

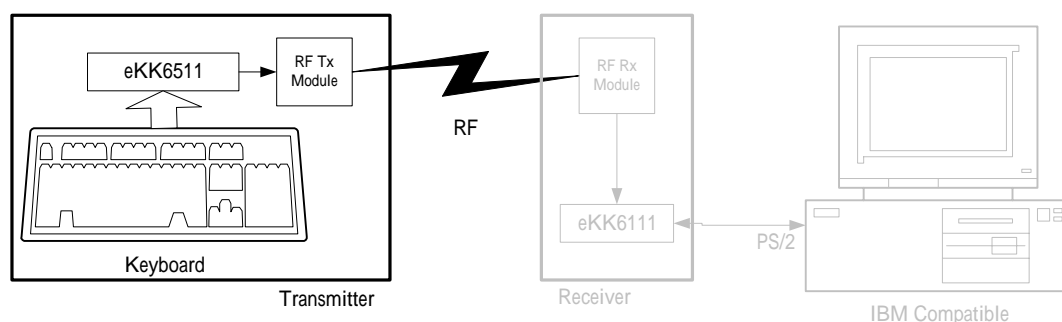


Preliminary

eKK6511
RF KEYBOARD ENCODER

GENERAL DESCRIPTION

In RF keyboard system, that is divided into two parts (the transmitter and the receiver). The eKK6511 micro-controller is dedicated to a RF keyboard encoder for single channel RF transmitter module. The eKK6511 is scanning keyboard state, encode key data and rely on RF Tx module to transmit data.



FEATURES

- Low cost – eliminate need external components.
- Phantom key detect.
- Resonator oscillator (2.00 MHz)
- Low power CMOS device technology
- Internal pull-up resistor.
- Tri-state outputs for easy board application.
- Built-in 4K ROM.
- Support WINDOWS™ 95, 98, 2000 keys.
- 104/107 keys with multi-media or other special keyboard encoder.
- Support RF transmit module sleep mode (Sleep current under 10μA).
- Warm-up time of RF Tx modules: 7.2μ sec
- Using the device ID to identify which receiver was connected.
 - DIP switch to select. (8 sets ID)
 - Random generate ID (255 sets ID) and store in EEPROM (93LC46)
- Package: 40-pins PDIP, 44-pins QFP

APPLICATION

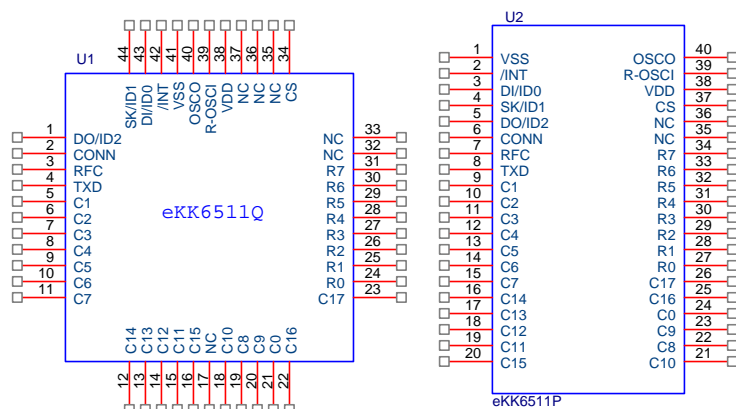
- Support the single channel or two channels RF transmitter module.
- IBM PC AT or compatible machine keyboard.
- IBM PS/2 model 30,50,60,80 or compatible machine keyboard.
- Japanese keyboard.
- Korean keyboard.
- Brazilian keyboard.
- European keyboard.



