

# COMMISSION OF THE EUROPEAN COMMUNITIES

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Proposal for a  
COUNCIL RECOMMENDATION

on the Coordinated Introduction of Digital European Cordless  
Telecommunications (DECT) in the Community

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Proposal for a  
COUNCIL DIRECTIVE

on the Frequency Bands to be designated for the Coordinated  
Introduction of Digital European Cordless Telecommunications (DECT)  
in the Community

(presented by the Commission)

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**PROPOSAL FOR A COUNCIL RECOMMENDATION ON THE COORDINATED INTRODUCTION OF DIGITAL EUROPEAN CORDLESS TELECOMMUNICATIONS IN THE COMMUNITY.**

**PROPOSAL FOR A COUNCIL DIRECTIVE ON THE FREQUENCY BANDS TO BE DESIGNATED FOR THE COORDINATED INTRODUCTION OF DIGITAL EUROPEAN CORDLESS TELECOMMUNICATIONS IN THE COMMUNITY**

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## A. SUMMARY

*Digital European Cordless Telecommunications (DECT) is a system which will provide a variety of applications for cordless telephones including residential and business use as well as a "telepoint" service. The basic cordless telephone set is simply a telephone which has its cord replaced by a radio link and in general has been employed for residential use in the home. The second application is the wireless PABX, or what has been more generally called the cordless business communication system, for use in offices. The third main application of DECT is the telepoint service for public access. Telepoints are base stations which are located in public places, such as railway stations, shopping centres or airports. Anyone with a suitable handset could access the ISDN/PSTN via such a telepoint. The DECT standard will provide full compatibility and inter-operability between systems utilised in the home, the public telepoint service and a wireless PABX system.*

*During 1991, Member States will introduce the pan-European Digital Cellular Communication System (GSM) to provide a high quality voice and data mobile telecommunications service interfacing with the fixed ISDN/PSTN network. For the first time it will be possible for mobile users to roam freely throughout the Community while remaining in telephone contact.*

*GSM is designed for wide-area, high mobility, while DECT will provide high capacity, low mobility. DECT cordless telephones will provide a lower cost service available for use in the home, office and in the vicinity of public telepoints.*

*The mobile telecommunications industry is experiencing considerable growth at present and with the increased traffic capacities which these systems will provide and falling equipment prices, it is expected to continue to grow throughout the 1990's.*

*Projections of equipment costs indicate that even portable cellular handsets could come within the reach of many customers well before the end of the century. This is likely to transform mobile communications services from a minority, high cost application into a mainstream telecommunications service.*

*The potential market for DECT in Europe is enormous, offering considerable opportunities to equipment manufacturers, network operators and users. This potential can only be realised and exploited by the timely and coordinated establishment of a fully harmonised DECT standard in the Community, and the Commission is proposing the following instruments in order to meet this objective:*

- *a Council Recommendation on the coordinated introduction of DECT;*
- *a Council Directive on the appropriate frequency band to be made available for DECT.*

*The proposed Recommendation and Directive will:*

- *initiate the transition from the present incompatible cordless telephone applications to an advanced fully harmonised European system in the Community, which will provide a broader range of services at more economic costs;*
- *contribute to the economic well being of individuals and businesses through increased efficiency made possible by the availability of a harmonised cordless system throughout the Community;*
- *allow the development of cordless telephones as an integral part of the evolution of an advanced mobile communication service in the Community;*

- encourage the necessary investment in the system by manufacturers and operators;
- provide entry for manufacturers into a truly Europe-wide market, enabling them to benefit from the economies of scale and hence reduced costs and increased competitiveness in world markets;
- provide a mechanism whereby network operators can substantially increase business opportunities.

*In general the development and implementation of a fully harmonised European cordless telecommunications standard will, in particular, offer private individuals and businesses a new degree of mobility in their daily transactions and provide a cost-effective solution for residential, telepoint and cordless PABX applications. Finally, the proposed system will provide a fully integrated system for the Community and eliminate the shortcomings currently experienced by the present fragmentation and incompatibility of cordless telecommunications systems. This particular feature will be of substantial benefit to Europe's citizens as a whole from an economic, cultural and social standpoint.*

*As foreseen in the Commission's Green Paper of June 1987 on the development of the Common Market for Telecommunications Services and Equipment [1] future intra-Community communications will depend on achieving Europe-wide compatibility and interoperability of current and future services, including mobile communications, which should be provided universally at a European level.*

*This Recommendation and Directive are proposed by the Commission as a further milestone in the Communities initiatives towards the convergence and evolution of GSM, ERMES, and DECT into universally available mobile communications in Europe.*

## **B. EXPLANATORY MEMORANDUM**

### **E. INTRODUCTION**

#### **1.1 Background**

As foreseen in the Commission's Green Paper of June 1987 on the development of the Common Market for Telecommunications Services and Equipment [1] future intra-Community communications will depend on achieving Europe-wide compatibility and interoperability of current and future services, including mobile communications, which should be provided universally at a European level. These requirements must build in particular on Decision 87/95/EEC, Directives 83/189/EEC, [.....(see [6])], 89/336/EEC and Recommendation 86/654/EEC. Also Recommendation 84/549/EEC calls for the introduction of services on the basis of a common harmonised approach in the field of telecommunications.

For its part, the European Parliament has requested that the current general incompatibility of mobile communication systems be resolved and that work towards Community-wide mobile communications be undertaken [2].

