



**Documents of the Regional Administrative Radio Conference for the Planning of Frequencies for
Maritime Radiobeacons in the European Maritime Area
(Geneva, 1985)**

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Draft

Note by the Secretary-General

STRUCTURE OF THE
REGIONAL ADMINISTRATIVE RADIO CONFERENCE
FOR THE PLANNING OF FREQUENCIES FOR MARITIME RADIOBEACONS
IN THE EUROPEAN MARITIME AREA
Geneva, 1985

The agenda of the Conference appears in Resolution No. 898 which was adopted by the Administrative Council at its 38th Session (Geneva, 1983). This Resolution is reproduced in the annex to Document No. 1001 of the Conference.

Bearing in mind Nos. 464 to 479 inclusive of the International Telecommunication Convention, Nairobi, 1982, the following committees with their terms of reference are suggested. These terms of reference have been drawn up within the framework of the Convention, the Conference Agenda and in the light of experience at previous conferences.

Committee 1 - Steering Committee

Terms of Reference :

To coordinate all matters connected with the smooth execution of work and to plan the order and number of meetings, avoiding overlapping wherever possible in view of the limited number of members of some delegations (Nos. 468 and 469 of the International Telecommunication Convention, Nairobi, 1982).

Committee 2 - Credentials Committee

Terms of Reference :

To verify the credentials of delegations and to report on its conclusions to the Plenary Meeting within the time specified by the latter (Nos. 390 and 471 of the International Telecommunication Convention, Nairobi, 1982).

Committee 3 - Budget Control Committee

Terms of Reference :

To determine the organization and the facilities available to the delegates, to examine and approve the accounts of expenditure incurred throughout the duration of the Conference and to report to the Plenary Meeting the estimated total expenditure of the Conference as well as the estimated costs entailed by the execution of the decisions of the Conference (Nos. 476 to 479 inclusive and No. 627 of the International Telecommunication Convention, Nairobi, 1982 and Nairobi Resolution No. 48).

Committee 4 - Technical and Planning Committee

Terms of Reference

To establish the technical parameters to be used for planning of frequencies in the band 283.5 - 315 kHz used by maritime radiobeacons in the European Maritime Area taking into account the Report of CCIR Study Group 8 (item 2.1 of the Agenda).

To prepare a frequency assignment plan for the maritime radionavigation service (radiobeacons) in the European Maritime Area in the band 283.5 - 315 kHz intended to replace the "Regional Arrangement concerning Maritime Radiobeacons in the European Area of Region 1", Paris, 1951 (item 2.1 of the Agenda).

To afford appropriate protection to frequency assignments to stations of other services to which this band is also allocated when establishing the Plan for the maritime radionavigation service (item 2.2 of the Agenda).

To elaborate the technical parameters to be taken into consideration for the establishment of procedures intended for the future modifications of the Plan and permitting a compatible development of the other services to which the band is allocated (item 2.3 of the Agenda).

Committee 5 - Procedures and Agreement Committee

Terms of Reference :

To prepare an agreement for the maritime radionavigation service (radiobeacons) in the European maritime area in the band 283.5 - 315 kHz intended to replace the "Regional Arrangement concerning Maritime Radiobeacons in the European Area of Region 1", Paris, 1951 (item 2.1 of the Agenda).

To establish procedures intended for the future modifications of the Plan and permitting a compatible development of the other services to which the band is allocated (item 2.3 of the Agenda).

Committee 6 - Editorial Committee

Terms of Reference

To perfect the form of the texts prepared in the various committees of the Conference, without altering the sense, for submission to the Plenary Meeting (Nos. 473 and 474 of the International Telecommunication Convention, Nairobi, 1982).

SEANCE PLENIERE
PLENARY MEETING
SESION PLENARIA

Projet / Draft / Proyecto

Note du Secrétaire général / Note by the Secretary-General
Nota del Secretario General

ATTRIBUTION DES DOCUMENTS / ALLOCATION OF DOCUMENTS
ATRIBUCION DE LOS DOCUMENTOS

<u>Plenièrè</u> <u>Plenary</u> <u>Plenaria</u>	: 1001, 1018, 1019
C2 - <u>Pouvoirs</u> <u>Credentials</u> <u>Credenciales</u>	: 1002
C3 - <u>Budget</u> <u>Presupuesto</u>	: 1009, 1010, 1011, 1014
C4 - <u>Technique et de planification</u> <u>Technical and Planning</u> <u>Técnica y de planificación</u>	: 1003, 1004(Rev.1), 1005, 1006 + Add.1, 1007, 1008, 1012, 1013, 1015, 1016, 1017, 1023
C5 - <u>Procédures et accord</u> <u>Procedures and Agreement</u> <u>Procedimientos y acuerdo</u>	: 1004(Rev.1), 1005

R.E. BUTLER
Secrétaire général

NOTE FROM THE CHAIRMAN OF EMA COMMITTEE 4

An ad hoc Group (EMA 4 ad hoc hyper) has been set up under the chairmanship of Mr. Van Erkel (Netherlands). The Group will meet on Tuesday, 5 March at 1900 hours in Room IX.

The terms of reference of the ad hoc Group are:

- 1) To consider whether stations of a hyperbolic navigation system as described by France in Documents 1012 and 1023 are "radiobeacons" as indicated in the Frequency Table of the Radio Regulations and thus fall within the terms of reference of this Conference.

If so:

- 2.1) To establish co- and adjacent-channel protection ratios and other necessary technical criteria to enable such stations to be included in the frequency planning process together with other radiobeacons.
- 2.2) To establish a suitable procedure for undertaking the planning, taking account of any constraints within the available computer programs.

If not:

- 3) To consider whether, and if so how, such hyperbolic navigation stations could be included on a non-interference basis.
- 4) To report conclusions to Committee 4 at the 0900 meeting on Wednesday, 6 March.

L.W. BARCLAY
Chairman of Committee 4 EMA

DRAFT REPORT OF COMMITTEE EMA-5 TO THE PLENARY MEETING

In accordance with the terms of reference it received from the Plenary Meeting, Committee EMA-5 examined the proposals relating to the draft Regional Agreement Concerning Maritime Radiobeacons in the European Maritime Area in the band 203.5 - 315 kHz.

The Committee unanimously adopted the texts set out in both of the Annexes hereto.

Annex 1. - Draft Agreement - Preamble, Articles 1, 2, 3, 6 - 13

Annex 2 - Articles 4 and 5.

R. BISNER
Chairman of Committee EMA-5

Annexes: 2

ANNEX 1

DRAFT

REGIONAL AGREEMENT CONCERNING MARITIME RADIOBEACONS
IN THE EUROPEAN MARITIME AREA

(Geneva, 1985)

Preamble

The delegates of the following Members of the International
Telecommunication Union:

meeting in Geneva for a Regional Administrative Radio Conference convened under the terms of Article 7 of the International Telecommunication Convention, Nairobi, 1982, have adopted subject to the approval of the competent authorities of their respective countries the following provisions relating to the maritime radionavigation (radiobeacon) service in the European Maritime Area.

