



# **IAAF Photo Finish Guidelines**

**For IAAF World Athletics Series Competitions**

**June 2015**

# IAAF PHOTO FINISH GUIDELINES

## 1 Introduction

The position of an International Photo Finish Judge (IPFJ) was first identified in the IAAF Handbook in 1994. IAAF Rule 118 now stipulates that the IPFJ “shall supervise all Photo Finish functions and be the Chief Photo Finish Judge” but provides no other guidelines as to what is expected of that official.

This document aims to provide clear guidelines as to the duties to be carried out by the International Photo Finish Judge. This will ensure consistency amongst the IPFJ Panel and ensure that the Local Organising Committees are well aware of the role and responsibilities of this Delegate.

***It is recommended that Member Federations adopt these Guidelines for the organisation of their own athletics competitions.***

## 2 Role of the International Photo Finish Judge

- 2.1 After the approval of the International Photo Finish Judges Panel in March 2007, appointments to designated IAAF competitions are made from this Panel.
- 2.2 The deployment of an International Photo Finish Judge is intended to:
  - Add a consistent approach to the reading of photo finish images;
  - Ensure the Technical Rules concerned with photo finish timing are correctly interpreted and implemented;
  - Provide the National Photo Finish Judge (NPFJ) with the necessary guidance to perform his duties properly.
- 2.3 The International Photo Finish Judge is the Chief Judge and decides the finishing order of the Track Events. The IPFJ supervises the system and its operation including the timing service provider and the National Photo Finish Judge(s).
- 2.4 The National Photo Finish Judge assists the IPFJ in many ways. The NPFJ remains in contact with the Start and Track Referee for information on any disqualifications or other adjudications on track events. The NPFJ assists the IPFJ in identifying the finishing order and determining the position of the timing cursor.

## 3 Responsibilities of the International Photo Finish Judge

The IPFJ should

### 3.1 ***Before the (First) Competition Day***

- 3.1.1 visit the competition stadium one or two days before the start of the competition to meet the National Photo Finish Judge (NPFJ) and to ensure that everything is in order. It is likely that the NPFJ may be relatively inexperienced with the complexity of the timing equipment to be used at the event. Together with the Timing Service Provider (TSP), the IPFJ should ensure the NPFJ understands exactly how the equipment works.
- 3.1.2 contact the TSP, as an introduction and to identify the person from the TSP who is in charge of that team. A review of the duties being allocated to those members of the team should be clearly undertaken by the IPFJ.
- 3.1.3 agree which camera shall be designated as “official” (Note to Rule 165.20). Under normal circumstances, this will be the camera located on the outside of the track. Where there are two cameras located on the outside of the track it will be necessary for the IPFJ to decide which is to be designated the “official” camera, leaving the second as a back-up. Naturally, the IPFJ will review the images produced by both cameras, and consider the ability of each camera to react to poor light conditions before identifying which is to be the “official” one. The designated “official” camera should always be used for determining the result unless it is clear that a problem has developed, in which case the back-up camera

should then be designated as official. Where possible, such change in camera status should be undertaken only at the conclusion of a specific series of races of a particular event.

