

ANNEX 4

TECHNICAL PROCEDURES FOR CO-ORDINATION

1. INTRODUCTION

The T-DAB Allotment Plan was developed using the concept of test points, T-DAB reference networks and agreements between administrations. Test points along the boundary of each T-DAB allotment area and for other services to be protected were supplied by administrations to the Planning Meeting.

This Annex describes the detailed procedures for:

- converting an allotment into one or more assignments;
- the addition or modification of an allotment.

2. PROCEDURES FOR THE CONVERSION OF AN ALLOTMENT INTO ONE OR MORE ASSIGNMENTS

2.1 General procedures

The following procedures have been determined to enable the implementation of the Plan without undue restrictions.

It is assumed that a T-DAB allotment will be implemented as a set of transmitting stations operating as a single frequency network. The latter is referred to below as a “real network”.

The individual field strength, at any test point, produced by each transmitter of a real network should be determined using the field strength prediction method specified in Section 2 of Annex 2. In the case of potential interference to the aeronautical mobile service, the free space propagation model is to be used, subject to a line of sight condition between transmitter and test point and also subject to a maximum distance of 500 km. The value of the determined individual field strength should be modified, where relevant, by taking account of any receiving antenna discrimination. The cumulative interfering field strength is calculated by the power sum method, with the result rounded to one decimal place as explained below. Only the interference from that allotment being converted into assignments will be taken into account.

The individual field strengths obtained at any test points from all transmitting stations of the T-DAB allotment are processed in decreasing order. The power sum is obtained as follows:

- starting from the highest, the power values equivalent to the interfering field strengths are added, one after the other;
- at each summation, the result is compared to the previous one;
- if the increase in power is greater than or equal to 0.5 dB, the summation process continues;
- if the increase in power would be less than 0.5 dB, the summation process is stopped and 0.5 dB is added, giving the result of the power sum.

In order to provide flexibility for the development of T-DAB services, it is necessary to provide an overall limit for the interference which could be created by a set of T-DAB assignments. In order to do this, a limited number of calculation test points are introduced (see Appendix 1 of this Annex).

To avoid ambiguity, the Plan Management Body will determine the position of the calculation test points for each allotment and distribute them to all administrations, after resolution of potential anomalies in the position of the test points with the relevant administration.

Agreed coastlines are needed for the calculation of the mixed paths and agreed country borders are needed to identify any affected country or countries. The coastline and country border data shall be the ~~current~~ latest version of the ITU Digital World Map (IDWM) versions.

In addition to any constraints arising from the protection requirements detailed in sections 2.2 and 2.3, if the cumulative field strength from the transmitters of the real network exceeds 33.0 dB(μ V/m) for Band III at any of the calculation test points (see Appendix 1), co-ordination is required with those countries:

- touched by a calculation test point at which the cumulative field strength value exceeds 33.0 dB(μ V/m) for Band III; or
- lying along the extension of the line which defines the calculation test point location, to a point at which a field strength value of 33.0 dB(μ V/m) for Band III is reached.

If, with regard to Section 3 in the procedure for the addition or modification of an allotment, values of the maximum permissible cumulative field strengths at the calculation test points lower than 33.0 dB(μ V/m) were notified, then co-ordination is required in the same way as if these values were exceeded.

If an assignment requested to be converted from an allotment exceeds the relevant limits, administrations may seek agreement between each other. If this is not possible, Section 3 can be applied.

2.2 Compatibility of T-DAB with T-DAB

2.2.1 Protection of co-block allotments

At the boundary test points describing any other co-block allotment, the interfering field strength level of 33.0 dB(μ V/m) for Band III must not be exceeded by a real network, unless there are special agreements between the administrations concerned. Such agreements are to be reached by bi-lateral or multi-lateral co-ordination. This value implies that the field strength to be protected becomes 61.0 dB(μ V/m) for Band III on the basis of a protection ratio of 10 dB and a margin of 18 dB (to allow for protection at 99 % of locations).

