Brand New Model F
F62 / F77 Keyboard

DRAFT
Via Software Guide

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Brand New Model F - F62/F77 Keyboard Via Software Guide

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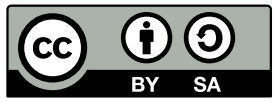

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  Inventor and Creator of the XWhatsit Controller & Software
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  ModelFKeyboards.com - Creator of the Brand New Model F
- ZCool31
  Illustrations
- Purdea Andrei
  QMK Firmware for Xwhatsit & Documentation

Others have contributed to this document, which are named and linked in the footnotes, if not mentioned here.

PREFACE

Important: *The Brand New Model F Keyboard Technical Reference is work in progress. Changes can and will be made. This Preface was written in large parts by Joe Strandberg.*

Intended for the following readers: This guide is aimed at helping owners of the Brand new Model F Keyboards to configure the functionality of the included firmware.

Introduction to Model F Keyboards: The Model F keyboard is a robust design. Every part is 100% user-replaceable / user-repairable, often needing just a couple of tools: screwdrivers, pliers, and at most a soldering iron. Compared to other consumer electronics products, Model F repair is easy and even a complete beginner can get up to speed quickly on how to use the keyboard software and keep their keyboard going for decades to come.

Statement from the Project: This manual was written for the Brand New Model F Keyboards specifically, but as those are replicas of the original IBM branded ones, the information here was also written with those in mind. Nevertheless, the Brand New Model F Keyboards are the primary focus and it is important to understand the philosophy around those:

- The Brand New Model F is a *community type project* where the goal is to have a product that you can use and learn to maintain yourself for decades, long after production has ended (with help from the community if need be).
- The most basic recommended maintenance involves just taking off the keys with a wire keycap puller to

clean them with mild soap and water every now and then.

- The current state of low-quality manufactured goods encourages a culture of just throwing something away or bringing it back to the store if anything is wrong with it. For something complicated like a motherboard or graphics card thats probably the best option, but the *New Model F Project Philosophy* is for the users to be able to fix small issues themselves due to the simplicity and full repairability of the Model F design. *This keeps costs down* so Model F Labs is able to offer these keyboards at less than half of what IBM charged for them (adjusted for inflation).

- There's a great community of Model F keyboard fans, most prominently on sites like *Deskthority* and *Geekhack*. You will never be out of reach of someone who can offer you advice and help in the coming years.

- IBM's 1980s price guides mentioned they would require charging banking customers a minimum of about US$ 100 per year (not adjusted for inflation) for each original Model F keyboard in maintenance costs as part of a service contract. However, if Model F Labs had to hire staff to deal with *free* returns, more personalized technical support / phone support, and doing even the most minor repairs (re-seating keys, replacing springs and barrels, changing the USB cable, etc.), each keyboard would cost a lot more because of overhead costs, and these keyboards are already not inexpensive to begin with *(and it would have dramatically slowed down the project)*.

- This direct to consumer, community type project is the best way to bring the Model F to as many people as possible and at the lowest possible cost.

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GETTING STARTED

In case you ordered and received a Brand New Model F Keyboard, you are ready to start. In case you have an original IBM Model F and it isn't pre-modified for you with a xwhatsit compatible controller or a converter like Soarer's, you need to look at the section "Hardware Details" first and learn about the modifications required.
In case you haven't ordered a Brand New Model F Keyboard[1], but plan to, this will also help you to tailor your keyboard to your particular needs. You can choose a variety of options which you can learn about in this Technical Reference.
Hardware alone does not form a completely functioning Model F Keyboard. Three elements must be working together:

- **Hardware (The Keyboard & Device or Computer).**
- **Software (The Keyboard Firmware).**
- **You.**

The following pages will help you to determine which sections in this *Technical Reference* to use.

1.1 Safety Precautions

Always consult the booklet included with your new Model F keyboard for safety precautions and other important information. Severe harm or even death can occur with any

[1] During the writing of this document, modelfkeyboards.com still takes orders

product if safety precautions are not followed. Unlike many other modern keyboards, the Brand New Model F can weigh more than 8 lbs (>3.5 kg) - this matter alone requires a first study of the booklet that comes with it. Furthermore, as the keycaps and other small parts are replaceable and are a choking hazard. Keep the keyboard and keyboard parts away from children. For the complete information, please consult the booklet.
Shall you be the proud owner of an original IBM Model F, the same safety precautions apply.

