Kc/s 10108 Kc/s	
Broadcasting (9500-9700 Kc/s)			
Fixed (9700-11000 Kc/s)	9700 Kc/s 9705 Kc/s through 11000 Kc/s	10112 Kc/s 10116 Kc/s through 11152 Kc/s	World-wide Fixed (10100-11175 Kc/s)
Mobile - (11000-11400 Kc/s)			
Fixed (11400-11700 Kc/s)	11400 Kc/s 11405 Kc/s through 11420 Kc/s	11156 Kc/s 11160 Kc/s through 11172 Kc/s	
			World-wide AeM(OR) and AeM(R) (11175-11400 Kc/s)
	11425 Kc/s 11430 Kc/s through 11700 Kc/s	11404 Kc/s 11408 Kc/s through 11624 Kc/s	
Broadcasting (11700-11900 Kc/s			World-wide Fixed (11400-11700 Kc/s)
Fixed (11900-12300 Kc/s)	11900 Kc/s 11905 Kc/s through 11985 Kc/s	11628 Kc/s 11632 Kc/s through 11696 Kc/s	
			World-wide Broadcasting (11700-11975 Kc/s)
	11990 Kc/s 11995 Kc/s 12000 Kc/s through 12300 Kc/s	11977 Kc/s 11981 Kc/s 11985 Kc/s through 12225 Kc/s	
Mobile (12300-12825 Kc/s)			World-wide Fixed (11975-12330 Kc/s)
Fixed and Mobile (12825-13350 Kc/s)	12825 Kc/s 12830 Kc/s through 12945 Kc/s	12229 Kc/s 12233 Kc/s through 12325 Kc/s	
			World-wide Maritime Mobile (12330-13200 Kc/s)
			World-wide AeM(OR) and AeM(R) (13200-13360 Kc/s)
	12950 Kc/s 12955 Kc/s through 13350 Kc/s	13362 Kc/s 13366 Kc/s through 13682 Kc/s	World-wide Fixed (13360-14000 Kc/s)

CAIRO BAND	BERNE LIST FREQ.	FREQ. AFTER COMPRESSION	ATLANTIC CITY BAND
			(contd.)
	13355 Kc/s 13360 Kc/s through 13745 Kc/s	13686 Kc/s 13690 Kc/s through 13998 Kc/s	World-wide Fixed (13360-14000 Kc/s)
Fixed (13350-14000 Kc/s)			World-wide Amateur (14000-14350 Kc/s)
	13750 Kc/s 13755 Kc/s 13760 Kc/s through 14000 Kc/s	14354 Kc/s 14358 Kc/s 14362 Kc/s through 14554 Kc/s	
Amateurs (14000-14400 Kc/s			World-wide Fixed (14350-14990 Kc/s)
	14400 Kc/s 14405 Kc/s through 14935 Kc/s	14558 Kc/s 14562 Kc/s through 14986 Kc/s	
			World-wide Standard Frequency (14990-15010 Kc/s)
Fixed (14400-15100 Kc/s)			World-wide AeM(OR) (15010-15100 Kc/s)
			World-wide Broadcasting (15100-15450 Kc/s)
	14940 Kc/s 14945 Kc/s 14950 Kc/s through 15100 Kc/s	15452 Kc/s 15456 Kc/s 15460 Kc/s through 15580 Kc/s	
Broadcasting (15100-15350 Kc/s)			
	15350 Kc/s 15355 Kc/s through 16400 Kc/s	15584 Kc/s 15588 Kc/s through 16424 Kc/s	World-wide Fixed (15450-16460 Kc/s)
Mobile (16400-17100 Kc/s)			
Fixed and Mobile (17100-17750 Kc/s)	17100 Kc/s 17105 Kc/s 17110 Kc/s 17115 Kc/s 17120 Kc/s 17125 Kc/s 17130 Kc/s 17135 Kc/s	16428 Kc/s 16432 Kc/s 16436 Kc/s 16440 Kc/s 16444 Kc/s 16448 Kc/s 16452 Kc/s 16456 Kc/s	
			World-wide Maritime Mobile (16460-17360 Kc/s)