The Commission's June 1987 Green Paper on telecommunications included the proposal to create a European Telecommunications Standards Institute (ETSI). This has resulted in a major reform of the European standards-setting process with the establishment of ETSI in March 1988 in Sophia-Antipolis Nice, France. ETSI has charged its Technical Sub-Committee RES 3 with producing the Digital European Cordless Telecommunications (DECT) standard by October 1991.

The standard will provide for three fundamental requirements, residential cordless telephones, telepoint and cordless PABX's. Detailed market surveys have shown that the market is price sensitive and the consumer will expect a relatively cheap handset. There are currently several different types of cordless telephones, serving different consumer requirements, using different technologies, located in different frequency bands. As a consequence, markets for cordless telephones are completely fragmented and the benefits resulting from economies of scale have not been realised. On the other hand, the DECT solution provides the most cost effective solution if advantage can be taken of the synergy that exists in today's rf technology and VLSI components by virtue of the developments for the pan-European digital cellular system. In addition, there is growing interest in linking cordless telephone and digital cellular technology into the office environment, to provide cordless PABX's and Key Telephone Systems (KTS) and to provide cordless Local Area Networks (LAN's). The chance to fully exploit these considerable opportunities will be missed if a totally harmonised DECT solution is not realised.

#### **1.2 The current state of cordless telephone development in the Community**

Cordless telephones were first introduced in the United States during the late 1970's. Since then, cordless telephones have been imported and used in the majority of the Member States. The first generation of analogue cordless telephones was a very simple telephone which has its cord replaced by a radio link and enabled the user to be connected to the public switched telephone network. Due to the low powers transmitted the range was between 200 metres and 1 km depending on the precise radio environment. The CEPT-1 standard for this type of application was introduced in 1984 and the majority of the Member States opted for this standard with the exception of the United Kingdom and France. As a part of the liberalisation process

in the UK and in order to allow the legal use of such telephones, a national specification was drafted based on the USA FCC regulations for operation in the frequency bands 47.44-47.55 MHz and 1.632-1.792 MHz (UK CT1). In the case of France, illegal cordless telephones started swamping the French market and it was necessary for France to introduce a national equipment specification based again on the USA FCC regulations for operation in the 41.375-41.475 MHz and 26.315-26.415 MHz bands respectively (41-26). Both these standards are different and are incompatible with the CEPT-1 specification. In general, different Member States have adopted different policies towards analogue cordless telephones and the situation is summarised in Table 1 below:

**TABLE 1**

<b>Member State</b>	<b>CT specification</b>
Belgium	CEPT-1
Denmark	CEPT-1
Fed. Rep. of Germany	CEPT-1
France	"41-26"
Greece	.....
Ireland	UK CT1
Italy	CEPT-1
Luxembourg	CEPT-1
The Netherlands	CEPT-1
Portugal	CEPT-1
Spain	"30-40",CEPT-1
United Kingdom	UK CT1

Due to the limitation of the technology used in the first generation of analogue cordless telephones the UK started developing a new generation of digital cordless telephones (UK CT2). A 4 MHz band in the 864-868 MHz was reserved for cordless telephony by the Department of Trade and Industry to allow for high density use, particularly in the urban areas. Whereas, the first generation of analogue CT's was primarily for the residential market for use in the home, the UK initiative was intended for both private and public use, and the UK CT2 Telepoint application was born. Within the frequency range 864-868 MHz, 40x100 kHz channels will be accommodated giving a system capacity better than cellular radio. The range of the handportables operating on a maximum power of 10 mW is approximately 50 metres indoors and 200 metres outdoors. Telepoint, is basically, a concept that enables a cordless telephone user to make calls when away from the residential base station. The user has to move within range (approx 100 metres) of a base station located in a public place. Such base stations will be installed at railway stations, petrol stations, airports, supermarkets, shopping malls etc... A Telepoint is very similar to an extended pay-phone, usable by more than one user simultaneously. Like conventional call boxes they will be located in the main conurbations covering high density population areas and then gradually extended into the more rural districts. The system itself is based on a Frequency Division Multiple Access/Time Division Duplex method of operation. It is digitally modulated, single channel per carrier and the transmission technique is referred to as "ping-pong" transmission. The UK has licensed four Telepoint operators and systems will commence operation initially in London, during 1989 and will gradually be expanded to cover other major conurbations and possibly rural districts.

The UK CT2 standard was notified according to the Directive (83/189) procedure and

a standstill was imposed until July 1988. To date the UK suppliers are currently the only ones with a working product. However, starting from its existing customer base, Ericsson of Sweden developed a different approach towards digital cordless telephones. The product is initially being developed for cordless PABX applications. However, Ericsson are using a different technological solution than the UK suppliers, based on Time Division Multiple Access/ Time Division Duplex (TDMA/TDD), and operates within the frequency bands 879-881 and 852-854 MHz respectively. The product will be on the market in 1990.

### 1.3 Market Opportunities and Requirements

Projections of the demand for digital cordless telephones are difficult, due to the technical options available to satisfy user demand, such as the rapidly developing portable cellular telephones and paging. As an embryonic market, the attempts to accurately identify the demand are bound to be subject to quite wide statistical variations. In order to carry out the market analysis the overall market is often divided into five distinct user/application groups, as follows:

- cordless telephones for use exclusively in a private residence;
- consumer Telepoint services;
- business Telepoint services;
- cordless PABX
- on-site cordless data.

