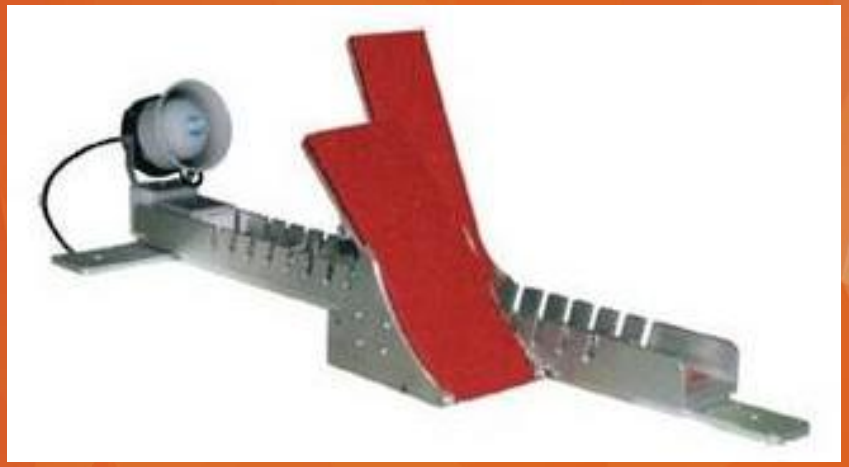
START INFORMATION SYSTEMS

Comité Nacional de Jueces
Comisión de Salidas



Seminar for starters
Firenze / ITA - January 2018

Start Information Systems

START / START REFEREE

Resources to take decissions at the starts:

1. Own visual judgement
2. Consultation of information provided by SIS
3. Consultation with Recallers

START / START REFEREE

Usefulness:

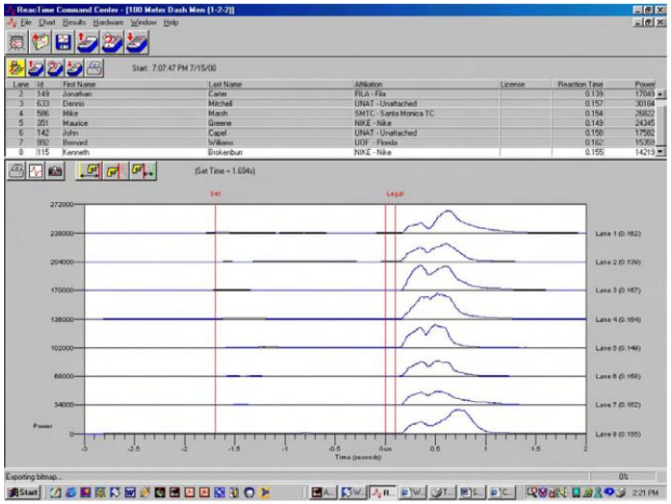
- ✓ informs reaction times of athletes running in all lanes
- ✓ provides wave form images very useful to reconfirm a posible false start or motions at the start

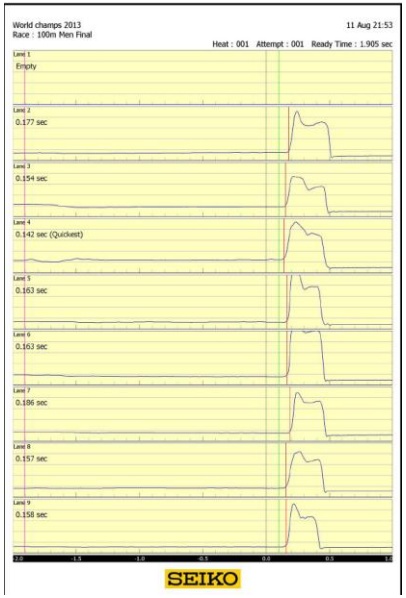
```
Race name      : 100H
Heat number    : 3
Starter name   : JOHN
Ready -> Start: 1,84 sec
IAAF setting   : 0,100 sec
Lane          Signal  Time
- - - - - - - - - - - - -
   10           000
    9           004
    8   OK      215  0,266
1   7   FALSE   244 -0,023
    6   OK      200  0,199
    5   FALSE   236  0,099
    4   OK      190  0,156
    3   OK      239  0,202
    2   OK      244  0,197
    1   OK      256  0,234
- - - - - - - - - - - - -
TimeTronics, div of IE
FalseStart II System
Start number: 18
```

Starter delay time.

