COMMISSION OF THE EUROPEAN COMMUNITIES

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Brussels, 24 July 1974

PROPOSAL FOR A DIRECTIVE

concerning the approximation of laws of Member States in respect of radio interference caused by equipment operating at radio frequencies in the range 10 kHz to 18 GHz - high-frequency industrial, scientific and medical equipment and similar apparatus

(submitted to the Council by the Commission)

EXPLANATORY MEMORANDUM

1. GENERAL

1. A comparative examination of the provisions laid down by law, regulation or administrative action of Member States in regard to radio interference has revealed a number of differences in the type of checks carried out, the permissible limits, the test equipment and methods employed, and the types of appliances concerned.

   These differences have prompted the Commission to take action to harmonize these provisions under Article 100 of the Treaty of Rome.

2. When the proposal for a directive on electrical equipment for use within certain voltage limits was being prepared, it was assumed, as mentioned in Annex I to the Commission's proposal, that harmonization of the laws relating to radio interference would be covered by later directives.

   Until these directives have been adopted, it is possible that an appliance which meets the harmonized standards, and is therefore considered reliable under the directive on equipment for use within certain voltage limits, may be banned or involve penalties if it does not comply with the legislation on radio interference in such and such a country.

   The entry into force in January 1971 of the German regulations penalizing the user of an appliance which does not carry the suppression-of-interference mark provided for in these regulations has considerably increased the likelihood of such an obstacle.

   Harmonization of such laws is therefore a priority matter which has justified the reference to this sector in the third phase of the general programme for the removal of technical obstacles to trade, approved by the Council on 28 May 1969, and the presentation to the Council on 26 July 1972 of two initial proposals, one relating to electrical household appliances and portable tools and the other to

lamps for fluorescent lighting. The third proposal, relating to sound and vision TV receivers, was presented to the Council on 24 April 1973.

This proposal for a directive relates to equipment operating at radio frequencies in the range 10 kHz to 18 GHz - high-frequency industrial, scientific and medical (ISM) equipment and similar apparatus.

II. GENERAL NOTE ON THE PROPOSAL FOR A DIRECTIVE

1. Harmonization solution

This directive, like those that preceded it, provides for a solution aimed at substituting, in each Member State, the technical requirements and the control procedure laid down in the directive for those existing in the States before the directives entered into force ("total harmonization" solution).

2. Keeping pace with technical progress

Since the proposal for a directive relating to electrical domestic appliances and portable tools makes provision for a committee responsible for adaptation to technical progress, the technical annex to this directive will be updated within the framework of the Committee's procedure. This will apply particularly when the international rules of the CISPR (1) have to be amended.

3. Explanatory notes on the proposal for a directive

Article 1 states that the directive covers high-frequency industrial, scientific and medical (ISM) equipment

Article 2 is the usual clause stating that the directive has been drawn up under the "total harmonization" system, i.e., that only products which comply with the directive may be put on the Community market. As in the three previous recommendations, the solution providing that all equipment marketed within the Community must satisfy the requirements of the relevant directives

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(1) International Special Committee on Radio Interference.

has been chosen in preference to the one which requires the user to satisfy himself that his equipment has been appropriately suppressed and bears the noise-suppression mark.

Article 3 examines the question of responsibility for ensuring that the equipment complies with the requirements of the directive, and assigns to the manufacturer the task of certifying that this is the case without requiring inspection beforehand. This solution is the one most widely adopted in the Community countries.

Article 4 is the standard clause which requires the free movement of products complying with the provisions of the directive.

Under the provisions of Article 5, the Member States undertake to ensure that the requirements of the directive are fulfilled.

The exception referred in Article 6 concerns the protection of certain public utility areas where radio interference is likely to cause serious damage. Specific regulations exist in nearly all Member States to cover such cases: technical devices may therefore be needed to eliminate the nuisance. It should, however, be emphasised that this is a local obligation which is imposed on the user irrespective of the source of his appliance.

Article 7 states the procedure for amending the directive to keep pace with technical advancement.

.../...

