AeroComm/Telxon Transmitter Operation

The AeroComm/Telxon transmitter transmits on 77 frequencies from 2402 MHz to 2479 MHz. The frequency channel carrier frequencies are separated by 1 MHz . The 20dB bandwidth of the transmitter is 900 kHz. The carrier frequencies are selected from a pseudorandom - ordered table of frequencies located in the system ROM area of memory. Each frequency has an occupancy time of 256 mS. controlled by the system microprocessor.

I. Pseudorandom Hopping Sequence

The pseudorandom - ordered sequence is chosen from one of 77 hopping patterns by setting the variable 'x' and using the index 'i' which increments every hop time (256 mS.) to look up the channel frequency to select. The following equation depicts the actual look-up and calculation of the selected frequency.

$$F_x(i) = [b(i) + x] \bmod (77)$$

Where: b(i) is defined in Table 1
i = 1 to 77
x = hopping pattern

x = 00,03,06,09,12,15,18,21,24,27,30,33,36,39,42,45,48,51,54,57,60,63,66,69,72,75
x = 01,04,07,10,13,16,19,22,25,28,31,34,37,40,43,46,49,52,55,58,61,64,67,70,73,76
x = 02,05,08,11,14,17,20,23,26,29,32,35,38,41,44,47,50,53,56,59,62,65,68,72,74,77

TABLE 1 -- The list of frequencies b(i) relative to 2402 MHz.

i	b(i)	i	b(i)	i	b(i)	i	b(i)	i	b(i)	i	b(i)	i	b(i)
1	00	12	32	23	55	34	62	45	15	56	49	67	17
2	16	13	64	24	39	35	37	46	04	57	36	68	59
3	09	14	05	25	72	36	11	47	65	58	28	69	74
4	34	15	66	26	30	37	31	48	47	59	44	70	27
5	70	16	73	27	68	38	63	49	38	60	21	71	57
6	52	17	02	28	07	39	48	50	26	61	59	72	20
7	67	18	58	29	56	40	54	51	53	62	06	73	50
8	19	19	25	30	76	41	40	52	33	63	41	74	61
9	01	20	10	31	43	42	46	53	52	64	14	75	24
10	35	21	23	32	18	43	13	54	22	65	69	76	75
11	08	22	12	33	72	44	03	55	42	66	45	77	29

II. Channel Usage

Channel usage is controlled by the Master unit. The master hops to a new channel every 256 ms. The master follows the pseudorandom sequence until all 77 frequency channels have been used. The sequence then repeats.

III. Receiver Bandwidth and Synchronization.

The receiver bandwidth matches the transmitter bandwidth. Frequency hopping is controlled by the Master unit. Receivers synchronize with a master transmitter by decoding Beacon data. Beacon data consists of preamble, address, frequency and timing information. The synchronization sequence is as follows:

1. **The master unit transmits a Beacon (approx. 4ms. in duration) at approximately a 32 ms. rate.**
2. **Slave units scan all available hopping frequencies searching for the Beacon data.**
3. **Once the slave units decode the Beacon data, they load the frequency and timing information into internal timers and hop in unison with the master‘s hopping algorithm.**