ARTICLE 1

Definitions

1. For the purpose of this Agreement, the following terms shall have the meanings defined below:

Union: The International Telecommunication Union;

Secretary-General: The Secretary-General of the Union;

IFRB: The International Frequency Registration Board;

CCIR: The International Radio Consultative Committee;

Convention: The International Telecommunication Convention, Nairobi, 1982;

Radio Regulations: The Radio Regulations, Geneva 1979, as revised by the WARC-MOB-83, annexed to the Convention;

European Maritime Area: The geographical area defined in No. 405 of the Radio Regulations;

Agreement: The whole of this Agreement including its Annexes and Appendices;

Plan: The Plan forming the Annex [] to this Agreement and its Appendices;

Contracting Member: Any Member of the Union which has approved or acceded to this Agreement;

Administration: Any governmental department or service responsible for discharging the obligations undertaken in the International Telecommunication Convention and the Radio Regulations;

Assignment in conformity with the Agreement: Any frequency assignment appearing in the Plan or any frequency assignment for which the procedure of Article 4 has been successfully applied.

ARTICLE 2

Frequency Bands

2. The provisions of this Agreement apply in the European Maritime Area to the band 283.5 - 315 kHz allocated under Article 8 of the Radio Regulations to the maritime radionavigation (radiobeacon) service on a permitted basis.

These provisions also apply to frequency assignments of the aeronautical radionavigation service to which the same frequency band is allocated on a permitted basis.

ARTICLE 3

Execution of this Agreement

3. The Contracting Members shall adopt, for their radiobeacon stations in the maritime radionavigation service operating in the European Maritime Area in the frequency band referred to in this Agreement, the characteristics specified in the Plan in the Annex and its Appendices.

4. The Contracting Members shall not bring assignments complying with the Plan into use, modify the technical characteristics of stations specified in the Plan, or bring new stations into use, except under the conditions specified in Article 4 of this Agreement.

5. When assigning frequencies to stations of the aeronautical radionavigation service, Contracting Members shall take account of the frequency assignments to radiobeacon stations of the maritime radionavigation service which are in conformity with the Agreement or for which the modification procedure contained in Article 4 has been initiated.

6. The Contracting Members shall endeavour to coordinate their efforts with a view to reducing any harmful interference that may result from the application of the Agreement.

ARTICLES 4 AND 5

(Separate document)

ARTICLE 6

Special Arrangements

[] In addition to the procedures provided for in Article 4 of this Agreement and to facilitate their application with a view to improving the utilization of the Plan, Contracting Members may conclude special arrangements in accordance with the relevant provisions of the Convention and of the Radio Regulations.

ARTICLE 7

Scope of Application of this Agreement

[] This Agreement shall bind Contracting Members in their relations with one another but shall not bind those Members with respect to non-contracting countries.

[] If a Contracting Member makes reservations with regard to any provision of this Agreement, other Contracting Members shall be free to disregard that provision in their relations with the Contracting Member which has made such reservations.

ARTICLE 8

Approval of this Agreement

[] This Agreement shall be subject to approval by the competent authorities of the Contracting Members. Instruments of approval shall be deposited, in as short a time as possible, with the Secretary-General, who shall inform all the Members of the Union.

ARTICLE 9

Accession to this Agreement

[] Any Member of the Union in the European Maritime Area which has not signed this Agreement may accede thereto at any time. Such accession shall extend to the Plan as modified at the time of the accession and shall be made without reservation. The instruments of accession shall be deposited with the Secretary-General who shall promptly inform all the Members of the Union. This Agreement shall enter into force for each Member acceding to this Agreement after the date of its entry into force on the date of the deposit by such a Member of its instrument of accession.

ARTICLE 10

Termination of Participation in this Agreement

[] Any Contracting Member shall have the right at any time to terminate its participation in this Agreement by a notification sent to the Secretary-General who shall inform all the Members of the Union.

[] Such termination of participation shall take effect after a period of one year from the date of receipt by the Secretary-General of the said notification.

[] On the date on which the termination of participation becomes effective, the IFRB shall delete from the Plans the assignments entered in the name of the Member concerned.

ARTICLE 11

Revision of the Agreement

[] No revision of this Agreement shall be undertaken except by a competent administrative radio conference of the Members of the Union in the European Maritime Area, convened in accordance with the procedure laid down in the Convention.

ARTICLE 12

**Abrogation of the Regional Arrangement concerning
maritime radiobeacons in the European Area of Region 1 (Paris, 1951)**

[] This Agreement and the annexed Plan cancel and replace the Regional Arrangement concerning Maritime Radiobeacons in the European Area of Region 1 (Paris, 1951).

ARTICLE 13

Effective Date of this Agreement

[] This Agreement shall enter into force on [] at 0001 hours UTC.

In witness whereof the delegations of Members of the Union mentioned above have, on behalf of their respective competent authorities, signed this Agreement in a single copy in the French, English and Spanish languages in which, in case of dispute, the French text shall be authentic. This copy shall remain deposited in the archives of the Union. The Secretary-General shall forward one certified copy to each Member in the European Maritime Area.

Done at Geneva, ... March, 1985.

ANNEX 2

ARTICLE 4

Procedure for modifications to the Plan

SECTION A - GENERAL

[] When a Contracting Member proposes to make a modification to the Plan, that is:

- a) to modify the characteristics of a frequency assignment to a radiobeacon station of the Maritime Radionavigation Service shown in the Plan, whether or not the station has been brought into use; or
- b) to bring into use an assignment to a radiobeacon station of the Maritime Radionavigation Service not appearing in the Plan; or
- c) to modify the characteristics of a frequency assignment to a radiobeacon station of the Maritime Radionavigation Service for which the procedure in this Article has been successfully applied, whether or not the station has been brought into use; or
- d) to cancel a frequency assignment to a radiobeacon station of the Maritime Radionavigation Service;

the following procedure shall be applied at the same time as the notification is made under the provisions of Article 12 of the Radio Regulations (see Article 5 of this Agreement).

SECTION B - PROCEDURE FOR MODIFYING THE CHARACTERISTICS OF AN ASSIGNMENT OR THE BRINGING INTO USE OF A NEW ASSIGNMENT

[] An administration proposing to modify the characteristics of an assignment or to bring an additional assignment into use shall, either directly or through the IFRB, seek the agreement of all other administrations whose assignments may be affected.

