国 际 电 信 联 盟

无线电通信局
（传真：+41 22 730 57 85）

通函 2011年8月19日

CR/325

致国际电联各成员国主管部门

事由： 与地面电台发射相关的国际监测信息的收集和公布安排

参考文件： 2001 年 5 月 9 日第 159 号通函
2010 年 10 月 18 日 1C 工作组主席的报告（1C/122 号文件）附件 3

致总局长

尊敬的先生/女士：

1 我谨告知您，1C工作组（频谱监测）根据《无线电规则》第16条，对HF频带监测信息收集和公布的当前安排进行了审议，并通过上述参考文件提及的1C工作组主席报告附件3将其研究结果提交无线电通信局。

2 这些研究的结果表明，在略行修改后（见附件第2节），继续采用前CR/159号通函中所描述的类似方法进行通常监测信息的收集和公布是适宜的。大部分修改已经由无线电通信局实施。

3 此外，1C工作组提出了一种包含自动频段登记数据在内的新方法，该方法详见附件第3节。

4 此类新方法的实施将要求分布在世界各地的监测站的协调参与，而且需配有必要的自动频谱监测系统。

5 此外，无线电通信局需开发或采购必要的软件，以便对各监测站提交的信息进行编辑、确认和公布。

Place des Nations
CH-1211 Geneva 20
Switzerland
Telephone +41 22 730 51 11
Telefax Gr3: +41 22 733 72 56
Gr4: +41 22 730 65 00
Telex 421 000 uit ch
Telegram ITU GENEVE
E-mail: itumail@itu.int
http://www.itu.int/

6　　考虑到所涉及的财务影响，主要是在网站软件和更新方面的影响，是否启动项目的决定将取决于是否有足够数量的主管部门承诺参与，以保证监测项目的成功。

7　　因此，特请贵主管部门评估附件第3节中所提及的建议，并（在2011年9月15日之前）说明贵方是否愿意参与此项目。

8　　如有任何问题需要澄清，请与无线电通信局联系。

顺致敬意，

无线电通信局主任
弗朗索瓦•朗西

后附资料：1C工作组主席报告附件3（Rev.1）（仅英文文本）

分发：

– 国际电联各成员国主管部门
– 无线电规则委员会委员

后附资料

Radiocommunication Study Groups

Source: Document 1C/TEMP/37 (edited)

Subject: Review of ITU-R Circular Letter CR/159

Revision 1 to
Annex 3 to
Document 1C/122-E

9 December 2010
English only

Annex 3 to Working Party 1C Chairman's Report

INFORMATION ON INTERNATIONAL MONITORING OF EMISSIONS FROM TERRESTRIAL STATIONS IN THE HF BANDS

Contact: Olivier Pellay
pellay@anfr.fr

Summary

Working Party 1C on Spectrum Monitoring, decided at its meeting, 16-22 September 2009, Geneva, Switzerland, to establish a Correspondence Group to further discuss "Arrangements for collection and publication of International monitoring information related to emissions originated from terrestrial stations" as now contained in Circular Letter CR/159.

During this meeting, Document 1C/77 (File "R07-WP1C-C-0077!!MSW-E.doc" available on the FTP server dedicated to the revision of the CR/159) proposed to introduce, in parallel of the regular measurement campaign, additional automated measurements which should provide more information about the spectrum usage by means of an automatic frequency band registration programme.

For the preparation of this document, a survey was sent to collect proposals from administrations on how to improve current procedures. The replies analysis of the survey has been regarded as a basis to draw proposals of improvement of the regular HF monitoring campaign. This is detailed in this report and main outcomes are:

– Update of the list of parameters of the regular program.
– Defining the automatic frequency band registration with a frame of a schedule.
– Defining an internet portal to improve the overall task of the regular HF monitoring campaign.

1 Introduction

Working Party 1C on Spectrum Monitoring, decided at its meeting, 16-22 September 2009, Geneva, Switzerland, to establish a Correspondence Group to further discuss "Arrangements for collection and publication of International monitoring information related to emissions originated from terrestrial stations" as now contained in Circular Letter CR/159.