Finally, Articles 8 and 9, which appear in all the directives, cover the entry into force of the directive and draw attention to the fact that copies are sont to all the Member States.

Annex :

The limits specified in this annex have been laid down after consultation with the specialists working in close collaboration with CENELEC (1). The methods of measurement are based en CISPR publications 1 (1972), 2 (1961) and 2A (1966). As radio-interference, produced by these apparatus, can be particularly troublesome for radio-transmission, these apparatus are divided in two categories.

III. CONSULTATION WITH THE BODIES CONCERNED

The bodies concerned have been closely associated with the drafting of this directive.

The consumers have been consulted through the Service Environment and Consumers Protection on the system adopted in the three previous directives (the marking of noise-free equipment or the suppression of noise in all equipment). They also expressed their views on this matter within the working party on technical obstables set up by the section of the Social and Economic Committee specializing in economic questions, where they stated that they were satisfied with the solution adopted.

IV. CONSULTATION OF THE PARLIAMENT AND OF THE SOCIAL AND ECONOMIC COMMITTEE

Consultation of these two authorities is required under the provisions of the second paragraph of Article 100.

Implementation of the requirements laid down in the directive will involve amendments to the laws of several of the Member States.

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(1) European Committee for Electrical Standardization.

PROPOSAL FOR A DIRECTIVE

concerning the approximation of laws of Member States in respect of radio interference caused by equipment operating at radio frequencies in the range 10 kHz to 18 GHz - high-frequency industrial, scientific and medical equipment and similar apparatus.

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 100 thereof;

Having regard to the proposal from the Commission;

Having regard to the Opinion of the European Parliament;

Having regard to the Opinion of the Economic and Social Committee;

Whereas in the majority of Member States appliances operating at radio frequencies in the range 10 kHz to 18 GHz are subject to strict provisions regarding the interference which they may cause, and whereas such provisions differ from one Member State to another;

Whereas the differences between such national provisions hinder trade in appliances operating at radio frequencies in the range 10 kHz to 18 GHz which are likely to cause radio interference; whereas for this reason they have a direct effect on the establishment and functioning of the Common Market;

Whereas it is consequently necessary to lay down, at Community level, the regulations to be observed in regard to the permissible upper limits of the radio interference caused by appliances operating at radio frequencies in the range 10 kHz to 18 GHz, together with the methods to be used for measuring such interference;

.../...

Whereas, for the purposes of measuring the interference produced by the appliances covered by this Directive, it is necessary to operate such appliances in specified conditions and to interpret the values recorded on the test set in an identical manner ;

Whereas technological progress necessitates frequent adaptation of the technical requirements contained in this Directive, and whereas in order to facilitate implementation of the measures necessary for this purpose, it is essential to adopt the procedure for close co-operation between Member States and the Commission within the Committee responsible for adaptation to technical progress set up by the Council Directive on the approximation of the provisions laid down by law, regulation or administrative action of Member States relating to radio interference caused by domestic electrical appliances and portable tools, of .....

HAS ADOPTED THIS DIRECTIVE :

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Article 1

1. This Directive aims at approximating the provisions laid down by law, regulation or administrative action of Member States relating to the radio interference caused by appliances operating at radio frequencies in the range 10 kHz to 18GHz - high-frequency industrial, scientific and medical (ISM) equipment and similar apparatus producing radio interference by fixing on the one hand the permissible upper limits for the interference produced by the above-mentioned equipment and on the other hand the methods to be used for measuring such interference.

2. The scope of this Directive is specified in Sections 1 and 2 of its annex.

Article 2

The radio-frequency equipment referred to in Article 1 shall not be placed on the market unless it meets the requirements of this Directive in respect of the permissible upper limits of the electrical interference which it is likely to cause.

Article 3

1. The conformity of the equipment operating at radio frequencies with the requirements laid down in this Directive is certified by the producer or importer on his own responsibility in a statement to be included in the instructions for use, the guarantee document or in the equipment itself.