1.2 Firmware

The firmware on the latest Brand New Model F keyboards is based on QMK with the extension module Via which supports direct modifications of the configuration without a firmware replacement.
The configuration files and supporting documentation for the controller of the reproduction keyboards can be found at the following link:

`https://www.modelfkeyboards.com/code/`

1.3 Before Connecting the Keyboard

IMPORTANT: Before you connect the keyboard via USB cord to your system, review your Brand New Model F keyboard and the package contents. Check your packaging list included with the order. Also, *do not connect the keyboard* until you have checked that all keys are installed. Finally, either *connect the keyboard directly to a free USB port on the computer / device* or a *powered* USB hub. In case of problems with the keyboard, this is the first item to check and the most common mistake.

1.4 Attaching the Keyboard

The Brand New Model F Keyboards all come with detachable USB cables. The F62 and F77 reproduction case keyboards have their cables preinstalled, while F62 and F77 Ultra Compact case keyboards include a cable that is detachable without opening the case.

The standard cables come with a USB Type-A plug as shown in the figure[2] below:

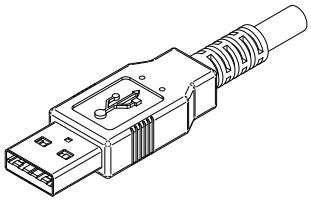

Figure A1: USB Type-A

Computers or Devices that only have a USB-C, Mini-USB, or Micro-USB connector, will require an adapter for connectivity.
As mentioned in 1.3 “Before Connecting the Keyboard” it is very important to either ***connect the keyboard directly to a free USB port*** *on the computer / device* or a ***powered*** USB hub. Connecting the USB plug to an un-powered hub can cause ghosting, missed key-presses, double key-presses and all sorts of other issues that manifest later during use or right after connecting it.

1.5 Re-configuring the Key Layout

The Brand New Model F keyboards arrive with a basic layout being pre-configured. If you need to re-configure the layout due to personal preference, or using a different operating system, it is important to know that every newly shipped keyboards arrives with QMK and an enabled Via extension. In the following Section a description will follow on how to download and use the software to make these adjustments.

[2] Original from Wikipedia: https://upload.wikimedia.org/wikipedia/commons/2/2e/USB_Type-A_plug_B%26W.svg

Section 1

SECTION - 2

KEYBOARD ADJUSTMENTS USING VIA

2.1 Downloading the required Application

Via is a project that allows the reconfiguration of the keyboard firmware without the need to re-flash it. The changes made are happening “on-the-fly”, or in other words, the changes get applied immediately when they are made.

Figure A1: Via Download Portal

The homepage of the project can be found here https://caniusevia.com which contains some additional information.

Go to this link for the download of the application itself: https://github.com/the-via/releases/releases/latest. It will link to the github location with the latest releases. There are three variants available for Windows, macOS, and Linux. Choose the version for your system accordingly. Below example shows the version for macOS or Windows:

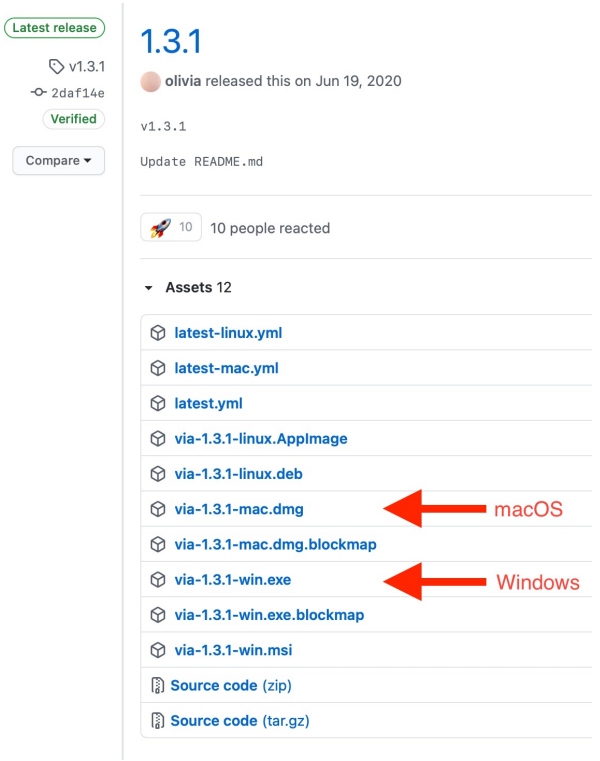

Figure A2: Via Download Version

Once the application for the respective system is downloaded, you will need the layout configuration for your keyboard. The layout file is available from the location below. The zip file contains two layouts; please extract the two files to a folder of your choice. One is for the F77 and the other for the F62 keyboard and is labeled as such.
https://www.bucklingspring.com/via-layout/