In order to collect proposals from administrations, a survey was published in the Circular Letter 1/LCCE/88, dated 1 April, 2010 and the replies analysis proposes to update parameters included in the circular letter, to define and to carry out an automatic frequency band registration campaign and to define a web portal as a support to collect and to publish campaign results and also as a mean to improve the mutual aid within administrations. The replies analysis is shown in Appendix 1 of this Report.

2 Update of the list of parameters

According to replies to the survey, two data should be added in the list of parameters:

– the year of the observation,

– the origin of the bearing (when only one bearing is provided).

Proposal 1: update the list of parameters to be recorded

The new list might be as follow:

1. Administration which submits observation
2. Name of the monitoring centre where observation is made
3. Measured frequency
4. Date of observation
5. Starting time
6. Finishing time
7. Field Strength
8. Identification
9. Administration responsible for transmission
10. Class of Station
11. Occupied bandwidth
12. Class of Emission

13 -14. Estimated location of transmitting station (Geographical coordinates)

15. Bearing to transmitting station

16 -17. Location of the origin of the bearing (Geographical coordinates)

18. Accuracy of the bearing
19. Non-conformity with the RR (see Art. 16.8)
20. Remarks

According to this update, the annex to BR Circular-letter No. CR/159 might be updated as shown in Appendix 2.

3 Automatic frequency band registration campaign

Proposal 2: define an automatic frequency band registration program.

This proposal has been raised in the framework of the Working Party 1C on Spectrum Monitoring, at its meeting, 16-22 September 2009, Geneva, Switzerland. The context and general approach are described in Document 1C/77 from the above-mentioned meeting.

The aim is to gather an amount of data from an identified frequency band with large facilities on a worldwide basis. The main outcome of such a procedure is to provide information on the spectrum occupancy. Doing this gives an overview of this specific frequency band so that all administrations, including those who do not have monitoring facilities, gain maximum information from the outcome of the monitoring efforts.

To perform this task, taking into account that each Administrations use different measuring equipment and different controlling software, that various data in different format could be collected and several possibilities to process data are possible, it is required to define a common measuring method and an harmonised data exchange to carry out such measuring campaign.

3.1 Measuring equipments

In order to perform the task above, it's required to use a calibrated system including a receiver or a spectrum analyser, a calibrated omnidirectional antenna monitored by software dedicated to this task.

3.2 Monitoring programme

The main idea is to sweep the frequency band from 2 850 to 28 000 kHz by step of 200 kHz a day (1.4 MHz should be swept in a week).

The main interest in such a campaign is to carry out a time synchronised measurement to collect data from the frequency spectrum in a same time from different countries in the world. The schedule may be established as proposed in Document 1C/77 and reminded as follow:

Week 1

Monday	2 850-3 050 kHz
Tuesday	3 050-3 250 kHz
Wednesday	3 250-3 450 kHz
Thursday	3 450-3 650 kHz
Friday	3 650-3 850 kHz
Saturday	3 850-4 050 kHz
Sunday	4 050-4 250 kHz

Week 2

Monday	4 250-4 450 kHz
Tuesday	4 450-4 650 kHz
Wednesday	4 650-4 850 kHz
Thursday	4 850-5 050 kHz
Friday	5 050-5 250 kHz
Saturday	5 250-5 450 kHz
Sunday	5 450-5 650 kHz

Week 3

Monday	5 650-5 850 kHz
Tuesday	5 850-6 050 kHz
Wednesday	6 050-6 250 kHz

….

Monitoring/measuring this way the entire frequency range from 2 850-28 000 kHz is covered in 21 weeks and so 2 samples a year could be collected for each 200 kHz part of the desired spectrum. Sample one and sample two are measured during different seasons (propagation).

If, for any reason, one cannot participate in Week 1, the idea is then to start with the scheme as indicated in Week 2.

The data resulting from measurements could be uploaded weekly to ITU. Processing software will process the data into information (plots).

3.3 Parameters of the measurement

In order to process and to compare data from measurement results, the monitoring procedure should be based on common measuring parameters.