Based on the growth patterns of cordless telephones in the USA, public surveys and the results of a set of consumer panels, the following conclusions are derived from a recent study carried out for the Commission [3].

#### Cordless Telephones for Residential Use

The market demand is based on the assumption that the price needs to be below 200 ECU in order to achieve the required volume sales. The volume sales are estimated to be between 300-700 thousand units/year/manufacturer for DECT. In the short term (first two years) the annual market is estimated to be between 1-3 million units per annum. If the penetration rate is achieved comparable to the United States annual sales between 8 and 10 million units could be achieved. In the medium term (third to sixth year) and long term (beyond sixth year) the projected sales could very well reach 8-10 million units per year. However, this figure depends on the degree of penetration and these estimates have been based on the previous penetration rates of consumer electronic products.

#### Consumer Telepoint Services

Statistics indicate that between 1 in 80 and 1 in 400 of all telephones are public pay phones. Given that pay-phone utilisation is between 3 and 10 times that of average residential utilisation in terms of traffic handling capacity; this indicates a maximum requirement for 1 in 8 residential cordless users for the telepoint facility. Hence in the short term the market requirement is likely to be between 100-300 thousand/annum. This penetration depends to a large extent on the price of the handset and the cost of the call is not perceived to be the deciding factor. In the

medium term and the long term the expected penetration is likely to be between 10 and 20%. Therefore the likely volume sales will be between 0.2 and 0.5 million units/annum.

### Business Telepoint Services

The primary users in the first few years of telepoint services are expected to be business users. In the first few years of service anticipated sales are likely to be between 0.3 and 0.8 million units/annum. There are several indications of the longer term potential of mobile communications for business. No doubt the opportunity for cordless telephones is significant but it is difficult to estimate what percentage of users will use the telepoint system compared to cellular radio and trunked private mobile radio systems. However, there are some 25 million mobile workers in Europe. Assuming a 40% penetration within 7-10 years of start up, with a 30% replacement level each year, sales would be 3 million units/annum.

### Cordless PABX

If this technology is available in the short term market surveys indicated that sales could reach 300,000 units by the third year. Regarding the medium term and long term, there are expected to be rapidly growing applications for cordless technology in offices and factories. On average only 30% of telephone calls reach the desired party because they are absent from their telephones 70% of the time. Also the user is less sensitive to price than consumers and so could afford a more expensive solution. The potential number of digital cordless telephone users within the office environment in Europe can be estimated by the number of PABX extensions sold per year. In 1986 the total annual sales of PABX extensions in Europe was 6.4 million and the growth rate was 4.8%.

Assuming a 20-30% penetration of this market, it will lead to annual sales of between 1.2-1.8 million devices.

### On-site Cordless Data

The need for cordless data terminals and their application is somewhat speculative but several systems have been implemented very successfully. The "radio-LAN" concept would allow workstations and terminals to be installed and moved easily. Also connection, at variable bit rates, would be available on demand. As with the PABX application, different solutions will be required to satisfy the various operational requirements of individual user organisations. Despite the early state of development of this market, there is a very wide range of potential applications. The scope for further applications will be further enhanced when it is recognised that such radio data systems offer not only access to mobile stations but permit connections to fixed stations. This would allow, for example, easy relocation of workstations, terminals and personal computers without rewiring into a fixed network, and a broad range of office devices which communicate via radio modems.

## **1.4 Limitations of existing cordless telephones**

The current cordless telephone, on sale in a number of national markets, represents a technological and indeed commercial impasse. CEPT analogue cordless telephones are in use in Belgium, Denmark, Federal Republic of Germany, Italy, Luxemburg, Netherlands, Portugal and Spain within the Community, as well as in Finland, Norway and Sweden, Austria and Switzerland. Prices for the handset plus base station are



relatively high (500 ECU - 700 ECU) and penetration low, a fraction of below one percent of the number of telephones. Though there are nominally a number of suppliers, many manufacturers have abandoned the market or decided not to enter it, as they first intended. Only in the UK, where a domestic system is on sale for about 160 ECU is there a penetration of several percent supplied from the Far East. In France, where a hybrid system is marketed for about 340 ECU, penetration remains low - about half of one percent.

### **1.5 Conditions favouring the Growth of Digital Cordless Telephones**

During 1987 the Council approved a Directive [4] on the provision of frequency bands for the pan-European Digital Cellular Communication System (GSM) which will provide a high quality voice and data mobile telecommunications service interfacing with the fixed ISDN/PSTN network. A related Council Recommendation [5] states that major urban areas should be covered by 1993 at the latest. For the first time it will be possible for mobile users to roam freely throughout the Community while remaining in telephone contact.

DECT cordless telephone will be available for use both in the home or office and also in the vicinity of public telepoints. For users who wish to receive simple messages only, paging will provide the most cost effective solution. Europe has now agreed basic principles for the ERMES pan-European paging system, for introduction in 1992.

The mobile telecommunications industry is experiencing considerable growth at present and with the increased traffic capacities which these systems provide and falling equipment prices, it is expected to continue to grow throughout the 1990's. Deregulation and competition between suppliers will provide additional impetus and services to the customer.

