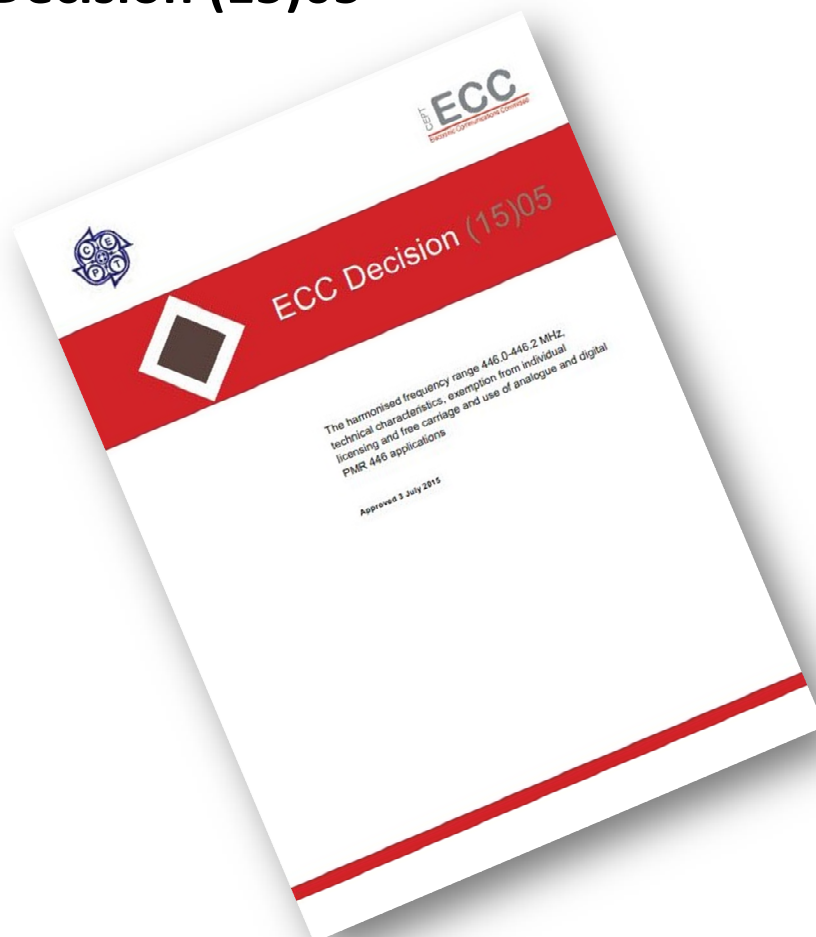


The effects on dPMR 446 of the new digital license-exempt radio frequencies following ECC Decision (15)05



dPMR 446 is a digital format of PMR446 (Personal Mobile Radio 446), a European licence-exempt two-way radio system which was introduced in analogue (FM) format in 1998 followed by digital (FDMA & TDMA) in 2005.

dPMR 446 provides a simple and cost-effective basis for instant communication between users over distances of up to 6km (although actual coverage and range depends on terrain and the environment) with both transmission and reception taking place on the same channel.

dPMR 446 is a license-free two-way radio communication format for use in peer-to-peer operations without base stations or repeaters in the 446 MHz UHF band. This technology is covered by the ETSI standard TS102 490.

