

Spectrum Management

Client Procedures Circular

Information Requirements
Relating to Frequency
Assignments
Coordination to Space
Radiocommunication Stations

Client Procedures Circulars describe the various procedures or processes to be followed by the public when dealing with Industry Canada. The information contained in these circulars is subject to change without notice. It is therefore suggested that interested persons consult the nearest district office of Industry Canada for additional details. While every reasonable effort has been made to ensure accuracy, no warranty is expressed or implied. As well, these circulars have no status in law. Additional copies of this or other circulars in the series are available from any office of the Department.

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Principle

To specify the technical characteristics required for the completion of the Forms of Notice AP3/II-A, AP3/II-B1, and -B2, AP3/II-C1, and -C2, AP3/II-D, AP3/III-A, AP3/III-B1, and -B2, and AP3/III-C1, and -C2 at the coordination stage with respect to a planned satellite network for submission to the Radiocommunication Bureau (formerly the IFRB) of the International Telecommunication Union (ITU).

Mandate

The Department, in discharging its obligations under the Convention of the ITU and the Regulations, requires adherence to the provisions therein that apply to the international coordination and notification of satellite networks eligible for licensing in Canada.

Policy

Before issuing a licence in accordance with the *Radiocommunication Act*, the Department will ensure that domestic licensing requirements, and domestic and international coordination requirements have been met.

Procedure

This procedure is in compliance with the provisions of the ITU *Radio Regulations*. It is based on IFRB Circular-letter No. 820 and is intended to provide guidance regarding the technical characteristics considered essential for inclusion in the specifications for a satellite network at the frequency assignment coordination stage intended for publication by the Radiocommunication Bureau of the ITU. Submission of incomplete forms to the Radiocommunication Bureau would delay completion of the coordination/notification process that is compulsory under the ITU *Radio Regulations*. Successful completion of this process is a prerequisite for registration of frequency assignments in the Master International Frequency Register (MIFR) and thus their protection from harmful interference.

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Introduction

The Forms of Notice AP3/II and AP3/III were developed by the Radiocommunication Bureau in accordance with the decisions of ORB-88. In drawing up the forms, the Bureau took into consideration the increased use to be made by the Radiocommunication Bureau of the ITU computer in the treatment of the forms of notice and in particular the data capture of their contents by means of terminals, and reconstruction of the satellite links by means of a computer-based satellite network file.

The present instructions supplement those in Sections II and III of Appendix 3 to the *Radio Regulations*, ORB-88.

These forms of notice, however, do not include some items of Appendix 3 that are required only when they are used for effecting coordination with another administration. The reason for this is to keep the forms of notice as simple as possible for the majority of frequency assignments. Whenever this additional information is to be notified, it should be provided on a separate attachment.

General

For each section of Appendix 3, a separate form of notice shall be used. Each of these forms consists of several parts; descriptions of these are given below, followed by some explanations.

Form of Notice AP3/II (for Appendix 3, Section II) consists of the following parts, to be used in connection with coordination of satellite networks under RR1060, and notification of space stations (see provisions of Articles 11, 13 and 14 of the *Radio Regulations*), which are presented on six pages identified in the lower left-hand corner:

Form AP3/II-A	Space station/satellite network (general characteristics of the satellite network)
Forms AP3/II-B1, -B2	Satellite network characteristics for reception at the space station
Forms AP3/II-C1, -C2	Satellite network characteristics for transmission from the space station
Form AP3/II-D	Overall link characteristics

Forms AP3/II-A, AP3/II-B1 and -B2, AP3/II-C1 and -C2 and AP3/II-D were created to cover the data items listed in Section II, parts A, B, C and D respectively of Appendix 3 along with the relevant general information in Section I.

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Form of Notice AP3/III (for Appendix 3, Section III) consists of the following parts, to be used in connection with coordination under RR1107 and notification of earth stations (see provisions of Articles 11, 13 and 14 of the *Radio Regulations*), which are presented on five pages identified in the lower left-hand corner:

Form AP3/III-A	Earth station (general characteristics of earth station)
Form AP3/III-B1, -B2	Characteristics of transmitting earth station
Form AP3/III-C1, -C2	Characteristics of receiving earth station

Forms AP3/III-A, AP3/III-B1 and -B2, and AP3/III-C1 and -C2 were created to cover the data items listed under Section III, parts A, B and C respectively of Appendix 3 along with the relevant general information in Section I.

In each part, each information item/data field includes a number on its label. This number is the same as that used for the same item in Appendix 3 (ORB-88) within the same part. For example, on the page labelled "Form AP3/II-B1" (at the bottom), the field "A2", "Date of bringing into use" is item no. 2 in Part A of Section II.

Data items that are related are grouped together in a box. For example, the page labelled "Form AP3/II-B2" (at the bottom) contains a box labelled "Emissions of the associated transmitting station(s)". It is possible to specify 12 different emissions (with associated power and power density) in this box. If there are more emissions, use another page of the same type to provide additional data, after checking (✓) the field labelled "More emissions on next page" on the original page. In all cases where there is more information than can fit in a box, follow this procedure.

The forms in the AP3/II series are to be used when data pertaining to a satellite network is to be provided. In any one such application, one Form AP3/II-A would be used, together with as many of the AP3/II-B1, AP3/II-B2, AP3/II-C1, AP3/II-C2 and AP3/II-D forms as are necessary to provide all the relevant details for all satellite antenna beams and frequency assignments concerned.

The use of AP3/II-B1 and AP3/II-B2 forms is based on the concept of providing details concerning a list of assigned frequencies operating within a given satellite receiving antenna beam, for which the associated frequency assignments have common information. This common information may be an individual data item (such as the date of bringing into use, the class of station or the assigned frequency band) or a block of data items (of which there are two, namely, the group of coordinations obtained or requested and agreements reached or sought, as well as the details of the emissions of the associated transmitting stations).

Therefore, for each new satellite receiving beam, a new set of the AP3/II-B1 and AP3/II-B2 forms is required.

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Within a given beam, the information to be provided in the second part of Form AP3/II-B1 ("Information common to the following lists of assigned frequencies in this beam") is taken as data common to all assignments for which the assigned frequencies are listed in the associated Form AP3/II-B2, and may indeed remain common for more than one such list of assigned frequencies (see below).

