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The Final Acts of the Administrative Radio Conference

(Geneva, 17 August to 21 December, 1959)

by A. Henry

(Translation)

The Administrative Radio Conference met in Geneva from 17 August to 21 December, 1959. Two articles on it have already appeared in the *Telecommunication Journal* (March and April, 1960).

The Final Acts of this Conference comprise :

The Radio Regulations ;
The Additional Radio Regulations ;
An Additional Protocol ;
Resolutions and Recommendations.

Twelve years, no less, had elapsed since the previous Administrative Radio Conference in Atlantic City (1947). During that time, technical progress and the evolution of radio operating procedures had been such as to render a review of the Radio Regulations necessary.

I. The Radio Regulations

The Geneva Conference drew up a new set of Radio Regulations, with forty-five articles (in eleven chapters), and twenty-seven appendices. Clearly, there is no space here to analyse these Regulations in great detail. However, it may not be devoid of interest to examine certain articles and see what new ideas they embody.

Article 1. Terms and definitions

Radio engineering has been moving swiftly ahead, and it had become essential to define certain terms currently used by radio specialists. Article 1 gives the following new definitions :

Tropospheric scatter : The propagation of radio waves by scattering as a result of irregularities or discontinuities in the physical properties of the troposphere.

Ionospheric scatter : The propagation of radio waves by scattering as a result of irregularities or discontinuities in the ionization of the ionosphere.

Radiodetermination : The determination of position, or the obtaining of information relating to position, by means of the propagation properties of radio waves.

Radionavigation : Radiodetermination used for the purposes of navigation, including obstruction warning.

Radiolocation : Radiodetermination used for purposes other than those of radionavigation.

Space service : A radiocommunication service between space stations.

Earth-space service : A radiocommunication service between earth stations and space stations.

Space station : A station in the earth-space service or the space service located on an object which is beyond, or intended to go beyond, the major portion of the earth's atmosphere and which is not intended for flight between points on the earth's surface.

Earth station : A station in the earth-space service located either on the earth's surface or on an object which is limited to flight between points on the earth's surface.

Radio astronomy : Astronomy based on the reception of radio waves of cosmic origin.

Assigned frequency : The centre of the frequency band assigned to a station.

Assigned frequency band : The frequency band the centre of which coincides with the frequency assigned to the station and the width of which equals the necessary bandwidth plus twice the absolute value of the frequency tolerance.

Necessary bandwidth : For a given class of emission, the minimum value of the occupied bandwidth sufficient to ensure the transmission of information at the rate and with the quality required for the system employed, under specified conditions. Emissions useful for the good functioning of the receiving equipment as, for example, the emission corresponding to the carrier of reduced carrier systems, shall be included in the necessary bandwidth.

Three new services have made their appearance :

the space service,
the earth-space service, and
the radio astronomy service.

Article 2. Designation of emissions

Emissions are classified and symbols are assigned to them, and the *type of modulation of the main carrier* is shewn :

A (amplitude),
F (frequency or phase), or
P (pulse).

This initial letter is followed by a letter standing for the *kind of transmission*, and there may be yet a third, standing for the *supplementary characteristics*. In relation to the Atlantic City Radio Regulations, new symbols have been introduced to shew emissions for which special techniques are used. For example :

A 7A : AM multi-channel voice-frequency telegraphy with single sideband and reduced carrier ;

F 6 : Frequency (or phase) modulated four-frequency diplex telegraphy ;

P 3E : Pulse-modulated telephony with width (or duration) modulated pulses.

Lastly, it is laid down that " whenever the full designation of an emission is necessary, the symbol for that emission . . . shall be preceded by a number indicating, in kilocycles per second, the *necessary* bandwith of the emission."

Article 5. Frequency allocations (10 kc/s to 40 Gc/s)

In Section IV of this article appears the " Table of Frequency Allocations " (10 kc/s to 40 Gc/s). The lay-out has been improved ; there are now only three columns—one for Region 1, one for Region 2, and one for Region 3—while the lines separating the three columns are deleted whenever a frequency band is allocated throughout the world to one or more services.

