Sangeo 60 Build Log

Parts used :

- Sangeo 60 kit. (aluminum case[gray], aluminum switch plate, and mid-plate foam)
- KeebsRGB 60% PCB (Tofu compatible PCB, ANSI layout, hot swappable, supports under key RGB)
- TecSee Sapphire tactile switches. (x60)
- Gateron Black Ink v2 (x1)
- OA Wuque stabilizers. (4x 2u, 1x 6.25u)
- KBDFans gasket pads (included with the Sangeo 60 kit)

Included parts that were not used :

- KBDFans DZ60 PCB. (PCB solder only and has downward firing LEDs only. This made no sense due to the all aluminum enclosure.)
- A very short USB C cable. Cable appears to be pretty nice, but is about 3ft. Long and is not long enough to work with any of my desktop configurations.

Misc. Items :

- Stickers (x3) The shark stickers are pretty adorable.
- Carry case. The case is very large and has a lot of room in it to store spare parts, tools, etc.

General Impressions :

The Sangeo 60 was an in stock purchase from Monstargear. It is an attractive board that uses an aluminum plate to gasket mount the Tofu 60 class PCB using poron strips. However, there is not a lot of flex because the plate is firmly held in place by the case and the gasket pads seem very compressed. The other important note is that the USB C connection is pretty recessed and does not have a lot of room to move. This makes the immobilized gasket mount a good thing overall since there is less risk of damage to the PCB or USB C connector. The board is a little overpriced for what you get, and the included PCB is disappointing. There are some minor internal cosmetic flaws that are not visible until the case is opened. On mine it was some scuffs on the brass weight. A larger weight, improved PCB, or a better Gasket mount implementation would have made this a better value than what it currently is.

Electronics and instructions :

There aren’t any instructions to speak of and you get to figure out the assembly by yourself. The good news is that it is pretty typical in terms of what needs to be done. The PCB and plate need to be put together as a single assembly and then using the poron gasket strips, place the strips on either the keyboard case or the plate. Sandwich the plate between the top and bottom halves of the assembly and screw it all together.

Make sure that the USB C connection has good clearance and that the pcb and plate assembly is correctly seated when you sandwich the case together is the only major pitfall.

Switches :

The TecSee Sapphire tactile switches were lubed with Krytox 205g0 on the bottom housing rails and the back of the stem. Krytox 105 was used on the springs using the container lubing method.

The Tecsee switches seem to have some inconsistency between switches. This resulted in screening the switches in an attempt to use the best of the bunch. The switches fell into three general categories of quality:

– Smooth sound and good tactile experience. The most desired of the group. Alphabet keys were given priority for these switches.
– A little bit of a scratchy sound and good tactile experience. An attempt was made to select the best sounding switches in the batch.
– A noticeable sound such as a click plus scratchy sounds. These were not accepted.

The single Gateron Black Ink V2 was used for the space bar. This switch was lubed with Krytox 205g0 on the front and back of the stem and the bottom housing rails. Krytox 105 was used on the springs using the container lubing method. A switch film was also placed between the top and bottom housing of the switch.

Stabilizers :

The OA Wuque Stabilizer stems and housings were lubed with Krytox 205g0 and the wires were coated and packed with Permatex dielectric grease. If this becomes an issue in the future, some Krytox HXT-BDZ grease may be used to touch up any problems with ticking or unwanted noise.

Analysis :

The aluminum enclosure overall looked and felt fine. The gray anodization also looked fine overall. The coated brass shark symbol looks very nice from the outside. The inside of the weight badge did have scuffs and abrasions that took away from the premium feel of the board.

The PCB that is included is a solder only KBDFans DZ60. This board supports the common Tofu class mounting points and does support multiple 60% layout options which is pretty nice. However, the ten downward firing RGB LEDs do not mesh with the design of this board. The Sangeo is an all aluminum enclosure and there is not a polycarbonate bottom case option available at this time. The result is illumination that goes nowhere. There are solder pads on the DZ60 for single color per switch leaded LEDs. So there is at least a way to get lighting where it will be seen. The DZ60 PCB also adheres to the Tofu tray mount layout. This is actually a nice boon because it allows for the board to be replaced with a similar but different Tofu compatible PCB. This is why the KeebsRGB board acquired from Cannon Keys was selected.

The KeebsRGB board had several desirable features that the DZ60 also had such as VIA support once the JSON file was loaded into VIA. Unfortunately, this file has to be reloaded every time you start VIA for the KeebsRGB board to be recognized. The board supports full per-key RGB that was logical and pointed in a direction that was visible: up. The board also uses the Kailh hot swappable sockets. which makes unexpected switch changes and post build tweaks much more manageable. As a bonus feature, the KeebsRGB breaks out a lot of the extra I/O pins giving you options for future modifications if you are inclined.