In the case of allotments or assignments which are co-ordinated after the Wiesbaden Planning Meeting and where the calculation test points of the affected or co-ordinated co-block allotment are located inside the area of the other allotment, there should be notified a record

of the maximum interfering field strength levels at individual test points of the affected and co-ordinated co-block allotments accepted when allotments are converted into assignments.

2.2.2 Protection of adjacent blocks in nearby areas

Co-ordination is needed if the cumulative interfering field strength of the real network is greater than 80 dB(μ V/m), for Band III (when the critical spectrum mask is assumed) at the boundary of any allotment with a frequency block adjacent to that of the allotment being converted to assignments. If the interfering field strength contour of the proposed station crosses the boundary of a nearby adjacent block allotment, it may be necessary to make a visual inspection of the relevant maps and undertake calculations to specify additional test points, taking account of topography.

2.3 Compatibility of T-DAB with Other Services

The cumulative interfering field strength resulting from the real network is to be checked at each boundary test point of the Other Service lying inside a circle with a radius of 500 km, around each boundary test point of the allotment being converted into assignments.

If there is no special agreement on the conditions of use of a T-DAB allotment with regard to the Other Services, the maximum permissible field strength (calculated as stated in Section 4.2.2 of Annex 2) to protect the relevant Other Service is to be observed.

The calculation of the maximum permissible field strength must take into account the field strength value to be protected which is specified in the data used at the planning meeting where this is higher than the default value given in Annex 2 for this Other Service.

Co-ordination is needed if the maximum permissible field strength value is exceeded by the cumulative interfering field strength of the real network at any boundary test point for a given Other Service requirement as described in Section 4.2.2 of Annex 2.

However, a T-DAB allotment in Annex 1 with no asterisk and no other conditions for use can be converted into T-DAB assignments without restrictions provided the cumulative interfering field strength of the real network does not exceed the worst case interfering field strength from a reference network situated at any of the boundary test points of the T-DAB allotment.

If there is a special agreement on the conditions of use of a T-DAB allotment with regard to the Other Services, co-ordination must be undertaken:

- if the agreement specifies that co-ordination is required before conversion of the allotment; or
- if the cumulative interfering field strength from the real network exceeds the agreed value, where such a value is specified in the agreement; or
- in the case where the agreement includes neither requirement for co-ordination nor specific field strength limit for T-DAB,

- if the cumulative interfering field strength of the real network exceeds the worst case interference from a reference network situated at any boundary test point of the T-DAB allotment at any of the boundary test points of the Other Service area, except,
 - for those boundary test points of the Other Service area at which the cumulative interfering field strength does not exceed the maximum permissible field strength value (calculated as stated in Section 4.2.2 of Annex 2);
 - those which lie within a distance of 10 km from the T-DAB allotment, initially approximated by using the boundary test points;
- and also if the cumulative interfering field strength exceeds the value of 30 dB(μ V/m) for Band III at any special calculation test point lying within the Other Service area; these special calculation test points shall be constructed in accordance with Appendix 1 of this Annex, but using everywhere 30 dB(μ V/m) instead of 27 dB(μ V/m) for Band III.

In this last case, at any of these test points, a cumulative interference field strength of the real network shall be accepted if it does not exceed the worst case interfering field strength from a reference network situated at any of the boundary test points of the T-DAB allotment, as this is the implication of an agreement without explicit restrictions.

Furthermore, when considering requests for co-ordination, administrations should note that it is difficult, when planning real networks, to avoid exceeding the field strength from a reference network by small amounts (1 to 2 dB), at a small number of test points. Such cases should be considered in a spirit of co-operation during the co-ordination process.

3. PROCEDURES FOR THE ADDITION OR MODIFICATION OF AN ALLOTMENT

In the application of the procedures given in Article 4, the methods and criteria given in Annex 2 have to be used to determine whether any other administration is affected by a proposal for a new or modified allotment.

Co-ordination is necessary if the allotment would, using the reference network of Annex 2:

- cause field strengths greater than or equal to 27 dB(μ V/m) for Band III at the boundary of any other administration; or,
- with regard to any other services, cause field strengths greater than or equal to the maximum permissible interfering field strengths at the boundary of any other administration.