Preliminary

eKK6511
RF KEYBOARD ENCODER

PIN ASSIGNMENT



PIN DESCRIPTIONS

| Symbol | I / O | Function |
|--------|-------|---|
| P50 | O | Column 3 Low output scan line, 3-state |
| P51 | O | Column 4 Low output scan line, 3-state |
| P52 | O | Column 5 Low output scan line, 3-state |
| P53 | O | Column 6 Low output scan line, 3-state |
| P54 | O | Column 7 Low output scan line, 3-state |
| P55 | O | Column 14 Low output scan line, 3-state |
| P56 | O | Column 13 Low output scan line, 3-state |
| P57 | O | Column 12 Low output scan line, 3-state |
| P80 | O | Column 11 Low output scan line, 3-state |
| P81 | O | Column 15 Low output scan line, 3-state |
| P82 | O | Column 10 Low output scan line, 3-state |
| P83 | O | Column 8 Low output scan line, 3-state |
| P84 | O | Column 9 Low output scan line, 3-state |
| P85 | O | Column 0 Low output scan line, 3-state |
| P86 | O | Column 16 Low output scan line, 3-state |
| P87 | O | Column 17 Low output scan line, 3-state |
| P91 | O | Switch DIP control line or Random ID connect bottom |
| P90 | I | Switch DIP for Device ID bit 2 or connect with DO pin of EEPROM |
| P70 | O | Connect with CS pin of EEPROM |
| P74 | I / O | Switch DIP for Device ID bit 1 or connect with SK pin of EEPROM |
| P75 | I / O | Switch DIP for Device ID bit 0 or connect with DI pin of EEPROM |
| P92 | O | Control line for RF Transmitter Module |
| P93 | O | Data Output for RF Transmitter Module connection |
| P94 | O | Column 1 Low output scan line, 3-state |
| P95 | O | Column 2 Low output scan line, 3-state |
| VSS | I | Ground |
| P60 | I | Row 0 Input Scan line, internal pull high (17K) |
| P61 | I | Row 1 Input Scan line, internal pull high (17K) |
| P62 | I | Row 2 Input Scan line, internal pull high (17K) |
| P63 | I | Row 3 Input Scan line, internal pull high (17K) |
| P64 | I | Row 4 Input Scan line, internal pull high (17K) |
| P65 | I | Row 5 Input Scan line, internal pull high (17K) |
| P66 | I | Row 6 Input Scan line, internal pull high (17K) |
| P67 | I | Row 7 Input Scan line, internal pull high (17K) |

* This specification are subject to be changed without notice.



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RF KEYBOARD ENCODER

| | | |
|------|---|--|
| VDD | I | +3V Battery power supply |
| OSCO | O | CLOCK output |
| OSCI | I | Connect with 2.00MHz Resonator Oscillation |

FUNCTION DESCRIPTION

Encoder buffer

The eKK6511 will buffer 24 bytes first-in-first-out order when the system is able to receive scan codes from the keyboard. The eKK6511 generate RF data frame according to FIFO and keyboard status. Then, modulation the data frame into serial signal to RF Tx module. When key pressed, the EKK6511 will generate a make code into FIFO. If key not released, eKK6511 will generate a make code into FIFO every 200ms. When key released, the eKK6511 will generate a break code into FIFO.

Device ID

The eKK6511 has support two device ID mode:

1. Controllable ID mode: Using the 3 bits DIP switch to control the device ID.
2. Random generate ID mode: Using the push bottom to generates a random device ID (255 sets) and restores in EEPROM (93LC46). The eKK6511 will broadcast 10 seconds the new device ID after push bottom released. When battery exchange or reset, the device ID will recovery from EEPROM.

ABSOLUTE MAXIMUM RATINGS

| Parameter | Sym. | Ratings |
|------------------------|-----------|--------------|
| Temperature under bias | T_{OPR} | 0 to 70 |
| Storage temperature | T_{STR} | -65 to 150 |
| Input Voltage | V_{IN} | -0.3V to +6V |
| Output Voltage | V_{OUT} | -0.3V to +6V |

DC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|-----------|--|---|------|------|---------|---------|
| I_{IL} | Input Leakage current | $V_{IN}=V_{DD}, V_{SS}$ | | | ± 1 | mA |
| V_{IH} | Input High Voltage | | 2.0 | | | V |
| V_{IL} | Input Low Voltage | | | | 0.8 | V |
| V_{IHx} | Clock Input High voltage | OSCI | 3.5 | | | V |
| V_{ILx} | Clock Input Low voltage | OSCI | | | 1.5 | V |
| V_{OH1} | Output High voltage (Ports 5,6,8,9 and P74,P75) | $I_{OH}=-12.0mA$ | 2.4 | | | V |
| V_{OH2} | Output High voltage (P70~P72)(S7=0) | $I_{OH}=-10.0mA$ | | 2 | | V |
| V_{OH3} | Output High Voltage (P70~P72)(S7=0) | $I_{OH}=-10.0mA$ | 2.4 | | | V |
| V_{OL1} | Output Low Voltage (ports 5,6,8,9 and P74~P75) | $I_{OL}=5.0mA$ | | | 0.4 | V |
| V_{OL2} | Output Low voltage (P70~P72)(S7=0) | $I_{OL}=12.0mA$ | | | 0.4 | V |
| V_{OL3} | Output Low Voltage (P70~P72)(S7=1)(P76~P77) | $I_{OL}=10.0mA$ | | 3 | | V |
| I_{PH} | Pull-high current | Pull-high active, input pin at V_{SS} | -250 | -400 | -500 | μA |
| I_{SB} | Power-down current | All input and I/O pin at V_{DD} , output pin floating, WDT enabled | | | 10 | mA |



