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### **Advantages of Ballistic Measurement System (BMS)**

(The following analysis is based on the known capabilities of the BMS and information derived from the websites of other performance measurement systems. It is correct to the best of our knowledge and the resources available)

- 1) Sample rate of 200Hz (Performance Plate - soon to be extended to 600Hz) or 500Hz for the XPV6+ provide high accuracy for measurement of fast movements. Microprocessor systems (e.g. FitroDyne Tendo, MicroMuscleLab) have much slower sampling speeds due to limitations of processing power.
- 2) Simultaneous measurement of force and displacement is the optimal solution for the most accurate and valid determination of displacement, velocity, acceleration, force, and power variables. Any system that relies on displacement measurement alone e.g. FitroDyne Tendo, MicroMusclelab or Gymaware or force alone e.g. Kistler Quattro, can only provide estimations of several key variables.
- 3) Direct interface to the Windows computer provides the most powerful and flexible solution. Systems (e.g. microMusclelab or Fitrodyne Tendo) which use microprocessors are non-standard & have limited storage and power and for more in-depth analysis require post testing download to the PC. Personal computers including laptops and tablets are incredibly inexpensive and powerful and that is why the BMS has been designed to run on the Windows platform.
- 4) Validity and reliability of the BMS, performance plate and linear transducer systems has been established in the peer reviewed scientific literature (see reference list).
- 5) Direct data interface with Microsoft Excel provides powerful and flexible data storage and processing in a familiar environment. Other systems either don't have data management capacity or use proprietary database systems which are non-standard and poorly integrated with Microsoft Office. Rather than lock the user into standard reports (e.g. Kistler Quattro) data collected from the BMS is exported direct to Excel to give the ultimate in reporting flexibility.
- 6) BMS training mode allows the setting of performance thresholds on a range of distance, velocity, force and power variables to provide real-time feedback to athletes enhancing motivation and improving skill acquisition.
- 7) Test protocols and measurement variable selection is based on 20 years of experience in athlete assessment by leading sports scientists in the strength and conditioning field. Other systems are developed by computer and electronics technicians (e.g. Gymaware) with little knowledge of working with athletes and the strength training research.
- 8) An optional component of the BMS is the Ballistic Braking System which is the only product in the world which provides dynamic control of eccentric forces and landing impacts. This system permits the athlete to perform heavy ballistic training with reduced injury risk.
- 9) Because the BMS is a Windows software solution upgrades can be downloaded via the Internet for free at any time. This future proofs the core of the BMS because new innovations in testing and training can be quickly incorporated into the software and updating only requires an internet connection.
- 10) BMS may include the XPV6+ USB data interface from Fitness Technology so that you can connect various contact mat and light gate switches, download the free Kinematic Measurement System Software and now have the most powerful athlete timing system in the World all running off the one computer and interface.
- 11) One of the biggest advantages of the BMS is that if the client buys a couple of light gates and a contact mat they have a fully functional KMS for very little outlay. All BMS & KMS software is free. All customers can use their existing XPV6+. The same applies vice versa. If a team has a KMS, with the addition of a cable transducer they are up and running with a BMS.

	Displacement Measurement	Force Measurement	500Hz plus sample rate	Windows personal computer platform	Direct integration with Excel for data management	Eccentric braking capability	Real time performance feedback	Integrates with KMS timing system
Ballistic Measurement System	yes	yes	yes	yes	yes	yes	yes	yes
Kistler Quattro Jump	no	yes	yes	yes	no	no	no	no
Micro MuscleLab	yes	no	no	no	no	no	yes	no
Fitrodyne Tendo	yes	no	no	no	no	no	no	no
Gymaware	yes	no	no	no	no	no	no	no

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