Reaction times. A '-' appears in front of the time in case the athlete reacted before the starting shot.

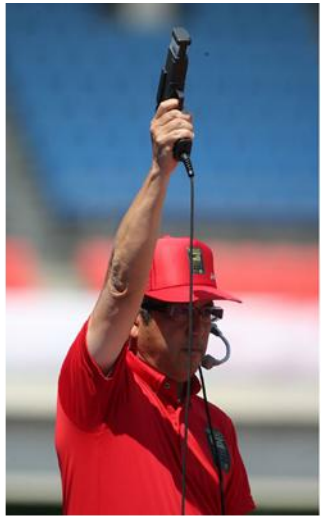
Number since total reset.





Start Information Systems

START / START REFEREE



Usefulness:

- if reaction time is less tan + 0,100 seg. → false start

✓ send a “beep” acoustic signal to Starter’s headphones

✓ provide automatic recall system (electronic shot)

Start Information Systems

START / START REFEREE

VERY IMPORTANT:

Information provided by SIS

until 1/11/2017 →

- shall be accepted as "conclusive" in order to take a decission

from 1/11/2017 →

- shall be used as a "resource" by the relevant officials to assist in making a correct decision

IAAF Certification for Start Information Systems

- IAAF determines the technical setting parameters for certification of SIS equipments
- Checking tests are mady by Technologic Institut of Sport University, Cologne (Germany)
- Institut determines if comply or not comply with the setting parameterso determina si cumple o no con los parámetros
- if comply → get IAAF certification
- If NOT comply → are retourned to supplier detailing which settings are not correct → supplier has to modify the system and ask again for certification

IAAF Certification for Start Information Systems

These systems may be based in two different principles:

- **ACCELERATION produced in the blocks**

LYNX REACTIME TimeTronics

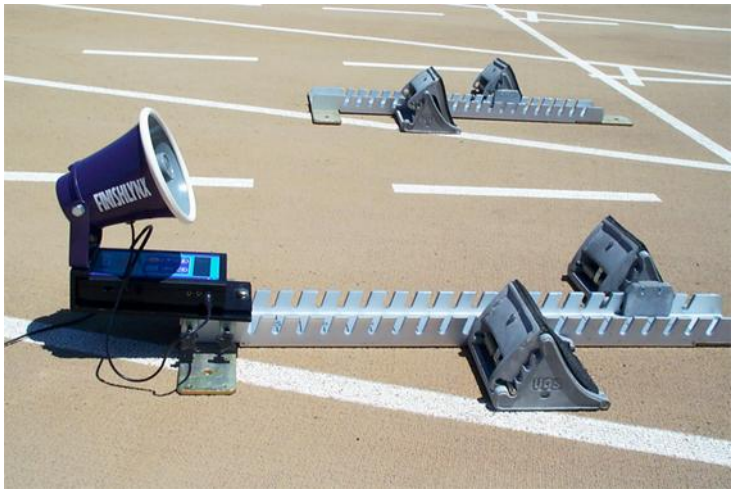
- **PRESSURE produced on the blocks**

SEIKO SWISS TIMING OMEGA

➢ ***Both systems may get the IAAF certification, but in practise, one system creates more problems than the other system***