The DZ60 and KeebsRGB boards were tested using the VIA keytester feature and both passed a functional test. A functional test is defined as the ability to have the board recognized by Windows and the ability to activate each button on the PCB and have it acknowledged by the VIA key tester or an equivalent application.

The plate is anodized aluminum and is a light blue. The plate also includes ten tabs for placement of gasket material that will be used in the mounting process. I opted to place the gasket material on the plate, but you can also place these gaskets inside the case cavities as well. What seems to be an issue is that if gaskets are placed on both sides of the plate, the fit is very tight. If one side of the plate does not have a gasket, then there is the possibility of the plate banging into parts of the aluminum case. I'm not sure if there just needs to be a deeper cavity for the gaskets to move in or if the trade of removing the gaskets on the left and right sides would be acceptable and give the plate a bit more flex.

The included gaskets were from KBDFans and included enough extras to fully outfit a second plate. The Gaskets themselves came in two lengths and used a 3M adhesive for attaching to the desired surface (plate or aluminum case depending on your choice)

The included mid-plate foam placed between the plate and PCB was a little less dense than I would like, but it is an adequate addition to help reduce unwanted noises such as the previously mentioned scratch sounds. It will never completely eliminate it, but seems like a good step to help improve the sound profile. No foam has been placed in the bottom of the case at this time. However that is a viable future option if it is needed.

Final Assembly :

After the KeebsRGB board was confirmed to be functional, the stabilizers were prepared. The stabilizers were then installed in the PCB and screwed into place with the included insulating washers until they were hand tight.

Next the mid-plate foam was put on top of the PCB and the orientation was confirmed before continuing. The foam was rather floppy and some care had to be taken to make sure that the foam did not drift out of place or partially block the installation of switches.

The aluminum plate was stacked on top and a few switches were added to confirm that the board and plate were going to match up as expected. Part of this installation procedure involved having the PCB plugged in and powered on while switches were installed. The socket of the switch to be installed was braced from the back. With the key tester software running the switch would be gently pressed into the socket with the switch depressed. If the key tester registered a press, it was interpreted that the switch pins were straight and the switch could be snapped into place. Switches that used stabilizers were installed first and then a semi-random pattern was used to cover about a third of the board and the rest of the switches were installed sequentially. The space bar had a Gateron V2 black ink installed instead of a Tecsee Sapphire switch.

There was some trouble getting the switches to seat correctly in the plate during most of the installation. A bit of force was needed on the northern part of the switch to get them seated flush with the plate. There was the occasional need early on to reseat the switch or gently pull up on the plate so that the installation of a switch was flush.

Once all switches were installed, the PCB was checked again for basic functionality. This test was the same procedure as described above except the switches now completed the circuit instead of a pair of tweezers. Once this passed, the PCB / plate / switch assembly had power removed for the following steps.
The KBDFans poron strips were applied to the areas of the plate where the case would hold the assembly in place. Care was taken to make sure these strips aligned with the cutouts that were in the case. The other concern is the cutout for the USB C interface. It does not have a lot of room to move and is pretty recessed.

The eight bottom screws were slowly tightened in a zig zag pattern to reduce risk of tension damaging one of the screws during assembly.

My keycap selection was the PolyCaps ‘Whale’ set sold by Kinetic Labs. These caps are doubleshot PBT in cherry profile and had a decent kit to support the layout. It also went with the theme of blue and gray sea life which was part of the intent of this build. Figure 1 and 2 show the completed build.

Firmware Configuration:

The supplied DZ60 board is supported by VIA right out of the box and if I had opted to use that PCB there would be no extra steps needed. However, the KeebsRGB PCB requires that you manually load the JSON configuration file into VIA for it to be recognized. You can download this file from Cannon Keys and the procedure to have the PCB be recognized is documented on the Cannon Keys site. However, you have to load this file every time you start up VIA and want to make changes to the KeebsRGB board. The result is a few extra steps to the configuration process. Other than that there are no obvious issues associated with either PCB.

Conclusion:

A very attractive 60% keyboard that is hurt only by the pricetag and the use of some generic components. The lack of a daughterboard module limits some options in terms of allowing the plate to move and flex during typing. This is why a stiff mount is not necessarily bad in this case. The good news is that there is room for substitutions because of these generic parts. There is a good amount of quality to the build and design, but the little things add up to make this board less than the apex predator that it was marketed to be.

Figure 1 : Glamour shot of Sangeo 60 described above.


Figure 2 : Glamour shot of the Sangeo 60 bottom.