CAIRO BAND	BERNE LIST FREQ.	FREQ. AFTER COMPRESSION	ATLANTIC CITY BAND
Fixed and Mobile (Contd.) (17100-17750 Kc/s)	17140 Kc/s 17145 Kc/s 17150 Kc/s through 17560 Kc/s	17362 Kc/s 17366 Kc/s 17370 Kc/s through 17698 Kc/s	World-wide Fixed (17360-17700 Kc/s)
			World-wide Broadcasting (17700-17900 Kc/s)
			World-wide AeM(R) and AeM(OR) (17900-18030 Kc/s)
	17565 Kc/s 17570 Kc/s through 17750 Kc/s	18034 Kc/s 18038 Kc/s through 18182 Kc/s	
Broadcasting (17750-17850 Kc/s)			World-wide Fixed (18030-19990 Kc/s)
Fixed (17850-21450 Kc/s)	17850 Kc/s 17855 Kc/s 17860 Kc/s through 20100 Kc/s	18186 Kc/s 18190 Kc/s 18194 Kc/s through 19986 Kc/s	
			World-wide Standard Frequency (19990-20010 Kc/s)
	20105 Kc/s 20110 Kc/s 20115 Kc/s through 21435 Kc/s	20012 Kc/s 20016 Kc/s 20020 Kc/s through 20996 Kc/s	World-wide Fixed (20010-21000 Kc/s)
			World-wide Amateur (21000-21450 Kc/s)
			World-wide Broadcasting (21450-21750 Kc/s)
	21440 Kc/s 21445 Kc/s 21450 Kc/s	21755 Kc/s 21760 Kc/s 21765 Kc/s	
Broadcasting (21450-21750 Kc/s)			World-wide Fixed (21750-21850 Kc/s)
Mobile (21750-22300 Kc/s)			
Fixed and Mobile (22300-24600 Kc/s)	22300 Kc/s 22305 Kc/s through 22375 Kc/s	21770 Kc/s 21775 Kc/s through 21845 Kc/s	
			World-wide Aero Fixed and AeM(R) (21850-22000 Kc/s)
			World-wide Maritime Mobile (22000-22720 Kc/s)

CAIRO BAND	BERNE LIST FREQ.	FREQ. AFTER COMPRESSION	ATLANTIC CITY BAND
	22380 Kc/s 22385 Kc/s through 22850 Kc/s	22725 Kc/s 22730 Kc/s through 23195 Kc/s	World-wide Fixed (22820-23200 Kc/s)
			World-wide Aero Fixed and AeM(OR) (23200-23350 Kc/s)
Fixed and Mobile (Contd.) (22300-24600 Kc/s)	22855 Kc/s 22860 Kc/s through 24485 Kc/s	23355 Kc/s 23360 Kc/s through 24985 Kc/s	World-wide Fixed and Land Mobile (23350-24990 Kc/s)
			World-wide Standard Frequency (24990-25010 Kc/s)
	24490 Kc/s 24495 Kc/s through 24600 Kc/s	25015 Kc/s 25020 Kc/s through 25125 Kc/s	
Mobile (24600-25000 Kc/s)			
Mobile (25 - 25.6 Mc/s)			World-wide Fixed and Mobile except AeM (25010-25600 Kc/s)
Broadcasting (25.6 - 26.6 Mc/s)			
	26600 Kc/s 26605 Kc/s through 27065 Kc/s	25130 Kc/s 25135 Kc/s through 25595 Kc/s	
Fixed (26.6 - 27.5 Mc/s)			World-wide Broadcasting (25600-26100 Kc/s)
	27070 Kc/s 27075 Kc/s through 27500 Kc/s	26105 Kc/s 26110 Kc/s through 26535 Kc/s Spare (Freqs 26536 to 27500 kc/s not assigned)	World-wide Fixed and Mobile except ACM

Appendix "B", Annexure 1, to
Cdn Study
Concerning New International
Frequency List

LAND MOBILE SERVICE

1. Under the Cairo Allocation Table, this service was entitled to operate between 4000-5500 Kc/s. Under the Atlantic City Allocation Table, the allocation to this service is different for each Region.

2. In many cases, a particular frequency has been registered by an administration for both Land Mobile and Fixed Service operation. In such cases, the Land Mobile registration has not been counted in these studies. Only those cases where a frequency is registered for Land Mobile only (with no other service indicated) have been considered.

3. The total number of registrations for Land Mobile Service between 4000-5500 Kc/s is approximately 166. Of these, approximately half are registrations by Australia.

4. An analysis of the frequencies registered at present shows approximately :

(a) 110 registrations are out of band on the basis of the Atlantic City Table ;

(b) 56 registrations are in band on the basis of the Atlantic City Table.

5. The reassignment effected by the proposed reduction of channel spacing gives the following result approximately :

(a) 74 registrations fall outside the appropriate Atlantic City Band ;

(b) 92 registrations fall inside the appropriate Atlantic City Band.

6. It is noted that the proposed reassignment places 36 more registrations "in band" than under the present listings.

7. It is considered that the problem of accommodating the remaining 74 registrations which are "out of band" after the proposed reassignment (of which 35 are registered for Australia and are therefore a purely regional problem) is a small one.