Similarly, the information to be provided in the first two parts of Form AP3/II-B2 ("Characteristics common to the following list of frequencies" and "Transmitting station(s) associated with the list of assigned frequencies below") is taken as data common to the assignments for which the assigned frequencies are listed on the bottom part of that form.

If, for example, there are two groups of frequency assignments (for a given beam), each group having a different set of emission data (designation of emission, total peak power and power density) with all other data remaining constant, two completed AP3/II-B2 forms would be required, one for each group of assigned frequencies. These two forms would then be combined with a single AP3/II-B1 form to provide the complete data for that satellite receiving beam.

In the same way, different associated transmitting earth stations would require separate complete AP3/II-B2 forms if any of the data changed, other than that concerning the station itself (i.e., the data in the box headed "Earth station"). If this data concerning solely the station itself is the only change, all that is necessary is to provide further AP3/II-B2 forms, with the box headed "Earth station" completed, together with the box "More associated transmitting stations on next page" (checked (√) on the preceding AP3/II-B2 form).

The number of AP3/II-B2 forms required for a given beam will thus depend on the complexity of the structure of the assignments and their characteristics, including those of the associated transmitting stations. It should also be noted that additional AP3/II-B1 forms would be required if the data provided in the second part of those forms did not remain constant for all combinations of data provided on the AP3/II-B2 forms.

The above comments are also valid for Forms AP3/II-C1 and AP3/II-C2.

For Form AP3/II-D (when used), the data is to be provided in two lists, with the serial number information allowing for cross-referencing between the two lists. Care in the ordering of the strapping data provided in Table d1 should ensure that the length of the list in Table d2 can be minimized. That is, in Table d1, strapping details should be grouped such that a group applies to one earth station, with one set of values for columns a1/a2 and b1/b2 in Table d2.

The forms in the AP3/III series are to be used when data pertaining to an earth station is to be provided. For any one such application, one Form AP3/III-A would be used, along with as many of the AP3/III-B1, AP3/III-B2, AP3/III-C1 and AP3/III-C2 forms

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necessary to provide all the relevant details for all satellite beams and frequency assignments concerned.

The use of these forms is effectively the same as described above for the AP3/II set of forms.

These forms, in addition to their use to provide data pertaining to a new network or earth station (Forms AP3/II and AP3/III respectively), can also be used to modify or suppress data pertaining to an existing network or station. The relevant indication (ADD, MOD, SUP) is to be given by checking (√) the corresponding box in the top right-hand corner of the first page, in the area titled "Notification intended for". In the case of a modification to an existing station, where certain data fields are to be added, modified or suppressed, *all* the data in the particular box, as they would look after the change, have to be provided. In addition, when the corresponding beam, associated station or assignment is being modified, indicate this by entering "M" in the field that has been provided for this purpose at these levels.

For data items where this flag is *not* provided, when changes are to be notified, provide *all* the data in the box as they would look after the change.

Certain fields on this notice form have a superscript "1" or "2" as part of their labels. These have the following meanings:

- 1) This information is to be provided when used for effecting coordination with another administration. See footnote number 1 to Appendix 3 (ORB-88) for further details.
- 2) This information is not required for the notification of a typical earth station.

Certain information has to be provided in a graphical form by means of an attachment. The presence of such an attachment should be identified by a reference to its figure number in the boxes provided for this purpose on the form. Instructions for presentation of graphical data are given in CPC-2-6-05 *The Presentation of Graphical Data Required under Appendices 3 and 4 of the International Telecommunication Union Radio Regulations*.

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1. Instructions for Completing Form of Notice AP3/II-A

Space Station/Satellite Network

Reference

Date	A date given by the notifying administration for its own use.
Administration serial number	A serial or reference number given by the administration for its own use.
Page 1 of ..	This box is to be used to indicate the total number of pages for this notification, of which this is the first page.
Notifying administration	The country symbol designating the notifying administration and the symbol designating the international satellite system, if appropriate. (See Tables B1 and B2 of the Preface to the International Frequency List (IFL).) If there is no symbol in Table B2 of the Preface to the IFL corresponding to the international satellite system concerned, spell out its name in the box labelled "Remarks", and the Bureau will provide a symbol.
RR1488 Notification	Enter "X" to indicate the reason why the form is being submitted.
RR1060 Request for coordination	Enter "X" to indicate the reason why the form is being submitted.
RR1610 Agreement under Article 14	Enter "X" to indicate the reason why the form is being submitted.
Request for assistance of the Radiocommunication Bureau for RR1060 and/or RR1610	Enter "X" to indicate the reason why the form is being submitted.

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Notification intended for ADD/MOD/SUP	<p>Enter "X" under "ADD" if the notice relates to a new satellite network; otherwise leave blank.</p> <p>Enter "X" under "MOD" if the notice relates to the modification of an existing satellite network; otherwise leave blank.</p> <p>Enter "X" under "SUP" if the notice relates to the suppression of an existing satellite network as a <i>whole</i>; otherwise leave blank.</p> <p>In this context "existing satellite network" means either:</p> <ul style="list-style-type: none">(a) a network for which a Special Section AR11/C has already been published, if the notice forms are forwarded under RR1060 (request for coordination);(b) a network for which a Special Section AR14/C has already been published, if the notice forms are forwarded under RR1610 (agreement under Article 14); or(c) a network for which the relevant details are already recorded in the MIFR if the data is forwarded under RR1488 (notification under Article 13).
First notification	Enter "X" in the case of any notification other than resubmission.
Resubmission	Enter "X" in the case of resubmission of a notice after its return by the Radiocommunication Bureau with an unfavourable finding with respect to coordination or the probability of harmful interference; otherwise leave blank.
Radiocommunication Bureau identification number of network to be modified/suppressed	If "X" is entered in the box under "MOD" or "SUP", enter the identification number of the network to be modified or suppressed. In these cases the administration has to provide all the data specified in Part A in order to confirm the identification of the network.

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A. Characteristics of the Network

1. Name of the space station (identity of the satellite network) Enter the name of the space station using not more than 20 characters.