[] For the purposes of this procedure, these other administrations shall be the administrations of Contracting Members which have:

- a) assignments in the Plan whose service may be affected as a result of applying the criteria specified in Annex [] to this Agreement;
- b) assignments recorded in the Master International Frequency Register for stations of the aeronautical radionavigation service which may be affected as a result of the application of the provisions of No. 1241 of the Radio Regulations together with the technical criteria contained in Annex [].

[] An administration proposing to modify the characteristics of an assignment or to bring an additional assignment into use shall so inform the IFRB not earlier than 90 days before the date of bringing into use and shall furnish the characteristics listed in Appendix 1 to the Radio Regulations, and shall also indicate to the IFRB the names of the administrations with which it considers agreement should be sought and of those with which agreement has been reached. The IFRB shall consider this information as a notification in accordance with Article 12 of the Radio Regulations. Publication in Part I of the weekly circular shall at the same time constitute information to the Contracting Members on the proposed modification.

[] When the Board reaches an unfavourable finding under No. 1241 of the Radio Regulations in relation to frequency assignments recorded in the Master Register on behalf of non-Contracting Members, it shall notify the administration proposing the modification and shall make recommendations with a view to reaching a satisfactory solution to the problem.

[] When the Board reaches a favourable finding under No. 1241 of the Radio Regulations in relation to frequency assignments recorded in the Master Register on behalf of non-Contracting Members, it shall examine the modification proposed in relation to assignments in conformity with this Agreement, assignments published in Part I of the weekly-circular in accordance with § 4 of this Article and assignments of the Aeronautical Radionavigation Service recorded in the Master Register on behalf of Contracting Members. It shall inform the administration proposing the modification of the results of its examination.

[] When the administration proposing the modification is informed of the results of the Board's examination, it shall endeavour to seek the agreement of the other administrations as soon as possible and shall notify the Board of the results of its efforts.

[] Following the examination carried out in accordance with § 6 above, the Board shall record the assignment in the Master Register indicating the names of those administrations whose agreement has to be obtained. It shall inform the administration concerned that the entry has been made subject to the proviso that no harmful interference will be caused to the assignments of administrations whose agreement must be obtained.

[] When the Board finds that the agreement of Contracting Members is not required or when the Board is informed that the required agreement was obtained, it shall update the master copy of the Plan.

SECTION D - CANCELLATION OF ASSIGNMENTS

[] An administration proposing to cancel an assignment in the Plan, whether or not as a result of a modification (for instance a change of frequency), shall immediately so inform the IFRB. The Board shall update the master copy of the Plan accordingly.

SECTION E - MAINTENANCE AND PUBLICATION OF RECORDS

[] The IFRB shall maintain an up-to-date master copy of the Plan and its appendices, taking account of the application of the procedure specified in this Article; to this end the IFRB shall periodically prepare recapitulative documents listing all amendments made to the Plan as a result of modifications made in accordance with the procedures of this Article, the addition of new assignments in conformity with this Agreement, and any cancellations of which the Board has been notified.

[] The Secretary-General shall publish an up-to-date version of the Plan in an appropriate form as and when circumstances justify and in any case every five years.

ARTICLE 5

Notification of Frequency Assignments

[] Whenever an administration intends to bring into use an assignment in conformity with this Agreement, it shall notify the assignment to the IFRB in accordance with the provisions of Article 12 of the Radio Regulations.

[] Notices of frequency assignments in conformity with this Agreement shall not be examined by the Board under No. 1241 with respect to frequency assignments recorded in the Master Register on behalf of Contracting Members for stations of primary or permitted services of administrations, Parties to the Agreement.

[] Notices of frequency assignments for which it has not been possible to reach agreement shall be treated as follows:

- a) when the disagreement of the administration concerned is with respect to an assignment in conformity with this Agreement, the notified assignment shall be recorded in the Master Register with a special remark indicating that the entry has been made subject to not causing harmful interference to the assignment of the administration with which agreement has not been reached;
- b) when the disagreement of the administration concerned is with respect to an assignment recorded in the Master Register for a station in the Aeronautical Radionavigation Service, the notified assignment shall be recorded in the MIFR only after the application of the provisions of No. 1255 of the Radio Regulations.

[] In relations between Contracting Members all frequency assignments in conformity with this Agreement and recorded in the Master Register shall be considered to have the same status irrespective of the date or dates entered in Column 2 for such assignments.

ARTICLE 6

Procedure applicable to Aeronautical Radionavigation Service

[] In order to permit the compatible development of the Aeronautical Radionavigation Service in the band 283.5 - 315 kHz, the IFRB shall examine in accordance with No. 1245 of the Radio Regulations the frequency assignments of this service notified by Contracting Members. To this effect the following provisions shall be applied.

[] The Board shall examine the frequency assignment with respect to the probability of harmful interference to the service provided or to be provided by a frequency assignment:

- a) which is already recorded in the Master Register and bears a date in Column 2a, or
- b) which is in conformity with No. 1240 of the Radio Regulations and is recorded in the Master Register with a date in Column 2b, but has not, in fact, caused harmful interference to any frequency assignment with a date in Column 2a or to any assignment in conformity with No. 1240 with an earlier date in Column 2b;
- c) which is in conformity with this Agreement but has not yet been notified in accordance with Article 4;
- d) which was published in Part I of the weekly IFRB circular in accordance with § 4 of Article 4.

[] In the event of the finding being unfavourable with respect to a frequency assignment described in §§ 2 c) or 2 d), if the administration resubmits the notice under No. 1255 of the Radio Regulations the period of two months specified in No. 1259 shall not start until that assignment is brought into service.

[] For the purpose of these examinations the Board shall apply the technical criteria contained in Annex [] to the Agreement.

INTERNATIONAL TELECOMMUNICATION UNION

**RARC FOR THE PLANNING OF FREQUENCIES
FOR MARITIME RADIOBEACONS IN THE
EUROPEAN MARITIME AREA**

GENEVA,

MARCH 1985

EUROP.

Document DT/1005-E

7 March 1985

Original: English

COMMITTEE (EMA)-4

NOTE BY THE CHAIRMAN OF
COMMITTEE 4

Annex 1 contains the information proposed for inclusion in the Plan for maritime radiobeacons in the band 283.5 - 315 kHz.

Annex 2 is a drafted channelling arrangement for the same band.

