

## Expository Statement

**Grantee:** Microsoft® Corporation  
**Model:** Microsoft® Wireless Desktop Comfort Keyboard 1.0A  
**Model No. :** 1027  
**Option :** USB and PS/2, flat keyboard

### KEYBOARD TRANSMITTER:

The Microsoft® **Wireless Desktop Comfort Keyboard** is a computer input devices typically used for data input, conventional cursor control, numerical keypad, internet and multimedia control, and the Zoom Slider can be used for controlling the zoom-in and zoom-out of a file or an image. When a user presses a key on the keyboard or slide the Zoom-slider, the circuitry within the keyboard detects this key switch closure and translates it into a form usable by the host computer.

The keyboard controller operates from a 8MHz clock speed derived from a 8MHz ceramic resonator. The controller takes its power from 2 (two) AA batteries and reads key stroke through a number of scan outputs and sense inputs. The scan outputs are connected to a Mylar sheet with conductive ink going from the scan output to the key switches. A separate Mylar sheet goes from the key switches to the sense inputs. When a key switch is pressed, conductive ink traces on the two Mylar sheets are connected, and a given scan output is connected to a given sense input. The controller detects which key is pressed, and sends the appropriate RF codes to the receiver via a wireless 27MHz FSK data transmission through the transmitter circuit board. The keyboard controller also connected to an EEPROM to store the information to bind with the receiver and low voltage detector circuit to warn user when batteries is in low power condition.

The transmitter operates on either one of the 2 channels: 27.095 MHz or 27.195 MHz and channel selection is accomplished by pressing the 'Connect Channel' button located underneath the keyboard. The transmitter uses Frequency Shift Keying (FSK) modulation, and consists of a crystal-controlled FSK modulator and an output driver. The crystal-controller modulator uses a 27.095 and 27.195MHz crystal. The radiated electric field of the transmitter is less than 52dBuV/m at 3 meters. To save the batteries, the controller switches ON the transmitter only in the active state of the keyboard. The active state continues about 5 milliseconds after the last movement or button press and release; then the keyboard goes in the sleep from active state. The controller will resume from the sleep state to active state after receiving a signal from the interrupt driven I/O lines (sense lines) while a key is pressed or the Zoom-Slider is activated.

The keyboard uses a double-sided printed circuit board for keyboard microprocessor controller, voltage detectors, EEPROM and the transmitter RF circuitry. The printed circuit board hosts the keyboard microcontroller and the 27MHz RF transmitter with the antenna matching circuitry. The printed circuit board also interfaces to and hosts the battery connector, the keyboard matrix as well as Zoom-slider connectors, and the antenna connector. A wired loop antenna which surrounded the whole keyboard is connected to the printed circuit board.

The Keyboard complies with Microsoft® and IBM® PS/2 specification, USB 2.0 and USB HID Specification. Where there is a discrepancy, the Microsoft® Specification is used.