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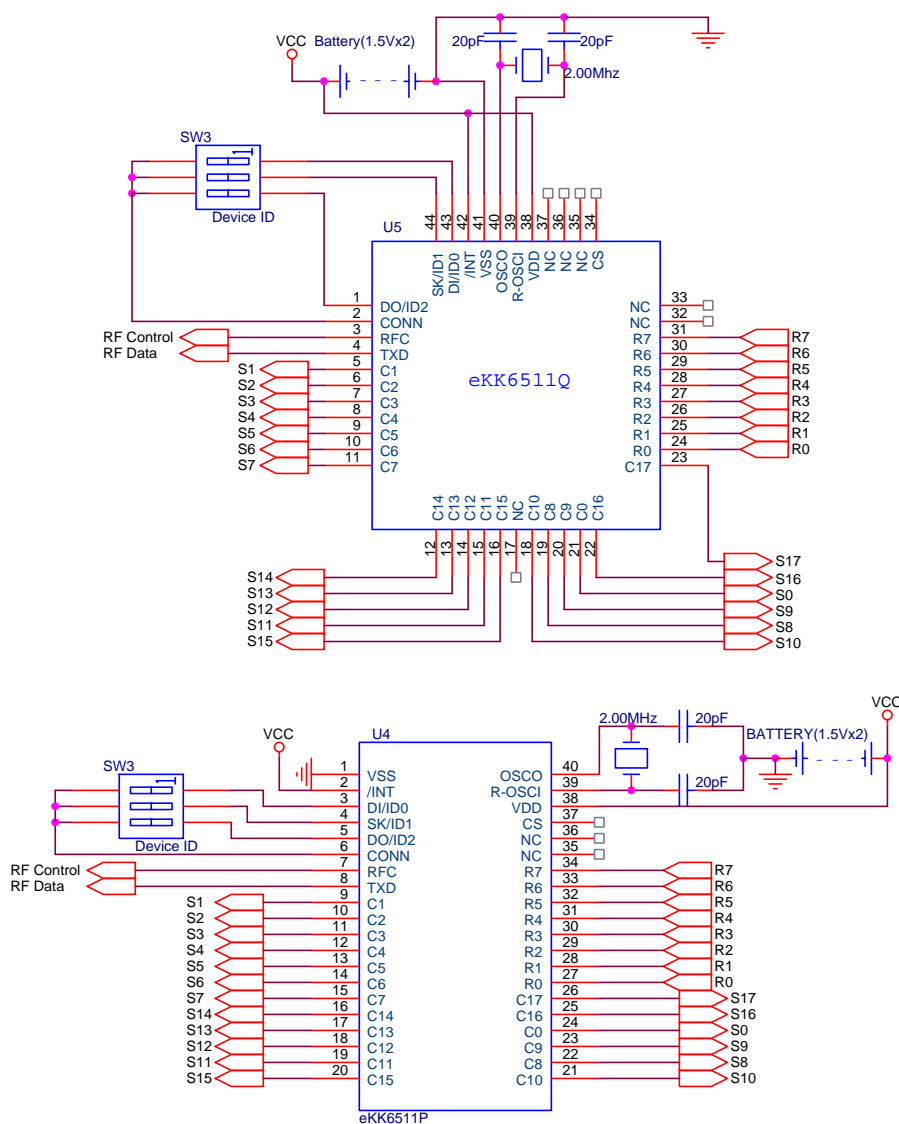
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RF KEYBOARD ENCODER

| | | | | | | |
|-----------|---|---|--|--|---|----|
| I_{CC1} | Operating supply current ($V_{DD}=5.0V$) at two cycles/two clocks | /RESET=High Fosc=2.00Mhz(CK2="0"), output pin floating | | | 3 | mA |
|-----------|---|---|--|--|---|----|