L.W. BARCLAY
Chairman of Committee 4

Annexes: 2

ANNEX 1

Information to be included in the Plan for the radionavigation service
(radiobeacons) for the European maritime area
in the band 283.5 - 315 kHz

1. Assigned frequency (kHz)
2. Channel number
3. Country symbol
4. Transmitting station name
5. Symbols of the country or geographical area in which the transmitting station is located (see Table 1 of the Preface to the International Frequency List)
6. Longitude and latitude (in degrees and minutes) of the transmitting station
7. Service area: longitude and latitude (in degrees and minutes) of the centre and radius (km) of the circular service area
(considered for ground-wave propagation conditions)
8. Nature of service
9. Necessary bandwidth and class of emission
10. Necessary Effective Monopole Radiated Power (e.m.r.p.) (dBW)
(value calculated on the basis of the [minimum usable field strength] and the service range for ground-wave propagation conditions)
11. Antenna characteristics (ND)
12. Regular hours of operation (UTC) of the frequency assignment
13. Remarks

ANNEX 2

Channelling arrangement for the maritime radiobeacon
in the band 283.5 - 315 kHz

Channel No.	Frequency (kHz)	Channel No.	Frequency (kHz)	Channel No.	Frequency (kHz)
1	284.0	21	294.0	41	304.0
2	284.5	22	294.5	42	304.5
3	285.0	23	295.0	43	305.0
4	285.5	24	295.5	44	305.5
5	286.0	25	296.0	45	306.0
6	286.5	26	296.5	46	306.5
7	287.0	27	297.0	47	307.0
8	287.5	28	297.5	48	307.5
9	288.0	29	298.0	49	308.0
10	288.5	30	298.5	50	308.5
11	289.0	31	299.0	51	309.0
12	289.5	32	299.5	52	309.5
13	290.0	33	300.0	53	310.0
14	290.5	34	300.5	54	310.5
15	291.0	35	301.0	55	311.0
16	291.5	36	301.5	56	311.5
17	292.0	37	302.0	57	312.0
18	292.5	38	302.5	58	312.5
19	293.0	39	303.0	59	313.0
20	293.5	40	303.5	60	313.5
				61	314.0
				62	314.5

First draft report of ad hoc 5 to Committee 4

RECOMMENDED MINIMUM TECHNICAL CHARACTERISTICS FOR
MARITIME RADIOBEACONS IN THE BAND 283.5 - 315 kHz

ANTENNA AND EARTH SYSTEM

1. The antenna and earth system should be so designed as to restrict radiation of horizontally polarized waves and signals directed towards the ionosphere. A vertical or T antenna should be used for preference.
2. The earthing system or counterpoise associated with the antenna should, as far as possible, preserve the symmetry of the radiation system as a whole.
3. To minimise their influence on the radiation pattern, horizontal power and telecommunication lines at less than 100 metres from the antenna should be underground.

TRANSMITTERS

Frequencies

4. Frequencies assigned to maritime radiobeacons shall be 500 Hz apart and on integer multiples of 100 Hz.
5. Transmitters of A1A emissions shall maintain their assigned frequency within a tolerance of ± 30 Hz.
6. Transmitters of [F1B] emissions shall maintain their assigned frequency within a tolerance of ± 10 Hz.
7. Maximum spurious emission power levels of all transmitters shall conform to Appendix 8 of the Radio Regulations, [Geneva 1979] 7.

Modulation

8. A beacon identity of one or two morse letters followed by a 'long-dash' shall be transmitted using class of emission A1A.

9. Additional information, permitted as a further aid to navigation, may be transmitted by a radiobeacon using the class of emission F1B. In this case the radiobeacon assigned frequency shall be frequency shift keyed ± 85 Hz at a rate of 100 bauds.

10. The structure of the radiobeacon signal shall be as given in Report No. [] .

Data F1B Transmission Sequences

11. [Data F1B transmission sequences shall conform to the characteristic given at Annex F.]

Accuracy of Timing

12. All maritime radiobeacons arranged in groups shall be controlled by a device ensuring the accuracy of the transmission schedules. The accuracy of transmission times should be maintained to within [0.25 seconds.]

Field Strength Measurements

13. When a maritime radiobeacon is put into service or if alterations are made to the equipment or antenna and earth system of a maritime radiobeacon in service, field strength measurements should be made to adjust the radiated power to the correct values to give the nominal day ranges with a 95% probability, (± 3 dB).

14. Such measurements should be taken again at regular intervals not exceeding one year.

Radiobeacon Transmissions

15. Each administration should ensure that the following are carried out:

- a) the field strength does not vary by more than ± 3 dB from the nominal value determined in accordance with paragraph 13;
- b) the transmission frequency does not vary by more than ± 10 Hz for the [F1B transmission] and ± 30 Hz for the A1A transmission;
- c) the transmitted signal is correct;
- d) the timing is maintained within [± 0.25] seconds.

STANDBY DEVICES

16. Maritime radiobeacons should have the necessary standby devices to prevent any stoppage due to the breakdown of the electric supply, the transmitter or the timing device.

RECOMMENDED MINIMUM TECHNICAL CHARACTERISTICS FOR MARITIME
RADIO DIRECTION-FINDERS WORKING ON FREQUENCIES
BETWEEN 283.5 kHz AND 315 kHz

FREQUENCY BANDS

1. Maritime radio direction-finders should permit bearings to be taken on class A1A emissions in the maritime radiobeacon frequency band between 283.5 kHz and 315 kHz.
2. Maritime radio direction-finders may also be equipped to receive, decode and display the additional information which a radiobeacon is permitted to transmit as a further aid to navigation. Such transmissions will be on the radiobeacon assigned frequency and be class [F1B emissions.]

SELECTIVITY

3. For class of emission A1A, the overall radio frequency (r.f.) and intermediate frequency (i.f.) selectivity of the direction-finder should be:-

- a) bandwidth between 190 Hz and 210 Hz for 6 dB attenuation;
- b) bandwidth less than 460 Hz for 30 dB attenuation;
- c) bandwidth less than 960 Hz for 60 dB attenuation.

3.1 The image frequency rejection ratio should be 80 dB or higher.

3.2 The i.f. protection ratio should be 80 dB or higher.

4. For class of emission F1B, the overall r.f. and i.f. selectivity of the receiver should be:-

- a) bandwidth between 270 Hz and 350 Hz for 6 dB attenuation;
- b) bandwidth less than 600 Hz for 30 dB attenuation;
- c) bandwidth less than 1100 Hz for 60 dB attenuation.

4.1 The image frequency rejection ratio should be 80 dB or higher.

4.2 The i.f. protection ratio should be 80 dB or higher.

SENSITIVITY

5. A field strength of equal to, or less than, 50 $\mu\text{V/m}$ shall produce a signal in the headphones of a receiver with a S/N ratio of 20 dB or higher, sufficient to identify and indicate the bearing of the transmitting station with a bearing readout accuracy within ± 1 degree of the correct bearing.

MISCELLANEOUS CHARACTERISTICS

6. Maritime radio direction-finders shall include means by which A1A identification signals can be recognised.

7. The receivers shall maintain the frequency to which they are tuned within a tolerance of ± 50 Hz.

8. Receivers utilising the [F1B] transmissions shall:-

a) [maintain the frequency to which they are tuned within a tolerance of ± 10 Hz;]

b) [be fitted with a method of displaying the additional navigational information obtained;]

c) [be fitted with means to indicate clearly when there is any discrepancy between displayed navigational information and its accompanying error check character (ECC).]