Appendix "B", Annexure 2 to
Cdn Study
Concerning New International
Frequency List

TROPICAL BROADCASTING SERVICE

1. Under the Cairo Allocation Table, this service was entitled to operate between 4770-4965 Kc/s. Under the Atlantic City Allocation Table, this service can operate in the bands 4750-4995 Kc/s and 5005-5060 Kc/s.

2. An analysis of the Tropical Broadcasting Registrations between 4000-5500 Kc/s shows approximately :

(a) 12 registrations between 4000-4770 Kc/s; it is to be noted that these registrations are out of band under the Cairo Table;

(b) 105 registrations between 4770-4965 Kc/s; these registrations are in band under both the Cairo and the Atlantic City Tables;

(c) 12 registrations between 4965-5500 Kc/s; it is to be noted that these registrations are out of band under the Cairo Table.

3. The reassignment effected by the proposed reduction of channel spacing gives the following result approximately :

(a) 5 registrations (now registered between 4750-4770 Kc/s) which are presently out of Cairo band, but are presently in band under the Atlantic City, will fall in band under the proposed reassignment ;

(b) 87 registrations (now registered between 4770-4965 Kc/s) which are presently in band both under Cairo and Atlantic City, will fall in band under the proposed reassignment ;

(c) 20 registrations (now registered between 4770-4965 Kc/s) which are presently in band both under Cairo and Atlantic City, will fall out of band under the proposed reassignment.

4. It is considered that the problem of accommodating the twenty registrations under para 3 (c) which will fall out of band under the proposed reassignment, is a small one and is regional in nature.

Appendix "B", Annexure 3 to
Cdn Study
Concerning New International
Frequency List

MARITIME MOBILE SERVICE (EXAMPLE)

1. Under the Cairo Allocation Table, this service was entitled to operate between 4000-5500 Kc/s. Under the Atlantic City Allocation Table, no maritime mobile shared bands are provided in Region 1, while in Regions 2 and 3 the maritime mobile service shares the band 4435-4650 with other services. There is in addition, an exclusive maritime mobile band 4063-4438 Kc/s available world-wide.

2. An analysis of the maritime mobile registrations between 4000-5500 Kc/s shows approximately :

(a) 8 registrations now operating between 4000-4063 Kc/s; these are not in any maritime mobile band (either exclusive or shared) under the Atlantic City Table ;

(b) 85 registrations now operating between 4063-4438 Kc/s. These are in the exclusive world-wide maritime mobile band under the Atlantic City Table ;

(c) (i) No registration in Region 1 now operating between 4438-4650 Kc/s ; this is not a maritime mobile band under the Atlantic City Table ;

(ii) 19 registrations in Regions 2 and 3 now operating between 4438-4650 Kc/s ; these are in a maritime mobile shared band under the Atlantic City Table;

(d) 42 registrations now operating between 4650-5500 Kc/s; these are not in a maritime mobile band under the Atlantic City Table.

3. The reassignment effected by the proposed reduction of channel spacing gives the following result approximately, for registrations now operating between 4000-5500 Kc/s :

(a) 9 registrations were reassigned to frequencies between 4000-4063 Kc/s; these would be out of band under the Atlantic City Table ;

(b) No registrations were reassigned to frequencies between 4063-4438 Kc/s, since the reassignment plan left the exclusive world-wide maritime mobile band unoccupied;

(c) (i) No registrations in Region 1 were reassigned to frequencies between 4438-4650 Kc/s; this band is not available in Region 1 for the maritime mobile service under the Atlantic City Table ;

(ii) 86 registrations in Regions 2 and 3 were reassigned to frequencies between 4438-4650 Kc/s these would be in band under the Atlantic City Table ;

(d) 59 registrations were reassigned to frequencies between 4650-5760 Kc/s ; these would be out of band under the Atlantic City Table.

4. Thus, under the proposed reassignment :

(a) The entire exclusive maritime mobile band (4063-4438 Kc/s) is uncommitted and is therefore available to accommodate the plans made for this service by the ITU ;

(b) 86 existing registrations fall in a shared band available to the maritime mobile service ;

(c) 68 existing registrations fall out of band.

5. If existing registrations are considered on the basis of the frequency at present in use :

(a) 8 registrations are out of band ;

(b) 85 registrations fall into the exclusive maritime mobile band 4063-4438 Kc/s ;

(c) 61 registrations are within Atlantic City shared bands available to the Maritime Mobile Service.

