



## Cordless Phones: Your Very Own RF Transmitter

Authors: Dipl. Med. Frank Mehlis, Bonn / Wolfgang Maes, Neuss / Dipl. Ing. Joachim Gertenbach,  
Wuppertal, Germany / Translated into English by Katharina Gustavs, Canada

VERBAND BAUBIOLOGIE (VB)

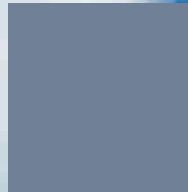
## Cordless Phones: DECT Your Very Own RF Transmitter

### What are cordless phones?

Cordless refers to those wireless home phones that function without a cord within a 50- to 300-meter radius and whose small inconspicuous base stations (often also functioning as battery charger) can be found within our own four walls at a desk or bedside table. They use RF radiation just like mobile phones. The small size of their base stations can be deceiving, but they are virtually a miniature version of the big mobile phone base stations otherwise found on rooftops and towers.

Over the past few years, DECT (Digital Enhanced Cordless Telecommunications) phones have pushed all other standards out of the market, including analog cordless phones in the 800 or 900 MHz range (also CT1+).

### Cordless Phones: DECT



### What does building biology have to offer?

Building biology consultants of the BUILDING BIOLOGY ASSOCIATION (VB) are experts in identifying and reducing environmental risks in indoor environments.

They measure, analyze, and assess RF radiation exposures of DECT cordless phones as well as mobile phones in addition to many other factors, including mold, indoor toxins, electromagnetic pollution, radioactivity, air quality, and indoor climate. They also make recommendations for remediations.

Building biology consultants help find and reduce disease-causing factors that often hide within our own four walls.

We are less interested in discussing or arguing about unreasonable exposure limits than in taking positive action.

Life is more satisfying when there are less stressors—as a precaution and to be on the safe side.

Your Building Biology Consultant  
Member of the Building Biology Association e.V. (VB)

VERBAND BAUBIOLOGIE | Maxstr. 59 | 53111 Bonn | Tel. (0228) 963 99 258 | [www.verband-baubiologie.de](http://www.verband-baubiologie.de)

The Building Biology Association (VB) follows the Standard of Building Biology Testing Methods SBM and works in cooperation with the Institute of Building Biology and Ecology IBN/Neubeuern (<http://www.baubiologie.de/site/english.php>). Comprehensive information on building biology can be found in Wolfgang Maes' book "Stress durch Strom und Strahlung" (German ISBN 3-923531-25-7).



The copyright of the design and contents of this flyer is reserved and belongs to the VERBAND BAUBIOLOGIE (VB). Available from the head office—but for VB members only. It is explicitly prohibited to copy or otherwise reproduce this flyer or parts thereof.

© 2009 (VB)

Printed on 100% recycled paper



### Do DECT phones emit high levels of microwave radiation?

Building biology home inspections reveal that these phones have turned into one of the highest RF radiation sources in indoor environments. On average, exposures from the latter are often much higher than those from mobile phone base stations within the neighborhood.

### What has changed in DECT technology?

CT1+ or analog cordless phones used to radiate without any pulse modulations and that only when an actual phone call was placed. This is how it is supposed to be, if at all, using wireless technologies for communication purposes. DECT phones operate at microwave frequencies twice or up to six times as high and with a much higher power output, but they do not reach farther—quite the contrary. The lower the carrier frequency is, the more easily RF radiation can penetrate solid building materials, and the higher the carrier frequency is, the worse the penetration will get. It follows that in order to achieve the same effect, namely an acceptable call transmission quality even through walls and concrete reinforcement, more force, energy, and power is required at higher frequencies, which also translates into higher RF emission levels. The actual technically effective and biologically relevant peak power output of a DECT antenna is 250 mW, and thus well within the average power output range of mobile phones (e.g. GSM, UMTS).

