

United Keys, Inc.
Efficiency Case Study
A Simple Icon Maker



OLED Display Keypad
Model Number: KBUN-0805



OLED Display Keyboard
Model Number: KBUN-0804



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1.0 Introduction

The United Keys™ OLED Display Keyboard and Keypad devices allow the use of symbols on keys that can be changed by software to match interaction in various applications and states. The OLED Manager tracks application focus changes in a windowing system and sets the layer shown to match

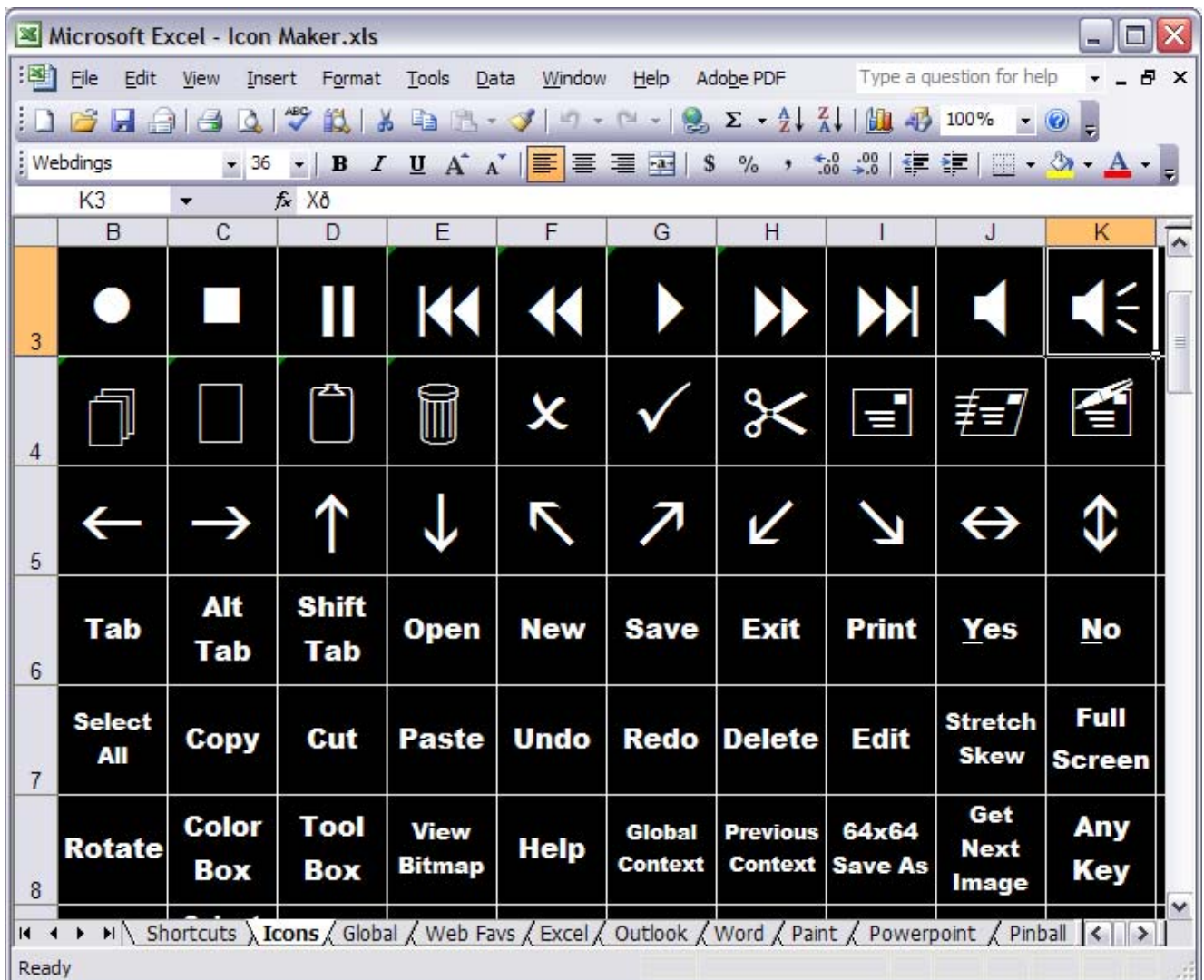
The following is an efficiency case study with a configuration to generate bitmaps using *Microsoft® Excel®* and *Paint*.

It is presumed the reader is already familiar with the United Keys OLED Management software.

Reference the United Keys OLED Display User Manual for instructions if needed.

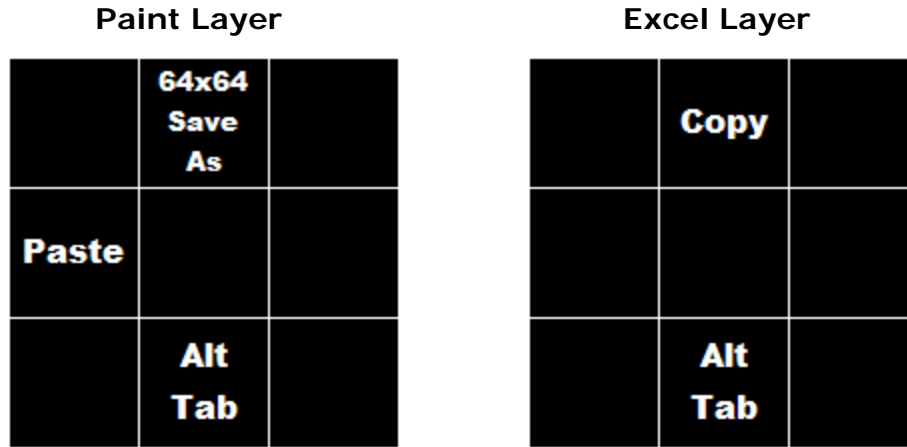
2.0 Assigned Task

The assigned task at hand is to convert the text shown in each of the 60 Excel 65x65 pixel cells below into perfect individual 64x64 bitmap image files using Paint. "Perfect" defined as individual bitmap files with black backgrounds and white foregrounds.