Section II defines " Categories of Services and Allocations. " Some difficulty had been encountered in applying the Atlantic City Regulations because the relative status of the various services mentioned in the Table or the footnotes thereto had not been defined.

Hence, in the Geneva Regulations, services are divided into

" PRIMARY "
" permitted "
" *secondary*, " and
" additional, " and provision is made for
" alternative allocations. "

Perusal of a part of the Table (for example, that between 510 kc/s and 1605 kc/s) will suffice to shew what this means.

The band 510-525 kc/s.

In Region 1, the maritime mobile service is a " primary " service ; the aeronautical radionavigation service is a " secondary " one, that is to say, aeronautical radionavigation stations :

a) must cause no harmful interference to the maritime mobile stations to which frequencies have already been assigned or are likely to be assigned ;

b) cannot claim protection against the harmful interference caused by maritime mobile stations to which frequencies have already been assigned or may be assigned ;

c) but are entitled to protection against harmful interference caused by aeronautical radionavigation stations to which frequencies may be assigned later.

In Region 2, the mobile service is a " primary " service, and the aeronautical radionavigation service is a " permitted " service, that is to say, it has the same rights as the mobile service except when frequency plans are being drawn up, when the mobile service has the first choice of frequencies.

Allocation to Services		
Region 1	Region 2	Region 3
510—525	**510—525**	**510—525**
MARITIME MOBILE	MOBILE	MARITIME MOBILE
Aeronautical radionavigation	Aeronautical radionavigation 188	*Aeronautical mobile* *Land mobile* 189
525—535	**525—535**	**525—535**
BROADCASTING 190	MOBILE Broadcasting 191 Aeronautical radionavigation 188	MOBILE Broadcasting
535—1 605	BROADCASTING	

188. In operating stations of the aeronautical radionavigation service, the administrations concerned shall take all the technical steps necessary to avoid harmful interference to the maritime mobile service.

189. In India, Iran, and Pakistan, the band 510-525 kc/s is also allocated, on a secondary basis, to the aeronautical radionavigation service.

190. In Rhodesia and Nyasaland, and the Union of South Africa and the Territory of South-West Africa, the band 525-535 kc/s is allocated to the mobile service.

191. The carrier power of broadcasting stations in this band shall not exceed 250 watts.

But note 188 describes how aeronautical radionavigation stations are to be operated.

In Region 3, the maritime mobile service is a " primary " service, while the aeronautical and land mobile services are " secondary " ones. Furthermore, according to note 189, the aeronautical radionavigation service is to be added, " on a secondary basis " to the services mentioned in the Table. It is an " additional " service.

Band 525-535 kc/s.

In Region 1, this band is allocated to broadcasting, except in Rhodesia and Nyasaland, and in the Union of South Africa and Territory of South-West Africa, where, according to No. 190, this band is used for mobile stations. This is an " alternative " allocation.

In Region 2, the mobile broadcasting service and the aeronautical radionavigation service are " permitted " services.

In Region 3, the mobile service is a " primary " service. The broadcasting service is a " permitted " service, but, according to No. 191, the power of the carrier of the broadcasting stations in this band must not exceed two hundred and fifty watts.

Band 535-1605 kc/s.

Throughout the world, this band is allocated for broadcasting.

The example chosen might lead one to suppose that the " Table of Frequency Allocations " is easy neither to decipher nor to interpret. In fact, however, cases such as those used as our examples are of rare occurrence in the other parts of the spectrum. But in perusing the Table, the most careful note must be taken of the footnotes, which, for certain countries, may appreciably change the allocations appearing in the Table.

Article 9. Notification and recording of frequencies in the Master International Frequency Register

This article, quite obviously, is of extreme importance, defining as it does the procedure for notification of frequency assignments to the International Frequency Registration Board (IFRB), and the rules governing the entry of these assignments in the Master International Frequency Register.

