



## **Terrestrial Services Department**

### **BROADCASTING ASSIGNMENT PLAN RJ81**

#### **1 Introduction**

This paper presents some general aspects of RJ81 Agreement:

- The Regulatory Procedures related to the Plan Modification (see flowchart on <http://www.itu.int/en/ITU-R/terrestrial/broadcast/Pages/LFME.aspx>)
- The Notification Procedure to the Master International Frequency Register (MIFR)
- The status of List B of the Plan
- The introduction of digital sound broadcasting in Region 2.

#### **2 General aspects of RJ81 Agreement**

Frequency band: 535 kHz – 1 605 kHz

Planning area: Region 2

Plan Type: Assignment (a frequency channel is assigned to a station at a given location)

The Regional Administrative Conference held in 1981 in Rio de Janeiro (Brazil) established the Plan for MF broadcasting in Region 2, as defined in Radio Regulations (RR)<sup>1</sup>. These agreed rules as well as the original Plan are contained in the Final Acts<sup>2</sup> of the RJ81 Conference. All the assignments appearing in the original Plan as modified before and during the Conference have been included in two separate lists:

- List A: includes only the assignments where caused and received interference are both accepted;
- List B: includes all the assignments which are not included in List A

The administrations whose stations appear in List B were urged to resolve the incompatibilities as quickly as possible.

<sup>1</sup> For a definition of Region 2, see the Radio Regulations available on the Publication section of the ITU website.

<sup>2</sup> The RJ81 Final Acts are available on <http://web.itu.int/ITU-R/terrestrial/broadcast/plans/index.html>.

The RJ81 Agreement entered into force on 1 July 1983. The updated RJ81 Plan is kept in a BR database and is included in the BR IFIC publication for Terrestrial Services (in DVD-ROM format)<sup>3</sup>.

There are three classes of broadcasting stations in RJ81 Plan:

Class A station to cover extensive primary service areas (delimited by ground wave field strength) and secondary service areas (delimited by sky wave field strength)

Class B station to cover one or more populated centres and the contiguous rural areas located in its primary service areas

Class C station to cover a city or town and the contiguous suburban areas located in its primary service areas

The nominal usable field strength ( $E_{\text{nom}}$ ) has been used as the reference for planning.  $E_{\text{nom}}$  is an agreed value of the minimum field strength required to provide satisfactory reception in the presence of atmospheric noise, man-made noise and interference from other transmitters. The agreed protection ratios with respect to co-channel, first adjacent channel and second adjacent channel are 26, 0, -29.5 dB, respectively. In the case of overlapping contours (Ch. 4.-4.10.4 of Annex 2: Protection outside national boundaries) the third adjacent channel interference is also taken into account.

Each station may operate during day-time (between local sunrise and local sunset) and/or during night-time (between local sunset and local sunrise). Day-time and night-time entries constitute one assignment (identified by its unique BR ID) if they operate on the same frequency and at the same location (a tolerance of one second is accepted). Objectionable interferences caused by a proposed modification to the protected stations (recorded in the Plan) are calculated on their protected contours separately for day-time entry (using ground wave propagation model) and night-time entry (using ground wave and sky wave propagation model) according to criteria of Annex 2 of RJ81 Final Acts. However proposed modification can enter the Plan as a whole assignment provided no affected administrations have been identified or all affected administrations accepted objectionable interferences caused to their stations. If one entry of an assignment produces non accepted objectionable interferences and the second one does not, both entries do *not* enter into the Plan. This is applied also in other situations when two entries of one assignment get different checking results (direct publication in Part B of the Special Section, suspension, findings, transfer from List B).

The main broadcasting standards of RJ81 Plan are as follows:

Class of emission: A3E (others may be used if the energy level outside the necessary bandwidth does not exceed that normally expected in A3E emission and if the emission is receivable by receivers employing envelope detectors without increasing appreciably the level of distortion; agreed protection ratios allow operation with 20 kHz occupied bandwidth)

Carrier frequencies: 540, 550, 560, ..., 1 580, 1 590, 1 600 kHz (integer multiples of 10 kHz)

Maximum power: class A station: 100 kW (day), 50 kW (night), higher from the origin may be kept but not increased

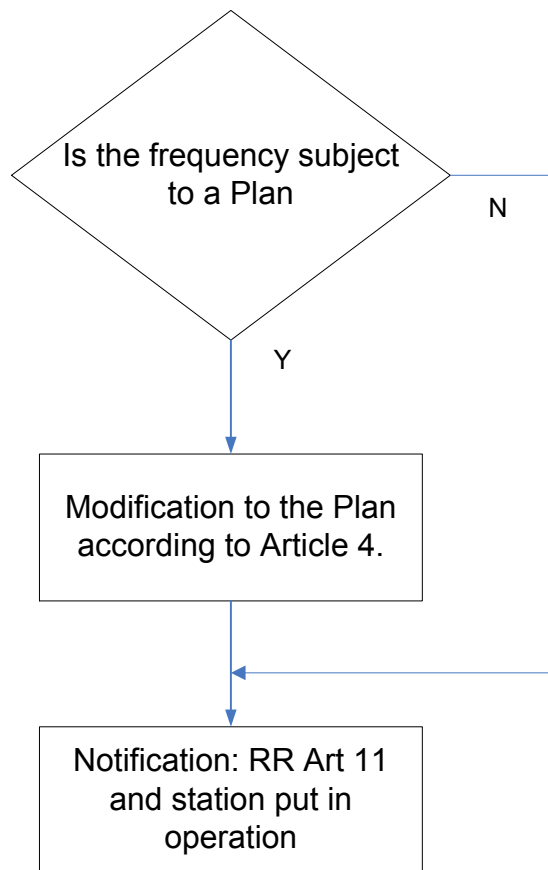
class B station: 50 kW (day and night)

