Instructions for modifying the Teensyduino LC code for a different keyboard matrix.

Modify the Teensyduino code from one of these LC example keyboards: Dell 1525, 131L, X1, HP 2100, V4000, DV9000, Sony PCG-K25, and VPCCW.

Each of the items that need to be modified are listed below.

If you are using Marcel's Python program, its output will automatically provide the information that needs to be added to the Teensyduino code. An example output from his program is given at the end of this document. Unfortunately his program adds single quotes around each character so you'll need to remove the quotes with an editor.

Const byte rows_max =

- Set this to the number of rows in your matrix (16, 17, or 18)

Const byte cols_max =

- Set this to the number of columns in your matrix (probably 8)

Int normal[rows_max][cols_max] = {

- This array should have 8 items on each line and 16, 17, or 18 lines (based on rows_max).
- Transfer every normal key from your matrix table to this array. Yes it's monotonous.
- This array is only for the normal keys, not for Control, Alt, Shift, GUI, or Fn.
- If your matrix table has no normal key in a cell then put a 0 in the array.
- Put a 0 in the cell if your matrix has Control, Alt, Shift, GUI, or Fn keys listed at this location.
- The names given for each key must be as shown in the "All Key Codes" table at: www.pjrc.com/teensy/td_keyboard.html the exception is KEY_MENU, which is not listed on the PJRC table but it does work.
- If your keyboard has a key name that does not exist in the PJRC table, it can't be used.
- The PJRC table uses Tilde for the back tick ` key (also known as grave accent key).

int modifier[rows_max][cols_max] = {

- This array should have 8 items on each line and 16, 17, or 18 lines (based on rows_max).
- Transfer every modifier key from your matrix table to this array.
- If your matrix table has a normal key or no key listed in the cell, put a 0 in this position.
- The names for the modifier keys are as listed in the PJRC table except the "lefts" listed below:
- MODIFIER_LEFT_CTRL, MODIFIER_LEFT_SHIFT, & MODIFIER_LEFT_ALT are missing from the PJRC table but they work fine.
- MODIFIER_FN has been defined by me at the top of this code so I can watch for it in case anyone wants to add multimedia or other Fn things. The Fn key by itself is not sent over USB.

Int media[rows_max][cols_max] = {

- This array should have 8 items on each line and 16 to 18 lines (based on rows_max).
- This table is for the media keys and any other key that are accessed by holding down the Fn key
- You can only use items that are listed in the PJRC "All Key Codes" table for the Normal, Media Player, and System Control Keys.
- Put a 0 in the matrix if the key has no Fn function or if the function is not supported by PJRC.

You can see the key code definitions that Teensyduino loaded on your PC at:

C:\Program Files (x86)\Arduino\hardware\teensy\avr\cores\teensy3\keylayouts.h

boolean old_key[rows_max][cols_max] = {

- This array should have 8 ones on each line and 16, 17, or 18 lines (based on rows_max).

int Row_IO[rows_max] = {   };

- Use the LC translation table shown below to convert each of the FPC pin numbers to Teensy LC I/O numbers starting from the first row in your matrix table down to the last row.

int Col_IO[cols_max] = {   };

- Use the LC translation table shown below to convert each of the FPC pin numbers to Teensy LC I/O numbers starting from the first column in your matrix table to the last column.

Teensy LC Translation Table

FPC Pin #	Teensy LC I/O #
1	23
2	0
3	22
4	1
5	24
6	2
7	21
8	3
9	25
10	4
11	20
12	5
13	19
14	6
15	18
16	7
17	17
18	8
19	16
20	9
21	15
22	10
23	14
24	11
25	26
26	12