9. Maritime radio direction-finders should be provided with means of indicating the bearing of the wanted signal. After allowing for any site error the relative bearing indicated by the receiver should be within 1° of the correct bearing for all measurements made.

10. The radio direction-finder should identify the presence of any interference which may cause a bearing to be incorrect.

TECHNICAL CONDITIONS FOR THE INSTALLATION OF RADIO DIRECTION-FINDERS IN VESSELS

11. The antenna assembly should be mounted as near as practicable to the vessel's centre line and should be as remote as is practicable from large movable metal objects and conductors such as other antennas, cranes, derricks and wires.

12. The sense-finding antenna should be as short as practicable.

13. The connecting cables between the antenna system and the apparatus should be electro-magnetically screened. All joints should be watertight.

14. The receiver should be earthed to the hull of the vessel by means of a conductor with as low a resistance as possible.

15. As far as possible, the Direction-Finder should be so located that as little interference as possible from mechanical or other noise will be caused to the efficient determination of bearings.

16. A means of providing information on the ships' magnetic or gyro compass heading should be provided in the vicinity of the Direction-Finder.

CALIBRATION OF MARITIME RADIO DIRECTION-FINDERS

17. The calibration curve of the direction-finder should be determined before the latter is put into operation and each time the position of the antennas or the conductors referred to above are changed or the superstructure of the vessel altered substantially.

18.* The calibration of the direction-finder should be verified at intervals not exceeding 12 months.

19. When calibrating the radio direction-finder the frequency used should be as close as possible to 300 kHz.

20. The calibration curve should preferably be determined by means of bearings on short range radiobeacons specially provided for the calibration of radio direction-finders.

D.K. GILLMAN
Chairman of Committee 4 ad hoc 5

* (Reservation by the Federal Republic of Germany)

COMMITTEE 4

Note by ad hoc Group 4

DIFFERENTIAL OMEGA

The Working Group has been asked to put forward the main characteristics of a differential omega correction transmission in order to assist the planning function of European area of Region 1 Conference.

1. The principle of the system consists of transmitting the omega data correction in an analogic mode by modulating the phase of the carrier during the radiobeacon's long dash, by a narrow spectrum sub-carrier (equal and below 30 Hz).

The sub-carrier phase represents the value of the omega phase correction.

2. The total bandwidth (99° of the power) is included within ± 50 Hz on each side of the carrier.

3. The protection ratio against interference is of the same value whether the disturbing signal is an unmodulated wave or an FSK modulated one.

A cochannel interfering signal must be 6 dB below the useful signal.

Any interference on 100 Hz offset adjacent channel must not be more than 6 dB higher than useful signal.

Any interference on 200 Hz offset adjacent channel must not be more than 19 dB higher than useful signal.

4. The signal format for transmitting two omega cycle corrections and identification codes will need an uninterrupted time length of at least 25s in the radiobeacon long dash.

It should be noted that the quality of information is greatly improved by continuous transmission.

It will be preferable that differential omega transmitting stations should not be grouped within other sequential transmitting radiobeacons and also a radiobeacon transmitting differential omega corrections should be dedicated to this single purpose.

5. If continuous transmission is not possible the interval length between two transmissions should not exceed three minutes. At least an interval of six minutes is bearable.

Radiated power may vary according to the required range.

The minimum field strength needed for correct reception is equal to 10 $\mu\text{v/m}$ so a radiated power of 1w should achieve a range of 200 nm.

M. RENOUX
Chairman of ad hoc Group 4-1

COMMITTEE EMA-5

NOTE BY THE CHAIRMAN OF COMMITTEE EMA-5

As stated at the second meeting, the attached two draft Resolutions have been prepared for consideration by Committee EMA-5.

Annex 1 - Draft Resolution No. COM 5/1 (EMA) relating to the application of Articles 4, 5 and 6 of the Agreement before its entry into force.

Annex 2 - Draft Resolution No. COM 5/2 (EMA) relating to the entry into force of the Agreement and the associated Plan.

R. BISNER
Chairman of Committee EMA-5

Annexes: 2

ANNEX 1

DRAFT RESOLUTION No. COM 5/1 (EMA)

**Relating to the application of Articles 4, 5 and 6 of the
agreement before the entry into force of the Agreement**

The Regional Administrative Conference for the Planning of the
Maritime Radionavigation Service (Radiobeacons) in the European Area
(Region 1), (Geneva, 1985),

considering

- a) that, in accordance with its agenda, it has adopted an Agreement and an associated Plan for the maritime radionavigation service (radiobeacons) in the band 283.5 - 315 kHz;
- b) that some administrations may need to modify the characteristics of assignments appearing in the Plan or to add new assignments to the Plan or to notify assignments included in the Plan before the Agreement enters into force;
- c) that some administrations may need to notify frequency assignments in the aeronautical radionavigation service in the band 283.5 - 315 kHz before the Agreement enters into force;
- d) that means must be provided, before the date of entry into force of the Agreement, to permit modifications to the Plan and to ensure that the proposed uses of the aeronautical radionavigation service in the relevant band are compatible with the Plan;

resolves

- 1. that, pending the entry into force of the Agreement, administrations and the IFRB shall apply the procedures set out in Article 4 of the Agreement for the modification of the Plan;
- 2. that, during the same period, administrations and the IFRB shall apply the procedures set out in Articles 5 and 6 of the Agreement for the notification, examination and recording of frequency assignments in the relevant frequency bands;
- 3. that the temporary provisions in the Annex to this Resolution shall be applicable during the period in question.

ANNEX TO RESOLUTION No. COM 5/1 (EMA)

**Provisional procedure applicable to frequency assignments notified
under the terms of Article 5 of the Regional Agreement prior to the date of
entry into force of the Agreement**

1. When an administration proposes to modify the characteristics of an assignment entered in the Master Register in order to make it consistent with the Plan, or when an administration wishes to bring into service an assignment in conformity with the Plan, it shall notify that assignment in accordance with Article 5 of the Agreement.
2. The IFRB shall examine such notifications relating to assignments entered in the Master Register on the date of receipt of the notification and shall inform the notifying administration of any incompatibility it may establish with assignments of other administrations.
3. The notifying administration shall endeavour to secure the agreement of the administrations identified under the terms of paragraph 2 above.
4. When the agreement of the administrations concerned has been obtained, the assignment may be brought into service in accordance with the Plan, and, if necessary, the corresponding assignment which has been the subject of the modification shall be deleted from the Master Register.

