

2. BRIEF SYSTEM DESCRIPTION

The basic system is a cordless telephone system, based on DECT. Because DECT is such a fundamental part of the proposed system, a brief description of this is first given.

DECT is a low-power two-way digital wireless communications system. Whilst DECT is a general digital communications system, it is most commonly used for cordless telephone systems. These telephone systems are generally either residential/domestic systems or PBX systems.

DECT uses TDMA to provide two-way communication between a base-station and multiple hand-sets. In this document the base-station is often referred to as the Fixed Part (or FP) and the hand-set is often referred to as the Portable Part (or PP).

Unlike a DECT system, the "Gleneagles" system does not have exclusive use of the spectrum. It has to share the spectrum with other users. The "Gleneagles" system uses frequency hopping to share the spectrum with other users according to the requirements specified by the FCC.

It is the frequency hopping requirement that creates the biggest difference between a DECT and a "Gleneagles" system. The other main difference between the two systems is the TDMA frame structure - "Gleneagles" has to use fewer 'slots' in the frame due to a lower bit rate.

2.1 Frequency channels

"Gleneagles" uses carriers whose centre frequencies are given by the following formula:

$$f_c = f_0 + (c \times 864 \text{ kHz})$$

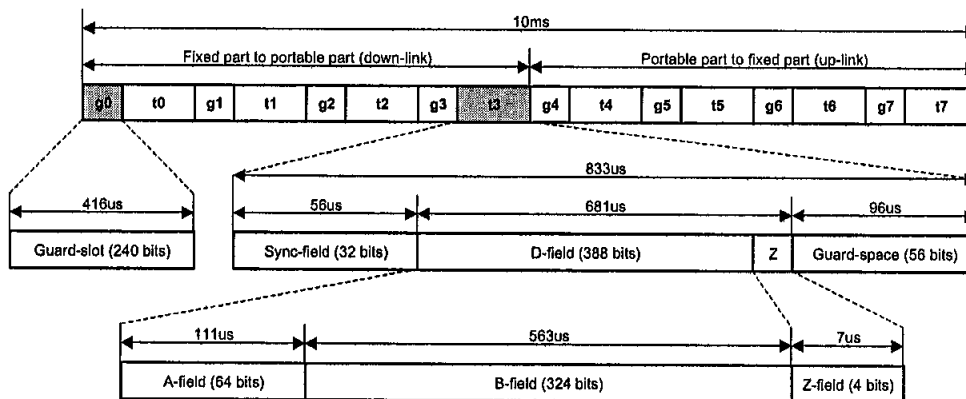
$$f_0 = 2377.728 \text{ MHz}, c = 0,1,\dots,127$$

The performance of the RF module, and the constraints of the ISM band, limit c so that $c = 27,\dots,117$ which maps onto the 91 WDCT channels 0,...,90.

There are 91 WDCT channels. Channel separation is 864 kHz. See "Appendix B - WDCT channel centre frequencies" for the full list of channels and centre frequencies.

2.2 TDMA frames structure

The "Gleneagles" TDMA frames structure is shown below:



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The basic repeating frame structure is broken down into a 'down-link' part and an 'up-link'. In the down-link, the FP transmits to the PP. In the up-link, the PP transmits to the FP.

The guard-slots (g0, g1, g2 ... g7) are 416 μ s long, they are not used for transmission. The transmission-slots (t0, t1, t2 t7) are 833 μ s long.

"Gleneagles" uses TDD to carry a two-way voice communication. This is always by using slot-pairs: t0 and t4, t1 and t5, t2 and t6, t3 and t7. In this way the up-link transmission of the duplex communication is always 5ms after the corresponding down-link transmission.