2.2 Application Setup

For the explanation of the application, a F77 keyboard with right split shift in HHKB style will be used:

Figure A3: Model F77

Startup the VIA application and click on the SETTINGS area in the top-right. Please activate the “Show Design tab” with the toggle switch like shown below:

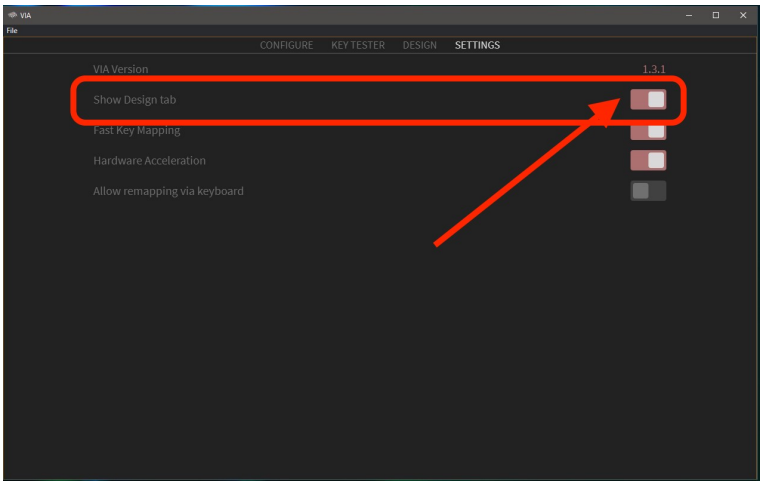

Figure A4: Show Design Tab

Click on the Design tab and drag the previously downloaded layout file (in this case for a F77) into the Via window:

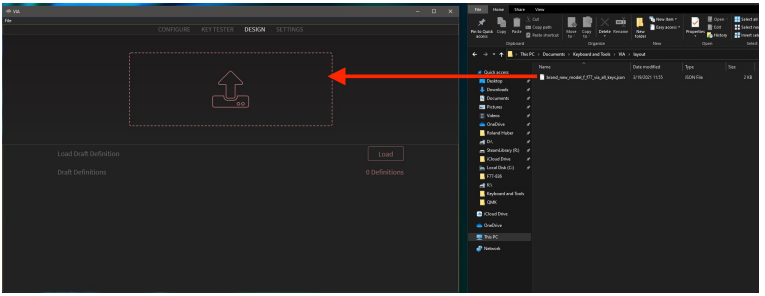

Figure A5: Upload Layout File

When this is complete, click on the Configure Tab and review the layout:

Figure A6: Initial Configuration View

This layout doesn't correspond with the keyboard fully. The Right Shift key is different to the physical keyboard.

Click on the Layouts menu for all possible design choices:

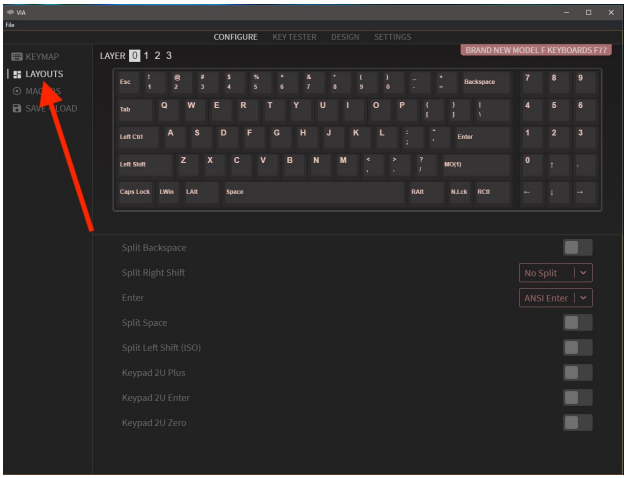

Figure A7: Layout Options

There are multiple layouts to choose from. The keyboard design in this explanation has a split right shift. In the dropdown menu for this option, select the HHKB Split. The change will instantly appear in the graphical representation.