Co-ordination requests will be dealt with by the Plan Management Body in the order in which they are received, the date of reception of each request being recorded and published with the request.

Where a co-ordination request is submitted before the Plan Management Body publishes a co-ordination request from another administration, and where these two requests are mutually incompatible, they shall have an equivalent status in bilateral negotiations between the administrations concerned.

It is admissible for a requesting administration to include, as given in Annex 3B, the full technical characteristics of the assignments which are intended to be used to serve the allotment area. In such a case, the requesting administration should declare in the co-ordination pro-forma based on Annex 3A, that these assignments are to be used in interference calculations for the co-ordination process, instead of the reference network of Annex 2.

The construction of calculation test points is the same procedure as given in Appendix 1 of this Annex. However, in the case described in the previous paragraph, the calculation test points are situated where the transmitting stations of these assignments create a cumulative field strength of 30 dB(μ V/m) for Band III. If a subsequent conversion of the allotment involves assignments which differ in any respect from those included in the co-ordination of the allotment, then the procedure of Section 2.1 of this Annex shall be applied.

An administration receiving a request for co-ordination of an allotment which is co-block with one of its existing allotments may make agreement to this request conditional on the maintenance of its existing rights of implementation for this existing allotment. The effect of such a condition is that the new allotment would then not have a right of protection from the existing allotment within the contour described by the latter's calculation test points.

The introduction of frequency offsets for T-DAB blocks contained in the Plan is considered as a modification which must be co-ordinated. The relevant co-ordination criteria for T-DAB against T-DAB would have to be agreed upon among the administrations concerned.

The use of frequency offsets for T-DAB blocks relative to the frequencies adopted in the Plan may be considered, for example, for the purpose of:

- a) reducing adjacent block interference;
- b) minimising interference from T-DAB into television.

Such changes involve design implications for T-DAB receivers and the effect of the offsets needs to be co-ordinated between the administrations concerned within the procedures for addition or modification of an allotment. In any event, the number of offset values should be kept to a minimum.

4. GENERAL

The principle of an equitable distribution of frequency resources shall be taken into account, in particular, if co-ordination requests are made for allotments which may have major effects on the T-DAB development plans of other administrations. In this case, the requesting administration should inform the countries affected prior to sending out the co-ordination request. However, in requesting an addition or modification of an allotment, the requesting administration should have a real intention to convert its allotment into one or more assignments within a suitable time period. In addition, it should be recognized that the requirements may vary in nature and detail from country to country. If necessary, administrations may apply the procedure given in paragraph 2.5 of Article 2.

In cases of bi-lateral or multi-lateral agreements, administrations may agree to use different field strength prediction models, e. g. considering topographic elements. Similarly, they may also agree on a programme of measurements to confirm predicted results.

APPENDIX 1

CONSTRUCTION OF CALCULATION TEST POINTS

- 1 The locations of the calculation test points are to be determined using the following procedure.
 - 2 Perpendicular bisectors:
 - calculation test points are located outside the allotment area, along the perpendicular bisector of each of the lines joining adjacent boundary test points, where the field strength from the reference network would be 27.0 dB(μ V/m) for Band III. Examples are point P in Figures 1, points 2, 4, 6, 8, and 14 in Figure 3 and points 1b and 1c in Figure 4.
 - 3 Angular bisectors:
 - further calculation test points are located outside the allotment area, along the bisector of the angle formed by the lines joining each boundary test point with its two adjacent boundary test points, where the field strength from a reference network would be 27.0 dB(μ V/m) for Band III . Examples are point P in Figures 2, points 1, 3, 5, 7, 10 and 13 in Figure 3, points 1a, 2a and 3a in Figure 4 and point 2e in Figure 5.
 - Taking account of the allotment boundary geometry shown in Figures 4 and 5, the following procedures are to be applied:
- 3.1 In the case where $\alpha < 180^\circ$ (see Figure 4):
- additional calculation test points are located outside the allotment area, along the perpendiculars to the lines joining point A to B, and point C to B, where the field strength from the reference network situated at point B would be 27.0 dB(μ V/m)for Band III . Test points 1e and 1d are the result.
 - If the distance between the constructed additional calculation test points 1e and 1d to calculation test point 1a is larger than 75 km (Band III) , additional test points are constructed by subdividing, equally, the sectors from test point 1a to test point 1e and/or test point 1a to test point 1d, to produce additional test points until:
$$\beta < 2 \arcsin(d/2D)$$