4. Orbital Information

4a. For Geostationary Satellites Only

- 4a1. Nominal orbital longitude Enter the nominal orbital longitude of the space station expressed in decimal degrees E or W: the value should not exceed 180°.
- 4a2. Longitudinal tolerance Enter the planned longitudinal tolerances in decimal degrees relative to the nominal orbital longitude. Boxes headed "To West" and "To East" should both be completed: they are provided in order to cover cases in which tolerances are not symmetrical.
- 4a3. Inclination excursion Enter the inclination excursion expressed in decimal degrees expected throughout the lifetime of the space station (i.e., the *maximum* angle between the plane containing the orbit and the plane of the Earth's equator).
- 4a4. Visibility arc Enter the extreme west and east longitudinal positions (expressed in decimal degrees) on the geostationary-satellite orbit which are visible from all points in the service area and which are at an elevation angle of 10° from the furthest-removed points within the service area. These two longitudes delineate a portion of the geostationary-satellite orbit arc within which a satellite will always have an angle of wave arrival on the earth's surface of $\geq 10^\circ$ and can thus, from a propagation point of view, provide an adequate quality of service to the area. In some cases, such as service areas in high altitudes or very large service areas, the visibility arc may be zero, since the service area may include points on the Earth's surface at which the wave arrival angle is less than 10°.

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4a5. Service arc
Enter (expressed in decimal degrees) the longitudes of the western and eastern extremes of the arc of the geostationary-satellite orbit within which the space station could provide the required service to all its associated earth stations in the service area(s).

Reason for service arc being less than visibility arc

Provision of this attachment is obligatory if the assignment is to a space station on board a geostationary satellite operating with earth stations, and the service arc (box 4a5) is less than the visibility arc (box 4a4). If the attachment is provided, enter its number in the box, and provide the reasons for which the service arc is less than the visibility arc. This reason may, for example, be one of the following:

- S the space station is on board a satellite together with another space station for which the orbital position was established by a plan or is restricted by other conditions;
- S the design of the space station antenna system is too complex to permit large variations in the satellite position;
- S time of day of the satellite eclipse is important; or
- S specific propagation conditions may require a higher arrival angle of the signal at the earth station.

4b. For Non-Geostationary Satellites Only

4b1. Inclination angle
Enter the acute angle (expressed in decimal degrees) of the inclination of the orbital plane relative to the equatorial plane of the earth.

4b2. Period
Enter the time elapsing between two consecutive passages of the satellite through a characteristic point on its orbit expressed in days and hours (symbol D), or in hours and minutes (symbol H). (See RR178.)

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4b3.	Apogee	Enter the relevant altitude of the apogee (4b3) or perigee (4b4), expressed in kilometres above a specified reference surface serving to represent the surface of the Earth or of the reference celestial body. (See RR179.)
4b4.	Perigee	
4b5.	Reference body	Leave this blank if the attracting celestial body which primarily determines the motion of the satellite is the Earth; otherwise indicate the body concerned, using symbols: L for Moon J for Jupiter M for Mars V for Venus S for Sun Indicate any other celestial body by describing the body in the box headed "Remarks", making reference to box 4b5.
4b6.	Number of satellite s	Enter the total number of satellites having the same radio frequency characteristics and the same notified orbital characteristics being used for the given service.

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2. Instructions for Completing Form of Notice AP3/II-B1

B. Satellite Network Characteristics for Reception at the Space Station

Separate forms are to be used for each beam. Each of these forms (AP3/II-B1) has to be complemented by the relevant information on Form AP3/II-B2.

Page .. of .. The page number of this page, with the total number of pages of the Form of Notice. (The latter corresponds to that provided on Form AP3/II-A.) As Form AP3/II-A is page 1, the first of the AP3/II-B1 forms will be page 2.

Satellite Receiving Antenna Beam Details

Characteristics of the Beam

ADD/MOD/SUP of the beam	Enter "A", "M" or "S" for an addition, modification or suppression, as appropriate.
1. Receiving beam designation	<p>If the assignment is to a space station on board a geostationary satellite, enter the receiving beam designation, using a symbol consisting of up to three characters. For practical reasons, there are different approaches to beam designation. The symbol may consist of:</p> <ul style="list-style-type: none">(a) numbers such as 1, 2 and 3, which refer to the number of the figure representing the corresponding antenna gain contour published in the relevant Special Section;(b) numbers such as 195, which identify a beam having a maximum gain of 19.5 dB; or(c) a symbol of up to three letters (or a letter and a figure), which is used to represent the abbreviated beam name, such as G for global, NWQ for North West Quadrant, WH for West Hemisphere, Z1 for zone 1, or O for omnidirectional.

For steerable beams, the last character shall always be the letter "R".

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Old beam
designation
(if changed)

If the receiving beam designation is
changed, indicate the old beam
designation.

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6. Antenna Characteristics

- c1/d1/f1. Maximum isotropic gain Enter the appropriate sign (+ or -), followed by the isotropic gain (G_i : see RR154) of the antenna in the direction of maximum radiation, expressed in dBi.
- h. Pointing accuracy If the assignments associated with this beam are to a space station on board a geostationary satellite, enter the maximum antenna deviation expressed in decimal degrees relative to the nominal pointing direction; otherwise leave blank.
- g. Polarization¹ If the assignments associated with this beam are to a space station on board a geostationary satellite and polarization discrimination was used as a basis to effect coordination with another administration, enter the symbol for the type of polarization (see symbols for the type of polarization in Table 9D1 of the Preface to the IFL).

¹ This information is to be provided when used for effecting coordination with another administration. See footnote number 1 to Appendix 3 (ORB-88) for further details.