As proposed in the paragraph 3.2, the bandwidth to be considered every 24 hours is 200 kHz.

The relation which liaises this parameter with the band filter is RBW < 120% BW (240 Hz). As the choice of the filter depends on its availability in the receiver, the nearest upper filter value should be chosen.

Most of receivers allow carrying out the measurement with a resolution of 1000 points. Taking into account previous parameters, this resolution should guarantee a sufficient resolution.

The re-visit time should be short enough to detect brief duration transmission but it should be larger than the scan time. In relation of parameters specified above, the re-visit time may be fixed at 10 seconds. The measurement consists in an average over the re-visit time period.

The value of the scan-time calculated by the equipment is suitable to perform such measurement. This avoids carrying out uncalibrated measurements.

The detector should be chosen as “Average” with maximum hold function.

The attenuation should be fixed as low as possible and should be adapted with the type of emission available in the swept frequency band.

3.4 Data exchange

The data collected should be sent to the BR every week. The harmonizing of these files is required for the processing of data files and further publication.

Recommendation ITU-R SM.1809 contains the basis for this automatic collecting data.

Each file should be submitted as an ASCII text file (an alternative in an XML format might be envisaged) divided into two parts:

– A “Header” section containing the static information relating to the monitoring task such as the location used for monitoring, time information and key monitoring parameters.

– A “Data” section containing all the measured results during the period of observation.

An example file is as follow:

Header

FileType Standard Data exchange Format 2.0
LocationName <name of the observation station>
Latitude <latitude of the observation station [dd.mm.ssN/S]>
Longitude <Longitude of the observation station [dd.mm.ssE/W]>
FreqStart <F1 [kHz]>
FreqStop <F2 [kHz]>
AntennaType <Omnidirectional>
FilterBandwidth <0.240 [kHz]>
LevelUnits <dBuV/m>
Date <yyy-mm-dd>
DataPoints <1000>
ScanTime <10 [s]>
Detector <Average>
Note This is a sample file to demonstrate the data format.
Data
00:00:00,65,56,64,54,23,29,32,43,54,25,29,25,36…etc…,43,59
00:00:10,64,53,65,59,42,37,35,34,64,25,26,36,63…etc…,54,61
00:00:20,62,57,64,59,41,36,26,42,53,62,16,52,24…etc…,52,66
.
.
.
etc
.
.
.
23:59:30,53,33,61,44,25,44,36,26,46,24,26,24,63…etc…,29,56
23:59:40,54,32,62,48,24,42,35,26,24,64,24,34,35…etc…,29,56
23:59:50,64,52,63,57,33,23,32,53,25,26,63,35,26…etc…,32,59

3.5 Data exploitation

From data files, all results should be included in a database available in consultation. An operator interface should be defined with several tools to allow displaying results on different plot type in order to easily manage the information. From the time, when data are available in a database all reckoning may be implemented. For example, different plots available may be:

– spectrogram (frequency versus time with a colour scale to indicate the value of the fieldstrength),
– Minimum/Median/Maximum values of the fieldstrength (frequency versus fieldstrength value),
– Occupancy of each frequency during 24 hours.

4 HF monitoring website

Proposal 3: define a website dedicated to the international monitoring system

In the framework of the International monitoring system, it is proposed to define a website in order to share and to improve the communication of information between worldwide Administrations.

Therefore, this working interface should:

– improve the exploitation of data from monitoring campaign by offering a requester based on the database of results;
– provide some plots tools to display results from monitoring campaign;
– provide some statistics on data;
– improve the mutual aid between worldwide Administrations by offering an international "Chat" dedicated to direct contact between operators;
– provide means to generate custom reports from monitoring campaign (formatting of results files, choice of information to display, format of the file….);
– offer an interface to upload results file from monitoring campaign and an FTP access to download data from the database;
– improve the communication with a homepage which displays news on HF monitoring (circular letter, information from ITU…);
– provide information on facilities to perform the monitoring campaign (items from list VIII might be included in this page).

The list above is not exhaustive but it reflects a possible solution to comments received during the consultation of the survey.