Projections of equipment costs indicate that even portable cellular handsets could come within the reach of many customers well before the end of the century. This is likely to transform mobile communications services from a minority, high cost application into a mainstream telecommunications service. For both market and technical reasons it is likely that the distinction between cellular, telepoint and paging services will decrease, and the provision of common hardware in the form of a Universal Personal Communicator will become increasingly feasible:

DECT will, therefore, be complementary both to cellular and paging but considerably less expensive than cellular, and will form part of the evolution towards UPC in the late 1990's. Most present systems use out of date technology and cannot cope with the required capacity; they are relatively expensive and are faced with restrictions on the availability of frequencies. In addition, present systems lack telephone toll quality, and are open to abuse due to the absence of call authentication and security. Even a digital FDMA standard based on 900 MHz will not cope with the projected demand expected in the 1990's which will include residential, telepoint and cordless PABX applications. As such the DECT standard has the unanimous support of European Industry as the desirable solution and it is perceived as a fundamental stepping stone towards the longer term "Universal Mobile Telecommunications System" of the late 1990's. Potential European manufacturers of digital cordless telephones are currently enjoying a world-wide lead. In the US there are no major companies involved in developing alternatives to the European proposals and Japanese companies have adopted a "wait and see" attitude. Also experience with paging and cellular telephone developments clearly show that a market for mobile services takes off once a service

becomes available to a large number of potential users covering a very wide geographical area. This fact was well illustrated by the growth of the market for cellular telephones in the Scandinavian countries and more recently in the UK and the largest US cities. Should the markets for a new generation of digital cordless telephones develop there is a substantial risk that consumer electronic suppliers particularly those from the Far East will seize the initiative from the European telecommunications industry so it is essential to introduce DECT at the first available opportunity. DECT represents a unique opportunity to create a mass market, so reducing manufacturing costs and the cost to the consumer.

## **2. POTENTIAL BENEFITS OF DIGITAL EUROPEAN CORDLESS TELECOMMUNICATIONS**

There is unanimous agreement among European manufacturers, operators and major users that the DECT approach is the most appropriate for Europe in the medium and long term. The general approach will allow for different types of market and at the same time the commonality of basic technology assures the required economies of scale. The cost of the handset and the base station can only be brought within the reach of the man and woman in the street if the demand and supply is Europe-wide. The DECT approach offers the following benefits:

- access to a large multi-vendor market with its attendant economies of scale resulting in a consumer price acceptable to business, private and domestic use.
- the successful development and implementation of DECT would provide the necessary technical and operational framework to facilitate the introduction of a Universal Mobile Telecommunications System as the successor to DECT.
- provide European industry with a leading edge technology with potential for considerable world wide sales and distribution opportunities.
- a first step towards the development of a general cordless data terminal to be used in conjunction with a radio-local area network.
- since the concept of DECT encompasses five different market segments it minimises the commercial and financial risk.
- European industry would be developing a system and product to gain experience in consumer electronics.
- DECT will offer major benefits to both private and business users and will stimulate the development and exploitation of major new market opportunities for European industry.
- DECT telepoint will be a tariffed service somewhat analogous to pay-phones. This will ensure the full support of Administrations and Public Network Operators since it represents a natural extension of their core business.

## **3. ETSI STANDARD FOR DIGITAL EUROPEAN CORDLESS TELECOMMUNICATIONS**

ETSI Technical Subcommittee RES 3 has been charged with specifying a technical

standard for Digital European Cordless Telecommunications by October 1991. The work is being supported by the European manufacturing industry through ECTEL and ESPA. The standard is being produced in two parts. The common interface specification (CI) includes the definition of a comprehensive single air interface which will permit the interoperability of different types of equipment supplied by different manufacturers and is obligatory for the telepoint application. The coexistence specification (CX) defines the minimum requirements for DECT equipment as far as it concerns the air interface and is necessary to ensure operation coexistence and differentiation with respect to equipment conforming to the CI. ETSI RES3 will define the CX specification as a subset of the CI specification in order to ensure compatibility. It is clear from consultations with manufacturers and network operators that the timescale for the introduction of DECT is reasonable and achievable. ECTEL have also confirmed that equipment can be made available by 1992.

#### **4. MATTERS RELEVANT TO THE DEVELOPMENT AND TIMELY IMPLEMENTATION OF A HARMONISED DECT SERVICE**

##### **4.1 Frequency Spectrum Requirement**

A prerequisite for the successful introduction of a fully harmonised DECT service is the availability of common frequencies throughout the European Community. RES3 has established that DECT will require an allocation of approximately 20 MHz to accommodate the future demand. The European Conference for Posts and Telecommunications (CEPT) Radio Committee has approved a Recommendation which designates the frequency band 1880-1900 MHz for DECT. No doubt Member States will have varying difficulty in making available the necessary allocation and some will have less incentive due to the emergence of interim systems. However, the coordinated and timely availability of the necessary common frequencies is imperative, if a fully harmonised system is to be introduced.

##### **4.2 Timescales for the completion of a single standard**

Harmonisation implies the use of a single standard. The DECT specification will cover all aspects of the system and a time-table for completing the specification has been agreed by ETSI. The date for completion is October 1991 and is considered achievable in practice and is acceptable to the manufacturing industry. Member States should ensure that progress towards the introduction of DECT can be maintained and implemented in 1992.

##### **4.3 Timescales for manufacturers to produce equipment**

Manufacturers should continue to support the work of ETSI as they do at present through their membership of ETSI, ECTEL and ESPA. They must also be prepared to manufacture the equipment in accordance with the ETSI standard in the shortest possible timescale.