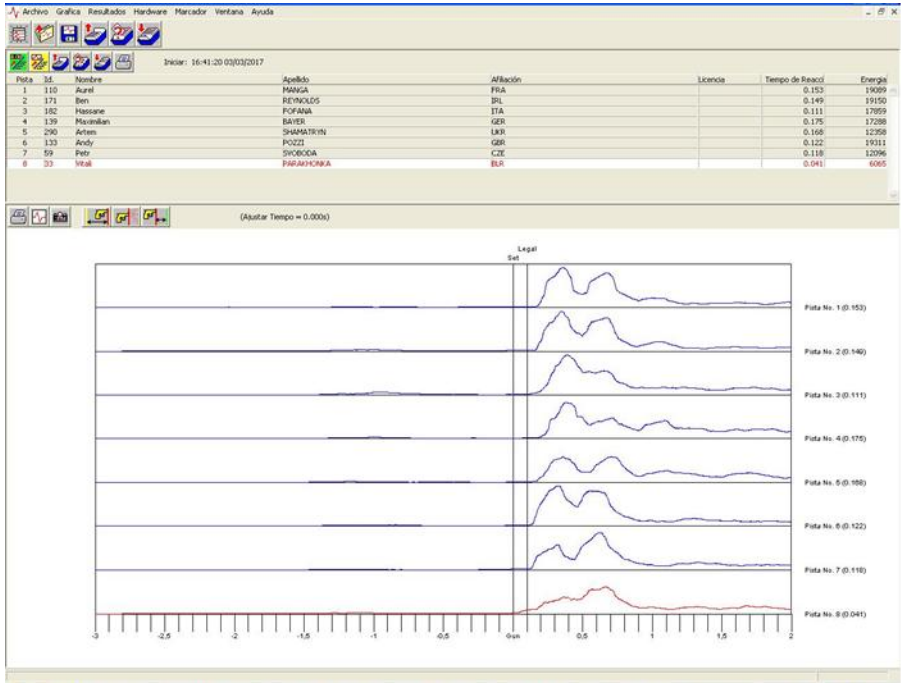
IAAF Certification for Start Information Systems

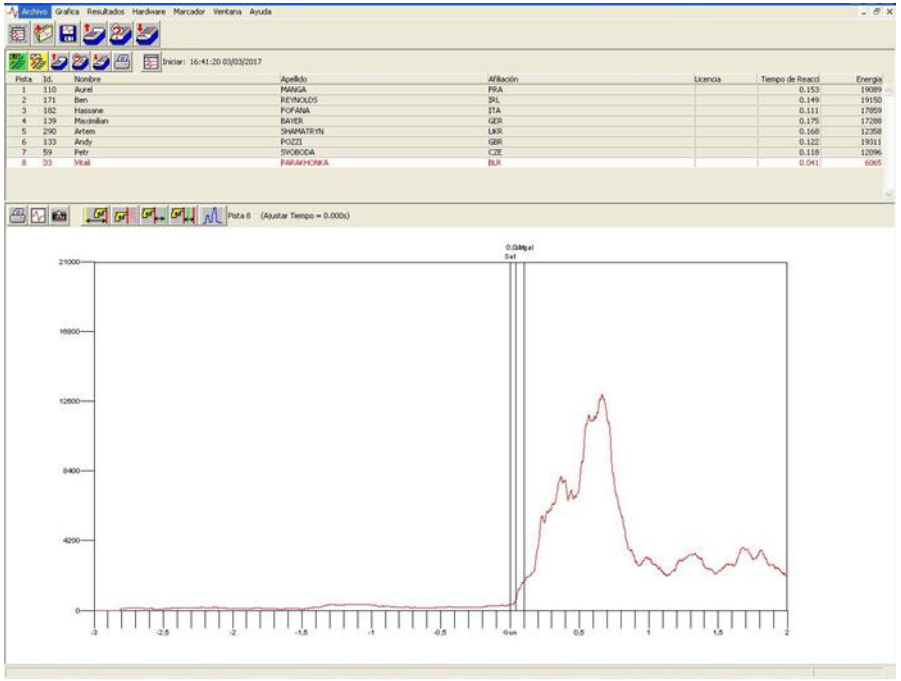
SIS based on ACCELERATION:



- System records the acceleration force produced by the athlete's feet in the blocks
- Analyze that information approx. from 1" before till 1" after the shot
- That movement shoud have to correspond to the reaction of the athlete to the gun shot

SIS based on ACCELERATION – wafe form images (LYNX)





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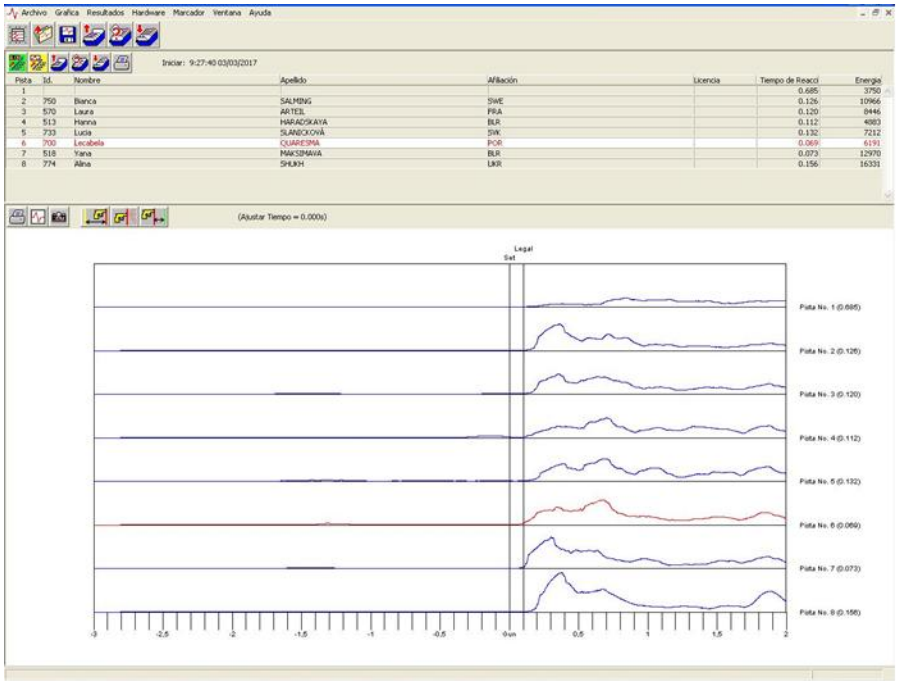
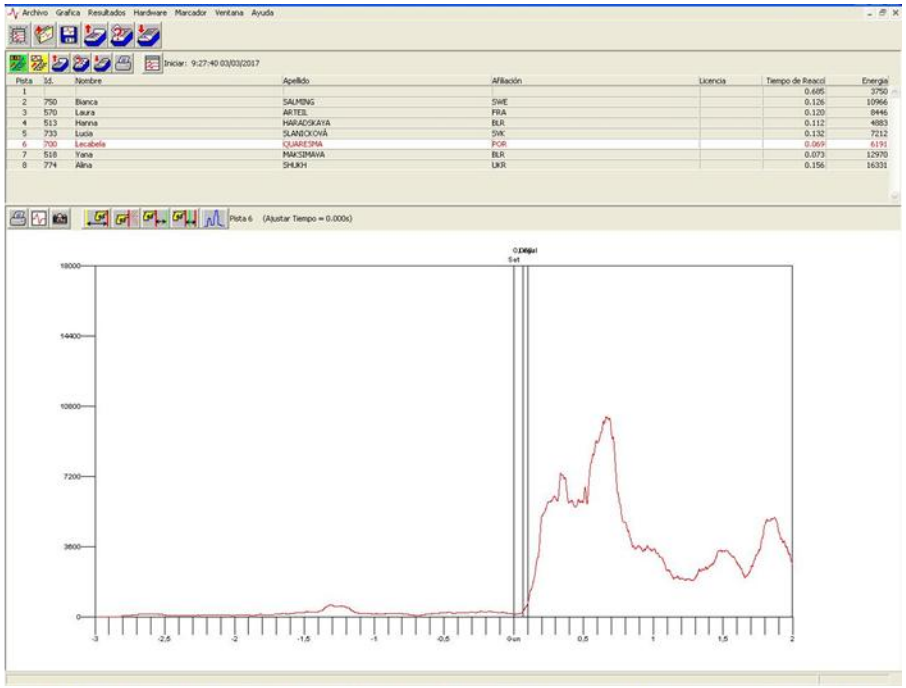