It will be remembered that the notification and registration procedure set forth in Article 11 of the Atlantic City Regulations could not be fully implemented throughout the spectrum between 4000 kc/s and 27 500 kc/s, and that the Agreement reached at the Extraordinary Administrative Radio Conference (Geneva, 1951) had provided for transitional measures, thanks to which it proved possible to draw up the Master Radio Frequency Record and to publish the Radio Frequency Record.

Article 9 of the Geneva Regulations synthesizes the ideas contained in the old Article 11 and in the EARC Agreement, and adds a few new ones, the fruit of the experience acquired over the last ten years.

We shall not consider the numerous provisions of this article in any detail. But it may be worth while to set forth some of the basic ideas involved :

a) From 1 May, 1961, the Master Radio Frequency Record will be replaced by the Master International Frequency Register, and the Radio Frequency Record by the International Frequency List.

b) The expression *frequency assignment* means either a *fresh* frequency assignment or a *change* in an existing assignment already appearing in the Master International Frequency Register.

c) All assignment notices must reach the IFRB between ninety days before, and thirty days after the assignments in question come into use.

d) The IFRB considers *complete* assignment notices only, that is to say, those giving the basic characteristics specified in Appendix 1 to the Radio Regulations. The basic characteristics to be given are those which will enable the IFRB to examine the assignment with a view to deciding whether it should receive a favourable or an unfavourable finding.

e) Assignment notices are examined with an eye to the general rules laid down in the Regulations, due attention being paid to the special provisions applicable to certain services and certain frequency bands. Further to this examination, the IFRB reaches its finding, and the assignment notice is referred back to the administration concerned if the finding is unfavourable.

f) Whenever the Board reaches an unfavourable finding, but the administration concerned persists in submitting the assignment notice again, the latter must declare that the assignment has been used for at least sixty days and no complaint of harmful interference has been received. The Board then has to conduct an inquiry into the actual use made of the assignment with regard to which an unfavourable finding has been reached.

g) At the request of an administration, and especially when the country in question requires special assistance, the Board investigates ways and means of improving the use made of a particular portion of the spectrum, with a view to ensuring the accommodation of a new assignment or to facilitate the solution of a problem of harmful interference.

h) Besides the three columns 2a (Registration), 2b (Notification) and 2c (Entry in service) provided for in the Atlantic City Regulations, there is a column 2d in which the IFRB can include a symbol or a date.

Article 10. Procedure for the bands allocated exclusively to the broadcasting service between 5950 kc/s and 26 100 kc/s

This article defines a new procedure applicable to the high-frequency broadcasting service.

The IFRB's draft plans for this service had been rejected by many Members of the Union. So that administrations may operate their high-frequency broadcasting services, Article 10 provides for " seasonal schedules, " to be used by the IFRB for the publication of " High-Frequency Broadcasting Schedules." The point of this new procedure is to make allowance for the fact that the frequencies required, for different seasons and sunspot phases, will themselves vary.

Article 19. Identification of stations

The identification signal emitted by a station may take very diverse forms, according to the type of service and the kind of transmission, as is shewn in No. 737 :

> " A station shall be identified either by a call sign or other recognized means of identification. Such recognized means of identification may be one or more of the following, necessary for complete identification : name of station, location of station, operating agency, official registration mark, flight identification number, characteristic signal, characteristic of emission, or other clearly distinguishing features readily recognized internationally."

Section IV, in particular, describes the identification signals to be used by stations in radiotelephony.

Article 20. Service documents

Among the documents to be published by the Secretary-General appear the following official lists :

List I. International Frequency List :

This contains :

a) particulars of the frequency assignments in the Master International Frequency Register ;

b) the frequencies (for example, 500 kc/s or 2182 kc/s) prescribed in the Regulations for the joint use of certain services, including the frequencies specified in Appendices 15, 17, and 18 ;

c) the allotments shewn in the Allotment Plans appearing in Appendices 25 and 26.

(Be it observed that above 50 Mc/s assignments are classified by Region.)