3.0 Set Up

The OLED Manager was setup with the following icons and keyboard shortcuts.



Where the keyboard macros are:

Display Icon	Keyboard Macro
64x64 Save As	Alt+E, 64, Tab, 64, enter, Alt, F, A
Paste	Ctrl+V
Alt Tab	Alt+Tab
Copy	Ctrl+C

- Notes:
1. "Alt+E" denotes the keystroke of pressing "Alt" then "E" keys down simultaneously then releasing.
 2. "Alt, F, A" denotes pressing and releasing each key serially.
 3. There is no "Save As" keyboard shortcut in Paint so one was created using the macro "Alt, F, A".
 4. The "Alt Tab" command is vertically assigned to the same key in the layer structure for increased efficiency.

4.0 Procedure

The general procedure is as follows:

1. Copy a cell in Excel
2. Paste in Paint
3. Move the image one pixel left and one pixel up to place properly in the top corner.
4. Change Image Attributes to 64x64 pixels to properly size the image.
5. Save as a bitmap.
6. Select next cell in Excel.
7. Repeat 1 through 6 for all images.

5.0 Simple Solution

The zero state for comparison is achieved by the following steps:

1. Click on Paint window to set focus. Set the View to 800%. Insure the window is large enough to see an entire image at 66 x 66 pixels.
2. Click on Excel window to set focus
3. Click on desired cell in Excel

Steps 1 and 2 sets proper focus shift from Excel to Paint and reverse using "Alt+Tab".

The table below shows the necessary steps to create one bitmap file using the keyboard and mouse compared to a keyboard, mouse and a 9 OLED Display key device.

Required Steps to Create One Bitmap using Excel and Paint

Step	Keyboard and Mouse Only	Step	Keyboard, Mouse and 9 Display Keys
1.	Press "Ctrl+C" or right click then click "Copy"	1.	Press "Copy" display key
2.	Press "Alt+Tab" or right click in Paint image area	2.	Press "Alt Tab" display key
3.	Press "Ctrl+V" or click "Paste"	3.	Press "Paste" display key
4.	Click and drag image 1 pixel left and up	4.	Click and drag image 1 pixel left and up
5.	Press "Ctrl+E" or click Image then click "Attributes"	5.	Press "64x64 Save As" display key
6.	Click off image to unselect	6.	Save file
7.	Click bottom right corner to drag	7.	Press "Alt Tab" display key
8.	Drag 2 pixels left and up	8.	Click on the next cell to copy
9.	Click "File"		Repeat 1 – 8 for all remaining images
10.	Click "Save As"		
11.	Save file		
12.	Press "Alt+Tab" or click on Excel window		
13.	Click on the next cell to copy		
	Repeat 1 – 13 for all remaining images		

6.0 Simple Results

In this simple example, only using the keyboard and mouse required a total of 13 steps to create one bitmap file. The number of steps was reduced to only 8 steps when using the display key device in conjunction with the keyboard and mouse. Completing the assigned task requires repeating the process above 59 more times. The display device will reduce the total number from 780 to 480 steps (a 38% step reduction).

7.0 Extreme Solution

The simple solution above is considered a normal use case scenario. Where most macros used are simple single purpose commands (e.g. Copy and Paste). These commands are not unique to the assigned task. The "64x64 Save As" is a unique nested macro created specifically for this task to eliminate multiple repetitive keystrokes or mouse clicks.

A more efficient solution for the assigned task is possible, one that would also not require an Excel layer. In this solution, a second nested macro is created to switch from Paint to Excel, increment right one cell, copy, return back to Paint and paste. The Paint layer could be setup as shown below.

Paint Layer

	64x64 Save As	Get Next Image

Where the keyboard macros are:

Display Icon

Keyboard Macro

64x64 Save As

Alt+E, 64, Tab, 64, enter, Alt, F, A

Get Next Image

Alt+Tab, right arrow, Ctrl+C, Alt+Tab, Ctrl+V

The zero state for is achieved by the following steps:

1. Click the Excel window and select the cell to the left of the first desired icon. Reformat into a single line of icons for greater efficiency.
2. Click the Paint window to set proper focus order for "Alt+Tab".

The procedure becomes:

1. Press "Get Next Image" display key
2. Click and drag image 1 pixel left and up
3. Press "64x64 Save As" display key
4. Save file
5. Repeat 1 – 4 for all remaining images

8.0 Extreme Results

This extreme solution reduced the task to four steps per image, a 70% reduction in steps over a standard keyboard and mouse. The task can now be completed in 240 steps, down from 780 initially.