where: d is 75 km (Band III) , and

D is either the larger of the distances from point B to test point 1e and point B to test point 1a in the case of the sector from test points 1e to 1a or, the larger of the distances from point B to test point 1d and point B to test point 1a in the case of the sector from test points 1a to 1d.

- The calculation test point on each of these additional lines is at the location where a field strength of 27.0 dB(μ V/m) for Band III is produced from a reference network situated at point B. This leads to calculation test points 1f and 1g in the case of the geometry of Figure 4.

3.2 In the case where $\alpha \geq 180^\circ$ (see Figure 5):

- additional calculation test points are located along the bisector of the angle formed by the lines joining the allotment test points A, B and C outside the allotment area, where the field strength from the reference network would be 27.0 dB(μ V/m) for Band III.
- If the field strength of a reference network at any of the other test points of the allotment produces a higher field strength than that given above, the calculation test point must be moved further outside the allotment area, along the bisector of the angle, until the field strength from a reference network at all test points of the allotment is equal to or less than 27.0 dB(μ V/m) for Band III; this gives calculation test point 2e in Figure 5.

- 4 All calculation test points that lie within the allotment area are to be disregarded, for example point 12 in Figure 3.
- 5 Calculation test points that lie too close to the boundary of the allotment area, such that the field strength from the reference network would be greater than 27.0 dB(μ V/m) for Band III are to be disregarded, for example points 9 and 11 in Figure 3.
- 6 If the length of a line drawn between adjacent calculation test points is more than 75 km (Band III), additional calculation test points are to be constructed by subdividing the line in equal parts until the distance between adjacent calculation test points is less than the values given above.
- 7 If any of the constructed calculation test points of the allotment A is located inside or beyond the allotment area of any other co-block T-DAB allotment B then it shall be moved back along the line being constructed towards the boundary of the co-block allotment until it intersects the contour defined by the boundary test points of the allotment B that faces allotment A. The intersection is to be taken as the required calculation test point of the allotment A.
- 8 Except where there is a co-block T-DAB allotment at a shorter distance, the distance between the allotment boundary and the relevant calculation test point in Band III will be approximately:
 - 120 km for an all land path;
 - 205 km for an all cold sea path;
 - 250 km for an all warm sea path;