List II. List of fixed stations operating international circuits

List III. List of broadcasting stations operating in bands below 26 100 kc/s

This latter appears in two volumes :

a) List III A. List of broadcasting stations operating in bands below 5950 kc/s

b) List III B. List of broadcasting stations operating in bands between 5950 kc/s and 26 100 kc/s

List IV. List of coast stations

List V. List of ship stations

List VI. List of radiodetermination and special service stations

List VII. Alphabetical List of call signs assigned from the international series to stations included in Lists I to VI

This List is published in two volumes :

a) List VII A. Alphabetical List of call signs of stations used by the maritime mobile service (coast, ship, radiodetermination, and special service stations)

b) List VII B. Alphabetical List of call signs of stations other than amateur stations, experimental stations, and stations of the maritime mobile service

List VIII. List of international monitoring stations

Chapter VII. (Articles 27 to 35)

Working Conditions in the mobile services

This chapter assembles everything to do with the workings of the mobile services. In 1947, at Atlantic City, the aeronautical and maritime mobile services were in full development, but it was felt that the time was not yet ripe to evolve regulations for them, especially as far as radiotelephony was concerned. Between 1947 and 1959, numerous regional and service conferences had studied the problems arising out of this growth. Thus, in 1948 and 1949, two aeronautical conferences met in Geneva, and in 1955, at Göteborg, a regional conference considered the problems to which the use of radiotelephony in maritime mobile communications gave rise. At The Hague, in 1957, a regional conference adopted a frequency plan for international VHF maritime mobile radiotelephony, in the bands between 156 and 162 Mc/s. During this period the International Civil Aviation Organization (ICAO) held a good many meetings at which rules governing major world air routes, regional air routes, and national air routes, were evolved.

Articles 27 and 28 in the new Chapter VII now deal with general considerations. Articles 29 to 32 give the rules applicable to radiotelegraphy, while Articles 33 to 35 apply to radiotelephony.

Article 36. Distress signal and traffic. Alarm, urgency and safety signals

The provisions herein given make provision for

the development of mobile service radiotelephony,

International Radio Consultative Committee Recommendations 219 and 250, and

the achievements of the Baltic and North Sea Radiotelephone Conference (Göteborg, 1955).

They also define two parallel distress procedures, one for radiotelegraphy, and the other for radiotelephony.

Thus the *distress signal* takes one of two forms :

1389 The radiotelegraph distress signal consists of the group ···———···, symbolized herein by $\overline{\text{SOS}}$, transmitted as a single signal in which the dashes are emphasized so as to be distinguished clearly from the dots.

1390 The radiotelephone distress signal consists of the word MAYDAY, pronounced as in the French expression " *m'aider.* "

Similarly, the *alarm signal*, which whenever possible precedes the distress signal, is defined as follows, for radiotelegraphy and radiotelephony :

1463 The radiotelegraph alarm signal consists of a series of twelve dashes sent in one minute, the duration of each dash being four seconds and the duration of the interval between consecutive dashes one second. It may be transmitted by hand but its transmission by means of an automatic instrument is recommended.

1465 The radiotelephone alarm signal consists of two substantially sinusoidal audio-frequency tones transmitted alternately. One tone shall have a frequency of 2200 c/s and the other a frequency of 1300 c/s, the duration of each tone being 250 milliseconds.

According to the new Regulations, then, the radiotelephone mobile service now has a distress, urgency and safety procedure similar to that tried and tested in maritime mobile radiotelegraphy.

Article 44. Special services

The increase in the number of stations transmitting standard frequencies and time signals in the bands allocated for this purpose has given rise to certain difficulties and, in particular, harmful interference. To remove these difficulties, Section IV of this article lays down the following rules :

1623 To facilitate more efficient use of the radio frequency spectrum and to assist other technical and scientific activities, administrations should endeavour to provide, on a coordinated world-wide basis, a service of standard frequency and time signal transmissions. Attention should be given to the extension of this service to those areas of the world not adequately served.

1624 To this end, each administration shall take steps to coordinate with the assistance of the International Frequency Registration Board, any new standard frequency or time signal transmission or any change in existing transmissions in the standard frequency bands. For this purpose, administrations shall exchange between themselves, and furnish to the Board, all relevant information. On this matter the Board shall consult the Director of the International Radio Consultative Committee who shall also continue to seek the advice and cooperation of the International Time Bureau (BIH), the International Scientific Radio Union (URSI), and other international organizations having a direct and substantial interest in the subject.

