C004 Frequency Hopping Spread Spectrum description

This document outlines the frequency hopping mechanism and scheme used in the transceiver. Herein is described how the following FCC requirements 15.247(a) (1), 15.247(g), 15.247(h) are met and adhered to. The radio system uses a 2FSK modulation format. Communication is FDD (Frequency division duplexing) based.

1) 15.247 (a) (1)

The system is a frequency hopping spread spectrum transceiver. The system channel hoping scheme is selected and determined by and from a pseudo randomly ordered list of hopping frequencies. Each frequency is used equally on the average.

The system utilizes a pseudo randomly generated list that is stored in a memory based lookup table. Each transmission event is started on the next channel in the table. (See channel selection table below…)

TX TABLE:

Seq	Low (MHz)
1	904.000
2	904.480
3	905.160
4	905.720
5	903.520
6	904.760
7	903.160
8	905.400
9	903.960
10	904.560
11	905.880
12	903.640
13	905.000
14	904.280
15	905.560
16	905.480

17	903.320
18	905.320
19	905.760
20	903.880
21	903.120
22	905.240
23	905.920
24	904.200
25	905.440
26	905.600
27	903.680
28	903.000
29	904.800
30	905.200
31	905.960
32	903.400
33	904.120
34	904.400
35	904.960
36	905.680
37	903.040
38	903.760
39	905.280
40	906.000
41	904.680
42	905.520
43	904.040
44	905.840
45	903.800
46	903.080
47	905.080
48	905.800
49	903.480
50	904.360
51	905.360
52	905.640

53	904.880

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RX TABLE:

Seq	High (MHz)
1	924.000
2	924.480
3	925.160
4	925.720
5	923.520
6	924.760
7	923.160
8	925.400
9	923.960
10	924.560
11	925.880
12	923.640
13	925.000
14	924.280
15	925.560
16	925.480
17	923.320
18	925.320
19	925.760
20	923.880
21	923.120
22	925.240
23	925.920
24	924.200
25	925.440
26	925.600
27	923.680
28	923.000
29	924.800

30	925.200
31	925.960
32	923.400
33	924.120
34	924.400
35	924.960
36	925.680
37	923.040
38	923.760
39	925.280
40	926.000
41	924.680
42	925.520
43	924.040
44	925.840
45	923.800
46	923.080
47	925.080
48	925.800
49	923.480
50	924.360
51	925.360
52	925.640
53	924.880

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The associated system receiver has a compliant input bandwidth and has the ability to hop in synchronization with the transmitter. Synchronization is achieved by decoding packet headers and position pointers within the packets. The receiver interprets the packet headers and position markers and determines the next receive and transmit channel assignment that is in the pseudo randomly ordered channel selection table.

2) 15.247 (g)

When presented with a continuous data stream the system will continue to operate using its pseudo randomly generated hoping scheme. A data stream which requires the use of all of the hoping channels in order to be completely received will be received using a pseudo random sequence.

During a short transmission or burst the system will select the next channel in its pseudo randomly ordered channel selection table. The last used position in the table is indexed in the memory and is incremented by one in order to select the next channel in the pseudo randomly ordered channel selection table for the next transmission event.

3) 15.247 (h)

The system does not incorporate any means for intelligent coordination other than a means for synchronization of the transmitter and the receiver. This synchronization does not take into account any interference or channel occupancy but other systems. Both the transmitter and the receiver synchronize to each other by decoding packet headers and position pointers within the packets. These serve to enable the system to know when to hop to the next channel in the pseudo randomly ordered channel selection table and to stay synchronized.