class C station: 1 kW (day in Noise Zone 1), 5 kW (day in Noise Zone 2), 1 kW (night).

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<sup>3</sup> The BR International Frequency Information Circular (BRIFIC) for Terrestrial Services is available in the Publication Section of the ITU-R website.

### 3 Regulatory procedures



A frequency assignment must first be recorded successfully into the RJ81 Plan before the station can be put in operation notified for registration in Master International Frequency Register (MIFR). Rules of Procedures Part 4 also adds some clarifications to some aspects of these regulatory procedures.

#### 3.1 Modification to the Plan

Article 4 of RJ81 Final Acts provides the procedure for the Plan modification. The “modification” comprises the addition of a new station and the modification or the suppression of already recorded ones. The format of the notification and the rules to follow are given in BR LF/MF Guidelines<sup>4</sup>. A flowchart of the modification procedure to the RJ81 Plan is given on <http://www.itu.int/en/ITU-R/terrestrial/broadcast/Pages/LFMF.aspx>.

After 60 days but not later than 180 days after the date of publication of the proposed modification in Part A of the RJ81 Special Section, the concerned administration must communicate to the BR the final characteristics of the proposed frequency assignment and request Publication in Part B. This request must be made before the end of the 180 day period, otherwise the administration concerned will have to restart the whole process from the beginning.

#### 3.2 Notification to the MIFR

Not before the date of entry into the Plan of a given proposed modification and not later than five years after that date, an administration may propose to bring the assignment into use by notifying to

<sup>4</sup> See Submission of frequency assignments/allotments to stations of terrestrial services – [http://www.itu.int/en/ITU-R/terrestrial/tpr/Documents/LFMF/lmf\\_guidelines.pdf](http://www.itu.int/en/ITU-R/terrestrial/tpr/Documents/LFMF/lmf_guidelines.pdf).

the BR in accordance with Article 11 of the RR. Notice form TB7 is used to notify assignments with technical characteristics identical to those recorded in the Plan. Otherwise notice form T04 shall be used.

The BR publishes the complete data notified in Part I of its BRIFIC as acknowledgement of receipt.

If the BR verifies that the notification is in conformity with the Agreement and that the procedure of Article 4 was successfully completed, it publishes in Part II of its BRIFIC the final characteristics of the relevant assignments and records (with favourable finding) it in the MIFR with the date of recognition equal to the date of receipt of the complete notification (in the case of minor modifications the previous date of recognition is maintained).

Otherwise, the BR publishes in Part III of its BRIFIC the final characteristics of the relevant assignments with unfavourable finding and returns the notice to the notifying administration.

### **3.3 Rules of Procedure**

Part A4 of the Rules of Procedure<sup>5</sup> clarifies the RJ81 Procedures for the following cases:

- Processing of a proposed modification to the Plan for which a request for Publication in Part B was not received within the 180 day period. Processing of an assignment recorded in the Plan and which has not been brought into use more than five years after the date of its entry to the Plan.
- Procedure of Resolution 2 of RJ81 Final Acts concerning the transfer of an assignment from List B to List A of the Plan.

## **4 Status of List B**

In list B there are still 177 day-time and 735 night-time entries. These figures can only decrease as no new proposed modification can enter into List B.

There is no direct procedure for transferring a station from List B into List A.

## **5 Introduction of digital sound broadcasting**

Two systems – Digital Radio Mondiale (DRM) and In-Band On-Channel Digital Sound broadcasting (IBOC DSB) – are recommended for digital sound broadcasting in the broadcast bands below 3 MHz by Recommendation ITU-R BS.1514-1 where they have been described and compared [6]. Both systems may also be used for digital sound broadcasting up to about 120 MHz.

In Circular Letter CCRR/20<sup>6</sup>, the Radiocommunication Bureau concluded that the current formulations in the RJ81 Final Acts do not permit digital modulation. The HD radio system (or Digital System C), is commercially used throughout the USA in the MF and VHF bands. The most recent information about its development can be found in the relevant Study Group 6 documents<sup>7</sup>.

The RJ81 Final Acts have to be modified by a competent Conference in order to permit the introduction of digital sound broadcasting in the RJ81 Plan.

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<sup>5</sup> <http://www.itu.int/pub/R-REG-ROP-2012/en>

<sup>6</sup> <http://www.itu.int/md/R00-CCRR-CIR-0020/en>

<sup>7</sup> <http://www.itu.int/rec/R-REC-BS.1514/en>