#### **5. NECESSARY COMMUNITY ACTION FOR THE INTRODUCTION OF DECT**

Community action is necessary to maintain progress in the areas described above and to ensure the following:

- the completion by October 1991 of the final DECT specification;
- the coordinated introduction of DECT according to a prescribed timescale;
- the availability of the common frequencies on a European scale for the introduction of the DECT system.

## 6. OBJECTIVE OF PROPOSED RECOMMENDATION

The proposed Recommendation on the co-ordinated introduction of Digital European Cordless Telecommunications in the Community aims to direct and accelerate the efforts by the Member States, telecommunications administrations, and industry to identify a single common solution to avoid a proliferation of national solutions that would lead to a fragmentation of the market, increased manufacturing costs, and incompatibility between systems.

The Recommendation is the result of an in-depth discussion by the experts of telecommunication administrations, ETSI, and the European manufacturing industry through ECTEL and ESPA. The Recommendation addresses in particular the following:

- the choice of transmission system, and network infrastructure to support the co-existence of the various applications, and the specification of a common air interface standard for a multi-service cordless telecommunication system;
- start-up of provision of service from the end of 1992 onwards. Firm political commitment to Europe-wide provision is essential for the credibility of the system. Only such credibility will allow the market participants, which include, users, network operators, service providers, and industry, to properly plan and develop the DECT system.

The necessary capital investment for the implementation of DECT will fall to a great extent on the operators, who together with users and manufacturers will derive major commercial benefits from the service. However, it is recognised in the Recommendation that the Community's financial instruments could play a role in the establishment of a major Community-wide infrastructure.

The Recommendation is proposed on the basis of Article 235 of the Treaty.

## 7. OBJECTIVE OF PROPOSED DIRECTIVE

The availability of a common frequency band for DECT is required throughout the Community. CEPT has recommended the frequency band 1880-1900 MHz for the DECT application.

The provision of frequencies in the Member States is laid down by law, regulation, or administrative action. Considering the above situation and the provision of radio frequencies as the most critical factor in the implementation of DECT, a Council Directive is necessary.

The proposed Council Directive on the frequency bands to be made available for the co-ordinated introduction of Digital European Cordless Telecommunications, has the primary objective to ensure the availability of sufficient frequency resources in order to implement the system at the earliest possible date.

The Directive is proposed on the basis of Article 100a of the Treaty.

## 8. PROPOSED ADDITIONAL COMMUNITY ACTIONS

The following additional Community actions are proposed to accelerate the development and introduction of the Digital European Cordless Telecommunications service:

- the Commission will give high priority to the mutual recognition of telecommunications equipment type approval [6] and the specification of the appropriate European Telecommunications Standard. This will facilitate international roaming and promote the market for DECT.
- the Commission will strictly apply Council Directive 83/189/EEC for the provision of information in the field of technical standards and regulations. Also the Commission will apply rigorously Council Decision 87/95 on standardisation in the field of information technology and telecommunications.

Finally, the Commission in collaboration and consultation with interested parties will develop a strategy for the evolution of GSM, ERMES and DECT into a universal personal communication system, and will consider such developments as are necessary to ensure the availability of the appropriate technology and will propose whatever measures are required in order to achieve this.

## 9. CONCLUSIONS

The attached Recommendation and Directive aim at the coordinated introduction of Digital European Cordless Telecommunications in the Community, and the availability of a frequency band as a pre-requisite to its introduction and complement previous Community initiatives in the field of mobile communications. This will establish the basis for a future Europe-wide DECT system.

The proposals have been based on careful analysis of the work within ETSI. Telecommunications Administrations and industry have responded positively to the analysis and recommendations. The Commission, in addition to the application of all relevant Community measures will make every effort to promote DECT in all the appropriate fora.

The proposals will ensure an important step forward for the introduction of DECT throughout the Community and will substantially improve the development of advanced telecommunications services and networks as requested by the Council of Ministers on 17th December 1984.

The Council is therefore requested:

- to adopt the attached Proposal for a Recommendation;

- to adopt the attached Proposal for a Directive;
- to take note of the additional preparatory actions which the Commission will undertake in close cooperation and collaboration with ETSI and CEPT.

## REFERENCES

- [1] "Towards a Dynamic European Economy - Green Paper on the Development of the Common Market for Telecommunications Services and Equipment", [COM(87)290], Brussels, 30.06.1987.
- [2] Report of the European Parliament on Telecommunications in the Community (Leonardi Report) doc 1.1477/3, 03.03.1984.
- [3] "The Market Requirements up to the Year 2000 for Cordless Telephone Products in Europe and the Means to Satisfy these Market Needs". Commission Study, March 1989.
- [4] Council Directive of 25 June 1987 on the frequency bands to be reserved for the coordinated introduction of public pan-European cellular digital land-based mobile communications in the European Community (87/372/EEC; O.J.L 196/85).
- [5] Council Recommendation of 25 June 1987 on the coordinated introduction of public pan-European cellular digital land-based mobile communications in the European Community (87/371/EEC; O.J.L 196/81).
- [6] [Proposal for a council directive on the approximation of the laws of the Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity [COM89/289].

## **GLOSSARY OF TECHNICAL TERMS AND ABBREVIATIONS**

The following list of technical and specialist terms is included to aid understanding of this document.

