

## **Analog Toy Product Description**

### **Toy Operation**

The toy device operated by system micro-controller, that receives instructions from PC. Digital data transmitted to toy in a slow rate (2 Kbps in Manchester code) using RF channel (FSK modulation,  $\Delta f \sim 11$  KHz). Micro-controller applies error correction algorithms on transmitted and also received data. Micro-controller's crystal frequency: 4.0 Mhz.

Motor, sensors and LEDs mounted inside the toy and wires connecting it to the electronic circuit.

Transmitted audio signal passes through automatic gain control (AGC) for flat audio level. Received audio signal passes through expander to increasing the dynamic range.

Tranceiver is an integrated RF module manufactured by Samsung Corporation, Electronic Components Group, model RU0926H18HKB.

Four size D 1.5V batteries feeds the toy power. Input voltage may swing from 4.0 up to +6.5V without affecting the system operation. Voltage regulator at the toy input stabilized the voltage for system componets espdghesially to the RF module.

### **System Test Start Up and Configuration**

#### **Toy**

When toy is powered up, the toy performs self - test routine and initialization, that includes motor and mechanics test. After self-test is passed, the toy starts searching the RF channels in order to find the valid channel and establishes the communication with the base and the PC software. If the base found, the toy enters its normal operation mode, while waiting for commands from the base.

Toy may be entered into sleep mode by the PC's software or by the user.