HP DV9000 Results from Marcel's Python Program is given below but all of the single quotes in the arrays need to be removed. For example '0','KEY_N','KEY_6' must be changed to 0,KEY_N,KEY_6 with no quotes or spaces.

```
-------------------------------------------------------
FPC PINS:

8 inputpins:
[15, 18, 19, 21, 22, 24, 25, 26]                    Keyboard FPC input
                                                    and output pins
18 outputins:
[1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, 20, 23]
-------------------------------------------------------
TEENSY PINS (these have to be copied to the arduino file):

8 inputpins:        cols_max=8
[18, 8, 16, 15, 10, 11, 26, 12]                     FPC pins translated to
                                                    Teensy I/O pins
18 outputins:       rows_max=18
[23, 0, 22, 1, 24, 2, 21, 3, 25, 4, 20, 5, 19, 6, 7, 17, 9, 14]
-------------------------------------------------------
KEY                                         int normal[rows_max] [cols_max] =
-------------------------------------------------------
```

int normal[rows_max] [cols_max] =

```
{
{'KEYPAD_7','KEYPAD_PLUS','KEYPAD_9','KEYPAD_2','KEYPAD_3','KEYPAD_1','KEYPAD_ENTER','KEYPAD_8'},
{'KEYPAD_SLASH','KEYPAD_6','KEYPAD_MINUS','KEYPAD_5','KEYPAD_PERIOD','KEYPAD_4','KEYPAD_0','KEYPAD_ASTERIX'},
{'KEY_DELETE','KEY_PAGE_UP','KEY_HOME','KEY_END','KEY_PAGE_DOWN','KEY_RIGHT','KEY_LEFT','KEY_INSERT'},
{'KEY_EQUAL','KEY_MINUS','KEY_LEFT_BRACE','KEY_SLASH','KEY_SEMICOLON','KEY_0','KEY_P','KEY_QUOTE'},
{'KEY_F12','KEY_F9','KEY_F10','KEY_PERIOD','KEY_L','KEY_9','KEY_O','KEY_F11'},
{'0','KEY_BACKSLASH','KEY_NUM_LOCK','KEY_SPACE','KEY_ENTER','KEY_DOWN','KEY_UP','KEY_BACKSPACE'},
{'0','0','0','0','0','0','0','0'},
{'0','KEY_MENU','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','KEY_RIGHT_BRACE','KEY_COMMA','KEY_K','KEY_8','KEY_I','0'},
{'KEY_N','KEY_6','KEY_Y','KEY_M','KEY_J','KEY_7','KEY_U','KEY_H'},
{'0','0','0','0','0','0','0','0'},
{'KEY_B','KEY_5','KEY_T','KEY_V','KEY_F','KEY_4','KEY_R','KEY_G'},
{'KEY_F1','KEY_F2','KEY_F3','KEY_C','KEY_D','KEY_3','KEY_E','KEY_F4'},
{'KEY_CAPS_LOCK','KEY_TILDE','KEY_TAB','KEY_Z','KEY_A','KEY_1','KEY_Q','KEY_ESC'},
{'KEY_F8','KEY_F5','KEY_F6','KEY_X','KEY_S','KEY_2','KEY_W','KEY_F7'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
}
-------------------------------------------------------
```

Normal keys in a row-column matrix

```
MODIFIER                int modifier[rows_max][cols_max] =
-------------------------------------------------------
{
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'MODIFIERKEY_RIGHT_ALT','0','0','0','0','MODIFIERKEY_LEFT_ALT','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','MODIFIERKEY_GUI'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','MODIFIERKEY_FN','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','MODIFIERKEY_LEFT_CTRL','0','MODIFIERKEY_RIGHT_CTRL','0','0','0'},
{'0','0','0','MODIFIERKEY_LEFT_SHIFT','0','0','MODIFIERKEY_RIGHT_SHIFT','0'},
}
-------------------------------------------------------
```

Modifier keys in a row-column matrix

FN   int media[rows_max][cols_max] =

```
{
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'KEY_MEDIA_NEXT_TRACK','KEY_MEDIA_PLAY_PAUSE','KEY_MEDIA_STOP','0','0','0','0','KEY_MEDIA_PREV_TRACK'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
{'0','0','0','0','0','0','0','0'},
}
```

Media keys in a
row-column matrix