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c2/d2. Antenna gain contours diagram attached. See Figure No.	Provision of this attachment is obligatory if the assignments associated with this beam are to a space station on board a geostationary satellite which is operating with earth stations. Enter a figure number indicating the presence of such an attachment and on this attachment indicate the designation of the satellite beam, the maximum isotropic antenna gain and the gain contours plotted on a map of all the Earth's surface visible from the satellite, preferably in a radial projection from the satellite onto a plane perpendicular to the axis from the centre of the Earth to the satellite. The contours which correspond to a gain of 2, 4, 6, 10 and 20 dB below the maximum isotropic gain, and at 10 dB intervals thereafter as necessary, are also to be indicated. Whenever possible in the case of circular or elliptical contours, the gain contours of the space station antenna should also be provided by a set of equations. The gain contours should take into account the antenna pointing error so that the worst-case interference situation may be identified. If the error is not included it should be so specified. This attachment can also be used to convey information about service area(s). The antenna gain contours diagram can be replaced by a statement indicating that the maximum antenna gain varies by less than 2 dB over the whole visible part of the Earth.
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e/f2. Antenna radiation pattern diagram attached .	Provision of this attachment is obligatory if the assignments associated with this beam are to a space station on board a geostationary satellite and the antenna beam is directed towards another satellite, or if it is to a space station on board a non-geostationary satellite. If the attachment is provided, enter a figure number indicating its presence. Define the antenna radiation pattern by means of a table, a diagram or a set of equations giving the isotropic gain in dBi as a function of the angular separation in all directions from the maximum beam axis. A basic distinction in presenting this data should be made regarding the maximum isotropic antenna gain and the side-lobe radiation. For high gain antennas, sufficient data (say in steps of 0.1 degree) should be provided for off-axis angles less than 1 degree, whereas, for off-axis angles greater than 50 degrees, the radiation pattern is rather flat, and a much lower definition could suffice. On the other hand, for low gain antennas, less data is necessary around 1 degree, and more data may be needed for the region of off-axis angle greater than 40 degrees. In general, the radiation pattern is assumed to be rotationally symmetrical and should be an envelope of peaks for all 360 degrees in a plane; however, some antennas are designed with nulls in predetermined directions in order to reduce interference and this should also be indicated with sufficient clarity and identification of the plane. If available, indicate the actual measured radiation pattern (relative to isotropic), rather than the reference radiation pattern. For rotationally non-symmetrical patterns, the diagram should be presented for the most important directions, such as that of the geostationary-satellite orbit.
See Figure No.	

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i. Estimated antenna gain diagram vs orbit longitude attached. See Figure No.

Provision of this attachment is obligatory if the assignments associated with this beam are to a space station on board a geostationary satellite and in a frequency band allocated for bi-directional use (i.e., Earth-to-space and space-to-Earth). If the attachment is provided, enter a figure number indicating its presence. The information to be provided is the estimated isotropic antenna gain in dBi towards the geostationary-satellite orbit, in directions which are not obstructed by the Earth, by means of a table or diagram of antenna gain against orbit longitude from 0 to 360 degrees. Instructions for the presentation of graphical data are given in CPC-2-6-05 *The Presentation of Graphical Data Required under Appendices 3 and 4 of the International Telecommunication Union Radio Regulations.*

Information Common to the Following Lists of Assigned Frequencies in this Beam

A2.Date of bringing into use

(a) In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) on which the frequency assignment will be brought into use.

(b) Whenever the assignment is changed in any of its basic characteristics (except in the case of a change in the name of the space station), the date to be indicated shall be that of the latest change (actual or foreseen, as appropriate). Indicate the day, month and year, in that order, using two digits for each.

Period of validity

If the assignments associated with this beam are to a space station on board a geostationary satellite, enter the period of validity of the assignment expressed in years (see Resolution No. 4 of WARC-79); otherwise leave blank.

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A3a. Operating agency or company	Using symbols from Table No. 12A/12B of the Preface to the IFL, indicate the operating agency or company and the postal and telegraphic addresses of the administration to which communications should be sent on urgent matters regarding interference, quality of emissions, and matters relating to the technical operation of stations. (See Article 22 of the <i>Radio Regulations</i> .) If there is no symbol in Table 12A/12B of the Preface to the IFL corresponding to the administration or agency concerned, spell out the name in the box headed "Remarks" referring to Box A3a or A3b as applicable, and the Radiocommunication Bureau will provide a symbol.
A3b. Administration responsible for the station	
15d. Special Section AR11/A/---- (RR1042)	Enter the number of the Special Section of the weekly Circular in which the advance information was published under Section I of Article 11.
15e. Special Section AR11/C/---- (RR1060)	Enter the number of the Special Section of the weekly Circular in which the coordination information was published under Section II of Article 11; leave blank if the space station does not belong to a geostationary-satellite network or if such publication has not taken place.
15f. Special Section Art. 14 (RR1610)	Enter the number of the Special Section of the weekly Circular in which the request for agreement under Article 14 was published; leave blank if such publication has not taken place.
Other Special Sections	Enter the reference and the number of the Special Section of the weekly Circular in which any other request for coordination was published; leave blank if such publication has not taken place. (See paragraph 2 of Section II of the Preface to the IFL.)
A5/A6. Coordinated with or agreement reached with	Note that coordination under RR1060 is required only if the space station concerned belongs to a geostationary-satellite network. Enter the provisions under which coordination has been successfully completed, or agreement reached, and the country or geographical area symbols (see Table B1 of the Preface to the IFL), indicating the country or countries concerned. Leave one blank space between country symbols.

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A5/A6.
Coordination
requested with; or
agreement sought
with

Enter the provisions under which coordination has been requested or agreement sought and the country or geographical area symbols (see Table B1 of the Preface to the IFL), indicating the country or countries concerned. Leave one blank space between country symbols.

15h. Remarks

This box should be used to supply any other information or remark which the notifying administration considers useful and which is not contained on the form itself or in an attachment thereto.

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3. Instructions for Completing Form of Notice AP3/II-B2

B. Satellite Network Characteristics for Reception at the Space Station

For a given beam you may provide one or more lists of assigned frequencies, each list having one set of common characteristics. The top part of this page contains common data that is applicable to the list of frequencies on the bottom part of this page. For each list of frequencies in this beam, first fill in the set of common characteristics, including all the associated earth (or space) stations and their emissions, followed by the list of frequencies to which the set applies. Use as many pages as necessary.

Receiving beam designation	Repeat the beam designation given in box 1 of Form AP3/II-B1.
Page .. of ..	The page number of this page, together with the total number of pages of the Form of Notice. (The latter corresponds to that provided on Form AP3/II-A.)