ANNEX 2

DRAFT RESOLUTION No. COM 5/2 (EMA)

concerning the updating of the Master International Frequency Register with regard to assignments maritime radionavigation (radiobeacons) service stations in the band 283.5 - 315 kHz to permit the entry into force of the Agreement and associated Plans

The Regional Administrative Conference for the Planning of the Maritime Radionavigation Service (Radiobeacons) in the European Area (Region 1) (Geneva, 1985),

considering

- a) that, in accordance with its agenda the present Conference has adopted an Agreement and a Plan for their maritime radionavigation (radiobeacons) service stations in the band 283.5 - 315 kHz;
- b) that under the provisions of Article 5 of the Agreement prepared by the present Conference, the Contracting Members are required to notify the IFRB of frequency assignments to stations of the planned service before they are brought into operation;
- c) that the administrations of Contracting Members and the IFRB should have a proper instrument for implementing with the least possible difficulty the Plan agreed at the present Conference;

resolves

- 1. that, within 90 days from the date on which the present Conference ends, the IFRB shall send to each administration a list of stations the planned service assignments entered on its behalf in the Master International Frequency Register in the planned bands. It shall at the same time send another list of the assignments entered on its behalf in the Plan adopted at the present Conference;
- 2. that when it sends these lists the IFRB shall request administrations to return it within 90 days a list showing the correspondence between the assignments entered in the Plans and those entered in the Master International Frequency Register;

3. that any assignment included in the Master International Frequency Register for the maritime radionavigation (radiobeacons) service in the planned band that has no corresponding assignment in the Plan shall be cancelled in the Register on the date of entry into force of the Agreement;

4. that, 90 days prior to the entry into force of the Regional Agreement, administrations shall notify the IFRB of the assignments in conformity with the Plan that are intended to replace the corresponding assignments entered in the Master Register;

5. that if, after examining the frequency assignments notified by administrations under the terms of paragraph 4 of this Resolution, the Board arrives at a favourable finding under No. 1241 of the Radio Regulations, these assignments shall retain the original date entered in column 2;

6. that, 30 days after the date of entry into force of the Regional Agreement, assignments entered in the Master Register for which the IFRB has not received a notice concerning the entry into service of the corresponding assignment in the Plan shall be retained in the Master Register with a remark in the appropriate column to show that the assignment in question is not entitled to any protection in relation to assignments that are in conformity with the Plan and must not cause any harmful interference to such assignments. Each administration concerned shall be advised of such action;

7. that if upon expiry of the above-mentioned period the Board receives a notice under the terms of paragraph 4 above, it shall cancel the corresponding assignment in the Master Register;

invites the IFRB

to provide administrations with all the necessary assistance in the implementation of the provisions of this Resolution.

COMMITTEE 2

DRAFT

REPORT OF COMMITTEE 2 TO THE PLENARY MEETING

(CREDENTIALS)

1. Terms of reference of the Committee
The terms of reference of the Committee are set out in Document 1026.
2. Meetings
The Committee met twice, on 5 and 8 March 1985.

At its first meeting, it set up a Working Group consisting of the Chairman and Vice-Chairman of the Committee, one delegate from the Czechoslovak Socialist Republic and one delegate from the Socialist Federal Republic of Yugoslavia to verify delegations' credentials in accordance with Article 67 of the International Telecommunication Convention, Nairobi (1982).

3. Conclusions
The conclusions reached by the Committee are reproduced in the Annex attached hereto and submitted to the Plenary Meeting for approval.

4. Final remark
The Committee recommends that the Plenary Meeting authorise the Chairman and the other members of the Working Group to verify the credentials received after the date of the present Report and to report to the Plenary Meeting on the matter.

J.F. PATRICIO
Chairman of Committee 2

Annex : 1

A N N E X

1. Credentials found to be in order, deposited by the delegations of countries having the right to vote

ALBANIA (Socialist People's Republic of)
GERMANY (Federal Republic of)
BELGIUM
BULGARIA (People's Republic of)
CYPRUS (Republic of)
DENMARK
SPAIN
FINLAND
FRANCE
HUNGARIAN PEOPLE'S REPUBLIC
ISRAEL (State of)
ITALY
LIBYA (Socialist People's Libyan Arab Jamahiriya)
MALTA (Republic of)
NORWAY
NETHERLANDS (Kingdom of the)
POLAND (People's Republic of)
PORTUGAL
ROMANIA (Socialist Republic of)
UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND
SWEDEN
CZECHOSLOVAK SOCIALIST REPUBLIC
TUNISIA
TURKEY
UNION OF SOVIET SOCIALIST REPUBLICS
YUGOSLAVIA (Socialist Federal Republic of)

Conclusion : The delegations of these countries are entitled to vote and to sign the Final Acts.

2. Delegations attending the Conference which have not deposited credentials

ALGERIA (Algerian Democratic and Popular Republic)
(credentials announced)
AUSTRIA (credentials announced)
GREECE (credentials announced)
LEBANON
MOROCCO (Kingdom of)

Conclusion : The delegations of these countries are not entitled neither to vote nor to sign the Final Acts

Note :

Credentials deposited for examination by the Working Group during the next meeting

IRELAND
GERMAN DEMOCRATIC REPUBLIC

COMMITTEE 4

During the afternoon meeting held by ad hoc Group 4 of EMA Committee 4, the following changes have emerged in the positions assumed by national administrations on the form of modulation to be adopted for the FLB portion of the signal.

- France, the Federal Republic of Germany and Belgium are available to accept the IALA compromise solution detailed in Annex 2 to Document DT/1010-E in order to facilitate the choice of a common system.

In the light of the new situation, all administrations represented in the Working Group are prepared to accept the IALA compromise solution with the sole exception of Sweden which has maintained its position.

B. DI FABIO
Chairman of ad hoc Group 4

COMMITTEE 4

REPORT OF CHAIRMAN OF

AD HOC WORKING GROUP EMA 4-4 TO COMMITTEE 4

In Annex 1 is detailed the list of the participants who attended the above ad hoc Working Group.

The terms of reference provided by the Chairman of EMA Committee 4 for the ad hoc Group were:

- to agree proposals for the FIB part of the radiobeacon signal. That is:
 - to decide if the modulation should be FSK or MSK;
 - to decide the baud speed;
 - to decide the structure of the data message (synchronizing length, data length, error detection, etc.)

If it is not possible to agree, at least to agree the duration of the FIB signal (e.g. four seconds).

The Chairman drew the attention of the Group on the following documents giving a brief technical summary of the contents of each document:

- Document 1003: CCIR Report to the EMA Conference;
- Document 1004(Rev.1)-E: United Kingdom proposal;
- Document 1005-E: French proposal;
- Document 1008-E: Swedish proposal;
- Document 1007-E: IALA Recommendations;
- Document 1016-E: IALA report on MSK trials conducted in Sweden.