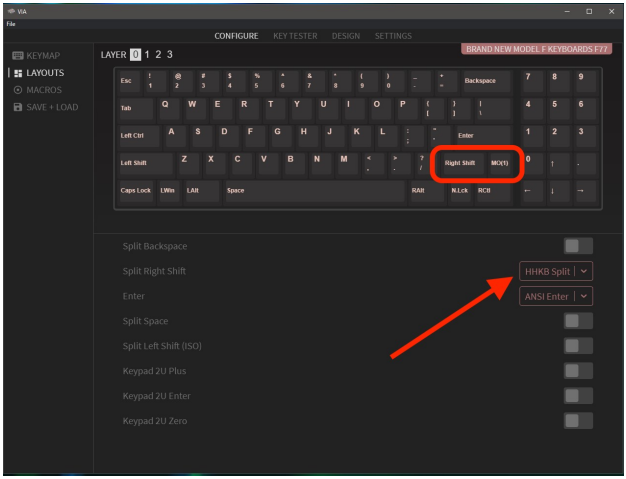

Figure A8: Layout HHKB Split Shift

2.3 Application Usage - Key Mapping

To remap keys click on the Keymap section to the right of the screen as shown below:

Figure A9: Configure Keymmap

When we compare it with the actual keys on the keyboard, there are several keys on the numpad area, that are incorrectly assigned:

Figure A10: Model F77

First, click on the key you want to change; in this case it is the key 7 in the numpad area:

Figure A11: Configure Numpad

While it has to be the Insert key, just click on the respective key in the BASIC are below and the key gets assigned. Furthermore, the selection jumps in the keyboard area to the next key, which is 8 on the numpad area.

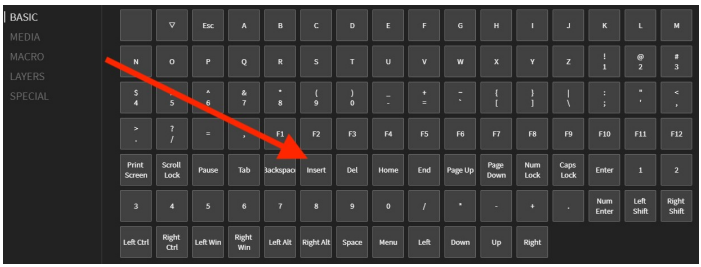

Figure A12: Configure Insert

Follow this procedure until the first two rows in the numpad area are corrected. In the following step, assign the Media keys accordingly. For this purpose, click on the MEDIA area on the left and assign the respective key mappings:

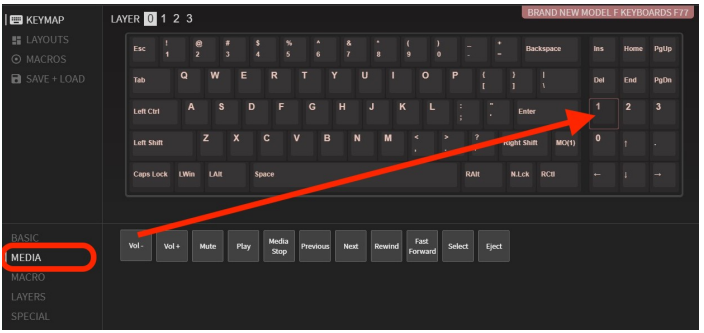

Figure A13: Configure Media

The corrected keyboard in its base layer would look like in the screenshot below:

Figure A14: Configured Layer 0

2.4 Application Usage - Keyboard Layers

One of the greatest function of the Brand New Model F keyboard is the ability to use multiple layers. Layers can be used to provide more virtual keys than are physical available. A very good example are the function keys F1 .. F12. To reach those keys, the first task needs to be to define a key that allows the switching between the layers. In this particular example this is already done with the key further right to the right shift - The MO(1) or Fn key. This key can be configured in the Layers section of the VIA application at the bottom area for the keys.

Figure A15: Momentary Layer Switch

While this key is set, let's select the Layer 1, which is above the Base Layer (here Layer 0):

Figure A16: Layer 1

In the above screenshot you can see several configurations already. The top row contains instead of 1, 2, 3, ... the functions keys. With that configuration it is simple to reach these keys by holding down the Fn or MO(1) key and pressing the respective key assigned in this layer. In short: Fn+3 will send a F3 key press to the computer.

The layers can be configured to the liking of the owner of the keyboard. Furthermore, there are multiple layers possible. In the following example, the space - key is acting as momentary switch for the Layer 2, but only when we already hold down the Layer 1 key. Hence, we set the Space to MO(2) in Layer 1:

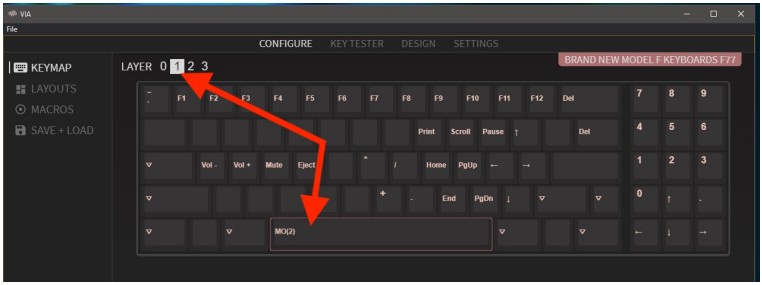

Figure A17: Layer 2 Key - Space as MO(2)

Before we configure the next layer, I want to show the macro option in VIA.