Characteristics Common to the Following List of Assigned Frequencies

5a. Class of station	Indicate the appropriate class of station and the nature of service, using the symbols given in Tables 6A1 and 6B1 respectively of the Preface to the IFL. 5b information is a basic characteristic only for stations of the fixed-satellite and mobile-satellite services.
5b. Nature of service	
4. Assigned frequency band (kHz)	Enter the bandwidth of the assigned frequency band as defined in RR141, expressed in kHz. The assigned frequency band should in no case exceed the bandwidth of a single satellite transponder.
7. Receiving system noise temperature (kelvins)	Enter the total receiving system noise temperature expressed in kelvins, referred to the output of the space station receiving antenna.

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2a. Service area; or
Service area
diagram attached.
See Figure No.

The service area can be defined either by using country symbols or geographical area symbols (see Table B1 of the Preface to the IFL), or graphically on the service area diagram in an attachment. If an attachment is provided, enter a figure number indicating the presence of the attachment. A graphical presentation of the service area can be provided on the same diagram as the antenna gain contours; in this case, the figure number would be the same for both applications. Leave blank where the assignment is to a space station operating as a space-to-space relay.

Transmitting Station(s) Associated with the List of Assigned Frequencies Below

Emissions of the Associated Transmitting Station(s)

11a. Designation of emission

Indicate the necessary bandwidth (RR146) and class of emission (RR133) in accordance with Article 4 and Appendix 6 of the *Radio Regulations*.

12b1. Total peak power

Enter the appropriate sign (+ or -) and the value of the total peak envelope power (RR151) expressed in dBW for the corresponding emission.

12b2. Maximum power density

Enter the appropriate sign (+ or -) followed by the value of the maximum power density per Hertz (expressed in dBW/Hz) supplied to the input of the antenna averaged over the worst 4 kHz band for carriers below 15 GHz, or averaged over the worst 1 MHz band for carriers above 15 GHz. For narrow-band carriers with a necessary bandwidth (RR146) less than the reference bandwidth, the peak power should be averaged over the reference bandwidth (4 kHz or 1 MHz) to obtain this value of maximum power density. The most recent version of CCIR Report 792 should be used to the extent applicable in calculating the maximum power density per Hertz.

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Earth Station

(The following information is required if the associated stations are earth stations.)

ADD/MOD/SUP of the station	Enter "A", "M" or "S", for an addition, modification or suppression of the associated earth station, as appropriate.
8c1. Earth station name	Enter the name of the locality by which the transmitting earth station is known or in which it is located, using not more than 20 characters; see Table 4A1 of the Preface to the IFL for standard abbreviations. If an earth station uses more than one antenna, the station name should be supplemented by a number (e.g., 1, 2 or 3) to distinguish one antenna from another. If the plan is for the satellite system to comprise groups of earth stations (each group having different characteristics), a typical earth station corresponding to each such group has to be the subject of a separate page and should be identified by separate designations in box 8c1.
Country ²	Indicate the country in which the station is located using the appropriate symbol given in Table B1 of the Preface to the IFL.
8. Type of station (Typical/Specific)	Enter "T" or "S" for a typical or specific station, as appropriate.
8c2. Geographical coordinates ²	Indicate the geographical coordinates (in degrees and minutes) of the transmitter site.
9a. Class of station	Indicate the appropriate class of station and the nature of service, using the symbols given in Tables 6A1 and 6B1 respectively of the Preface to the IFL. 9b information is a basic characteristic only for stations of the fixed-satellite and mobile-satellite services.
9b. Nature of service	

² This information is not required for the notification of a typical earth station.

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10. Antenna Characteristics

- 10a. Maximum isotropic gain Enter the appropriate sign (+ or -) followed by the isotropic gain (G_i : see RR154) of the antenna in the direction of maximum radiation, expressed in dBi.
- 10b. Beamwidth Enter the total beamwidth at the mean half-power points of the main lobe, expressed in decimal degrees. Describe in detail in Attachment 10c1, if not symmetrical.
- 10c1. Antenna radiation diagram attached.
 See Figure No. If a reference radiation pattern cannot be indicated by one of the symbols in 10c2, or the measured radiation diagram of the antenna is available, give the relevant information in an attachment. If an attachment is provided, enter a figure number indicating its presence.

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10c2. Radiation pattern

Indicate the reference radiation pattern, preferably by means of the following symbols or similar symbols not exceeding 12 characters.

Symbol	Description of the radiation pattern
REC-465	Current version of CCIR Recommendation 465: "Reference earth station radiation pattern for use in interference assessment in frequency range from 2 to about 30 GHz."
REC-580	Current version of CCIR Recommendation 580: "Radiation diagrams for use as design objectives for antennas of earth stations operating with geostationary satellites."
AP28	Point 4, Annex II to Appendix 28. Note: This radiation diagram is identical to that in Annex III to Appendix 29.
29-25LOG(FI)	Represents a reference radiation pattern similar to that in CCIR Recommendation 465, with side-lobe radiation reduced by 3 dB.
27-25LOG(FI)	As above, with side-lobe radiation reduced by 5 dB.
ND	Quasi-omnidirectional radiation pattern, with the maximum isotropic gain stated in 9a.

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Space Station

(The following information is required if the associated stations are space stations.)

ADD/MOD/SUP of the station	Enter "A", "M" or "S", for an addition, modification or suppression of the associated space station, as appropriate.
8a. Space station name	Define the associated transmitting space station with which communication is to be established by providing its name if it is on board a geostationary satellite or by providing the name of the system to which it belongs if it is on board a non-geostationary satellite.
Transmitting beam designation	If the associated transmitting space station is on board a geostationary satellite, enter its transmitting beam designation, using a three-character code.
8. Type of station (Geo/Non-geo)	Enter "G" or "N" for geostationary or non-geostationary space station, as appropriate.