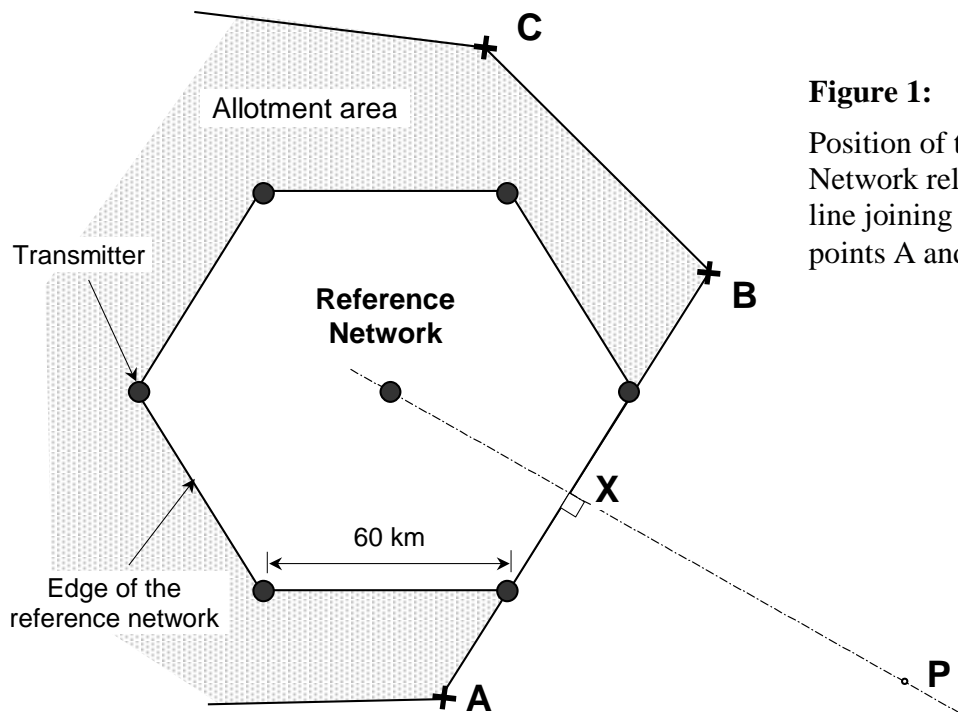


Figure 1:

Position of the Reference Network relative to the line joining boundary test points A and B

Note:

- Points A, B and C are boundary points of the allotment area.
- The point X is the midpoint of the line A-B and is also the reference point of the reference network.
- The line defined by the points X and P is the perpendicular bisector of the line A-B and is also the line along which the interfering field strength is calculated.

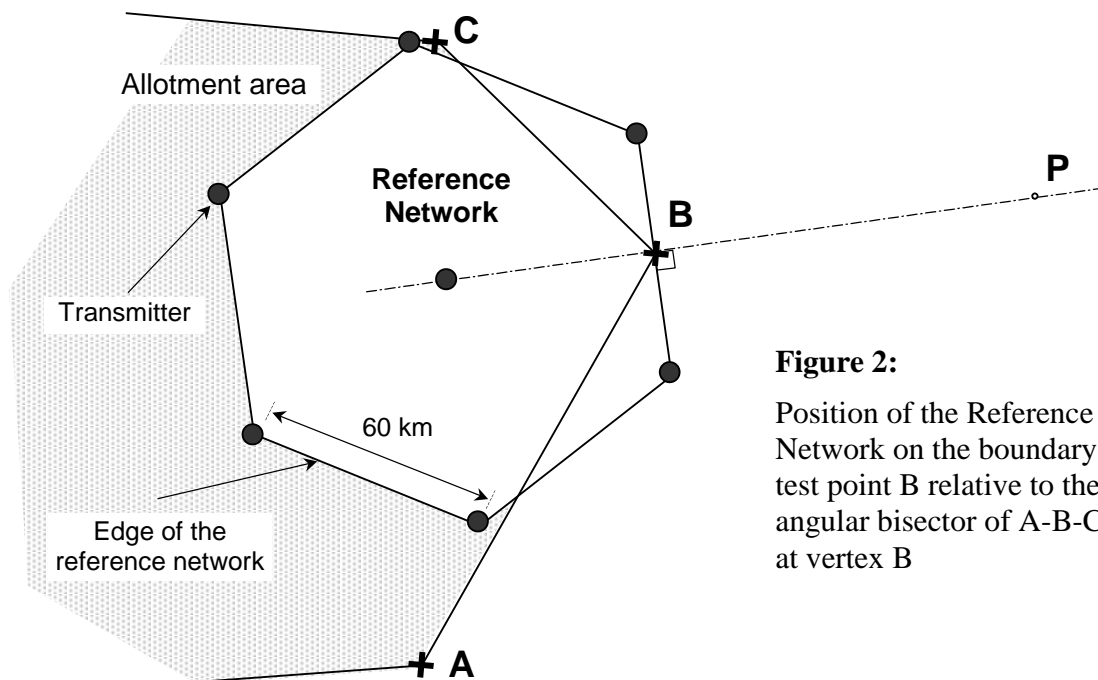


Figure 2:

Position of the Reference Network on the boundary test point B relative to the angular bisector of A-B-C at vertex B

Note:

- Points A, B and C are boundary points of the allotment area.
- The point B is the vertex of the angle A-B-C and is also the reference point of the reference network.
- The line defined by the points B and P is the angle bisector of angle A-B-C and is also the line along which the interfering field strength is calculated.