1626 Administrations shall cooperate in reducing interference in the standard frequency bands in accordance with the recommendations of the International Radio Consultative Committee.

Article 45. Effective date of the Radio Regulations

This article says that the new Regulations will take effect on 1 May, 1961, on which date the Agreement reached by the Extraordinary Administrative Radio Conference (Geneva, 1951) will be abrogated.

* * *

The Geneva Radio Regulations comprise twenty-six appendices as well. These deal in detail with certain matters which, had they been treated in the body of the Regulations themselves, would have made the Regulations inordinately cumbersome.

APPENDIX 1

This appendix relates to Article 9. It gives full instructions as to how assignment notices for a new frequency assignment or change in an assignment already appearing in the Master International Frequency Register should be filled in for transmission to the International Frequency Registration Board. The appendix specifies the particulars required, but administrations are free to devise a card of whatever dimensions they desire. Moreover, the *basic characteristics* are specified for each kind of assignment. This is important. The IFRB is to consider full assignment notices only, that is to say, only those giving *at least* the basic characteristics specified.

APPENDIX 2

According to Article 10, administrations are to supply the IFRB with high-frequency broadcasting schedules. Appendix 2 shews a specimen form to be used and gives instructions for filling in the various columns therein. There are symbols to shew the various kinds of antenna. Thus RHO/2·5/0·4/65 means : a rhombic antenna, length of one side 2·5 wavelengths, height above ground 0·4 wavelengths, one half of the interior side angle 65 degrees.

APPENDIX 3. TABLE OF FREQUENCY TOLERANCES

In general, the tolerances given are those shewn in International Radio Consultative Committee Recommendation 233, adopted by the Ninth Plenary Assembly of that body in Los Angeles (1959). There are to be two columns :

one for the tolerances applicable until 1 January, 1966, for transmitters now in use and those to be brought into use before 1 January, 1964, and

another for the tolerances applicable to new transmitters installed from 1 January, 1964, onwards, and to all transmitters from 1 January, 1966.

Hence, while the tolerances in the second column are more severe than those in the first for transmitters brought into service before 1 January, 1964, administrations have two years' grace in which to improve transmitter stability. In the new Regulations, frequency tolerances are expressed in millionths, and in some cases in cycles per second.

APPENDIX 4. TABLE OF TOLERANCES FOR THE LEVELS OF SPURIOUS EMISSIONS

This table is based on the figures given in International Radio Consultative Committee Recommendation 232, and specifies tolerances only for trans-

mitters operating on basic frequencies of 235 Mc/s or less.

Provision is made for two columns :

Column A : tolerances applicable until 1 January, 1970 for transmitters already in use and those to be installed before 1 January, 1964 ; and

Column B : tolerances applicable to any transmitter set up after 1 January, 1964, and to all transmitters from 1 January, 1970.

Appendix 9. Service documents

This specifies the lay-out of the various official lists to be published by the General Secretariat.

As regards the List of Ship Stations, the following symbols are used to shew the various frequency bands used in radiotelegraphy and radiotelephony :

Radiotelegraphy	*Radiotelephony*
w = 110– 150 kc/s	**t** = 1 605– 4 000 kc/s
x = 405– 535 kc/s	**u** = 4 000–23 000 kc/s
y = 1 605– 3 800 kc/s	**v** = 156– 174 Mc/s
z = 4 000–25 110 kc/s	

Appendix 14. SINPO and SINPFEMO codes

To assist in assessing the quality of transmissions, International Radio Consultative Committee Recommendation 251 gives two codes, SINPO and SINPFEMO, thanks to which a coded report can be made using the digits 1 to 5 in a scale for each of the following characteristics :

S	Signal strength
I	Interference
N	Noise
P	Propagation disturbance
F	Frequency of fading
E	Modulation quality
M	Modulation depth
O	Overall rating

The SINPO code is derived from the SINPFEMO code by dropping the characteristics F, E, and M. The best mark that can be awarded is 5, the worst, 1.