### DECT – pulsed RF radiation nonstop?

DECT cordless phones are based on digital technology, transmitting with relatively strong and pulsed digital signals. Their small base stations (not their handsets)—and this is very important—transmit at full power nonstop, day and night, 24/7, even when no phone call is placed. Pulsed electromagnetic pollution at home and beyond, nonstop, as far as 300 meters. DECT radiates with 250 mW at 1880 to 1900 MHz (Europe) or 2.4 to 6 GHz (North America), including a 100-Hz pulse signal. In 1997, the DECT standard was expanded by GAP (Generic Access Profile), thereby ensuring that DECT phone systems of different manufacturers can always provide optimal communication among each other. GAP and DECT means the same.

DECT engineers, based on their DECT standard, declared that the base stations with their constantly pulsing



cordless antennas are a necessity: One base station can connect several handsets, which in turn can communicate with each other. It follows then that the base station needs to constantly stay in contact with the handsets. It was only after the German Federal Agency for Radiation Protection had demanded that base stations cease broadcasting when no phone call is being placed, that all of a sudden it became possible. Caution is still warranted: Even so-called repeaters constantly transmit as do modern multi-devices that combine a normal corded phone with an additional DECT cordless option. Sometimes such DECT transmitters are also installed even in fax machines.

### Can pulsed RF radiation impact human health?

For quite a few years now, numerous scientific studies have indicated associations between pulsed RF radiation and impairment of well-being.

Affected individuals report the following symptoms:

- Sleep disorders,
- Fatigue,
- Irritability,
- Concentration problems,
- Headaches,
- Dizziness,
- Inner restlessness,
- Rapid heartbeat,
- High blood pressure, etc.

Since long-term effects of modern wireless communication technologies have not been researched sufficiently, many crucial institutions, including the VB and also the German Federal Agency for Radiation Protection (BFS), are calling for suitable precautionary measures in order to avoid—as much as possible—RF radiation exposures, which also translates into lowering RF radiation exposures from DECT phones.

### What options are available to reduce RF radiation exposures?

For functionality and safety reasons alone, such homemade solutions as wrapping the base station in aluminum foil or hiding it in a pressure cooker are not recommended. The base station should be placed as far away from sleeping and rest areas as possible. In this process, you ought to consider your neighbors as well so that their RF exposure is not unnecessarily increased.

It's simple logic: As far away as you can place a phone call with the handset is the exact same distance the RF radiation emissions from your and your neighbors' base stations will reach.

### What are “low-emission” DECT phones?

Up until 2005, almost all DECT phones available for sale emitted pulsed radiation at maximum power from the base station as well as from the handset during a phone call. For some time now, several newer models offer the following advantages:

- Completely shut off RF radiation emissions from base station after the phone call ends.
- Reduce RF radiation of base station emissions by a factor of 250,000 to 100,000,000 after the phone call ends.
- Adjustable power output of portable handset that is reduced by 25 to 30% when in the vicinity of the base station.

Often these newer DECT phones come with labels such as “eco mode” or “low radiation.” Watch out, though: In some models, this mode needs to be specifically activated. Also, the often repeated recommendation to put the handset back into the base station only when completely discharged is not too smart from a low-radiation perspective, considering that many base stations only reduce the output of their pulsed stand-by signals when the handset is properly placed into the base station. In North America, you can find the odd low-emission DECT phone without any such label. If using a DECT cordless phone without the appropriate low-emission certification, always have it tested by a qualified building biology consultant.

### Which criteria should be applied in selecting a cordless phone?

Generally speaking, each single cordless phone emits RF radiation: The closer the RF radiation antenna is to the human body, the more radiation will be absorbed. Therefore, a corded phone is still your best alternative. If a DECT phone is absolutely essential, consider the following criteria:

- The base station should shut off automatically after each phone call even when the handset is not put back into the charger.
- Lowering the nonstop radiation exposure from the base station down to 0.000 001% has already been realized by a few manufacturers. It is important to ensure that these models will also lower the radiation emissions as soon as a phone call ends, regardless of where the handset is placed.
- Moreover, the power output of the base station as well as the portable receiver should always be automatically lowered subject to the call transmission quality.