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2. The use of marks or certificates issued by any of the organizations notified by each Member State to the other Member States and to the Commission shall render unnecessary the statement provided for in the preceding paragraph.

Article 4

Member States shall not invoke reasons concerning radio interference for prohibiting, restricting or preventing the marketing or use of equipment which meets the requirements of this Directive and of its annex.

Article 5

Member States shall take all necessary steps to ensure that measurement test methods used for official checks and intended to verify compliance with the requirements relating to the permissible limits for each type of equipment are in accordance with those laid down in the annex.

Article 6

The requirements of this Directive shall not prevent the application in each Member State of the provisions relating to the protection of public utility receiving stations.

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Article 7

Any amendments required in order to bring the provisions of the annex to this Directive (with the exception of Sections 1 and 2) into line with technical progress shall be agreed in accordance with the procedure in Article 8 of the Council Directive of .... concerning approximation of laws of Member States on radio interference caused by domestic electrical appliances, portable tools and similar apparatus.

Article 8

1. Member States shall bring into force the necessary provisions to comply with this Directive within a period of eighteen months from the date of its issue and shall inform the Commission immediately thereof.

2. Member States shall ensure that the text of the provisions under national law which they are adopting in the field governed by this Directive is forwarded to the Commission.

Article 9

This Directive is addressed to all Member States.

ANNEX

TO THE PROPOSAL FOR A COUNCIL DIRECTIVE

concerning the approximation of laws of Member States in respect of radio interference caused by equipment operating at radio frequencies in the range 10 kHz to 18 GHz - industrial, scientific and medical equipment and similar apparatus

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1. SCOPE

These provisions relate to appliances operating at radio frequencies (industrial, scientific and medical appliances and other similar appliances) in categories I and II, but not to appliances used in diathermic surgery.

The frequency range concerned extends from 10 kHz to 18 GHz. (*)

These regulations do not cover appliances capable of being tested prior to assembly at their place of use.

The regulations set out the maximum values and measuring methods and also the frequencies allocated by the International Telecommunication Union (ITU) for industrial, scientific and medical appliances in respect of which no maximum values are laid down.

The maximum values apply to the operating frequencies and their harmonics.

In the case of appliances operating on one of the ITU unallocated frequencies, these limits apply only to the harmonics thereof which coincide with allocated frequencies.

2. DEFINITIONS

2.1. Appliance operating at radio frequencies.

Appliance, device or unit intentionally producing or using energy at frequencies of 10 kHz or higher for industrial, scientific, medical or similar purposes but not for telecommunications.

2.2. Category I appliance operating at radio frequencies

Appliance operating at radio frequencies falling within the category I limits.

2.3. Category II appliance operating at radio frequencies

Appliance operating at radio frequencies falling within the category II limits.

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(*) Requirements in respect of the 10 - 150 kHz frequency range are under study.

NOTICE :

a) Category I vcovers mass-produced radio frequency appliances conforming to the category I limits.

However, even appliances which conform to these limits are sometimes capable of causing interference and hence, in certain countries, may be subject to administrative formalities, notably the submission of a declaration of use. This declaration of use is simply a notification made by the user to the administrative authority that an appliance conforming to the category I limits has been put into service in a specific place. The purpose of the declaration is to facilitate the location of appliances in the event of interference since although these appliances conform to the category I limits they are still capable of causing interference under certain local conditions, especially in residential areas.

The fact which has to be considered is that, given equal measured values, the interference caused by appliances operating at radio frequencies is more troublesome than that produced by household electrical appliances or motors ; and set the limits for the latter appliances and those for category I appliances are equal or comparable.

b) Category II covers mass-produced radio frequency appliances conforming to the category II limits.

Since the category II limits are more stringent than those specified for category I, appliances conforming to them ought no longer to be subject to administrative formalities. Appliances in this category are considered unlikely to cause interference.

The case of these appliances is comparable with that of the household electrical appliances, portable tools and similar appliances dealt with in Annex 1 to the Directive.

c) Appliances other than those in categories I and II

Appliances belonging neither to category I nor to category II are generally large appliances. Same of these are completely assembled at the factory but can only be tested in situ. Others are assembled only al therplace of use.

