

# Player Analysis Technology Approval report

## BigBow Basic Sensor

**Test code:** PAT-14-010

**Software versions:**

BigBowAnalyzer 1.0.0.0  
Imugres 2.0.1

**Firmware version:** 3.0.1

**Issue date:** 4 January 2016



**Objective:** To test and evaluate the BigBow Basic Sensor Player Analysis Technology according to Rule 31 of the 2014 Rules of Tennis.

**Result:** Approved

### SUMMARY

The BigBow Basic Sensor 'pod' (mass 3-9 g) containing electronic sensors is typically attached to the butt of the racket, but can also be attached to other equipment or directly to the player's body, to record the orientation, acceleration and vibration of the object of interest.

Data collected by the pod are transferred to an auxiliary device, e.g. laptop, by removal of the micro SD card from the pod and insertion into a card reader connected to the auxiliary device.

Coaching information including time histories of the racket's acceleration and rotation is available on the auxiliary device.

Restrictions on the access by a player to the BigBow Basic Sensor components during periods when coaching is and is not allowed are as follows:

COMPONENT	NO COACHING	COACHING
Pod	Permitted	Permitted
Auxiliary device (e.g. laptop)	Not permitted	Permitted

## MAIN COMPONENTS

The main components of the system are described in table 1 and depicted in figure 1.

COMPONENT	FUNCTION(S)
Pod with removable micro SD card	Record motion and vibration of the racket, store and transmit data
Imugres software	Transfer data from the micro SD card to the auxiliary device
BigBow Analyzer software	Process and view data
Auxiliary device (e.g. laptop)	Communicate, store and transmit data

Table 1. Description of the components of the BigBow Basic Sensor system.



Figure 1. Components of the BigBow Basic Sensor system (from left to right): Basic pod; Basic 'Long-life' pod (with battery holder); auxiliary device (laptop).

## DATA CAPTURE AND PROCESSING

A 'pod' containing electronic sensors (a triaxial gyroscope and triaxial accelerometer) is attached to the object of interest (e.g. a racket). Typically, the pod is either taped or fitted to the butt of a racket (see figure 2), but can also be attached to other equipment, e.g. a shoe, or the player's body. The sensors in the pod measure the orientation, acceleration and vibration of the object of interest. The mass of the Basic pod (with battery) is 3 g; the mass of the Basic 'Long-life' pod (with battery) is 9 g.



Figure 2. Basic pod, with protective cap, fitted to the butt of the racket.

Data capture is started by connecting the pod to its power supply (see figure 3) and moving the pod (to activate the sensors). Data capture is stopped by disconnecting the power supply or after several minutes of inactivity.

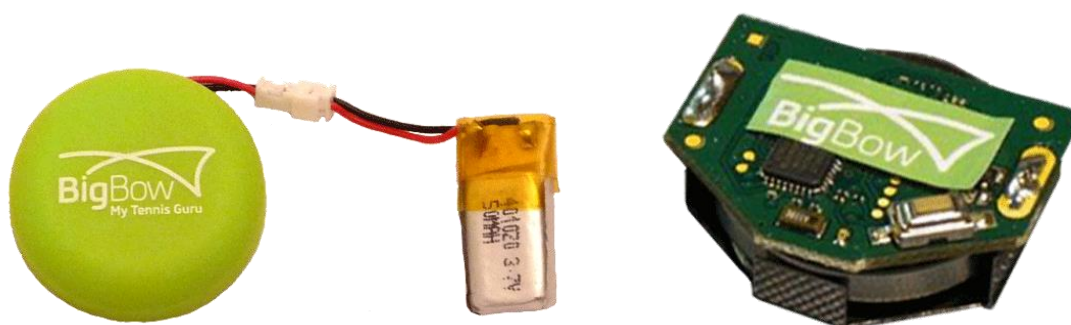


Figure 3. Basic pod (left) and Basic 'Long-life' pod connected to respective power supplies (batteries).

Data can be transferred by removal of the micro SD card from the pod and insertion into a card reader connected to an auxiliary device, e.g. laptop.

#### COMMENTS

The pod must be activated to record data. The pod is typically attached to the butt of the racket, but can be attached to any object of interest.

Data can only be transferred by removal of the micro SD card from the pod. Data cannot be transmitted wirelessly.

#### DATA COMMUNICATION

Access to the data is via software installed on a laptop or personal computer (PC).

Imugres software is used to transfer data from the micro SD card to the laptop. BigBow Analyzer software is then used to view the data, which includes time histories of the acceleration and rotation of the object of interest (e.g. racket).

#### COMMENTS

The pod does not have a means to communicate data directly to the user. The data must be transferred to an auxiliary device, via removal of the micro SD card from the pod, in order to view the data.

Coaching information is available on the auxiliary device. Therefore, players must not have access to auxiliary devices, e.g. laptop, when coaching is prohibited.

## ADDITIONAL INFORMATION

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**Date received:** 14 August 2014

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**Report authorised by:** Stuart Miller

**Revision number:** 0

**Please note:**

Approval does not attempt to, nor does it in fact, establish the accuracy or reliability of data or fidelity of its transmission.