During the discussion conducted in the morning meeting the following positions emerged:

- United Kingdom - USSR - Italy in favour of FSK (100 bauds) form of modulation;
- France - Sweden - Federal Republic of Germany - Belgium - Ireland - Denmark and IALA in favour of MSK (40 bauds) form of modulation.

During the afternoon meeting a possible compromise proposal was suggested by IALA in order to progress the discussion. The mentioned proposal is detailed in Annex 2 and consists of an FSK (100 bauds) transmission of reduced duration of approximately two seconds, followed by an ALA transmission of approximately two seconds.

This was in order to accommodate an operational advantage seen by IALA in being able to take a bearing at some time during the data transmission sequence, the period required to take this bearing being 1 to 2 seconds.

The United Kingdom stated that while it preferred the message format given in Annex 3 and did not see an advantage, according to its national requirements, in the compromise proposed, it could support it. Sweden was not available to give its approval to the compromise solution and preferred instead to propose a modified format of the FIB transmission, maintaining the MSK (40 bauds) form of modulation with a small increase in duration of transmission, in order to improve the quality of the information transmitted (see details of the Swedish proposal in Annex 4). France on its side remained in favour of the MSK form of modulation and proposed in turn to further investigate the possibility of improving the baud speed of transmission and the frequency shift as appropriate to improve the quality of transmission.

France was also available to increase duration of data transmission, in line with the Swedish proposal.

The positions of other delegations on the compromise IALA proposals were:

- Denmark: still in favour of MSK but available to adopt the compromise proposal;
- Italy: still in favour of FSK and available to accept the compromise proposal;
- Belgium: still in favour of MSK; does not consider it necessary to improve the quality of the data message.

Having not been able to find a unanimously agreed solution for the form of modulation, the Group was consequently unable to decide the baud speed and the structure of the data message to be adopted.

The various proposals and positions are reported to EMA Committee 4 for further consideration.

B. DI FABIO
Chairman of ad hoc Group 4

Annexes: 4

ANNEX 1

List of participants

		<u>Box</u>
- <u>Chairman:</u>	Mr. B. DI FABIO (Italy)	200
- <u>Participant administrations:</u>		
- Denmark:	Mr. I.J. PFORR-WEISS	161
- United Kingdom:	Mr. R. CROLL	16
- IALA:	Mr. W. PATERSON	47
	Mr. J.D. LAST	45
	Mr. F.E.J. HOLDEN	44
- Sweden:	Mr. S. FOGELBERG	65
- IMO:	Mr. J.L. THOMPSON	286
- Belgium:	Mr. A.L.I. MOERMAN	181
- France:	Mr. P. BRUNSCHWIG	140
	Mr. J.-P. RENOUX	137
- Italy:	Mr. S. PIETROBONO	201
- USSR:	Mr. CHERNOV ¹	34
- Ireland:	Mr. P. CAREY ¹	58
- Federal Republic of Germany:	Mr. K. MAIER ¹	116
- Spain:	Mr. M. MANRIQUE ²	80

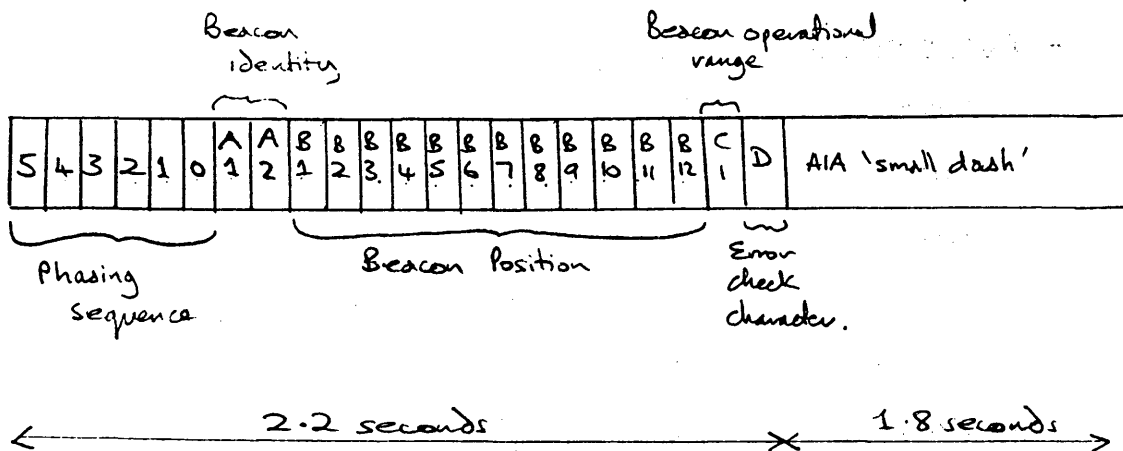
¹ Present only part of the time

² Observer only

ANNEX 2

IALA compromise FSK (100 baud)/ALA data message format

The proposed method of modulation is FSK ± 85 Hz shift using the ten-unit error detecting code given in Table 1 of Document 1003. The message format to be as shown below.

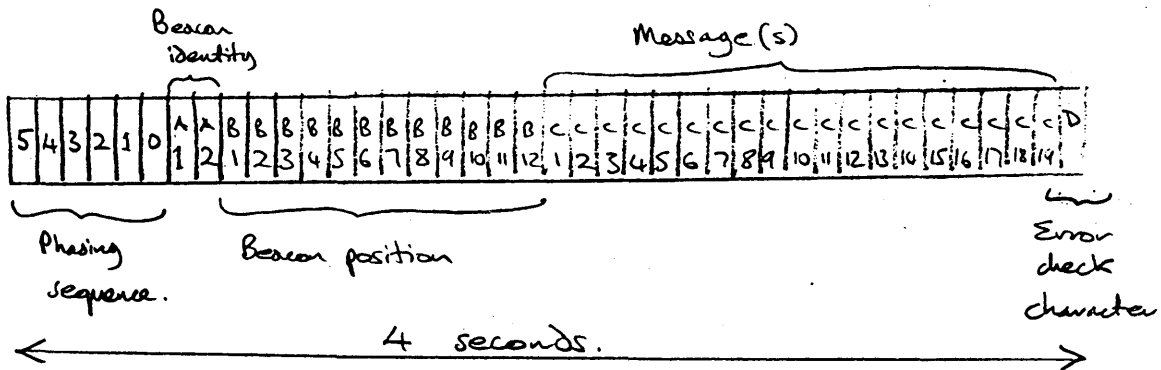


ie 22 characters.

