

para-la-raqueta-id_8247319.html) is an external sensor that is placed on the racket's throat, just at the end of the grip, to which it is attached by two Velcro tapes. There is also a watch which is connected to the sensor by means of waves with which it shares information immediately when the distance between them is less than 20 m. Its main disadvantages with respect to its competitors are: a) the attachment of the sensor to the racket is unstable, reducing reliability of the data, b) because it has a considerable size, and it is placed on the throat of the racket, it modifies the racket's balance and impacts on technical execution of the stroke (see figure 1).



Figure 1. Artengo Personal Coach.

Babolat Play System

Babolat Play System (<http://es.babolatplay.com>) is made up of several sensors that have been built-in the racket handle without altering its initial weight. This is its main advantage; however at the same time it may be used only on a single racket, an important aspect for those competition players who break strings all the time. In the butt cap there are two buttons and a USB port. The buttons are used for turning the device on and off, and for the Bluetooth connection; the USB port, is used to charge the battery and transfer the information recorded. It offers Bluetooth technology and an application for tablets and smart phones with which you can see the data instantly. Play technology is available in Babolat Pure Drive, Pure Drive Lite and Pure Aero (see figure 2).



Figure 2. Babolat Play.

Babolat Pop

Babolat Pop (<http://es.babolatplay.com/pop>), from same brand as the above, is a sensor that is placed on a specially designed wrist-band, which the player must wear on his dominant hand. Just like Babolat Play, it transfers the information through a USB port or via Bluetooth, and there is an app for tablets and smart phones. Its main advantage is that because it is outside the racket structure, it does not alter its weight or balance, and it can be used with all racket models and brands. At the same time, this might pose as a disadvantage, since it may reduce the reliability of its measurements, and it may not be comfortable for the player (Figure 3).



Figure 3. Babolat Pop.

Sony Smart Tennis Sensor

It is a small device that is placed on the butt of the racket and consists of something that is inserted (Figure 4). This device has an internal sensor, and just like the others above: it has Bluetooth technology; a USB port, to charge and to transfer the information; and, a specific application, as well. These characteristics are an asset when compared to Babolat Play system, as it can be attached to the structure of the racket, and therefore can be used with a variety of brands; however, not too often, since it increases the weight. This can slightly alter the sensations of the tennis player, and therefore affect their performance, although not so much as the Artengo Personal Coach, because of the position of the sensor. (<https://www.sony.es/electronics/dispositivos-inteligentes/ssetn1w>)



Figure 4. Sony Smart Tennis Sensor.

Zepp Tennis

Zepp Tennis and Zepp Tennis 2 (<http://www.zepp.com/en-us/tennis/>), are two devices of a different brand, which have the same specifications as those detailed for the Sony Smart Tennis Sensor. That is, they are external devices, have a USB port and Bluetooth functionality, and can be used in different racket models. Therefore, they have the same advantages and disadvantages mentioned before (Figure 5).



Figure 5. Zepp Tennis & Zepp Tennis 2.

CHARACTERISTICS OF THE DEVICES

Table 1 below illustrates, in a simple way, the technical and working characteristics of the different devices selected.

	Artergo Personal Coach	Babolat Pop	Babolat Play	Sony Smart Tennis Sensor	Zepp Tennis	Zepp Tennis 2
It can only be used on a single racket	-	-	✓	-	-	-
It can only be used on Wilson, Prince, Yonex and Head rackets	-	-	-	✓	-	-
This tool can be used in all kinds of brands	✓	✓	✗	✗	✓	✓
This tool discriminates data depending on the specific type of racket	✗	✗	✓	✓	✓	✓
The tool discriminates between right and left handed players	?	✓	✓	✓	✓	✓
The tool does not alter the racket weight	✗	✗	✓	✗	✗	✗
It can be used with junior rackets	✗	✗	✗	✗	✗	✗
The tool has Bluetooth technology	✗	✓	✓	✓	✓	✓
Duration of the battery without Bluetooth technology	6 hours	?	6 hours	3 hours	4 hours	8 hours
Duration of the battery using Bluetooth technology	✗	?	?	1.5 hours	?	?
Capacity of the memory in hours or strokes	10 hours	10 hours	150 hours	12,000 strokes	3,500 strokes	?
Charging time	3 hours	?	?	2 hours	2-5 hours	1.5 hours
Possibility to view data immediately	✓	✓	✓	✓	✓	✓
Weight	20 gr	10 gr	0 gr	8 gr	7.7 gr	6.25 gr
Size	?	-	-	31,3 x 17,6 mm	28 x 11 mm	25,4 x 12,3 mm
Compatible with iOS and Android	✗	✓	✓	✓	✓	✓
Price (approximately, November 2017)	?	€80	€350	€200	-	€100

Table 1. Tool, application use and function related aspects of intelligent devices. NB. ? indicates that the information does not include technical and performance characteristics.

CONCLUSION

After the final revision of scientific literature, and product websites, the conclusion is that the use of the technology is very positive, it gives a great deal of information in real time that will provide more quality, efficiency and motivation to the training programme. These tools must always be used as a complement to provide added value to the coaches' task, but they will never become a suitable substitute. Thus, coaches must be updated as to developments in, and invest in the new technologies, if they want to improve their performance, and that of their athletes.

REFERENCES

- Barnett, T., Meyer, D. & Pollar, G. (2005). Combining player statistics to predict outcomes of tennis matches. *IMA Journal of Management Mathematics*. 16(2). 113-120. <https://doi.org/10.1093/imaman/dpi001>
- Barnett, T. & Clarke, S.R. (2008). Applying match statistics to increase serving performance. *Medicine and Science in Tennis*. 13(2). 24-27.
- Gillet, E., Leroy, D., Thouvarecq, R. & Stein, J.F. (2009). A notational analysis of elite tennis serve and serve-return strategies on slow surface. *Journal of Strength and Conditioning Research*, 22(2), 532-539. <https://doi.org/10.1519/JSC.0b013e31818efe29>
- Martín, C., Pestre, B. & Peter, J.M. (2014). Tecnologías de ayuda al análisis técnico, Homenaje a Gil de Kermadec. *ITF Coaching & Sport Science Review*. 62, 17-19.
- Quinlan, G. (2013). El uso de las aplicaciones para mejorar el entrenamiento: La aplicación técnica de Tenis Australia. *ITF Coaching & Sport Science Review*. 59, 22-24
- Over, S. & O'Donoghue, P. (2008). Cuál es el punto. *Análisis y porqués del tenis*. *ITF Coaching & Sport Science Review*. 45, 19-21.
- Over, S. & O'Donoghue, P. (2010). Análisis de la estrategia y la táctica en el tenis. *ITF Coaching & Sport Science Review*. 50, 15-16
- Pestre, B. (2009). La politique de la FFT en matière de formation des jeunes. In *Le Tennis dans la société de demain*, L. Crognier & E. Bayle (Eds.), Montpellier: AFRAPS, p. 187-190.
- Pollard, G.N., Pollard, G.H. Barnett, T. & Zeleznikow, J. (2010). Applying strategies to the tennis challenge system. *Medicine and Science in Tennis*. 15(1). 12-15.
- Reid, M., McMurtrie, D., Crespo, M. (2010). The relationship between match statistics and top 100 ranking in professional men's tennis. *International Journal of Performance in Analysis in Sport*. 10(2). 131-138. <https://doi.org/10.1080/24748668.2010.11868509>

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