

## KB-2100 series hardware limitations

H1	H2										
A1	B1	C1	D1	E1		G1	G6	F6	E6	D6	H6
A2	B2	C2	D2	E2	F1	G2	G7	F7	E7	D7	H7
A3	B3	C3	D3	E3	F2	G3	G8	F8	E8	D8	
A4	B4	C4	D4	E4	F3	G4	G9	F9	E9	D9	
A5	B5	C5	D5	E5		G5	G10	F10	E10	D10	

In KB-2100 series, the detection of each key press is achieved through the use of combination of “Logical columns” and “Logical rows”. The above is a diagram of how the “Logical columns” and the “Logical rows” are defined in the key switch location map. In the notations, letters “A” through “H” are used to denote the “Logical columns” whereas the numbers “1” through “10” represent the “logical rows”. For example, when the key noted as “A1” is pressed, the “Logical column” “A” is connected to the “Logical row” “1” by hardware, the CPU of KB-2100 detects such connection and determines that the key marked as “A1” above has been pressed. However, in the case of multiple simultaneous key-press, there are limitations on the position of the keys selected. The basic rule of such limitations is

**No two keys in the combination are allowed to be in the same “Logical column” nor the same “Logical row”.** Let us take some examples to illustrate this limitation.

Example 1: If in the combination of the multiple keys, “D5” and “D7” are included, then there will be no possible way to recognize whether the third key pressed is say “G5” or “G7”. The reason is that as “D5” is pressed, column D is connected to row 5 and as “D7” is pressed, column D is also connected to row 7. Now let us assume that “G5” is the third key pressed. The column G will then be connected to row 5 by definition. However, it can be found that the column G is also connected to row 7 indirectly even when the key “G7” is not touched.

Example 2: If keys “E10” and “F10” are pressed, the press of most of the numerical key pad area will have trouble. For example, pressing the key “F2” which is printed as number 5 in the numerical key pad. However, the key “E2” which is the number key for 7 will be considered as virtually pressed though actually untouched.

Example 3: If keys “A1” and “A2” are pressed, turning of the key no matter to either “Open” or “Close” position gives same ambiguity. In such case, the hardware just fail to identify row 1 from row 2.

The above examples indicate only part of the problems when any two keys of either same “Logical column” or “Logical row”. To overcome such problem, the output of KB-3100 when the above rule is violated could be prohibited.

The original mapping of the KB-2100 keyboard to the 176 keyboard is as following, where “P4” is for key turned to “H1” position and “N4 is for key turned to “H2” position.

P4	N4											
P1	P2	P3	P5	P6		P8	O8	O7	O6	O5	O4	
N1	N2	N3	N5	N6	P7	N8	M8	M7	M6	M5	M4	
L1	L2	L3	L5	L6	N7	L8	K8	K7	K6	K5		
J1	J2	J3	J5	J6	L7	J8	I8	I7	I6	I5		
H1	H2	H3	H5	H6		H8	G8	G6	G6	G5		