ANNEX 3

FSK (100 baud) data message format as given in United Kingdom Document 1004

The proposed method of modulation is FSK ± 85 Hz shift using the ten-unit error detecting code given in Table 1 of Document 1004. The message format to be as shown below.



ie 40 characters

ANNEX 4

Swedish proposal to increase:

MSK data reliability

Concern was raised whether error checking of the MSK data was sufficient to ensure that corrupted data would not be accepted by the receiver.

In order to improve the data reliability a modification is proposed as detailed in Figure 1.

The modification consists mainly in the addition of two check-sum characters to the end of the data stream thereby considerably adding to the error detection capability of the data message.

A new character to indicate the service range of the radiobeacon has been added and the two stop bits ending each character have been reduced to one.

This all results in an increase of 21 bits in the number of bits in the data stream (from 164 bits to 185 bits) thereby increasing the duration of the data slot from 4.1 seconds to 4.6 seconds.

As an alternative of increasing the duration of the data slot to 4.6 seconds the baud speed could be increased. With an increase to 45 baud (frequency shift 11.25 Hz) the duration of the data slot would remain 4.1 seconds. The necessary bandwidth will however increase from 64 Hz to 72 Hz which is still quite small compared to the 304 Hz necessary in the FSK case.

Effects on transmission schedule

In the single beacon operation these data could be transmitted several times per minute thereby further increasing redundancy and the possibilities for the receiver to extract the correct message in a short period of time. This can be done since the small frequency shift ± 11.25 Hz would not effect D/F-ing.

In the grouped beacon situation the data slots can still be transmitted so that bearing updates can be made each minute. The two methods,

- 1) Increase baud rate to 45 Hz in which case the transmission schedule as indicated in Figure 1 of Report EMA/1005, page 51, is still valid.
- 2) Increase the duration of each data slot from 4.1 seconds to 4.6 seconds and let the transmission of data form a trailing part of the long dash, i.e. the transmission of data starts at the 38th second instead of the 40th second as indicated in the same figure.

Either of these methods should provide adequate data error detection capability and fit in in a grouped beacon arrangement.

It is however suggested that the baud rate and frequency shift remains unchanged 40 baud (± 10 Hz) as in the original MSK proposal and that for grouped beacons the arrangement 2) above is chosen.

For single beacons the same format is used with the additional advantage that the data can be sent more often.

COMPOSITION OF DATA BLOCK

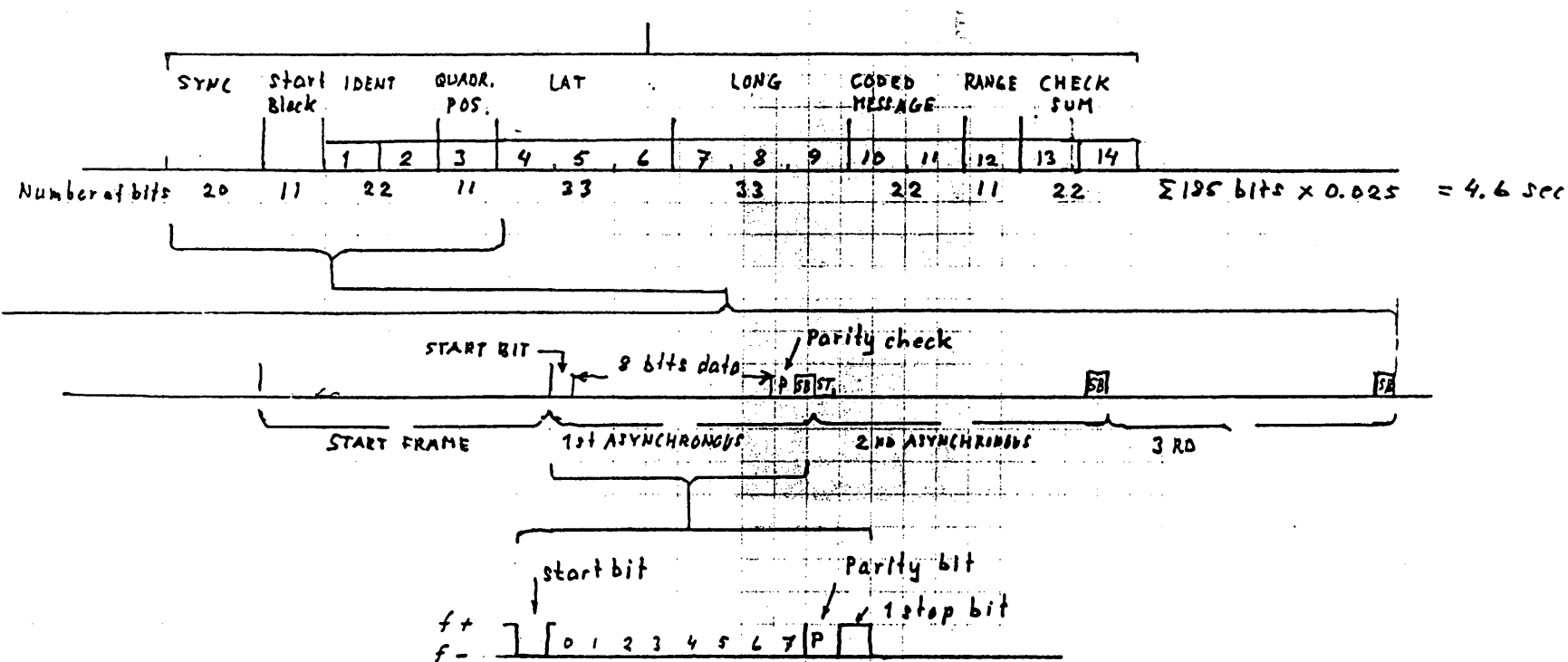


FIGURE 1

UNION INTERNATIONALE DES TÉLÉCOMMUNICATIONS

**CARR POUR LA PLANIFICATION DES FRÉQUENCES
UTILISÉES PAR LES RADIOPHARES MARITIMES
DANS LA ZONE EUROPÉENNE MARITIME**

GENÈVE,

MARS 1985

EUROP.

Document DT/1011-F/E/S
12 mars 1985

RÉGION 1

UNION INTERNATIONALE DES TÉLÉCOMMUNICATIONS
**CARR POUR LE SERVICE MOBILE MARITIME ET LE
SERVICE DE RADIONAVIGATION AÉRONAUTIQUE
DANS CERTAINES PARTIES DE LA BANDE DES
ONDES HECTOMÉTRIQUES DANS LA RÉGION 1**
GENÈVE, FÉVRIER/MARS 1985

Document DT/22-F/E/S
12 mars 1985

Le document 1049 (EMA) / 107 (MM) est un PROJET DE RAPPORT de la
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En conséquence, le N° du document doit être : DT/1011 (EMA)
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The document 1049 (EMA) / 107 (MM) is a DRAFT REPORT of the Budget
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DT/22 (MM).