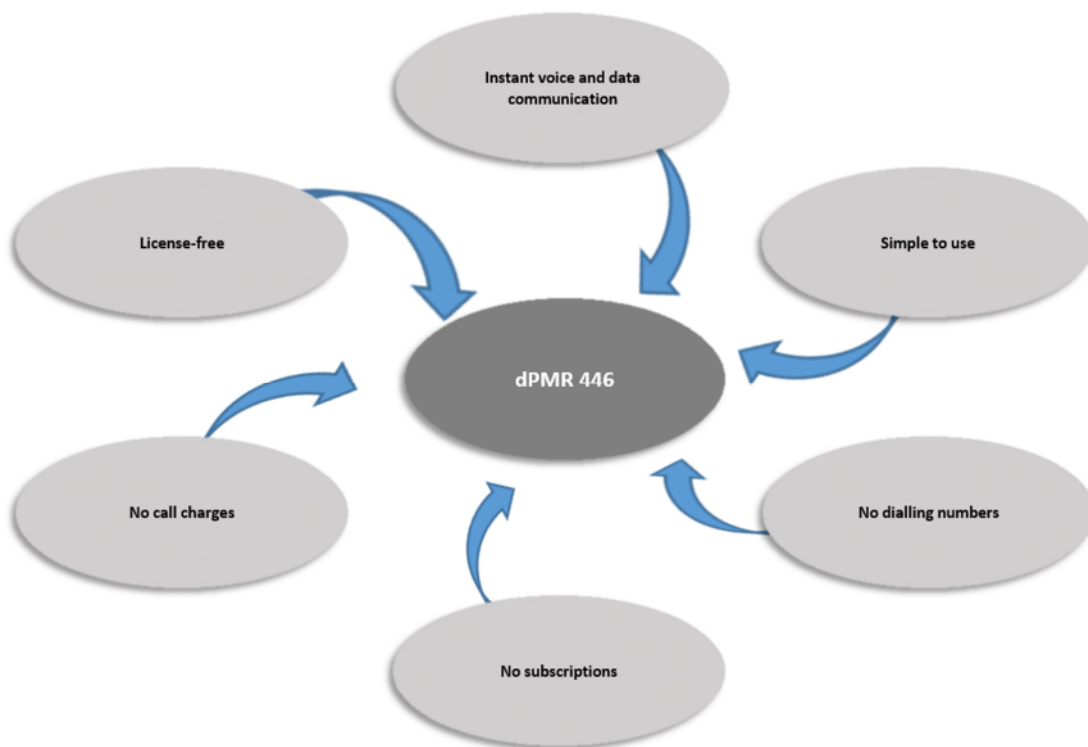
All equipment for use on PMR446 frequencies, whether analogue or digital, is required to be in hand-portable form, feature a fixed integral antenna and operate with an effective radiated power not exceeding 500mW (0.5 watts), while the use of base station, mobile radio, repeater or fixed infrastructure is specifically excluded.

dPMR446 equipment is capable of both voice and data modes of operation using a simplified addressing system that can be considered analogous with CTCSS use in PMR446 or with an extended addressing system as used by the fully functional TS102 658 type dPMR radios.

As well as offering voice and data capabilities, the dPMR446 protocol also supports combined voice + data so it is possible to embed data into a voice call or automatically append it at the end of a call. This means that dPMR446 can offer all the usual voice services plus text messaging (SMS), status information texts, embedded data such as GPS position etc.

A further benefit of dPMR equipment is that they can operate in both analogue (FM) and digital (dPMR 446) modes which allows users to migrate from an existing analogue fleet to the benefits of digital dPMR 446 without having to replace all their radios at the same time.

dPMR 446 - a simple and cost-effective solution for instant communication straight out of the box



Where can I use dPMR 446?

PMR446 compliant equipment may be used in the following CEPT (European Conference of Postal and Telecommunications Administrations) territories and their overseas or semi-autonomous territories without restriction:

Austria	Iceland	Portugal
Belgium	Ireland	Romania
Bosnia and Herzegovina	Italy	Russian Federation
Bulgaria	Latvia	Serbia
Croatia	Liechtenstein	Slovak Republic
Cyprus	Lithuania	Slovenia
Czech Republic	Luxembourg	Spain
Denmark	FYRO Macedonia	Sweden
Estonia	Moldova	Switzerland
Finland	Monaco	Turkey
France	Montenegro	Ukraine
Germany	Netherlands	United Kingdom
Greece	Norway	
Hungary	Poland	

- Includes the overseas or semi-autonomous territories of Denmark, France, Greece, Italy, Netherlands, Norway, Portugal, Russian Federation, Spain plus the constituent parts of the United Kingdom as well as the Channel Islands and the Isle of Man

- Assignments for use of licence free radios may change from time to time and the user is advised to check if PMR446 equipment can be used in the destination country.

The differences between dPMR 446 (FDMA), DMR 446 (TDMA) and Analogue (FM) PMR 446 formats

Digital PMR 446 v Analogue PMR 446

Digital PMR 446 gives significant performance advantages over analogue PMR 446, specifically:

- Improved audio quality
- Improved service quality extending the effective communication range limit
- Data capability
- Increased battery life

dPMR 446 v DMR 446

dPMR is an FDMA (Frequency Division Multiple Access) channel access method offering true spectrum efficient 6.25kHz channel spacing while DMR 446 is a TDMA (Time division multiple access) channel access method with 12.5kHz channel spacing.


In practical terms, as dPMR 446 provides 16 digital channels against the 8 digital channels DMR 446 offers, users are better able to avoid channel congestion and restrictions of service availability especially in cities or at times of peak demand.