List of Assigned Frequencies Having the Above Common Characteristics

ADD/MOD/SUP of the frequency assignment	If, in the context of a modification to data pertaining to the station, a frequency assignment is to be added, modified or suppressed, enter "A", "M" or "S" as appropriate.
3. Assigned frequency	Enter the assigned frequency as defined in RR142, expressed in kHz up to 28 000 kHz inclusive, in MHz above 28 000 kHz to 10 500 MHz inclusive, and in GHz above 10 500 MHz, and enter the letter "K", "M" or "G", as appropriate.
Radiocommunication Bureau identification number for modification/ suppression of a frequency assignment	If a box ADD/MOD/SUP of the frequency assignment contains an "M" or "S", enter the radiocommunication Bureau identification number of the assignment to be modified or suppressed, as appropriate.

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4. Instructions for Completing Forms of Notice AP3/II-C1 and -C2

C. Satellite Network Characteristics for Transmission from the Space Station

The information to be entered is essentially the same as that in Forms AP3/II-B1 and -B2, but it applies to characteristics for transmission at the space station. For the relevant explanations, see sections 2 and 3 of this publication, with the following addition on Form AP3/II-C2:

Earth Station

13. Receiving
system
noise
temperature

Enter the value of the lowest total receiving system noise temperature expressed in kelvins, at the output of the earth station antenna under clear conditions. This value shall be indicated for the nominal value of the angle of elevation when the associated transmitting station is aboard a geostationary satellite and, in other cases, for the minimum value of angle of elevation.

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5. Instructions for Completing Form of Notice AP3/II-D

D. Overall Link Characteristics

The overall link characteristics are required only for frequency assignments to geostationary space stations using simple frequency-changing transponders and operating with earth stations.

Table d1 indicates per line the strapping (connection) between the uplink and downlink frequency assignments for each intended combination of receiving and transmitting beams of the space station. The serial number is to be used to relate each strapping with the following relevant information per line in Table d2 for each associated receiving earth station whose name or designation is to be entered in the last column:

- a1 Lowest equivalent satellite link noise temperature, in kelvins;
- a2 Transmission gain (γ), in dB, associated with the value in a1;
- b1 Equivalent satellite link noise temperature, in kelvins, that corresponds to the highest ratio of transmission gain (γ) to equivalent satellite link noise temperature;
- b2 Transmission gain (γ), in dB, associated with the value in b1.

Associated earth station name See 10c1 on Form AP3/II-C2.

When the above values in Table d2 apply to several strappings in Table d1, the reference to serial number(s), is to be given by means of a range of serial numbers.

Where a modification is to be made to the overall link characteristics (in which case the box labelled "Notification intended for ADD/MOD/SUP" on page AP3/II-A should contain the indication "MOD"), the relevant indication is to be given in the box labelled "ADD/SUP of the Strap" as follows:

- (i) if a new strap is to be added, enter the symbol "A" in the box "ADD/SUP of the Strap" and provide all the details of the new strap;
- (ii) if an existing strap is to be suppressed, enter the symbol "S" in the box "ADD/SUP of the Strap" and provide sufficient details to uniquely identify the strap concerned. This would mean, for any one strap, that at least the values of the uplink beam and the downlink beam designations as well as the uplink assigned frequency and the downlink assigned frequency are to be provided. When this link to be suppressed is used by more than one associated receiving earth station, it is necessary to also provide the name of the particular associated earth station if only the strap pertaining to *this* station is to be suppressed; otherwise it will be assumed that the suppression of the strap applies to all of the associated receiving earth stations;

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- (iii) if an existing strap is to be modified, it is necessary to proceed by suppressing the existing version of the strap record (see (ii) above) and by adding the new version of the strap record (see (i) above).

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6. Instructions for Completing Form of Notice AP3/III-A

Earth Station

Date	A date given by the notifying administration for its own use.
Administration Serial Number	A serial or reference number given by the notifying administration for its own use.
Page 1 of ..	This box is to be used to indicate the total number of pages for this notification, of which this is the first page.
Notifying administration	The country symbol designating the notifying administration (see Table B1 of the Preface to the IFL).
RR1488 Notification	Enter "X" to indicate the reason why the form is being submitted.
RR1107 Request for coordination	Enter "X" to indicate the reason why the form is being submitted.
RR1610 Agreement under Article 14	Enter "X" to indicate the reason why the form is being submitted.
Request for assistance of the Radiocommunication Bureau for RR1107 and/or RR1610	Enter "X" to indicate the reason why the form is being submitted.
Notification intended for ADD/MOD/SUP	Enter "X" under ADD if the notice relates to a new station; otherwise leave blank. Enter "X" under MOD if the notice relates to the modification of an existing station; otherwise leave blank. Enter "X" under SUP if the notice relates to the suppression of an existing station as a <i>whole</i> ; otherwise leave blank. In this context "existing station" means either: (a) a station for which data has already been submitted to the Radiocommunication Bureau, if the notice forms are forwarded under RR1107 (request for coordination); (b) a station for which a Special Section AR14/C has already been published, if the notice forms are forwarded under RR1610 (agreement under Article 14); or (c) a station for which the relevant details are already recorded in the Master International Frequency Register if the data is already forwarded under RR1488 (notification under Article 13).

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First notification	Enter "X" in the case of any notification other than resubmission.
Resubmission	Enter "X" in the case of resubmission of a notice after its return by the Radiocommunication Bureau with an unfavourable finding with respect to coordination or the probability of harmful interference; otherwise leave blank.
Radiocommunication Bureau identification no. of the station to be modified/suppressed	If an "X" is entered in the box under "MOD" or "SUP", enter the identification number of the station to be modified or suppressed. In these cases the administration has to provide all the data specified in Part A in order to confirm the identification of the station.

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A. Characteristics of the Earth Station

- 1a. Type (Specific/
Typical) Enter "T" or "S" for typical or specific station, as appropriate.
- 1aa. Name of the earth station Enter the name of the locality by which the earth station is known or in which it is located, using not more than 20 characters; see Table 4A1 of the Preface to the IFL for standard abbreviations. If an earth station uses more than one antenna, the station name should be supplemented by a number (e.g., 1, 2 or 3) to distinguish one antenna from another. If the plan is for the satellite system to comprise groups of earth stations (each group having different characteristics), a typical earth station corresponding to each such group has to be the subject of a separate notice and should be identified by separate designations in Box 1aa.
- 1b. Country³ Indicate the country in which the station is located using the appropriate symbol given in Table B1 of the Preface to the IFL.
- 1c. Geographical coordinates³ Indicate the geographical coordinates of each transmitting and receiving antenna site comprising the earth station (longitude and latitude in degrees and minutes). Indicate also the seconds⁴ with an accuracy of one tenth of a minute.
- 5a. Associated space station Indicate the name of the associated space station with which communication is to be established.
- 5b. Nominal orbital longitude (if geostationary) If the associated space station with which communication is to be established is on board a geostationary satellite, enter the nominal longitude of the orbital position of that satellite expressed in decimal degrees E or W (the value should not exceed 180°); otherwise leave blank.