AC ELECTRICAL CHARACTERISTIC($T_a=0 \sim 70$, $V_{DD}=5V$, $V_{SS}=0V$)

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|-----------|--------------------------|-----------|------------------|------|------|------|
| D_{CLK} | Input CLK duty cycle | | 45 | 50 | 55 | % |
| T_{TCC} | TCC input period | | $(T_{ins}+20)/N$ | | | ns |
| T_{WDT} | Watchdog timer period | $T_a=25$ | | 18 | | ns |
| T_{DRH} | Device reset hold period | $T_a=25$ | | 18 | | ns |

APPLICATION CIRCUIT

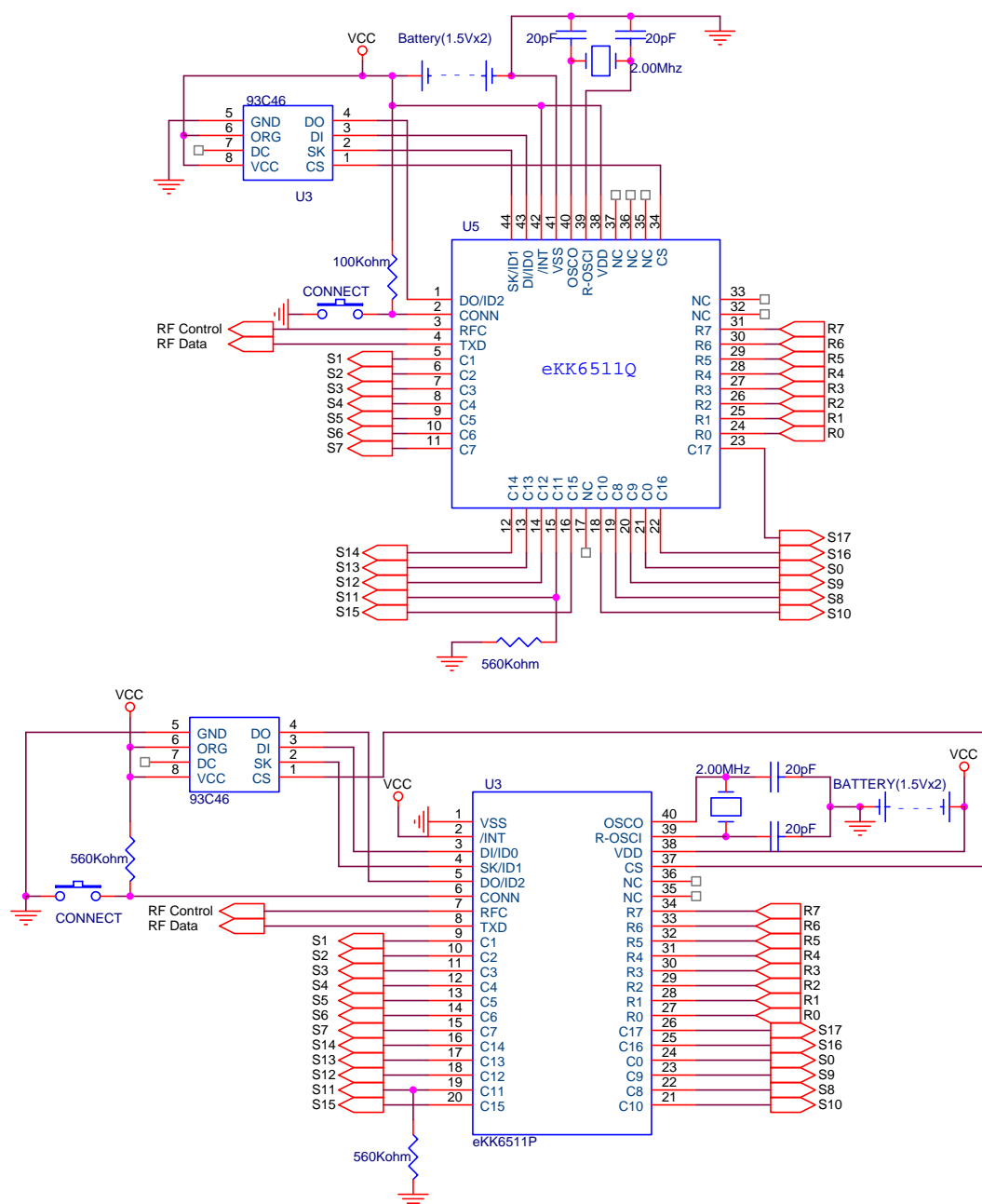


DIP Switch ID mode



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Random generate ID mode



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KEYBOARD ARRANGE MAP

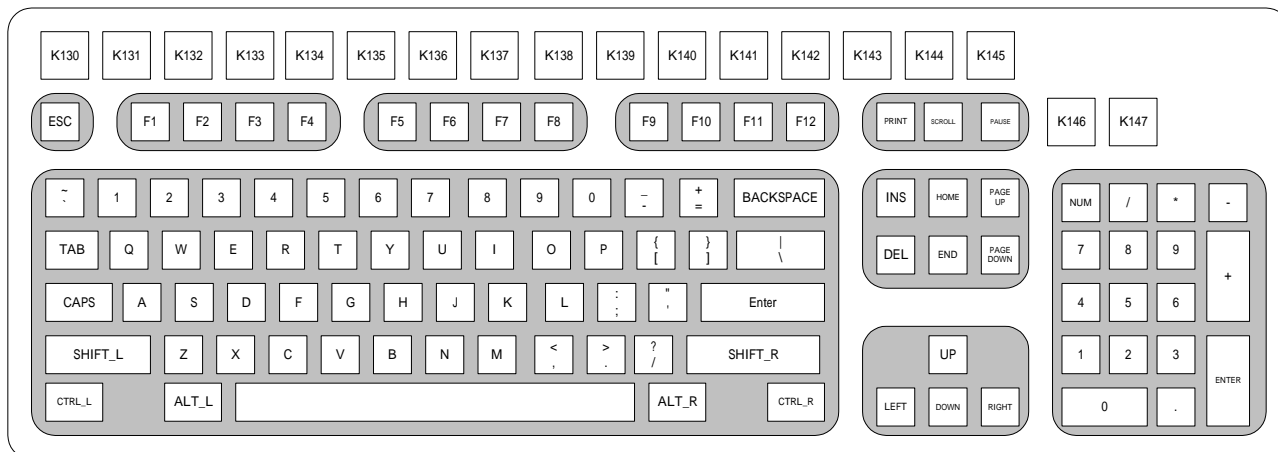
| | R0 | R1 | R2 | R3 | R4 | R5 | R6 | R7 |
|-----|----------------|----------------|-----------------|----------------|-------------------|----------------|----------------|------------------|
| C0 | PAUSE 126 | POWER | | SLEEP | CTRL-R 064 | WAKE UP | CTRL-L 058 | F5 116 |
| C1 | Q 017 | TAB 016 | A 031 | ESC 110 | Z 046 | N-CHG 131 | ` (~) 001 | 1 (1) 002 |
| C2 | W 018 | CAP 030 | S 032 | K45 045 | X 047 | CHG 132 | F1 112 | 2 (@) 003 |
| C3 | E 019 | F3 114 | D 033 | F4 115 | C 048 | ROMA 133 | F2 113 | 3 (#) 004 |