IAAF Certification for Start Information Systems

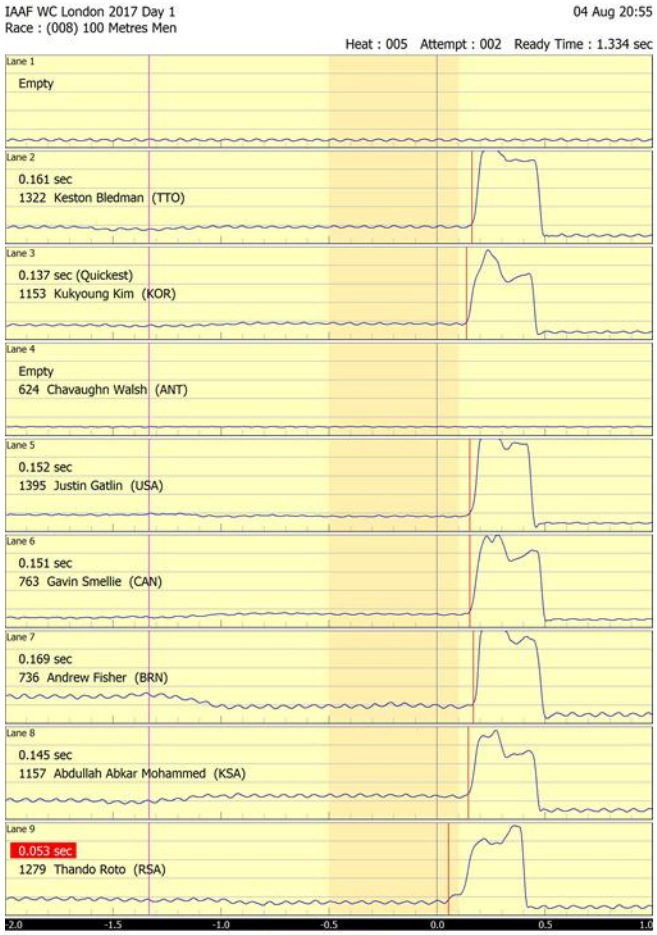
SIS based on PRESSURE / FORCE:

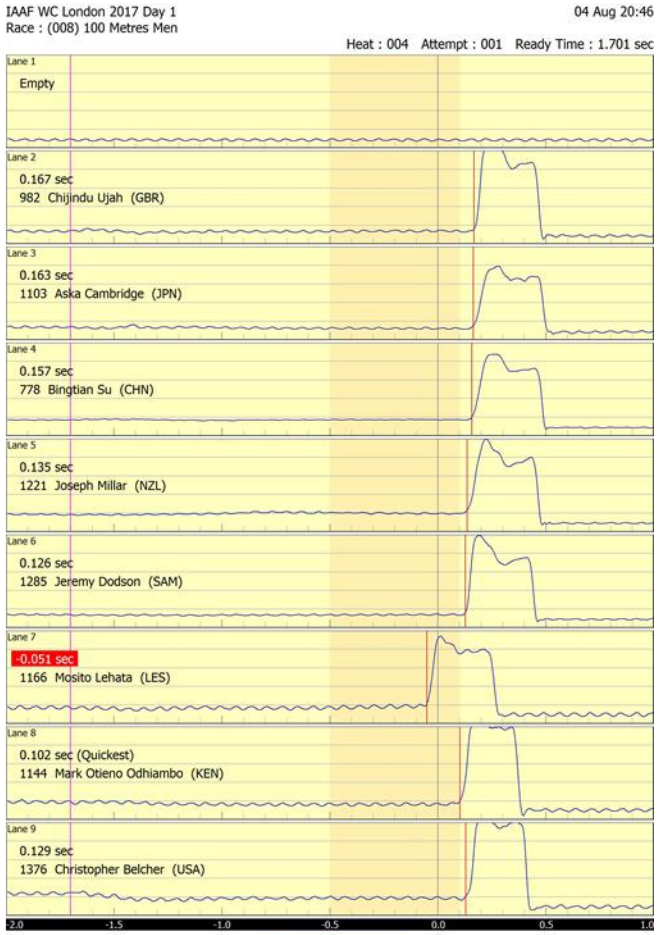
- System has sensors to measure the physiological reaction time from the shot to the pressure's change in the blocks produced by the athlete's feet