APPENDIX 1

Analysis of survey's replies

1 Introduction

The survey was sent to all Administrations through Circular Letter 1/LCCE/88 dated 01 April 2010 (see at http://www.itu.int/md/R00-SG01-CIR-0088/en). The deadline of the consultation was the 15th May 2010. Eight replies were received.

2 Replies analysis

The survey was divided into two sections:

1) Participation in the regular monitoring programme;

2) Use of the monitoring summaries.

2.1 Analysis of the first section of the survey

The two first questions are based on the participation to the regular monitoring programme.

a. Does your administration participate regularly?	☐	☐
b. Does your administration plan to participate to the future programme?	☐	☐

Five of eight administrations participate regularly in the regular monitoring programme.

Seven of eight Administrations plan to participate to the future programme.

Summary of comments received:

Comment 1

"Participation will be conditioned to availability of human and technical resources and should be aligned to national regulatory activities. As such, decision about participation should be evaluated on a case by case basis."

Comment 2

"If monitoring data could be measured, collected and delivered completely through our automatic monitoring system, we have possibility to join the program"

Proposal

Regarding these comments, a web interface may be suggested in order to collect and to publish automatically results from the campaign.

The third question was about the list of parameters to report includes in the current Circular Letter CR/159.

c. Do you have proposals to change (add/modify/delete) the list of parameters to report defined in CR/159 (* refers to mandatory data elements)	
1. Administration which submits observation* 2. Name of the monitoring centre where observation is made* 3. Measured frequency* 4. Date of observation* 5. Month of observation* 6. Starting time * 7. Finishing time * 8. Field Strength 9. Identification* 10. Administration responsible for transmission 11. Class of Station* 12. Occupied bandwidth 13. Class of Emission* 14 -19. Estimated location of transmitting station (Geographical coordinates) 20. Bearing to transmitting station 21. Accuracy of the bearing 22. Non-conformity with the RR (see Art. S16.8) 23. Remarks *	

Four comments were received.

<u>*Comment 1*</u>

"Serial No. 2, "Name of the monitoring centre where observation is made," implicitly implies that all measurements, including "Bearing to transmitting station," are carried out at a single monitoring station. For better accuracy in bearing, however, an administration may prefer to employ more than one DF station. Accordingly, an editorial correction would be in order."

<u>*Comment 2*</u>

"Item 21: Accuracy of the bearing should be replaced by "bearing Uncertainty" and as such, not only include the instrument accuracy but also the statistical variation of the measurements performed. Report should additionally include Noise floor at the frequency band and Field Strength measurement uncertainty. Administration responsible should include contact information, of the administration, such as presented on List VIII, since List VIII needs to be purchased and not all administrations can have it promptly available."

<u>*Comment 3*</u>

"The year of the observation should be added"

Comment 4

"2.Name and Geographical Location of the monitoring centre where observation is made.

Geographical Location of Monitoring centre will help to plot the Bearing (to Transmitter) on the map"

Proposals

Regarding these comments,

- one item should be added about the year of observation,
- Item 2 should be specified as the zero point of a bearing (whichever is provided); this may include specifying the geographic coordinates and therefore, two additional sub-items should be introduced. If a location of transmitting station is provided and not only a bearing, the name of monitoring centre where the observation is made should be sufficient.
- Contact information of the Administration might be available on a "private" web portal. Moreover, an international "chat" might be established to promote and to facilitate the mutual aid between each international monitoring centre.
- Concerning the accuracy of the measurement, this point should be discussed in order to assess the workflow that would cause.

The fourth question was about the capability of each administration to have a receiver available to carry out automatic measurement.

d. Do you have equipment available for performing automatic spectrum occupancy measurements? *(future expansion of the monitoring programme as described in the document "R07-WP1C-C-0077!!MSW-E.doc")*	☐	☐

Six of the seven administrations willing to participate to the automatic measurement programme have a receiver available which could be dedicated to this task.

Four general comments were provided on the regular monitoring programme and its possible extension.

Comment 1

"We should call this "automatic frequency band registrations" in order not to mix up this type of measurements with channel occupancy measurements."