The future of Digital PMR 446

At the time of writing, the frequency band 446.1-446.2 MHz has been designated for use by digital PMR 446 equipment, however to ensure continued availability of license-exempt analogue and digital PMR446 frequency bands and reduce congestion, new PMR 446 frequencies are being introduced across Europe from 1 January 2018 in line with Harmonised European Standards EN 300 296-2, EN 300 113-2 and EN 301 166-2.

The new frequencies, which follow ECC Decision (15)05, create greater capacity by extending the assigned frequency spectrum for digital equipment to 446.0 - 446.2 MHz with a channel plan based on 6.25 kHz and 12.5 kHz spacing where the lowest carrier frequencies are 446.003125 MHz and 446.00625 MHz respectively.

The table below illustrates the effect the new assigned frequency spectrum, which effectively doubles the number of license-free PMR446 channels available for equipment operating at 12.5 kHz and 6.25 kHz channel spacing, will have on analogue and digital PMR 446 equipment:

FM	Analogue (12.5 kHz Channel Spacing)	DMR	Digital DMR 446 (12.5 kHz Channel Spacing)	 Digital dPMR 446 (6.25 kHz Channel Spacing)
Ch1	446.00625Mhz *	Ch1	446.00625Mhz	Ch1 446.003125Mhz
Ch2	446.01875Mhz	Ch2	446.01875Mhz	Ch2 446.009375Mhz
Ch3	446.03125Mhz	Ch3	446.03125Mhz	Ch3 446.015625Mhz
Ch4	446.04375Mhz	Ch4	446.04375Mhz	Ch4 446.021875Mhz
Ch5	446.05625Mhz	Ch5	446.05625Mhz	Ch5 446.028125Mhz
Ch6	446.06875Mhz	Ch6	446.06875Mhz	Ch6 446.034375Mhz
Ch7	446.08125Mhz	Ch7	446.08125Mhz	Ch7 446.040625Mhz
Ch8	446.09375Mhz**	Ch8	446.09375Mhz*	Ch8 446.046875Mhz*
Ch9	446.10625Mhz	Ch9	446.10625Mhz	Ch9 446.053125Mhz
Ch10	446.11875Mhz	Ch10	446.11875Mhz	Ch10 446.059375Mhz
Ch11	446.13125Mhz	Ch11	446.13125Mhz	Ch11 446.065625Mhz
Ch12	446.14375Mhz	Ch12	446.14375Mhz	Ch12 446.071875Mhz
Ch13	446.15625Mhz	Ch13	446.15625Mhz	Ch13 446.078125Mhz
Ch14	446.16875Mhz	Ch14	446.16875Mhz	Ch14 446.084375Mhz
Ch15	446.18125Mhz	Ch15	446.18125Mhz	Ch15 446.090625Mhz
Ch16	446.19375Mhz	Ch16	446.19375Mhz	Ch16 446.096875Mhz
<i>*Heavily used / Children's Channel / Data **DX & Calling Channel</i>		<i>*DX & Calling Channel ** Channels shown in red are available for use from 01 January 2018</i>		Ch17 446.103125Mhz
				Ch18 446.109375Mhz
				Ch19 446.115625Mhz
				Ch20 446.121875Mhz
				Ch21 446.128125Mhz
				Ch22 446.134375Mhz
				Ch23 446.140625Mhz
				Ch24 446.146875Mhz
				Ch25 446.153125Mhz
				Ch26 446.159375Mhz
				Ch27 446.165625Mhz
				Ch28 446.171875Mhz
				Ch29 446.178125Mhz
				Ch30 446.184375Mhz
				Ch31 446.190625Mhz
				Ch32 446.196875Mhz
				<i>*Digital Calling Channel **Channels shown in red are available for use from 01 January 2018</i>

dPMR 446 compliant equipment



Equipment tested and certified as complying with dPMR Mode 1 of the ETSI standard TS102 658 is available from members of the dPMR Association including Icom, Kenwood, Lisheng and Alinco, details can be found in the [Product Showcase](#) pages or the manufacturer's websites.

Please be aware that equipment offered by other manufacturers employing low quality vocoders and chipsets which have not been tested or certified as complying with the applicable ETSI standard may not offer the full range of functions or be interoperable with compliant equipment. If in doubt, please contact secretary@dpmrassociation.org for clarification.

Acknowledgment

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