Appendix 15. Table of frequencies to be used by ship stations in the bands between 4 and 27.5 Mc/s allocated exclusively to the maritime mobile service

According to Appendix 10 of the Atlantic City Regulations, ship station high-frequency radiotelegraph frequencies were divided into three groups :

calling frequencies,
cargo-vessel working frequencies, and
passenger-ship working frequencies.

Appendix 15 to the Geneva Regulations has two sections :

Section A, applicable to ship radiotelegraph stations, has four groups :

calling frequencies,
working frequencies for " low-traffic " ships,
working frequencies for " high-traffic " ships, and
working frequencies for ships using wide-band telegraphy, facsimile, and special transmission systems.

Be it observed that ships are now classified into three categories instead of two. This is the fruit of experience acquired over the last ten years, which has shewn that the traffic of cargo ships with a gross tonnage of 12 500 or more can be as heavy as that of passenger-liners, and that the use of transmission systems such as facsimile and teletype aboard ship called for the use of frequencies well protected against reciprocal interference, allowance being made for the bandwidth occupied.

Section B lays down the frequencies to be used for single-sideband radiotelephony, together with the calling frequencies usable for double-sideband radiotelephony in the 8, 12, 16, and 22 Mc/s bands.

Appendix 17. Duplex channelling of the maritime mobile radiotelephone bands between 4000 and 23 000 kc/s

The channels indicated in this appendix now number

eleven (in the 4 and 8 Mc/s bands) and
ten (in the 12, 16, and 22 Mc/s bands).

Channel spacing varies between 6·3 kc/s and 7 kc/s, according to the band. Furthermore, provision is made for these bands to be used either for double-sideband transmissions or for single-sideband transmissions, or again for independent-sideband transmission, always provided, however, that the requisite bandwidth does not extend beyond the upper or lower limit of the bandwidth specified for double-sideband transmission.

Appendix 18. Table of transmitting frequencies in the bands 156 to 174 Mc/s for radiotelephony in the international maritime mobile service

This table adopts the provisions of the Hague Agreement (1957) where the channels provided for this VHF service make it possible to set up communications of the following kinds :

calling and safety,
public correspondence,
port operations, and
ship-to-ship.

APPENDIX 25. FREQUENCY ALLOTMENT PLAN FOR COAST RADIOTELEPHONE STATIONS OPERATING IN THE EXCLUSIVE MARITIME MOBILE BANDS BETWEEN 4000 AND 23 000 KC/S

APPENDIX 26. FREQUENCY ALLOTMENT PLAN FOR THE AERONAUTICAL MOBILE SERVICE, AND RELATED INFORMATION

These two appendices, published separately, contain, in slightly amended form, the allotment plans adopted by the Extraordinary Administrative Radio Conference (Geneva, 1951).

II. The Additional Radio Regulations

The purpose of these is to lay down rules for the routing of mobile-service communications and for their charges.

The Additional Radio Regulations contain several novelties in relation to the old Atlantic City ones, amongst them provisions to the effect that

for every full-rate radiotelegram, the minimum charge shall be the same as the charge for seven words ;

in press radiotelegrams, the minimum number of chargeable words is fourteen ;

lastly, the new Article 5 deals with charges for radiotelephone calls in the maritime and aeronautical mobile services (mobile station charge, land station charge, land-line charge.)

The Additional Radio Regulations, like the Radio Regulations, will take effect on 1 May, 1961.

III. The Additional Protocol

The Additional Protocol appended to the Radio Regulations contains reservations made by a number of Members of the Union which signed the Final Acts of the Conference. These reservations apply to all sorts of things, for example :

the " Table of Frequency Allocations, "

application of the European Broadcasting Convention (Copenhagen, 1948),

high-frequency broadcasting,

the plans and lists adopted by the EARC,

certain clauses in the Additional Radio Regulations, and

questions of sovereign rights in certain territories.