Comment 2

"It should be interesting to process automatically the spectrum occupancy."

Comment 3

"Capability for measurements are limited due to the low sensibility of the instruments available, which may limit the ability to assess various emissions that may be received by more sensitive instruments."

Comment 4

"Service-wise monitoring (the services being those as defined in RR Nos. 1.19 to 1.60) following a pre-determined pattern may, perhaps, lead to better utilisation of the monitoring data."

2.2 Analysis of the second section of the survey

The first question of the second section was on the consultation of the summaries of regular monitoring programme.

a. Do you consult the summaries of regular monitoring programme published by the BR (http://www.itu.int/ITU-R/terrestrial/monitoring/index.html)	☐	☐

Six of the eight administrations consult the summaries of regular monitoring campaign.

One comment raised on the summaries of regular monitoring programme.

<u>*Comment*</u>

"no feedback for the data processing"

The second and third questions of the 2nd section were about the presentation of result data from the monitoring campaign.

b. Do you have suggestions on exchanges with ITU (the way to provide results for example)?
c. Do you have suggestions to modify/improve the presentation of the data?

Comments received on this subject are:

<u>*Comment 1*</u>

"The possibility to display data on a map would be an improvement (non authorised emissions in a country for example)."

<u>*Comment 2*</u>

"The PDF version of the reports should be divided on sections. First page, link to the terms of reference (circular letter) and other applicable recommendations. First section, a list of administrations and stations used; Second section, a presentation, as made, of the carriers identified; Third, a detailed description of the stations used in terms of accuracy, sensitivity, as proposed above, allowing better understanding of the presented results. The dbf version should be divided in similar way using 3 different tables"

<u>*Comment 3*</u>

"The data format used for presenting the 'summaries of regular monitoring programme,' referred to in 2(a) above, perhaps, needs to be revisited to make it more easily adaptable to popular desktop applications"

Proposals

Regarding these comments, a proposal consists in a web interface which allows displaying results on a map, a database interface which allows doing queries, generating custom reports and displaying administrative and technical information on administrations providing the results.

The last question was on general comment.

d. Others comments on monitoring summaries

Four general comments were provided on monitoring summaries.

Comment 1

"If possible, maps should be included in order to allow more graphical representation of the results. At least 3 maps could be considered: 1. Participating administrations, indicating by colour histogram, the number of stations received/identified by each administration; 2. Location of the Monitoring Stations Used; 3. Emitter stations located. Experiments could be tried on using lines connecting transmitters and monitoring stations."

Comment 2

"It could be interesting to clarify rules to declare the conformity of an emission."

Comment 3

"Specifications and implementation of data processing tools taking into account all the results should be discussed."

Comment 4

"The brific dvd for the participating countries should be free."

3 Synthesis of proposals

Regarding terms of reference of the correspondence group and the outcome of the survey consultation, guidelines to draw the reports might be as follow:

– To define a web portal dedicated to the HF monitoring campaign.

– To extend the regular monitoring programme with automatic frequency band registrations.

– To update the list of parameters of the current Circular Letter CR/159.

APPENDIX 2

Update of the Annex to BR Circular Letter No. CR/159

ANNEX TO BR CIRCULAR LETTER NO. CR/159

Instructions for the submission of monitoring reports

The reports of monitoring observations should be provided to the Bureau in table format, with the order of columns described below and with one line per emission observed. Those administrations wishing to participate for the first time are invited to contact the Bureau for more detailed information.

PARTICULARS OF THE MONITORING CENTER

Column 1 - Administration (M_ADM)

Indicate the Administration code responsible for the monitoring centre.

Column 2 - Centre (M_CENTER)

Indicate the name of the monitoring centre where the observation was made.

PARTICULARS OF THE MONITORED STATION

Column 3 - Frequency (M_FREQ)

Indicate the frequency measured in kilohertz and fractions thereof up to three decimals.

Column 4 - Date (M_DATE)

Indicate the day during which the observation was made.

Column 5 - Starting Time (M_HEURED)

Indicate the starting time of the observed emission, expressed in hours and minutes in coordinated universal time (UTC), as follows, 0000 etc., up to 2400. Where 0000 indicates the beginning of the day and 2400 indicates the end of the day.

