

BIOMECHANICAL ANALYSIS OF THE HORIZONTAL JUMPS

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During the years 1982 - 1987 biomechanical research team consisting of Czechoslovakia, West Germany and Greece obtained film materials from the most important athletic competitions of that period. Our aim is biomechanical analysis of individual athletic disciplines and the transfer of the information to the sport training. The target of our work is the analysis of the horizontal jumps biomechanical aspects of the technical exploiting of the space cinematography. One part of its putting to use is verifying of new methods in obtaining and elaborating information with the help of computers.

Biomechanical observing of sport motion is based, above all, on collective processing of great data, their valuation and transformation of the received information to a suitable form for the training process.

Elaboration of horizontal jumps methods is with respect to receiving the data in the top-level events conditions based on:

- information about time duration of sport motion
- geometrical and kinematographical characteristics of the sports actions

With the respect to higher information value of the top-level competition observing we used these methods:

1. space cinematography
2. videoanalysis
3. run-up speed measures (and following velocity) aided by fotocells
4. valorization of the received data with the computers.

The basic method applied in all the previous measures and experiments was the kinematographic method.

We divided the long jump on the methodical level to Run-up, Hop, Step, Jump and Landing.

We are going to deal in view of quantity of the exploiting materials with Pre-take-off rythm and Take off in the long jump and with the geometric and kineatic parameters and Landing in the triple jump only.

The period of 1983 - 1987 means the progressive trend in the development of the horizontal jumps. The development of the motion abilities led, above all, to another performance improving (in the long jump to 8.50 m limit and in the triple jump to 17.50 m limit). It is possible to support by evidence to these tendencies also in the changes of some biomechanical parameters characterizing changes in the technical execution of that discipline.

LONG JUMP

Pre-take off-rythm

It is evident that present athletes are able to achieve top-level sport performance in long jump both based on a high degree of run-up speed (for men 10.8 - 11.2 m/s, women 9.5 - 10.0 m/s) and based on a high dynamic power of the run-up speed is one of the basic conditions for the elite performance we can not affirm that it is a non-substituable condition at all. Neither the best world jumpers are able to realize in the correct technical way the pre-take-off modification until today.

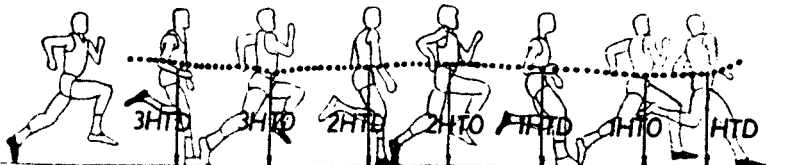


Figure 1: