CLAIMS

1. A true random number generator comprising a digital chaotically oscillating autonomous Boolean network as a source of entropy, wherein said digital chaotically oscillating autonomous Boolean network includes three logic elements connected to each other, the first of which is a two-input “Exclusive OR” or “Exclusive NOR” gate, the second is a two-input “Exclusive OR” or “Exclusive NOR” gate, and the third logic element has three inputs and one output, and implements a logic “counting ones” function, in which its output is set to a logic one if a logic one is present at no more than one of its inputs, otherwise it is set to a logic zero, while the output of the first two-input logic element is connected to the first input of the second two-input logic element and to the second input of the third logic “counting ones” element, the output of the second two-input logic element is connected to its second input, to the second input of the first two-input logic element, and to the third input of the third logic “counting ones” element, and the output of the third logic “counting ones” element is connected to its first input, to the first input of the first two-input logic element, and to the output of the entire network.

2. The generator according to claim 1, wherein the second and/or third inputs of the third logic “counting ones” element are inverted.

3. The generator according to any one of claims 1-2, wherein both two-input “Exclusive OR” and/or “Exclusive NOR” gates have additional third logic inputs, which are combined together and represent a modulation input of the autonomous Boolean network and connected to an external modulation input of the digital chaotically oscillating autonomous Boolean network.

4. The generator according to any one of claims 1-3, wherein the generator has a shutdown input, while both “Exclusive OR” and/or “Exclusive NOR” gates have additional shutdown inputs with the possibility of forcibly switching the output of both said gates to the logic zero or logic one state regardless of the state of the other inputs,

these inputs being combined together and connected to the specified generator shutdown input.

5. The generator according to any one of claims 3-4, wherein the digital chaotically oscillating autonomous Boolean network is combined with a D-trigger into a synchronous chaotic oscillator block having a clock input connected to the clock input of the D-trigger, a modulation input connected to the modulation input of the autonomous Boolean network, an asynchronous output connected to the output of the autonomous Boolean network, and a synchronous output connected to the output of the D-trigger, the output of the autonomous Boolean network being further connected to the data input of the D-trigger.

6. The generator according to claim 5, wherein said generator comprises an additional two-input “Exclusive OR” and/or “Exclusive NOR” gate, the first input of which is connected to the input of external modulation, the second input is connected to the output of the D-trigger, and the output is connected to the modulation input of the autonomous Boolean network.

7. The generator according to claim 5, wherein said generator comprises a plurality of N blocks of synchronous chaotic oscillators combined into a ring structure, the clock inputs of which are combined together and connected to a common clock signal, and their synchronous outputs are connected to an N-bit output of the generator, and a set of N additional two-input “Exclusive OR” and/or “Exclusive NOR” gates so that the output of each such gate is connected to the modulation input of the corresponding block of the synchronous chaotic oscillator, its first input is connected to the asynchronous output of the previous synchronous chaotic oscillator block in the chain, and the second input is connected to the asynchronous output of the subsequent synchronous chaotic oscillator block in the chain.