| C4 | R 020 | T 021 | F 034 | G 035 | V 049 | B 050 | 5 (%) 006 | 4 (\$) 005 |
| C5 | U 023 | Y 022 | J 037 | H 036 | M 052 | N 051 | 6 (^) 007 | 7 (&) 008 |
| C6 | I 024 |] () 028 | K 038 | F6 117 | , (<) 052 | K56 056 | + ' (=) 013 | 8 (*) 009 |
| C7 | O 025 | F7 118 | L 039 | | . (>) 054 | APP APP | F8 119 | 9 (' ') 010 |
| C8 | P 026 | [({) 027 | ; (:) 040 | ' (") 041 | K42 042 | / (?) 055 | _ (-) 012 | 0 (' ') 011 |
| C9 | SCROLL 125 | | | ALT-L 060 | | ALT-R 062 | | PRINT 124 |
| C10 | K14 014 | BACK 015 | \ () 029 | F11 122 | ENTER 043 | F12 123 | F9 120 | F10 121 |
| C11 | 7 (K) 091 | 4 (K) 092 | 1 (K) 093 | SPACE 061 | NUM 090 | | DEL 076 | POWER |
| C12 | 8 (K) 096 | 5 (K) 097 | 2 (K) 098 | 0 (K) 099 | / (K) 095 | | INS | SLEEP |
| C13 | 9 (K) 101 | 6 (K) 102 | 3 (K) 103 | . (K) 104 | * (K) 100 | - (K) 105 | PageUp 085 | PageDown 086 |
| C14 | +(K) 106 | K107 | ENTER(K) 108 | | Play/Pause 083 | | HOME 079 | END 081 |
| C15 | WAKEUP | SHIFT-L 004 | SHIFT-R 057 | Volume- | Volume+ | NextTrack | PrevTrack | Media |
| C16 | Mail | WIN-L | WWWForward | WWWStop | WWWBack | WWWRefresh | Mute | WWWSearch |
| C17 | K150 (KC-L) | WWWFavorites | WIN-R | MyComputer | Stop | Calculator | Web/Home | K151 (KC-R) |