### **CCITT**

International Telegraph and Telephone Consultative Committee - a committee of the International Telecommunication Union (ITU)

### **CEPT**

European Conference of Postal and Telecommunications Administrations

### **CT1**

First Generation (analogue) Cordless Telephone

### **DECT**

Digital European Cordless Telecommunications

### **ECTEL**

European Telecommunications and Professional Electronics Industry Association

### **ECU**

European Currency Unit

### **ERMES**

European Radio Messaging System - the pan-European paging system specified by ETSI

### **ESPA**

Association of European Manufacturers of Pocket Communication Systems

### **ETS**

European Telecommunications Standard

### **ETSI**

European Telecommunications Standards Institute

### **FCC**

Federal Communications Commission

### **FDMA/TDD**

Frequency Division Multiple Access/Time Division Duplex



**GSM**

pan-European Digital Cellular Communication System (Groupe Spéciale Mobile)

**ISDN**

Integrated Services Digital Network. A network providing end-to-end connectivity to support a wide range of services, including voice and non-voice, to which users have access through a limited set of multi-purpose user network interfaces

**KTS**

Key Telephone System

**LAN**

Local Area Network

**OSI**

Open Systems Interconnection

**PABX**

Private Automatic Branch Exchange

**PSTN**

Public Switched Telephone Network

**RES 3**

The Radio Equipment Specifications Sub-Working Group 3 charged by ETSI (formerly by CEPT) with specifying the DECT standard

**SOG-T**

The Senior Officials Group for Telecommunications. A group of officials from the European Commission and Member States concerned with telecommunications

**SS NO.7**

CCITT signalling system allowing two switching centres to exchange information e.g. information needed to establish a telephone call

**Telecommunications Administrations**

Public telecommunications administrations and recognised private operating agencies offering public mobile telecommunications services

**Telepoint**

A service which enables users of cordless telephones to make calls within about 200 metres of receiver points usually located at busy points such as railway and airport terminals

**TDMA/TDD**

Time Division Multiple Access/Time Division Duplex

**VLSI**

Very Large Scale Integration

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**THE COUNCIL OF THE EUROPEAN COMMUNITIES**

Having regard to the Treaty establishing the European Economic Community, and in particular Article 235 thereof,

Having regard to the proposal from the Commission, [1],

Having regard to the opinion of the European Parliament, [2],

Having regard to the opinion of the Economic and Social Committee, [3]

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[1] ...

[2] ...

[3] ...

Whereas Council Recommendation 84/549/EEC [4] calls for the introduction of services on the basis of a common harmonised approach in the field of telecommunications;

Whereas the Council in its Resolution of 30 June 1988 [5] on the development of the common market for telecommunication services and equipment calls for the promotion of Europe-wide services according to market requirements;

Whereas the resources offered by modern telecommunications networks should be utilised to the full for the economic development of the Community;

Whereas current cordless telephone systems in use in the Community, and the frequency bands they operate in vary widely and do not allow the benefits of Europe-wide services or benefit from the economies of scale associated with a truly Europe-wide market;

Whereas the European Telecommunications Standard Institute (ETSI) is currently developing the European Telecommunications Standard (ETS) for Digital European Cordless Telecommunications (DECT);

Whereas the development of the ETS must take account of the safety of users, and the need for Europe-wide interoperability;

Whereas the European implementation of DECT will provide a unique opportunity to establish truly European digital cordless telephone facilities;

Whereas a coordinated policy for the introduction of DECT will make possible the establishment of a European market in mobile handsets which will be capable of creating, by virtue of their size, service features, and costs, the necessary development conditions to establish a lead in worldwide markets;

Whereas such a future system, offering both voice and data services, is to be based on digital techniques, thereby facilitating compatibility with the general digital environment and the Integrated Services Digital Network (ISDN) in the Community in accordance with Council Recommendation 86/659/EEC [6];

Whereas Council Directive .../.../EEC on the approximation of the Laws of the Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity [7] will allow the rapid establishment of common conformity specifications for DECT;

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[4] OJ No L298, 16.11.1984, p. 49.

[5] OJ No C257, 04.10.1988, p. 1.

[6] OJ No L382, 31.12.1986, p. 36.

[7] OJ No L

Whereas consideration should be given to Council Directive 83/189/EEC of 28 March 1983 laying down a procedure for the provision of information in the field of technical standards and regulations [8], and to Council Decision 87/95/EEC of 22 December 1986 on standardisation in the field of information technology and telecommunications [9];

Whereas Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of Member States relating to electromagnetic compatibility [10] is applicable, and particular attention should be taken to avoid harmful electromagnetic interference;

Whereas it is necessary to allow unrestricted access to cordless communications and free circulation of DECT equipment throughout the Community;

Whereas it is appropriate to make full use of the potential of the Community's financial instruments in order to promote the development of the Community's telecommunications infrastructure in the Community;

Whereas consideration should be given to Council Recommendation 87/371/EEC [11] which points out that special attention should be paid to the urgent requirement of certain users for pan-European land-based communications and that the Commission will in future submit other proposals in the field of mobile communications;

Whereas the implementation of such a policy will lead to closer cooperation within Europe between the public telecommunications administrations and the recognised private operating agencies offering public mobile telecommunications services, herein referred to as "telecommunications administrations";

Whereas favourable opinions have been delivered by the telecommunications administrations, by European Conference of Postal and Telecommunications Administrations (CEPT) and by the telecommunications equipment manufacturers in the Member States;

Whereas these measures will allow the economic benefit and rapidly increasing market potential of cordless telephones to be fully realised in the Community;

Whereas the Treaty has not provided the necessary specific powers to this end,

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[8] OJ No L109, 26.04.1983, p. 8 .