6. It is apparent that the majority of the Berne List Maritime Mobile Service Registrations are provided for in the plans prepared by the ITU for the exclusive maritime mobile bands. There appears to be adequate provision under the proposed reassignment plan for the remaining registrations which were not accommodated in this way, within the shared bands available under the Atlantic City Table for this service.

Appendix "B", Annexure 4 to
Cdn Study
Concerning New International
Frequency List

AERONAUTICAL MOBILE SERVICE (EXAMPLE)

1. Under the Cairo Allocation Table, this service was entitled to operate between 4000-5500 Kc/s. Only "Off Route" (OR) aeronautical mobile operations are permitted in shared bands under the Atlantic City Table. Since "Route" (R) operations are confined to exclusive "Route" (R) bands, these are not considered here.

2. In some cases a particular frequency has been registered by an administration for both Aeronautical and Fixed Service operation. In such cases the Aeronautical registration has not been counted in this study.

3. The total number of registrations for Aeronautical Mobile Services falling within the Cairo Mobile bands (4000-5500 Kc/s) is as follows :

Region 1 - 69

Region 2 - 96

Region 3 - 99

4. Under the proposed reassignment, the situation is as follows:

	Berne Registrations Falling Within the Atlantic City Shared Bands Open to AeM	New Assignments Falling Within the Atlantic City Shared Bands Open to AeM
Region 1	7	21
Region 2	19	23
Region 3	16	Nil

5. In view of the fact that the majority of Aeronautical Mobile requirements will be satisfied in their exclusive bands, it is considered that there is sufficient (in fact more than sufficient) provision for these registrations in the limited shared space available under the Atlantic City Table.

PROPOSAL N° 6

TUNISIA

(Letter No. 205-TSF of 1 February 1951)

Further to Administrative Council Resolution No. 200, relative to implementation of the Atlantic City Table of Frequency Allocations, I have the honour to acquaint you, in what follows, with the views entertained by the Tunisian Administration.

If it be assumed that, as is to be hoped, a plan can be evolved for the aeronautical, maritime and high-frequency broadcasting services, the kernel of the problem will lie in the preparation of a list for the fixed services. Two problems arise : first, transfer of the stations using frequencies in bands allocated to the fixed services by the Cairo Regulations, but not allocated to this service by the Atlantic City Conference, and, second, satisfaction for the new requirements submitted. We feel, incidentally, that the allocations made in the Cairo Regulations should not be too drastically revised when they really correspond to the bands now allocated to the fixed services. This would mean that frequency requirements, rather than circuit requirements, would be studied.

Thus it would seem that administrations having frequencies to transfer, or new frequency requirements, should themselves, in the light of what they have observed, seek such new frequencies in the bands allocated at Atlantic City as may appear suitable for their needs.

It would then be incumbent on the IFRB to examine these requirements, and to submit observations and proposals to any administrations which might have chosen those same frequencies. Such a procedure, one may reasonably hope, would lead by successive approximations to the goal desired.

PROPOSAL N° 7

FRENCH OVERSEAS TERRITORIES AND

TERRITORIES ADMINISTERED AS SUCH

(Letter Postel 2/LB No. 0844 of 9 February 1951)

In paragraph c) of Resolution 200, the Administrative Council asks administrations to send the IFRB : "proposals relating to new methods of bringing into effect those parts of the Atlantic City Table for which the Conference (Extraordinary Administrative Radio) is unlikely to establish a frequency list."

In my letter 9 Postel/1/LB, dated 2 January 1951, I have already given my views on those parts of the Table for which, in all likelihood, the Conference will be unable to produce a list based on the work done by the PFB.

The parts in question are those which have been designated "K" and "bb" by the PFB. I may as well say that I see no chance of anything more than limited regional agreements for the bands lower than "K".

In other words, a plan for the bands between 5 and 21.7 Mc/s is impossible, while there is some chance of limited agreement for those between 4 and 5 Mc/s and those above 21.7 Mc/s.

In view of the fact that :

1) the PFB evolved its plans by assigning frequency complements to circuits ;

2) most of the frequencies in those plans which might conceivably serve as a basis for agreement are associated with other frequencies in plans with regard to which it would seem that agreement cannot possibly be reached ;

3) the Atlantic City Table involving a very considerable modification of the Cairo one, its implementation has been made dependent on the prior preparation of a new frequency list ;

4) this modification involves particularly serious sacrifices for the fixed service ;

5) frequency bands shared between several services under the Cairo Table have been allocated for the exclusive use of services in the Atlantic City one ;

I ean but support the proposals submitted by the French Administration in letter No. 2/452 CR, dated 30 January 1951.

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