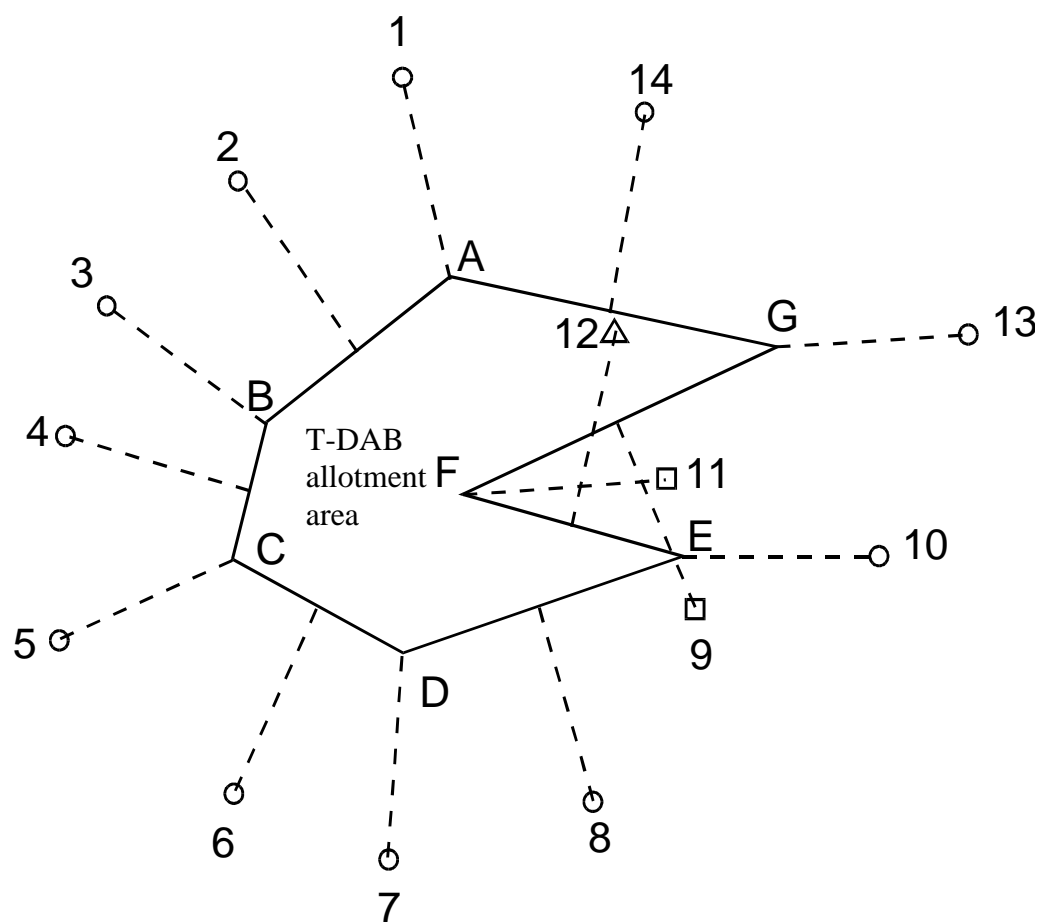


Figure 3: Location of the calculation test points

Note 1: Points A to G are the boundary test points of the allotment

Note 2: Points 1 to 14, excluding points 9, 11 and 12, are calculation test points