2.5 Application Usage - Keyboard Macros

Macros are text blocks or key presses that can be loaded into the keyboard and retrieved by pressing specially defined keys. When we click on the Macro area in Via as shown in the figure below, there is a list of Macro storage spaces to the left and the stored value to the left. In this case the selection was Macro 0 and the text entered in the field is “This is my initial Macro ...”. To store it we have to click on the Save button as final step:

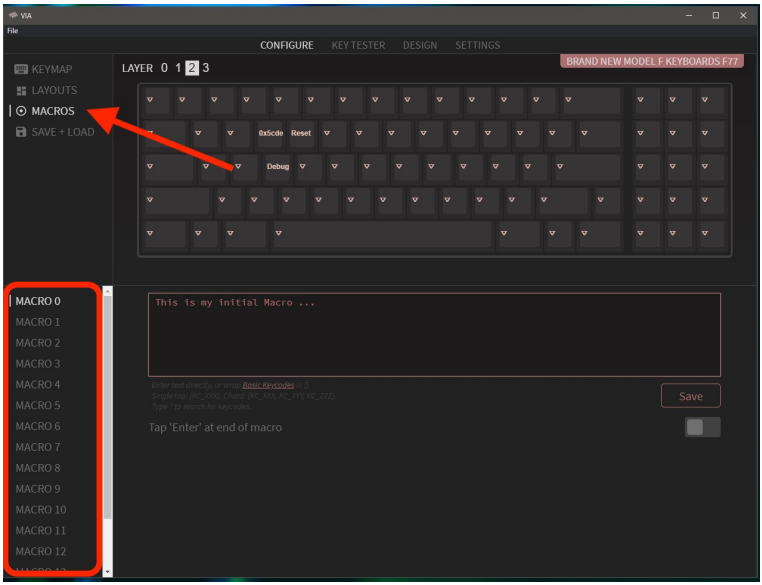

Figure A18: Macro Area

To assign the Macro to a specific key, we have to go back to the KEYMAP and, in this case, Layer 2:

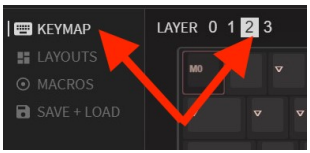

Figure A19: Keymap

While being in the KEYMAP and Layer 2, we have to click on MACRO in the bottom selection as shown here:

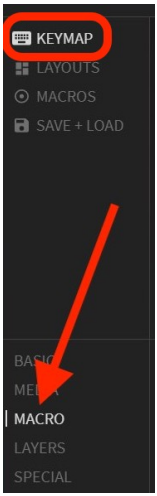

Figure A20: Selecting Macro Key Shortcut

In the next step, we select any key on layer 2 that is not yet taken - in this case the location of the Esc key and then we click on the M0. This will assign Macro 0 to the Esc key in Layer 2.

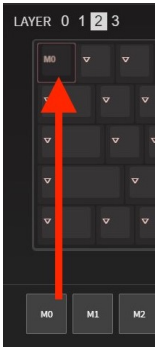

Figure A21: Assigning Macro to Key

This configuration will have the following effect. When Fn + Space + Esc is pressed:

Figure A22: Fn + Space + Esc = Macro 0

Macro 0 will be initiated (in this case it was pressed twice):

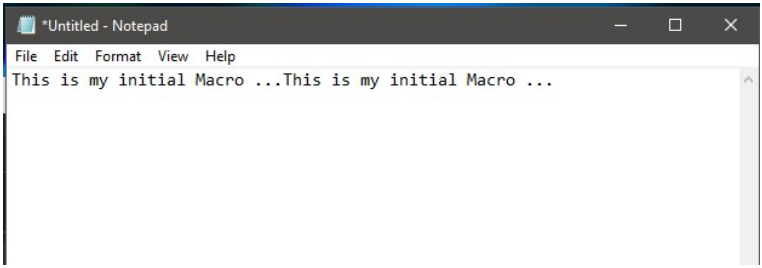

Figure A23: Pressing Macro Shortcut in Notepad