3. MAXIMUM VALUES

3.1. Radiation

3.1.1. 150 kHz - 1.000 MHz frequency range

The maximum values for all frequencies in the 0.15 - 1,000 MHz range, ether than those listed in Article 5, are shown in Table I. Below 30 MHz, only the magnetic component of the radiation field is measured.

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TABLE I

Maximum radiation values (in μV/m)

Frequency range MHz	Distance of test site from the appliance			
	Category I		Category II	
	30 m	100 m	10 m	30 m
0.15 to 0.285	-	50 m	-	50 m
0.285 to 0.49	-	250	-	50
0.49 to 1.605	-	50	-	50
1.605 to 3.95	-	250	-	50
3.95 to 30	-	50	-	50
30 to 41	500	-	50	-
41 to 68	30	-	50	-
68 to 80	500	-	50	-
80 to 108	30	-	50	-
108 to 162	500	-	50	-
162 to 230	30	-	50	-
230 to 470	500	-	50	-
470 to 960	100	-	200	-
960 to 1000	500	-	200	-

3.1.2. Radiation in the 1 - 18 GHz frequency range

The maximum radiation value for all frequencies in the 1 - 18 GHz range, other than those listed in Article 5, is 57 dB (pW) e.r.p. referred to a half-wave dipole.

Note

A band of frequencies in the region of 12 GHz (11.7 - 12.5 GHz) has been allocated for satellite broadcasting, including the direct reception of signals in individual dwellings.

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Since the prescribed limit is not capable of affording sufficient protection to a service of this kind, there is a possibility that the limit will have to be reduced in this band.

3.2. Terminal voltages

The maximum value for all frequencies in the 0.15 - 30 MHz range, other than those listed in Article 5, are shown in Table II.

No maximum value is prescribed for frequencies above 30 MHz, although line filters must of necessity be incorporated in the appliance in order to conform to the maximum radiation values.

The limits apply to voltages as measured at the terminals of the appliance.

Note

Where a heavy-duty lead is used to connect the radio frequency appliance to the mains, the effectiveness of the built-in filters may be considerably impaired, and the interference voltage may then exceed the maximum values. Should this be the case, additional measures for the suppression of interference will have to be taken at the place of use.

TABLE II

Maximum voltage values at the terminals of the appliance.

Frequency range MHz	Maximum value mV	
	Category I	Category II
0.15 - 0.5	2	0.50
0.5 - 30	1	0.25

4. MEASURING METHODS

4.1. Frequencies from 0.15 to 300 MHz

Details of the equipment and methods to be used are set out in CISPR Publication 1 (1972) for the 0.15 - 30 MHz range and in CISPR Publications 2 (1961) and 2A (1966) for the 25 - 300 MHz range.

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4.2. Frequencies from 300 to 1,000 MHz

For the 300 - 1,000 MHz range the measuring equipment used must meet the requirements of CISPR Publication 4 and measurements must be taken in accordance with the method described in Publication 2A, pending the publication of a document dealing specifically with the high-frequency range.

Note

For these two frequency ranges (see 4.1, and 4.2. above), measuring instruments with characteristics differing from those laid down in Publications 1, 2 and 4 may be used provided that it can be shown that the values measured are the same as those which would be obtained by using a CISPR appliance. For example, in order to measure the modulated radiation of an industrial, scientific or medical appliance, it is permissible to use a detector capable of providing an approximate indication of the peak value.

4.3. Frequencies from 1 - 18 GHz

4.3.1. Measuring equipment

The measuring equipment used must satisfy the requirements of CISPR Recommendation 52, dated .....

4.3.2. Receiving aerial

The measurements must be taken by means of a narrow-beam directional aerial capable of providing separate readings for the vertical and horizontal components of the radiation field.

The height-above-ground of the aerial axis must correspond to the approximate height of the centre of radiation of the appliance under test.

4.3.3. Checking and calibration of the test site.

The calibration of the test site must be carried out by means of a substitution method. It is performed in two stages.