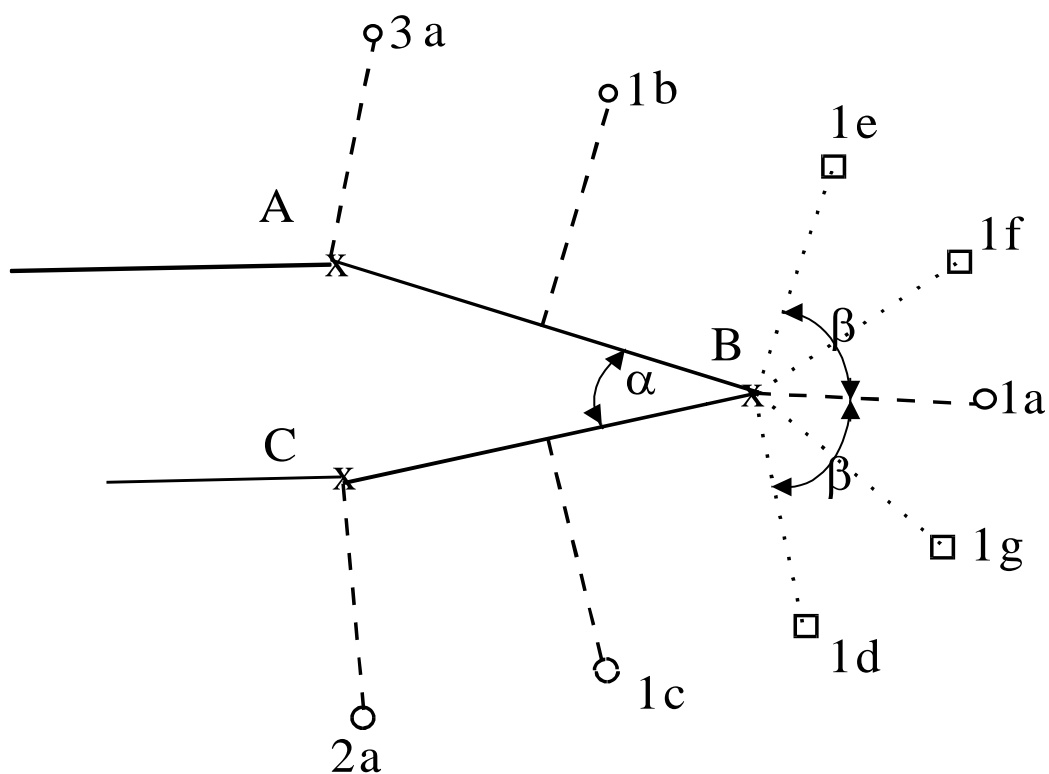


Figure 4: Construction of additional calculation test points if $\alpha < 180^\circ$ (see Note below)