³ This information is not required for the notification of a typical earth station.

⁴ This information need only be furnished if the coordination area of the earth station overlaps the territory of another administration.

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B5d/C7d. Horizon elevation diagram attached ⁵ See Figure No.	Enter a figure number on the diagram indicating the horizon elevation angle for each azimuth around the earth station; the horizon elevation angle is the angle viewed from the centre of the earth station antenna between the horizontal plane and a ray that grazes the visible physical horizon in the direction concerned. Instructions for presentation of graphical data are given in CPC-2-6-05 <i>The Presentation of Graphical Data Required under Appendices 3 and 4 of the International Telecommunication Union Radio Regulations</i> .
B5e/C7e. Elevation angle ⁵	Enter the planned minimum operating angle of elevation of the antenna in the direction of maximum radiation towards the associated space station, expressed in decimal degrees from the horizontal plane. ⁶
B5f/C7f. Operating azimuthal angles ⁵	Enter the planned range of operating azimuthal angles for the direction of maximum radiation, each value expressed in decimal degrees clockwise from True North. ⁶
B5h/C7h. Altitude ⁵	Enter the height of the centre of the antenna above mean sea level, expressed in metres.

⁵ This information is not required for the notification of a typical earth station.

⁶ In the case of a geostationary-satellite network, these angles are to be calculated for the nominal orbital longitude, taking into account the tolerances.

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7. Instructions for Completing Form of Notice AP3/III-B1

B. Transmitting Earth Station Characteristics

Page .. of .. The page number of this page, together with the total number of pages of the Form of Notice. (The latter corresponds to that provided on Form AP3/III-A.) As Form AP3/III-A is page 1, the first of the AP3/III-B1 forms will be page 2.

Characteristics of the Antenna

Separate forms are to be used for each associated satellite receiving beam designation. Each of these forms (AP3/III-B1 and -B2) has to be complemented by the relevant information on Forms AP3/III-C1 and -C2.

1. Associated satellite receiving beam designation

If the associated space station is on board a geostationary satellite, enter the receiving beam designation, using a symbol consisting of up to three characters. For practical reasons, there are different approaches to beam designation. The symbol may consist of:

 - (a) numbers such as 1, 2 and 3, which refer to the number of the figure representing the corresponding antenna gain contour published in the relevant Special Section;
 - (b) numbers such as 195, which identify a beam having maximum gain of 19.5 dB; or
 - (c) a symbol of up to three letters (or a letter and a figure), used to represent the abbreviated beam name, such as G for global, NWQ for North West Quadrant, WH for West Hemisphere, Z1 for zone 1, or O for omnidirectional.

For steerable beams, the last character shall always be the letter "R". Leave blank for non- geostationary satellites.

Old beam designation (if changed) If the receiving beam designation is changed, indicate the old beam designation.

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5. Earth Station Antenna Characteristics

5a. Maximum isotropic gain	Enter the appropriate sign (+ or -) followed by the isotropic gain (G_i : see RR154) of the antenna in the direction of maximum radiation, expressed in dBi.
5b. Beamwidth	Enter the total beamwidth at the mean half-power points of the main lobe, expressed in decimal degrees. Describe in detail in Attachment 5c1, if not symmetrical.
5g. Polarization ⁷	If the associated space station is on board a geostationary satellite and polarization discrimination was used for effecting coordination with another administration, enter the symbol for the type of polarization. See symbols for the type of polarization in Table 9D1 of the Preface to the IFL.
5c1. Antenna radiation pattern diagram attached. See Figure No.	If the reference radiation pattern cannot be indicated by one of the symbols in 5c2, or the measured radiation diagram of the antenna is available, give the relevant information in an attachment. If an attachment is provided, enter a figure number indicating its presence.

⁷ This information is to be provided when used for effecting coordination with another administration. See footnote number 1 to Appendix 3 (ORB-88) for further details.

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5c2.Radiation pattern

Indicate the reference radiation pattern, preferably by means of the following symbols or similar symbols not exceeding 12 characters.

Symbol	Description of the radiation pattern
REC-465	Current version of CCIR Recommendation 465: "Reference earth station radiation pattern for use in coordination and interference assessment in frequency range from 2 to above 30 GHz."
REC-580	Current version of CCIR Recommendation 580: "Radiation diagrams for use as design objectives for antennas of earth stations operating with geostationary satellites."
AP28	Point 4, Annex II of Appendix 28. Note: This radiation diagram is identical to that in Annex III to Appendix 29.
29-25LOG(FI)	Represents a reference radiation pattern similar to that in CCIR Recommendation 465, with side-lobe radiation reduced by 3 dB.
27-25LOG(FI)	As above, with side-lobe radiation reduced by 5 dB.
ND	Quasi-omnidirectional radiation pattern, with the maximum isotropic gain stated in 5a.