- Analyzes that information from approx. 0,3-0,5" before the shot to 0,5-0,7" after the shot (depending each mark)

- System monitors and displays the pressure exerted by the athlete in the blocks → it corresponds to the effective reaction time to the shot

SIS based on PRESSURE / FORCE – wafe form images (SEIKO)





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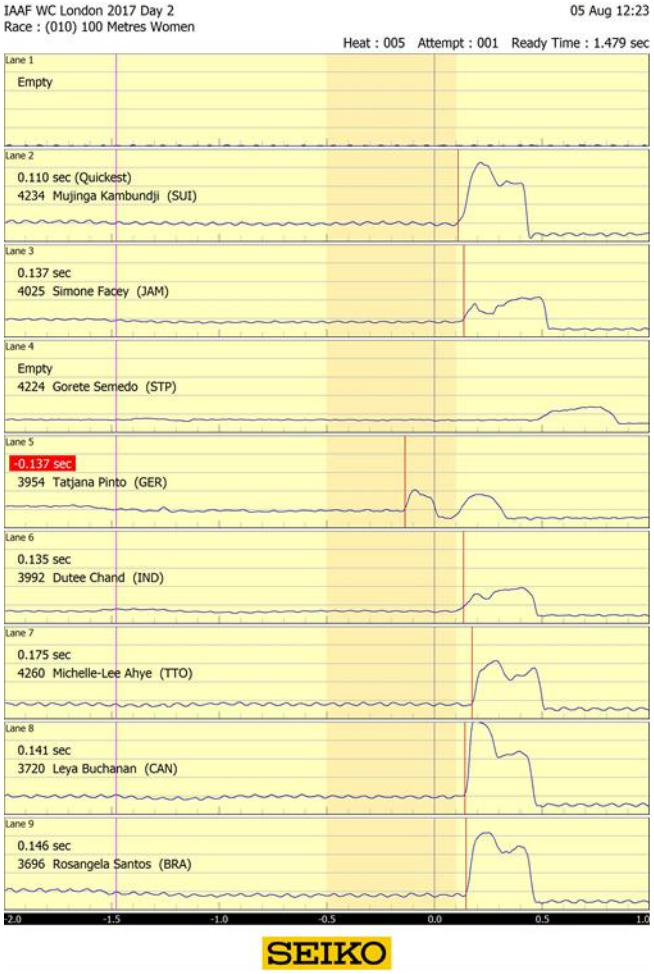