Be it observed, incidentally, that under No. 1631 of the Radio Regulations and No. 2164 of the Additional Radio Regulations, the signatories declare that should an administration make reservations about the application of one more or provisions in the Regulations, no other administration will be under an obligation to abide by that provision or those provisions in its relations with the administration which made the reservations.

IV. Resolutions and Recommendations

The Administrative Radio Conference also adopted fifteen Resolutions and thirty-seven Recommendations.

The Resolutions deal with matters which could not properly be handled in the Regulations themselves because they are of passing interest, or future interest, only. They do, however, reflect formal decisions taken by the Conference.

RESOLUTION 1. Establishment of the Master International Frequency Register

The Master International Frequency Register will be used with effect from 1 May, 1961. Hence, from this date, it will replace the Master Radio Frequency Record, prepared and kept up-to-date in accordance with decisions taken by the Extraordinary Administrative Radio Conference (Geneva, 1951).

Resolution 1 defines

the initial entries to appear in the Master Register,

how the entries in the Master Record are to be transferred to the Master Register, and

what additional basic characteristics are to be notified by administrations.

Annex 1 thereto contains five tables, describing how entries in the Master Record are to be transferred.

Annexes 2 to 5 deal with bands below 27 500 kc/s, while Annex 6 deals with frequency assignments in bands above this figure.

RESOLUTION 2. Application, from 1 March, 1960, to 30 April, 1961, of the procedure specified in Article 10 of the Radio Regulations, Geneva, 1959, for the bands allocated exclusively to the broadcasting service between 5950 and 26 100 kc/s :

According to this Resolution, the new procedure laid down in Article 10 for high-frequency broadcasting comes into force on 1 March, 1960. Administrations must supply the International Frequency Registration Board with broadcasting schedules. The first edition of the High-Frequency Broadcasting Frequency List will be dated September, 1961.

RESOLUTION 3. Study by a panel of experts of measures to reduce congestion in the bands between 4 and 27·5 Mc/s

In view of the tendency to saturation in the bands between 4 and 27·5 Mc/s, the Conference in this resolution called for the convening of a group of experts to see how congestion could be lessened. The Administrative Council is asked to arrange for such a meeting, and to decide (in the light of the group's final report and after consulting administrations) whether or not an Administrative Radio Conference

should be convened. Annex 1 defines the preliminary inquiry to be undertaken by the International Frequency Registration Board before the panel meets, while Annex 2 sets forth the panel's terms of reference.

RESOLUTION 5. Notification of frequency assignments

This resolution embodies ideas set forth in Recommendation 10, adopted by the Extraordinary Administrative Radio Conference. It says that, unless specifically stated otherwise in special agreements referred to the Union by the parties concerned, frequency assignments in the sense of the Radio Regulations shall be notified by the administration of the country in which the stations in question are.

RESOLUTION 6. Frequency terminology

This gives official sanction to the following somewhat idiosyncratic frequency usage terminology to be employed in documents of the Union.

Frequency distribution to :	*French*	*English*	*Spanish*
Services	Attribution (attribuer)	Allocation (to allocate)	Atribución (atribuir)
Areas or countries	Allotissement (allotir)	Allotment (to allot)	Adjudicación (adjudicar)
Stations	Assignation (assigner)	Assignment (to assign)	Asignación (asignar)

RESOLUTION 13. Preparation of revised allotment plans for the aeronautical mobile service

During the last ten years, the development of civil aviation has given rise to a search for new techniques in aeronautical radio communications. Things are moving at such a rate that in all likelihood the aeronautical mobile frequency allotment plans adopted by the EARC in 1951 (and slightly amended by the Administrative Radio Conference in 1959) will require a thorough overhaul in a few years' time. Hence Resolution 13, which describes in detail the problems to be solved, says that an Extraordinary Administrative Radio Conference shall be convened when the Administrative Council feels that the time is ripe and that the conference could suggest solutions to the problems involved and adopt a new frequency allotment plan.

* * *

The Recommendations are addressed to the International Radio Consultative Committee, to the administrations of Union Members, to the United Nations specialized agencies and to international organizations. They give vent to ideas incompletely developed at the Conference, set problems for study, and prepare the way for decisions by future conferences.