[9] OJ No L36, 07.02.1987, p. 31 .

[10] OJ No L139, 23.05.1989, p. 19 .

[11] OJ No L196, 17.07.1987, p. 81 .

HEREBY RECOMMENDS:

1. that the telecommunications administrations implement with due respect to the Community Law the recommendations as described in the Annex concerning the co-ordinated introduction of Digital European Cordless Telecommunications (DECT) in the Community. For the purposes of this Recommendation, DECT shall mean terminal apparatus conforming to the European Telecommunications Standard for digital cordless telecommunications based on a Multi Carrier/Time Division Multiple Access/Time Division Duplex technique, and the telecommunications systems, providing both public and private services, which directly utilise such terminal apparatus, and where users provided with a service in one Member State could also gain access to the service in any other Member State;
2. that the telecommunications administrations continue the cooperation within the CEPT and/or ETSI, particularly concerning the objectives and time schedule set out in the Annex for the completion of the specifications and the implementation of the DECT system;
3. that the Commission take appropriate initiatives, within the application of existing Directives, to encourage the completion of the specifications and the implementation of the DECT system;
4. that the Commission develop a long-term strategy, in collaboration and consultation with interested parties, for the evolution of the soon to be introduced pan-European digital cellular and paging systems, and DECT into a universal personal communications system taking account of recent studies and the ETSI work programme;
5. that the Community's financial instruments take this Recommendation into account within the framework of their interventions, particularly regarding capital investments required for the implementation of the infrastructure for the DECT system;
6. that the telecommunications administrations prepare and sign by **30 June 1991** at the latest a memorandum of understanding on the implementation of DECT systems for public services;
7. that Member States inform the Commission at the end of each year, from the **end of 1990** onwards, of the measures taken and the problems encountered in the course of implementing this Recommendation; that the progress of work be examined by the Commission and the Senior Officials Group on Telecommunications (SOG-T) which was set up by the Council on 4 November 1983; and that the European Parliament be regularly informed.

Done at Brussels,

For the Council

The President



**ANNEX**

**DETAILED REQUIREMENTS ON THE COORDINATED INTRODUCTION OF  
DIGITAL EUROPEAN CORDLESS TELECOMMUNICATIONS  
IN THE COMMUNITY**

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- 1. GENERAL REQUIREMENTS**
- 2. CHOICE OF TRANSMISSION SYSTEM**
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- 5. SYSTEM FEATURES**
- 6. SIGNALLING**
- 7. TARIFF CONSIDERATIONS**
- 8. GEOGRAPHICAL COVERAGE**

## 1. GENERAL REQUIREMENTS

The future DECT system should be developed in accordance with the ETS being developed by ETSI and should comply with the following general requirements

- be suitable for operation over the frequency bands 1880 - 1900 MHz to be made available for DECT in the Community;
- provide a means, using cordless technology, for meeting user requirements on an interoperable basis in respect of the following applications:
  - a residential service that will interconnect to ISDN/PSTN;
  - a business cordless telecommunications service that combines the features of a PBX with the mobility of cordless telecommunications for both voice and non-voice application;
  - a telepoint service that offers public network access to a handset through a public, or privately owned, base station;
  - a service that provides a radio means of extending public and private networks into customer user premises;
- provide the user with a voice transmission quality approximately equal to existing fixed systems;
- permit easy access to and from the ISDN/PSTN;
- permit simultaneous operation of two or more independent systems in the same geographical area.

## 2. CHOICE OF TRANSMISSION SYSTEM

The detailed specification of the DECT transmission characteristics should be completed by October 1991 and should take account of the relevant international guidelines on limiting exposure to electromagnetic fields, and the Council Directive 89/336/EEC of 3rd May 1989 on the approximation of the laws of Member States relating to electromagnetic compatibility. The system must be able to support geographically co-located DECT systems.

## 3. NETWORK ARCHITECTURE

The standard for the network structure and the definition and allocation of functions between the various system components should be defined by October 1991. In the course of this work, the appropriate interfaces between the various system components should be completely specified for all OSI layers applicable to the relevant services, and for all applications using those interfaces (call processing functions, maintenance, etc.).

#### 4. SYSTEM SPECIFICATION AND IMPLEMENTATION

Telecommunications administrations and operators should be responsible for the establishment of public services using DECT in their countries. The majority of traffic on each national system will be national, but implementation should support full roaming. Furthermore, the system specification should enable economic implementation in areas of both low and very high traffic density. To enable DECT to be introduced in 1992, the system specification should be completed by October 1991.

#### 5. SYSTEM FEATURES

The services and facilities specification should be completed by October 1991, and should fall into two categories: minimum and additional.

##### **Minimum service capabilities and facilities**

Minimum services and facilities should define the minimum features available for each application.

Minimum services for generic capability and for each potential DECT application should include the following:

##### **Generic capability:**

- interface with ISDN;
- equivalent functions to a wired telephone directly or indirectly (e.g. via PABX) connected to ISDN/PSTN;
- signalling capacity to support standard telephony features;
- dialling and calling security;
- emergency services.
- compatibility between residential, business, and telepoint applications.

##### **Additional services and facilities**

The additional services should be provided by open competition taking into account the national conditions for the implementation of these services. The non-provision of an additional service or facility should not affect in any way the functioning of DECT. The provision of an additional service or facility on one national system should not increase the cost of the minimum service on that system, or require an increase in functionality or an increase in cost on any other national system.

