



European Radiocommunications Committee (ERC)  
within the European Conference of Postal and Telecommunications Administrations (CEPT)



## **DESIGNATION OF A EUROPEAN HARMONISED FREQUENCY BAND FOR MOBILE DIGITAL TRUNKED RADIO SYSTEMS (MDTRS)**

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## HARMONISATION OF A EUROPEAN HARMONISED FREQUENCY BAND FOR MOBILE DIGITAL TRUNKED RADIO SYSTEMS (MDTRS)

### 1. INTRODUCTION

User demand for Private Mobile Radio (PMR) has resulted in its continued expansion in parallel with Public Services, such as GSM. Current PMR services in Europe, including analogue trunking, today total around 4 million vehicle mobile and hand-portable subscriber units and within most CEPT countries are accommodated in a number of separate bands spread over the VHF and UHF frequency range from 47 MHz - 470 MHz. The total amount of spectrum varies from country to country and is typically around 50 MHz - 70 MHz.

In order to meet this growing requirement for PMR, MDTRS has been conceived and will use digital and trunking technology to enhance the spectrum efficiencies and user features compared with the various PMR services in use today. The required spectrum will cater for both voice and data messages and will give the European user the benefit of volume production of identical equipment. The frequency requirement for MDTRS for PMR is estimated by ETSI RES6 as 2 x 20 MHz, preferably below 500 MHz. An initial 2 x 5 MHz is required by 1995 and the remainder is required from around the year 2000.

It is, however, the opinion of CEPT that the total demand of 2 x 20 MHz of additional harmonised unoccupied spectrum cannot be met in the frequency bands below 500 MHz or even 1 GHz by the years 2000 or 2005 due to the presence of existing systems or systems which are currently being introduced. However, in some countries the possibilities of satisfying these needs are considerably better.

Furthermore, it also became apparent that most Administrations would be unable to free 2 x 5 MHz of spectrum by 1995.

### 2. GENERAL APPROACH

CEPT agreed on the need to provide frequencies for MDTRS and considered all frequency bands which are allocated to the mobile service in the range 47 MHz-2100 MHz. CEPT was of the opinion that in the long term MDTRS requirements would be accommodated by UMTS.

This Report considers the extent to which CEPT could meet the demand of ETSI RES6.

### 3. BACKGROUND

CEPT came to the conclusion that a solution could only be found by providing a frequency band or bands within which the tuning range of the equipment could be developed and which could then enable Administrations to designate sub-bands for MDTRS on a national basis and according to market demand. In some countries certain frequency bands below 400 MHz may in the near future be available. By 1995 only small parts of the frequency band could probably be made available by Administrations but by deciding the duplex separation for the equipment from the outset CEPT believes that this may provide a basis for the gradual introduction of MDTRS by allowing for a later expansion as the spectrum becomes available. It is also essential that the technical characteristics and frequency allocation for MDTRS are compatible with systems in adjacent channels or bands which means that the relevant CEPT Recommendation T/R 24-01 E has to be fulfilled (adjacent channel selectivity of -76 dB).

Although CEPT has in the past indicated preferred frequency bands for digital PMR systems at 900 MHz (CEPT Recommendation T/R 75-02 E) these are not preferred by ETSI because of propagation constraints and could not be used in some countries before the year 2000 or even longer. However, a significant number of countries did indicate that some spectrum in this band could be made available for MDTRS.

Frequency ranges around 400 MHz seem to offer the most realistic chance for meeting most of the operational requirements of MDTRS.

Although some Administrations are currently introducing analogue trunked networks in the band 410 MHz - 430 MHz and others had military users it was felt that there may be possibilities for local networks to be gradually introduced although sharing conditions would have to be developed. There might then be a gradual move to digital systems according to demand.

A few Administrations could provide spectrum for MDTRS in the band 450 MHz - 470 MHz although most felt that such a designation would be impossible before the year 2000 or even longer due to the large number of users in the band. However, by association with the band 410 MHz - 430 MHz it did give the possibility to introduce MDTRS to those countries not able to free spectrum in the frequency range 410 MHz - 430 MHz and would provide a possibility for some countries to use spectrum in both bands. It would, however, be necessary for ETSI RES6 to design equipment that is capable of operation in both frequency ranges 410 MHz - 430 MHz and 450 MHz - 470 MHz with a duplex separation of 10 MHz. Still wider ranges of operation, if technically feasible, could facilitate early implementation of digital trunked systems in some countries

#### 4. **CONCLUSION**

CEPT is prepared to designate spectrum for MDTRS in two separate bands, 410 MHz - 430 MHz and 450 MHz - 470 MHz, if ETSI RES6 can confirm that solutions to the various technical constraints can be found. It is believed that most Administrations would be able to provide some spectrum for MDTRS by 1995 but not of the magnitude of 2 x 5 MHz. It should be recognised that most Administrations would not be able to use the frequency band 450 MHz - 470 MHz for some considerable time while some Administrations would similarly not be able to use the 410 MHz - 430 MHz band.

Further contact between ETSI RES6 and the European Radiocommunications Committee is necessary to evaluate this proposal.