RECOMMENDATIONS 1 to 8

These call on the International Radio Consultative Committee to pursue inquiries already under way, or to undertake fresh investigations into certain technical problems, such as

transmitter frequency tolerances,

the IFRB's " technical standards, "

signal-to-noise ratios and minimum necessary field strengths,

propagation and radio noise,

international monitoring in the bands below 28 000 kc/s,

the technical characteristics of equipment,

the production of cheap radio receivers, and

the classification of emissions.

RECOMMENDATION 16. Measures to be taken to prevent the operation of broadcasting stations on board ships or aircraft outside national territories

The Conference urges administrations to ask their governments to consider what could be done, by means " direct or indirect," to stop the use of broadcasting stations on board ships or aircraft outside national territorial limits, and to take the requisite action. This recommendation was made because the existence of such stations has been observed during the last few years.

RECOMMENDATION 20. Concerning the matter of providing a suitable frequency allocation for a collision avoidance system in the aeronautical radionavigation service

The aircraft used in civil aviation, and the speeds at which they fly, are steadily increasing. Hence an effective anti-collision system has to be devised. This is the purpose of Recommendation 20, according to which administrations and ICAO are asked to give special attention to this matter. Should it prove impossible to find frequencies for such a system from the aeronautical radionavigation bands, then the question will have to be taken up internationally.

RECOMMENDATION 22. An international radiotelephone code for the maritime mobile service

This is addressed to the

Inter-Governmental Maritime Consultative Organization,

the International Civil Aviation Organization, and

administrations.

As far back as 1955, the Baltic and North Sea Radiotelephone Conference (Göteborg) had recommended that administrations investigate some international radiotelephone code whereby language difficulties in aeronautical and maritime mobile communications might be circumvented. In the light of the proposals made by several administrations, this Recommendation gives an international radiotelephone code for the maritime mobile service. The phrases, expressions, and symbols are taken from the International Signal Code. The new code is referred to the specialized organizations and administrations for their consideration, so that a decision may be taken at the next Administrative Radio Conference as to inclusion of the code in the Radio Regulations.

Annex 3 gives a table to be displayed in full view of the wireless operator, so that he may transmit the distress message if he needs immediate assistance.

RECOMMENDATION 24. Adoption of a radiotelephone alarm signal

This Recommendation is addressed to the governments which signed the International Convention for the Safety of Life at Sea. It invites them, at the London Conference (1960) to consider those parts of the Radio Regulations which deal with the radiotelephone alarm signal and the conditions of its use.

RECOMMENDATION 32. The radio astronomy service

This service is now counted as a radio service, and certain bands have been allocated to it. Nevertheless, it is important that provision be made for the future of radio astronomy. This is the purpose of Recommendation 32, which indicates the kind of frequency which is useful for radio astronomical observations, and invites administrations to let the Secretary-General know where their national observatories are and what frequency bands are used therein. The Secretary-General is to pass this information on to Union Members and Associate Members.

RECOMMENDATION 36. Convening of an Extraordinary Administrative Radio Conference to allocate frequency bands for space radiocommunication purposes

The Geneva " Table of Frequency Allocations " allocates a number of bands, for research purposes, to the " Space " and " Earth-Space " services. When the outcome of certain space research programmes is know, it should be possible accurately to define the bands of use for space communications. Recommendation 36 provides for the convening of an Extraordinary Administrative Radio Conference towards the end of 1963 to consider the problems involved. The Council, at its ordinary sessions in 1962 and 1963, is to consider whether the time is ripe for convening such a conference.

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At the end of this brief account of the Final Acts of the Administrative Radio Conference (Geneva, 1959), I would emphasize the scope of the decisions taken by the Conference as regards existing radio communications and their future development.

In 1965, the Union will be celebrating its hundredth anniversary. It is especially gratifying, at this time, to observe its youthful vigour in a technical field in constant movement, and the genuine desire displayed by its Members and Associate Members effectively to cooperate in the search for international solutions which shall be in everybody's interests.

A. Henry