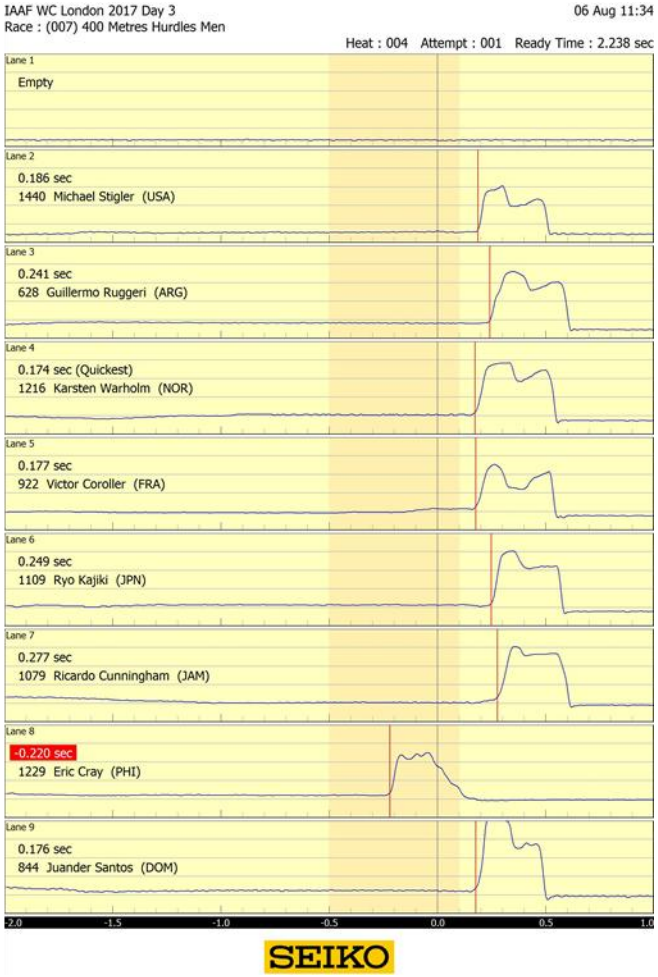

Issues which may influence in SIS:

a) SIS based on acceleration:

- Manifest trembling movements on “Set”
- Strong twitching motion on “Set”
- Indoor: non-static surface or exposed to crashes or vibrations
- Volume of start loudphones or other type of loudphones

Issues which may influence in SIS:

b) SIS based on pressure / force:

Could happen some manifest movements before the shot but the own system detects that them not correspond to the effective start and discriminate them, for instance:

- *Starts with trembling*
- *Starts with weakening force before leaving*
- *Twitching*

Issues which may influence in SIS:

Regular starts with trembling:

A lot of athletes tremble in "set" position. The following curves are examples of athletes that visibly trembled on the block. Trembling is a fast repetitive movement that may cause amplitudes of up to 50N. Trembling will never trigger a reaction time measurement.

Issues which may influence in SIS:

Regular starts with weakening force before leaving:

Few athletes weaken the force on the starting block before leaving. It can be seen by a movement of the hip. This movement is a reaction on the start sound but it is not detected by the starting block (it detects only positive force changes). Such starts normally have quite high reaction times.

Issues which may influence in SIS:

Twitching:

*Twitching is a single movement that occurs during "set" position. In the force curve it is seen as a single peak during the steady phase of set position. Such movement is not a false start, but Starter **may** give a warning to the athlete for not being steady in "set" position.*

Twitching is normally filtered by the starting block and does not trigger a reaction time. However, if the twitching occurs quite late and starts overlapping with the starting movement or if it is very strong and long, the filter may fail and a reaction time is triggered.

To consider these starts as false start or not is in the starter's sole discretion.

Conclusions:

- There are systems very advanced in technology, but any of them will arrive to process as much information as the human eye is able.
- Systems have to pass a checking test for its certification, but it is quite difficult to reproduce in a laboratory the same scenary that we found in a track and field arena.
- It is necessary to be an experienced starter and knowing the functioning of these systems to interpretate the information provided by the system and take the decisions
- All these decisions usually have to be taken en few seconds and “under pressure”

Start Information Systems

Suggestions:

In view of a false start informed by the SIS but not noticed by Starter, neither the Recallers, it is reccommended to act with máximum caution being sure and reinforcing our deccision with any aditional resource:

- Our own visual judgement of the start
- Information provided by SIS
- Consultation with Recallers
- Any other resource (i.e.: replay video cámara system, etc.)

THANK YOU FOR YOUR ATTENTION !!

Jordi Roig, ESP

IAAF International Starter

EA International Starter

Head of Starters Commission of RFEA Technical Comittee