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Information Common to the Following Lists of Assigned Frequencies of this Antenna

- | | | | |
|------|---|-----|---|
| A2. | Date of bringing into use | (a) | In the case of a new assignment, indicate the date (actual or foreseen, as appropriate) on which the frequency assignment will be brought into use. |
| | | (b) | Whenever the assignment is changed in any of its basic characteristics (except in the case of a change in the name of the space station), the date to be indicated shall be that of the latest change (actual or foreseen, as appropriate). Indicate the day, month and year, in that order, using two digits for each. |
| A3a. | Operating agency or company | | Using symbols from Table 12A/12B of the Preface to the IFL, indicate the operating agency or company and the postal and telegraphic addresses of the administration to which communications should be sent on urgent matters regarding interference, quality of emissions, and matters relating to the technical operation of stations (see Article 22 of the <i>Radio Regulations</i>). If there is no symbol in Table 12A/12B of the Preface to the IFL corresponding to the administration or agency concerned, spell out the name in the box headed "Remarks" referring to Box A3a or A3b as applicable, and the Bureau will provide a symbol. |
| A3b. | Administration responsible for the station | | |
| I5d. | Special Section AR11/A/--
--
(RR1042) | | Enter the number of the Special Section of the weekly Circular in which the advance information was published under Section I of Article 11. |
| 15e. | Special Section AR11/C/--
--
(RR1060) | | Enter the number of the Special Section of the weekly Circular in which the coordination information was published under Section II of Article 11; leave blank if the space station does not belong to a geostationary-satellite network or if such publication has not taken place. |

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15f.	Special Section Art. 14 (RR1610)	Enter the number of the Special Section of the weekly Circular in which the request for agreement was published. Leave blank if such publication has not taken place.
	Other Special Sections	Enter the reference and the number of the Special Section of the weekly Circular in which any other request for coordination was published. Leave blank if such publication has not taken place. (See paragraph 2 of Section II of the Preface to the IFL.)
A6.	Coordinated with; or	Note that coordination under RR1060 is required only if the space station concerned belongs to a geostationary-satellite network. Enter the provisions under which coordination has been successfully completed or an agreement reached and the country or geographical area symbols (see Table B1 of the Preface to the IFL) indicating the country or countries concerned. Leave one blank space between country symbols.
A7.	Agreement reached with	
A6.	Coordination requested with; or	Enter the provisions under which coordination has been requested or an agreement sought and the country or geographical area symbols (see Table B1 of the Preface to the IFL) indicating the country or countries concerned. Leave one blank space between country symbols.
A7.	Agreement sought with	
15h.	Remarks	This box should be used to supply any other information or remark which the notifying administration considers useful and which is not contained on the form itself or in an attachment thereto.

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8. Instructions for Completing Form of Notice AP3/III-B2

B. Transmitting Earth Station Characteristics

For a given satellite receiving beam, you may provide one or more lists of assigned frequencies, each list having one set of common characteristics. The top part of this page contains common data that is applicable to the list of frequencies on the bottom part of this page. For each list of frequencies in this beam, first fill in the set of common characteristics, followed by the list of frequencies to which the set applies. Use as many pages as necessary.

Satellite receiving beam designation Repeat the beam designation given in Box 1 of Form AP3/III-B1.

Page .. of .. The page number of this page together with the total number of pages of the Form of Notice. (The latter corresponds to that provided on Form AP3/III-A.)

Characteristics Common to the Following List of Assigned Frequencies

- | | | |
|------|-------------------------------|--|
| A4a. | Class of station | Indicate the appropriate class of station and the nature of service, using the symbols given in Tables 6A1 and 6B1 respectively of the Preface to the IFL. |
| A4b. | Nature of service | A4b information is a basic characteristic only for stations of the fixed-satellite and mobile-satellite services. |
| 3. | Assigned frequency band (kHz) | Enter the bandwidth of the assigned frequency band as defined in RR141, expressed in kHz. The assigned frequency band should in no case exceed the bandwidth of a single associated satellite transponder. |

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Emissions Applicable to the Assigned Frequencies Listed Below

- | | | |
|------|-------------------------|--|
| 4a. | Designation of emission | Indicate the necessary bandwidth (RR146) and class of emission (RR133) in accordance with Article 4 and Appendix 6 of the <i>Radio Regulations</i> . |
| 6b1. | Total peak power | Enter the appropriate sign (+ or -) and the value of the total peak envelope power (RR151) expressed in dBW for the corresponding emission. |
| 6b2. | Maximum power density | Enter the appropriate sign (+ or -), followed by the value of the maximum power density per Hertz (expressed in dBW/Hz) supplied to the input of the antenna averaged over the worst 4 kHz band for carriers below 15 GHz, or averaged over the worst 1 MHz band for carriers above 15 GHz. For narrow-band carriers with a necessary bandwidth (RR146) less than the reference bandwidth, the peak power should be averaged over the reference bandwidth (4 kHz or 1 MHz) to obtain this value of maximum power density. The most recent version of CCIR Report 792 should be used to the extent applicable in calculating the maximum power density per Hertz. |

List of Assigned Frequencies Having the Above Common Characteristics

- | | |
|--|--|
| ADD/MOD/SUP of the frequency assignment | If, in the context of a modification to data pertaining to the station, a frequency assignment is to be added, modified or suppressed, enter "A", "M" or "S" as appropriate. |
| 2. Assigned frequency | Enter the assigned frequency as defined in RR142, expressed in kHz up to 28 000 kHz inclusive, in MHz above 28 000 kHz to 10 500 MHz inclusive, and in GHz above 10 500 MHz, and enter letter "K", "M" or "G", as appropriate. |
| Radiocommunication Bureau identification number for modification/suppression | If a box ADD/MOD/SUP of the frequency assignment contains an "M" or "S", enter the Radiocommunication Bureau identification number of the assignment to be modified or suppressed, as appropriate. |

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9. Instructions for Completing Forms of Notice AP3/III-C1 and -C2

C. Receiving Earth Station Characteristics

The information to be entered is essentially the same as that on Forms AP3/III-B1 and B2, but it applies to characteristics for reception at the earth station. For the relevant explanations see sections 7 and 8 of this publication, with the following addition on Form AP3/III-C2:

Characteristics Common to the Following List of Assigned Frequencies

- | | |
|--|--|
| 8a. Receiving system noise temperature (kelvins) | Enter the value of the lowest total receiving system noise temperature expressed in kelvins, at the output of the earth station antenna under clear conditions. When the associated space transmitting station is on board a geostationary satellite, the value to be entered is that for the nominal antenna elevation. |
|--|--|

Emissions Received by the Assigned Frequencies Listed Below

- | | |
|-----------------------------|--|
| 4a. Designation of emission | Indicate the necessary bandwidth (RR146) and class of emission (RR133) in accordance with Article 4 and Appendix 6 of the <i>Radio Regulations</i> . |
|-----------------------------|--|



















