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Bluetooth Technical Operations

Bluetooth is a high speed, low powered wireless link technology that's designed to connect phones or other portable equipment together with little to no work required by the user. Unlike infrared, Bluetooth doesn't require line of site positioning to work.

Current prototype circuits are contained on a board that is 0.9 cm square, with a much smaller circuit board being developed.

When one Bluetooth device comes in contact with another, they will automatically exchange addresses and details of capability. Then, they can establish a 1 MB link with security that they will use as required. The protocols involved with handle both data and voice, with a very flexible topography.

The technology achieves its goal by embedding tiny, non expensive short range tranceivers into the devices available today. The radio operates on the 2.45 GHz frequency band, and supports up to 721 KBps, along with three voice channels.

Each devices offers a unique 48 bit address from the IEEE 802 standard, with the connections being point to point or multipoint. The max range is 10 meters, although it can be extended to 100 meters by increasing the power. The devices are also protected from radio interference by changing their frequencies, also known as frequency hopping.

What's important, is the fact that Bluetooth devices won't drain battery life. The specification targets power consumption of the device, limiting the drain on the battery. The radio chip will consume only 0.3mA in stand by mode, which is less than 5% of the power that standard phones use.

Bluetooth will also guarantee security at the bit level. The authentification is controlled by the user via a 128 bit key. The radio signals can

be coded with anything up to 128 bit. With the frequency hopping, Bluetooth is already very hard to listen into.

The baseband protocol is a combination of both circuit and packet switches. Slots can be reserved for synchronous packets as well. Each packet will be transmitted in a different hop frequency. Normally, a packet covers a single slot although it can be extended to cover up to five slots.

Bluetooth can also support data channels of up to three simultaneous voice channels. Therefore, it's possible to transfer the data while you talk at the same time. Each individual voice channel will support 64 KB.

From a technical standpoint, Bluetooth is very different indeed. It's the best wireless method in the world, surpassing even infrared. For communication on the go, Bluetooth is indeed very hard to compete with.

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