First, the test site must be checked in the manner prescribed below.

A transmitting aerial must be set up at a point coinciding with the centre of radiation of the appliance under test (normally the geometrical centre of the appliance).

The receiving aerial must have the radiation pattern of a half-wave dipole and must be installed at the place where the actual measurements will be taken.

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The two aerials should be positioned in such a way that they are identically polarized, the polarization being perpendicular to the straight line joining the centres of the aerials.

The tests must be carried out both for horizontal and for vertical polarization.

The test site is considered suitable for the taking of measurements at a test frequency if the reading given by the measuring instrument does not deviate by more than ± 1.5 dB when the centre of the transmitting aerial is moved 0.15 cm in all directions, calculated in each instance from the initial position.

Next, the calibration proper is carried out. For each test frequency, the transmitting and receiving aerials must be positioned as indicated above. A signal of sufficient strength to provide a usable reading on the measuring instrument is fed to the transmitting aerial. The relation between the measuring instrument reading and the input strength at the transmitting aerial, under matching conditions, gives the conversion factor. This factor is used to convert each reading on the measuring instrument into radiated power.

4.3.4. Load

4.3.4.1. Appliances other than microwave cooking ovens

To check compliance with the maximun radiation level laid down in 3.1.2. above, the appliance is tested with a notional load consisting of a quantity of tap water in a plastic or glass container.

The size and shape of the container, its position in the appliance and the quantity of water will be adapted in such a way as to ensure maximum energy transfer, account being taken of possible variations in frequency and harmonic radiation.

4.3.4.2. Microwave cooking ovens

Microwave cooking ovens must comply with the radiation limit laid down in 3.1.2. above when tested with the normal accessories, such as shelves, in position and with a 250 - 500 ml load of tap water containing 1% of kitchen salt at an initial temperature of 20 °C ± 5 °C placed in the centre of the load-supporting surface provided by the manufacturer.

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The water is placed in a container made of non-conducting material such as glass or plastic and having an inside diameter of 8 - 15 cm.
Where necessary, steps must be taken to ensure that the quantity of water remains constant.

4.3.5. Procedure

The measurements must be performed with the aerial polarized vertically and horizontally, the appliance under test being placed on a turntable.

The radiation level to be taken into account for the measuring frequency in question is the highest level.

It must be verified that when the appliance is switched off the background noise level is at least 10 dB lower than the reference limit, otherwise the readings may be significantly affected.

5. FREQUENCIES ALLOCATED BY THE ITU FOR THE USE OF INDUSTRIAL, SCIENTIFIC AND MEDICAL APPLIANCES.

Frequencies MHz	Frequency tolerance
13,560	± 0.05%
27,120	± 0.60%
40,680	± 0.05%
433,92	± 0.20% (reserved for West Germany)
2.450	± 50 MHz
5.800	± 75 MHz
24.125	± 125 MHz

ANNEX

Frequencies in use in the member countries of CENELEC

Belgium

ITU unallocated frequencies.

France

ITU unallocated frequencies.

United Kingdom

Frequency, MHz	Limits in dB (uV/m)	Remarks
13.56 ± 0.05 % 13.56 ± 0.2 %	unallocated (ITU) 120	
27.12 ± 0.6 %	unallocated (ITU)	
42 ± 0.2 %	120	When channel 1 CCIR System A TV is not received
49 ± 0.2 %	120	When channel 2 CCIR System A TV is not received
56 ± 0.2 %	120	When channel 3 CCIR System A TV is not received.
61 ± 0.2 % 66 ± 0.2 %	120 120	Fall-back frequency Fall-back frequency
84 ± 0.005% 168 ± 0.005%	130 130	
896 ± 10	120	
40.680		ITU unallocated frequency (prohibited)

Netherlands

ITU unallocated frequencies.

Frequencies, MHz	Limits
3.390 ± 0.6%	3 m V/m at 300 m
6.780 ± 0.6%	3 m V/m at 300 m

West Germany

ITU unallocated frequencies.