

range in both directions to maintain symmetry (between the 44th and the 45th note on a standard piano). If you put all the extra notes in the bass, an imbalance is created, as could be said to be the case with the Bösendorfer. Above all, a keyboard of 108 keys expands the musical possibilities for improvisers and composers by extending the field of vision - the black blinkers of the key blocks and side arms. Among the fears that have been expressed, are that the arms are too short for such a large range. A 1.60 m tall person can easily play the first and the last note of a 115 key range at the same time although it is unlikely that a composer could be impractical enough to write at both ends of an extended range piano.

**Cost**

There are many music instruments whose price is notably proportional to their range. This is the case, for instance, of percussion instruments (glockenspiel, marimba, celesta), harps, or accordions, whose price is determined, among other things, by their tonal range, their registers, the number of ranks or the number of bass notes. Some wind instruments have an extra key, piston valve or barrel in accordance with their price, in order to extend their range in the bass register. It was also the case for some piano manufactures in the 19th and 20th centuries. On the Érard catalogue of 1932, we can see a Model 4 upright piano (1.27 m) with 7 octaves, a Model 0 baby grand (1.80 m) with 7¼ octaves, and a concert model No. 3 (2.60 m) with 7½ octaves; same for Ibach. A few years earlier, Pleyel used to follow the same principle with pianinos. Until recently, some brands still offered 85 notes on small pianos. Bösendorfer offers three types of keyboards: 88, 92 and 97 according to the model and the price.

Perhaps more manufacturers could follow this model? For the same brand, the bigger the instrument would be, and the more notes it would have. Is it normal to have to same tonal range on a baby grand as on a concert model? Should the price not take into account the extension of the range, as it is the case in many other musical instruments? Pianos' keyboards could then extend towards 108 keys as their size and price increase.

**A composer's opinion — an interview with Artur Cimirro**

*In order to complete this article, I thought it would be illuminating to seek for the point of view of a performer / composer. Artur Cimirro is a Brazilian composer, art critic and pianist. He was the first composer in the world who ever composed works for 108-note pianos.*

**Q: For which purpose do you use additional notes?**

*"First of all, I use them because I precisely don't consider them as additional. When they sit before the 102 keys of a Stuart & Sons, the first thing that pianists do is to press the first and the last key of the keyboard. It seems as if they tried to solve a problem that they don't understand. Why? Because they are not composers. The debate on these "additional" notes only concerns composers (and technicians of course), not pianists.*

**Q: Were you inspired by the 102 keys of Stuart & Sons or did you use to compose your pieces before knowing those pianos?**

*"My first compositions were written in 1998, and they only require 88 notes. In 2002, I made a transcription of the famous Flight of the Bumblebee by Korsakov. Because of different techniques I used for that piece (octaviated notes, for in-*



*stance), it was logical to reach the last E\*. Later, I changed all the octaves into thirds to make that transcription playable on a standard 88-key piano. Finally, I put the top E again in the latest edition.*

*Then, in 2006, I started my Sonata Opus 3 that requires the contra C and the top E-flat of the keyboard\*\*, and it is only in 2011 that I heard about the Stuart & Sons pianos for the first time. Three months after the director's invitation, I went to the manufacturer to visit it. Just before my leaving, I had composed two pieces requiring 102 keys. In 2012, I visited the factory a second time and it was at this moment that I heard about the new type of string (XM) which allowed to build pianos that wouldn't have 102 keys, but 108. I immediately made changes in my scores and after a few days' work, the first piece for 108-key piano: Eccentric Prelude No. 1, Opus 20. Since that day, some of my other compositions use the whole ambitus (range) and I plan on writing more."*



**Q: Are you convinced of their interest and necessity?**

*"Absolutely, I hate the sensation of composing for a "half-instrument", and this is what I feel when I think of 88 notes only. With 108 notes, you have the piano in its practical standards, so this is the standard of the future. Of course, I can compose a piece requiring only 88 keys, I have already done so in some of my compositions, but I prefer to compose a new piece without a minimum nor a maximum of notes in mind.*

*At the same time, I do not believe that we need more than 108 notes for composing since this is the practical limit of the piano. Thus, I think that everything is in its right place. Cristofori's first forte-piano only had 49 keys (four octaves), and the ambitus (range) gradually increased because it was still very far from its limits. In 1844, when Boisselot & Fils made the first sostenuto pedal, the idea was not welcome, and it was only thirty years later that it was used in Steinway pianos. Today, some people still find it difficult to understand how to use it correctly.*

*When Beethoven was unhappy with the limits of the pianos of his time, he still wrote his scores with the notes that were missing, and new pianos were built in accordance with this. Today, it is the same but with different pianos and composers.*

*Other composers such as Liszt, Herz, Pixis, Brahms, Busoni, Ravel, Scriabin... struggled to explore the limits of the piano, and today we have the opportunity to discover the true limits of this instrument in its most complete ambitus. This is a wonderful thing! All those who disagree do not know it yet, but they are doomed to fail, and soon they will be six feet under."*

## Conclusion

The reader may well ask why try to fix something that is not broken? It can be argued that it is necessary more than ever, to give this instrument fresh consideration. Since it was created, the piano has always evolved together with its range and I am still convinced that its evolution can continue only if its range extends too. Maybe one day, pianists will admit that 88-note pianos were restrained and limited instruments.

This article does not attempt to establish a new standard – after all, how could the piano have 108 notes tomorrow when the vast majority of piano makers have not even gone through the stages of 102, 97, 92 or even 90? Its aim is to inform pianists, technicians, composers and all persons in relation with the piano that it is possible to extend its tonal range and that it may be time to do so. The author believes that a new 97-note standard (contra F to top F) as understood by Pape, is wholly conceivable in the future. For an idea to spread, it has to become a generally accepted standard. The advantages of a 97 note standard is that it can be applied on nearly any model of piano, from the verticals

(starting from 1.20 m) to concert grands, without adding much complication to design and manufacturing.

All conditions now exist to build pianos with a larger tonal range. Some of the technical means to achieve that goal are very recent but now well within our reach. We have the opportunity to blow the dust off the situation in which this instrument has been stuck for far too long. Just like you, I am a technician and my primary motivation is for the advancement of our profession and industry. I have struggled to write this article in the most sincere way, with the sole purpose to serve my profession and music.

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