Column 6 - Finishing Time (M_HEUREF)

Indicate the ending time of the observed emission, expressed in hours and minutes in coordinated universal time (UTC), as follows, 0000 etc., up to 2400. Where 0000 indicates the beginning of the day and 2400 indicates the end of the day.

(Observations made after 2400 should be indicated in the following day as a separate record. For example, 2300 to 0100 should be indicated as 2300 to 2400 and 0000 to 0100 of the following day.)

Column 7 - Field strength (M_DB)

Indicate the field strength measured in dB (referred to 1 μV/m) and fractions thereof up to one decimal.

Column 8 - Identification (M_IDEN)

Indicate the name, call sign or other means of identification of the observed emission.

Column 9 - Administration (M_ADMIN)

Indicate the Administration code responsible for the observed emission. (This should normally be different from Administration indicated in Column 1).

Column 10 - Class of station (M_CLST)

Indicate the code corresponding to the class of station of the monitored emission (see Preface to the BR IFIC).

Column 11 - Occupied bandwidth (M_BAND)

Indicate the bandwidth in accordance with APS1, section 1, measured or estimated. In the last case include the symbol E after the value indicated. For example, 10K0-E means 10 kilohertz estimated bandwidth.

Column 12 - Class of emission (M_CLEM)

Indicate the three basic characteristics of the class of emission in accordance with APS1 sub-section IIA of the Radio Regulations

Columns 13 to 14 - Estimated location

The estimated location of the monitored station. Indicate also in Column 18, the estimated accuracy and in Column 20 the names of the cooperating stations.

Column 13 - (M_LONG1)

Indicate Longitude (DMS format (+E, -W))

Column 14 - (M_LAT1)

Indicate Latitude (DMS format (+N, -S))

Column 15 - Bearing (M_BEAR)

If the monitoring station is equipped with direction-finding facilities, indicate in degrees from true North the bearing of the station concerned. Also indicate in Column 18 the classification of bearing.

Columns 16 to 17 - location of the origin of the bearing

The location of the origin of the bearing.

Column 16 - (M_LONG2)

Indicate Longitude (DMS format +E, -W)

Column 17 - (M_LAT2)

Indicate Latitude (DMS format +N, -S)

Column 18 - Accuracy (M_PREC)

When the estimated location is given in Columns 13 to 14 or the bearing is given in Column 15, indicate the estimated accuracy or the classification of bearing.

Column 19 - Non-conformity with the Radio Regulations (M_RR)

When the monitored station is not operating in accordance with the Radio Regulations, indicate the number of the column containing characteristics which are not in conformity. For example, if a broadcasting station (symbol BC in Column 12) is monitored in a band not allocated to this service, a reference to Column 12 should appear in this column.

Column 20 - Remarks (M_REMARK)

Indicate in this column any additional information which may be useful for the understanding of the information supplied in other columns.

ELECTRONIC FILE FORMAT

When submitting observations electronically, administrations are requested to use the following standard table structure.

Col no.	Item	Width	Decimal	Type
1	M_ADM	3		TEXT
2	M_CENTER	20		TEXT
3	M_FREQ	8	3	NUMERIC
4	M_DATE	8 (YYYYMMDD)		NUMERIC
5	M_HEURED	4		TEXT
6	M_HEUREF	4		TEXT
7	M_DB	5	1	NUMERIC
8	M_IDEN	20		TEXT
9	M_ADMIN	3		TEXT
10	M_CLST	2		TEXT
11	M_BAND	5		TEXT
12	M_CLEM	3		TEXT
13	M_LONG1	8 (+/-dddmmss)		NUMERIC
14	M_LAT1	7 (+/-ddmmss)		NUMERIC
15	M_BEAR	3		NUMERIC
16	M_LONG2	8 (+/-dddmmss)		NUMERIC
17	M_LAT2	7 (+/-ddmmss)		NUMERIC
18	M_PREC	1		TEXT
19	M_RR	2		NUMERIC
20	M_REMARK	20		TEXT