Application **PBY8505002**

Response to e-mail dated September 20th 2001 regarding additional information to be filed regarding Ericsson's Bluetooth Headset marked PBY8505002

Answer to 1)

Please check **Exhibit 13 Modified Request for Confidentiality.pdf**, uploaded on September 25th**.**

Answer to 2)

Please check **Exhibit 9 Additional Internal Photographs.pdf**, uploaded on September 25th**.**

Answer to 3): coordination requirement in data mode

The hopping sequence applied uses all 79 frequencies and is a very long sequence determined by the master's identity. (Each Bluetooth unit has a unique identity.) The phase in the sequence is determined by the system clock of the master. So transmissions start always at a random frequency in the band. Data transmission is not synchronized to initiate on any specific frequency or any event not originating from the piconet. There are no provisions for coordination between various piconets or other frequency hopping systems. Occasional loss of data frames due to collisions on a channel are handled by a retransmission, but the hopping goes on.
Acknowledgement of received packets is used to support this feature.

See also responses to question 3, 4 and 5

Answer to 5): equal frequency use in data mode

A communication channel shared by two devices (master and slave) is called a piconet. This channel is divided into fixed length slots. Each slot lasts 625 us and is always placed at a different hop frequency. The nominal hop rate is 1600 hops/s. The hop sequence applied uses on average all 79 frequencies and is a very long sequence determined by the master's identity. (Each Bluetooth unit has a unique identity.) The phase in the sequence is determined by the system clock of the master. So transmissions start always at a random frequency in the band. Data transmission is not synchronized to initiate on any specific frequency. (See also the response to question 4 for details about the generation of these frequencies.)

Answer to 6): receiver matching bandwidth and sync in data mode

The receiver bandwidth = 1 MHz.

During connection establishment, the master identity and clock are transferred to the slave unit so it can synchronize to the channel. The master clock in a slave unit is obtained by adding an offset to the internal clock of the slave. When the connection is released, the Bluetooth device will return to its own (free-running) clock.

Synchronization uses a system of beacon channels generated by the master unit with the remaining slave unit periodically waking up and listening on a beacon channel. Beacon channels are designated by the master unit during paging to identify a communication channel for the slave unit to listen to. The beacon channel packet also contains the synchronization information required for the slave to sync with the master unit. During paging mode the same 32-hop segment is used and the segment is selected by the address with different units having different paging segments.

See also: the response to question 4 and 5.

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Answer to 4): pseudorandom hop sequence in data mode

In the data mode the device uses a pseudorandom hopping sequence of 79 channels. Each unit will synchronize to the hopping sequence randomly selected by the master unit.
The hop selection kernel for the 79 hop system is shown in the figure below. The X input determines the phase in the 32-hop segment, whereas Y1 and Y2 selects between master-to-slave and slave-to-master transmission. The inputs A to D determine the ordering within the segment, the inputs E and F determine the mapping onto the hop frequencies. In this way a pseudo random hopping sequence is generated.
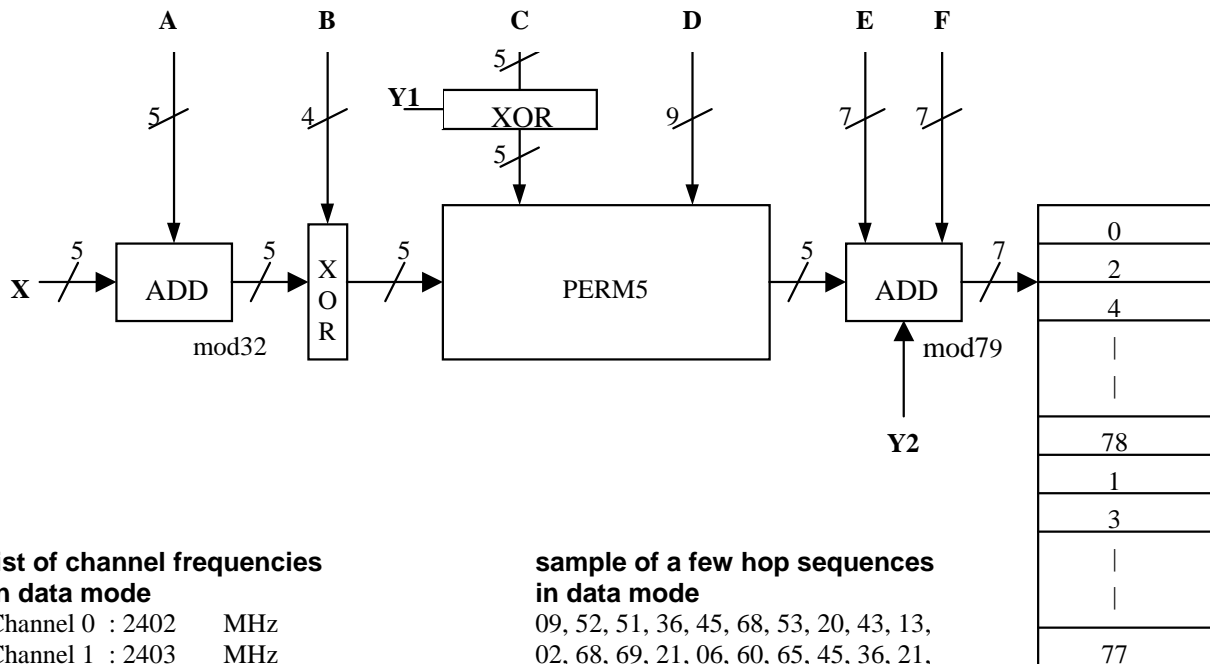
list of channel frequencies in data mode

Channel 0 : 2402   MHz
Channel 1 : 2403   MHz
Channel n : 2402 + n MHz
Channel 78: 2480   MHz

sample of a few hop sequences in data mode

09, 52, 51, 36, 45, 68, 53, 20, 43, 13,
02, 68, 69, 21, 06, 60, 65, 45, 36, 21,
22, 53, 38, 20, 41, 42, 49, 59, 67, 36,
55, 12, 63, 20, 61, 60, 68, 65, 52, 75,
30, 04, 71, 00, 77, 06, 70, 46, 24, 23,
08, 31, 16, 29, 56, 64, 40, 73, 02, 71,
44, 00, 52, 77, 13, 06, 75, 04, 10, 18,
66, 08, 42, 16, 50, 14, 11, 22, 19, 12,
74, 03, 62, 24, 46, 32, 54, 30, 15, 38

23, 28, 78, 36, 57, 65, 55, 63, 48, 61,
09, 69, 17, 59, 72, 67, 01, 20, 03, 36,
19, 16, 74, 11, 38, 51, 18, 34, 44, 60,
21, 40, 76, 56, 13, 46, 37, 62, 53, 42,
29, 58, 45, 07, 48, 78, 64, 15, 54, 70,
50, 66, 47, 12, 01, 28, 17, 08, 72, 24,
09, 14, 33, 49, 26, 41, 50, 37, 66, 53,
48, 64, 54, 70, 52, 61, 77, 51, 09, 43