#### 6. SIGNALLING

User access signalling (customer signalling) should be defined according to the principles included in ETSI standards for ISDN, and should enable the supplementary services of ISDN/PSTN to be provided.

Network and inter-network signalling processes should be defined in the framework of the SS NO. 7 in such a way that international roaming and hand-over facilities, where provided, are safeguarded.

#### **7. TARIFF CONSIDERATIONS**

On the basis that the DECT service in the Community will utilise radio, a scarce resource, and furthermore that the trend is away from charging on the basis of distance, since the transmission costs for long distance telephone calls represent a relatively small part of the total, the DECT public service charge should mainly depend on the duration of the radio channel use.

The basic tariff principles for such matters as the charging for the Community service and cross charging between national operators for the handling of roaming traffic, should be identified by June 1991 so that the network implications can be identified and resolved in a timely manner.

#### **8. GEOGRAPHICAL COVERAGE**

DECT should be introduced in the Community from the end of 1992 at the latest. The DECT telepoint service should be widely available in major urban areas by 1995 at the latest.

Furthermore, telecommunications administrations and operators should jointly study mutual priorities for coverage in order to stimulate the maximum Europe-wide traffic as early as possible. This should take into account the needs of users at major European road, rail and air transport centres.

**PROPOSAL FOR A COUNCIL DIRECTIVE**

**on the frequency bands to be designated for**

**the Coordinated Introduction of**

**Digital European Cordless Telecommunications (DECT) in the Community**

Proposal for a  
COUNCIL DIRECTIVE

on the Frequency Bands to be designated for the Coordinated  
Introduction of Digital European Cordless Telecommunications (DECT)  
in the Community

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**THE COUNCIL OF THE EUROPEAN COMMUNITIES,**

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

Having regard to the proposal from the Commission [1],

In cooperation with the European Parliament [2],

Having regard to the opinion of the Economic and Social Committee [3],

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[1] ...

[2] ...

[3] ...

Whereas Council Recommendation 84/549/EEC [4] calls for the introduction of services on the basis of a common harmonized approach in the field of telecommunications;

Whereas the Council in its Resolution of 30 June 1988 [5] on the development of the common market for telecommunications services and equipment calls for the promotion of Europe-wide services according to market requirements;

Whereas the resources offered by modern telecommunications networks should be utilised to the full for the economic development of the Community;

Whereas Council Directive 89/336/EEC [6] of 3 May 1989 on the approximation of the laws of Member States relating to electromagnetic compatibility is applicable, and particular attention should be taken to avoid harmful electromagnetic interference;

Whereas current cordless telephone systems in use in the Community, and the frequency bands they operate in, vary widely and do not allow the benefits of Europe-wide services or benefit from the economies of scale associated with a truly European market;

Whereas the European Telecommunications Standard Institute (ETSI) is currently developing the European Telecommunications Standard (ETS) for Digital European Cordless Telecommunications (DECT);

Whereas the development of the ETS must take account of the safety of users, and the need for Europe-wide interoperability;

Whereas the European implementation of DECT will provide a unique opportunity to establish truly European digital cordless telephone facilities;

Whereas ETSI has estimated that DECT will require 20 MHz in high density areas;

Whereas the European Conference of Postal and Telecommunications Administrations (CEPT) has designated the common European frequency band 1880-1900 MHz for DECT, recognising that subject to the system development of DECT additional frequency spectrum may be required;

Whereas the implementation of Council Recommendation .../.../EEC of ..... on the coordinated introduction of Digital European Cordless Telecommunications in the Community [7], will ensure the implementation of DECT by 31 December 1992 at the latest ;

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[4] OJ No L298, 16.11.1984, p. 49 .

[5] OJ No C257, 04.10.1988, p. 1 .

[6] OJ No L139, 23.05.1989, p. 19 .

[7]...



Whereas Council Directive .../.../EEC of ... on the approximation of the laws of the Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity [8] will allow the rapid establishment of common conformity specifications for DECT;

Whereas the establishment of DECT depends on the allocation and availability of a frequency band in order to transmit and receive between fixed-base stations and mobile stations;

Whereas some flexibility will be needed in order to take account of different frequency requirements in different Member States; it will be necessary to ensure that such flexibility does not slow down the expansion of a pan-European system;

Whereas the progressive availability of the full range of the frequency band set out above will be indispensable for the establishment of DECT on a Europe-wide basis;

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[8] OJ No L

HAS ADOPTED THIS DIRECTIVE:

Article 1

For the purposes of this Directive, Digital European Cordless Telecommunications (DECT) shall mean terminal apparatus conforming to the European Telecommunications Standard (ETS) for digital cordless telecommunications referred to in Council Recommendation .../.../EEC, and the telecommunications systems, both public and private, which directly utilise such terminal apparatus, and where users provided with a service in one Member State can also gain access to the service in any other Member State.

Article 2

Member States shall designate the frequency band 1880-1900 MHz for DECT by 1 January 1992. DECT shall have priority and shall be protected in the designated band.

Article 3

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by 31 December 1991. They shall forthwith inform the Commission thereof.

Any measures adopted pursuant to the first subparagraph shall make express reference to this Directive.

2. Member States shall communicate to the Commission the text of any national law which they adopt in the field governed by this Directive.

Article 4

The Commission shall report to the Council on the implementation of this Directive not later than the end of 1995.

Article 5

This Directive is addressed to the Member States

Done at Brussels,

For the Council

The President

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# DOCUMENTS

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