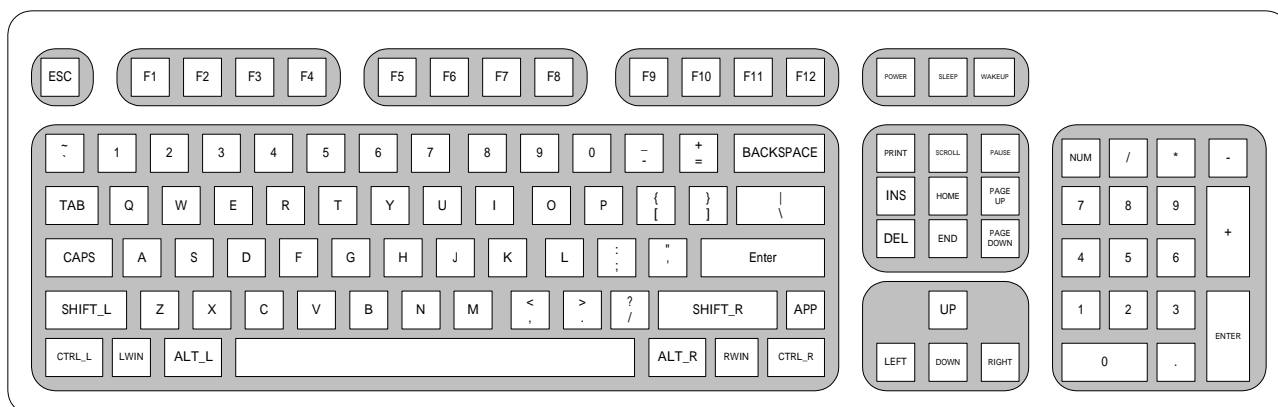
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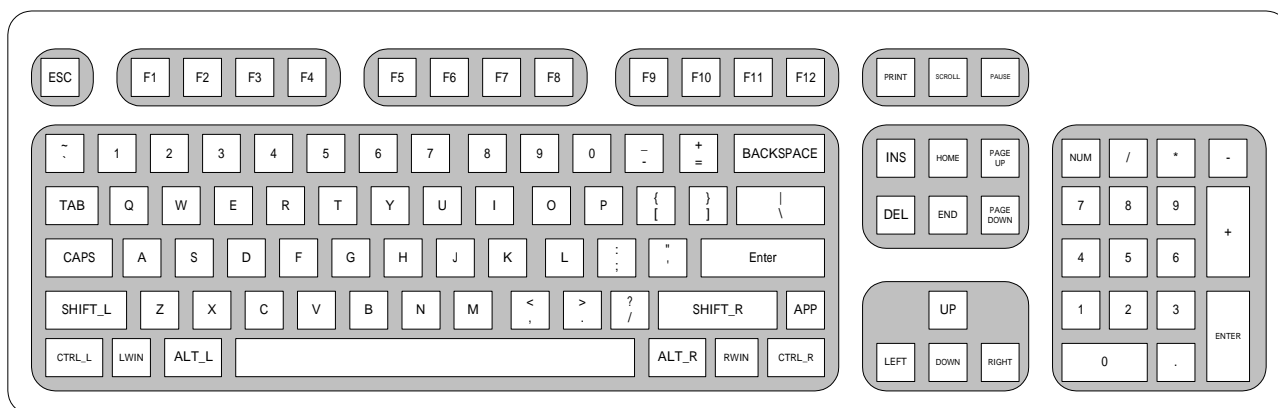
KEYBOARD LAYOUT



The Windows 2000 keyboard layout.



The 107-key keyboard layout



The 104-key keyboard layout