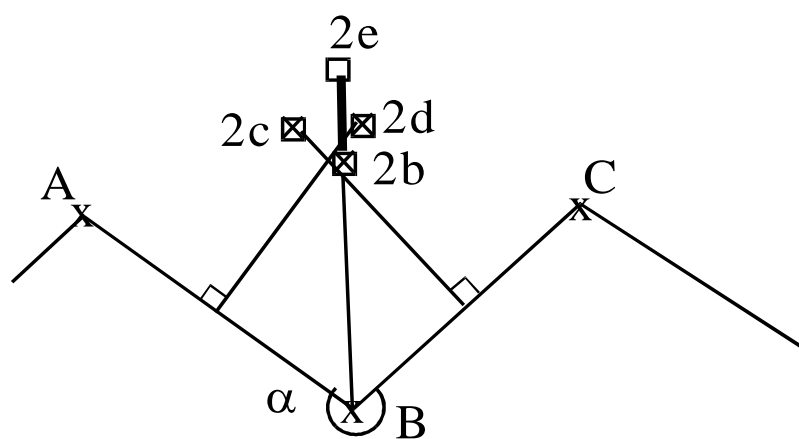
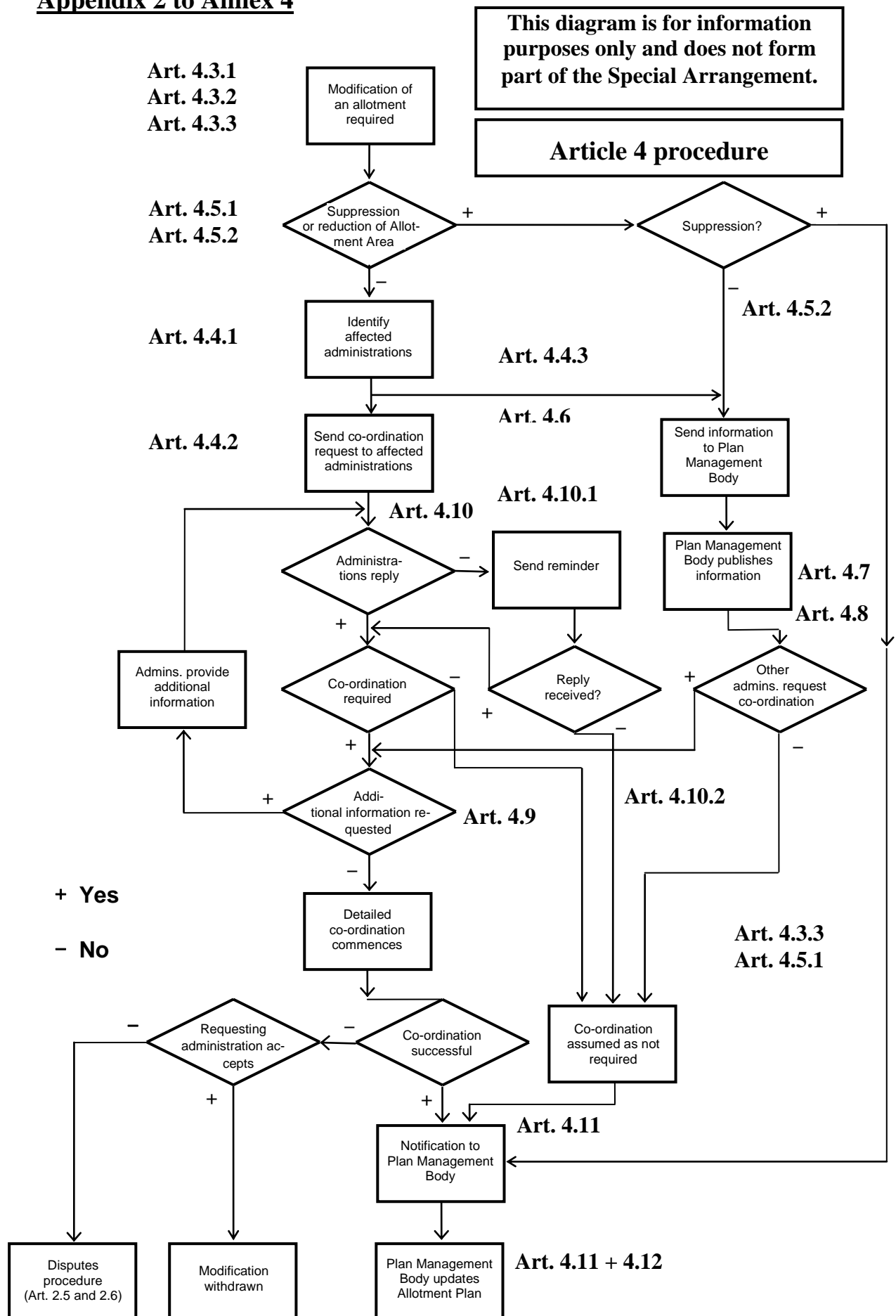


Figure 5: Construction of additional calculation test points if $\alpha \geq 180^\circ$ (see Note below)

Note:	A, B, C	Boundary test points of allotment
○	1a, 1b, 1c, 2a, 3a	Calculation test points
□	1d, 1e, 1f, 1g, 2e	Additional calculation test points
⊠	2b, 2c, 2d	Calculation test points disregarded because the field strength exceeds the specified threshold

Appendix 2 to Annex 4



Article 6 procedure

**This diagram is for
information purposes only
and does not form part of the
Special Arrangement.**