- 3.1.4 confirm whether the cameras in use have an automatic iris adjustment and aligning function. During the competition, there is a wide range of lighting conditions between morning and evening session, the latter likely to be under floodlights. If such an automatic function is not available, then it will be necessary to enquire how accessible the cameras are to enable manual adjustments to be made, other than during a complete break in the competition sessions. The biggest problem may well lie with the infield camera which, clearly, is not accessible for manual adjustment of exposure or focus during the course of a session. As will be appreciated, the key races in terms of media interest are likely to be held during the evening session in adverse lighting conditions, coupled with strobing caused by the artificial lighting. Every effort needs to be made to make the images produced to be of the highest possible clarity. Sufficient light is required for good quality images. Opening the iris when light dims can have an impact on focus.
- 3.1.5 contact the representative of the TSP responsible for the relaying of results from the terminal in the photo finish room to determine what data will be needed to identify the finishing order of the athletes. In races run in lanes, this is almost inevitably by the input of the appropriate lane number. For events not finishing in lanes, the process needs to be clearly identified.  
If the draw order (and corresponding leg / hip number) is to be used, there needs to be a careful check that the numbers have been allocated correctly. In Championships, it is perhaps unlikely that athletes will be sharing lanes but in these instances there is always the chance that the athletes sharing the lane have been allocated leg / hip numbers the wrong way round.
- 3.1.6 attend any rehearsal (at many major athletics competitions, a rehearsal is held prior to the first day of competition. It is expected that all officials will be in position for this rehearsal so as to familiarise themselves with the equipment and processes that will be used for the competition) together with the NPFJ. This occasion can be used to ascertain the competence and speed of decision-making by the NPFJ. During the real competition, it may be that the NPFJ will act closely with the TSP and make the decisions about judging. The IPFJ remains the final decision maker and will supervise the reading process. The IPFJ may choose to take a more active role in determining the cursor position, while the NPFJ provides the support.
- 3.1.7 ensure, if the photo finish system is assisted by an integrated video camera showing the finish line from a head on position, that such camera shows the finish line at least as far out as lane 6 (for an 8 lane track) and the image should be suitably in focus. It is also essential the IPFJ is alert to anything that might block the image in the course of a finish. Judges, photographers and others may well not be aware of the function of such a camera and may inadvertently stray into the line of vision of that camera at a critical time during the finish of a middle distance race. The value of such camera in the identification of athletes can be vital. As the cursor on the image on the read computer is moved, the image from the video camera is advanced to the same elapsed time automatically.  
The image from this camera should be made available for scrutiny in close proximity to the screen showing the image from the main photo finish camera.
- 3.1.8 ensure that the photo finish room is set out, as far as possible, with the screens showing the image from the “official” and the infield camera in close proximity to each other so that both may be reviewed quickly.
- 3.1.9 attend, if possible, the first meeting of the National Judge(s) and the TSP team.
- 3.1.10 identify the level of communication and understanding of language between the operators and the National Judge(s). If there are obvious language difficulties then the degree of “supervision” by the IPFJ will be increased and may necessitate a more active

role in the decision making process and in the transfer of the data to the computer operator by the IPFJ.

- 3.1.11 agree with the Technical Delegate(s) what principle is to be adopted as far as the confirmation of results is concerned. In general, the results will be displayed on the stadium scoreboard before there is confirmation from the track officials that the race is clear of potential infringements and possible disqualifications. It is necessary that such results are indicated clearly to be “unofficial” until such confirmation is received.
- 3.1.12 agree with the NPFJ and the TSP at what time the zero control tests shall be carried out. Ideally, keep the same time interval between the test and the start of the first track event for all subsequent sessions, unless there are unusual circumstances (e.g. the start of the Marathon on the track at the time allotted or similar circumstances). It is also necessary to consult / inform the Track Referee, Starter and Technical Delegate to be sure that all interested people are available and present.
- 3.1.13 agree with the TSP at what time prior to the first session of the day the start and “run through” checks are to be carried out. Endeavour to be present on each occasion that these checks are carried out and review the results for uniformity of times between all of the cameras in use. (See 3.2.1)
- 3.1.14 confirm with the NPFJ what procedure is in place to obtain from the Track Referee and Start Referee that the race is clear of infringements and that the result can be made “official”. Also, identify the process by which details of disqualifications are to be notified to the NPFJ, including the relevant IAAF Rule number under which the disqualification has been made.
- 3.1.15 ensure that the finish line is marked in accordance with IAAF Rule 165.15.

### **3.2 Before Each Competition Session**

- 3.2.1 confirm alignment of the cameras with the vertical plane of the leading edge of the finish line, it is common to have someone “run through” the finish line in each of lanes 1, 4, 8. Images from both the outfield and infield cameras are used. The cameras should be scanning at least 1000 lines per second (preferably 2000), and the precision should be at least 1000<sup>th</sup> of a second (or finer). Easily identifiable features for the range of heights (such as the nose and the toe) for a runner in each lane are considered for each of the cameras. Agreement between the cameras to 0.001s gives a high level of confidence that the alternate view’s image and times can be used when the principal camera has an obscured view of an athlete’s torso.

The “run through” is a useful guide that the cameras are level and equally aligned to the vertical plane of the leading edge of the finish line.

- 3.2.2 ensure that the zero control test is taken on all cameras in use at a rate of 1000 lines per second or greater (preferably 2000 lines per second or greater), and that the time is read to a precision of at least 1/1000<sup>th</sup> of a second and preferably 1/10,000<sup>th</sup> of a second. Ensure in the case where ammunition is being used that the cursor is not placed on any minor build-up of smoke / flame that would mark the “pre-burn” before the actual explosion producing the “gun sound”. An electronic gun will produce a clear vertical flash. Check that the resulting times correspond to the requirements of Rule 165.14. Ensure that a photograph of the test from each camera for each session is available, suitably labelled and is provided to the Technical Delegates.
- 3.2.3 ensure that the TSP operator pressing the capture button appreciates that in middle distance races once the winner has been recorded the image of every athlete crossing the finishing line subsequently will need to be captured whether finishing or not.

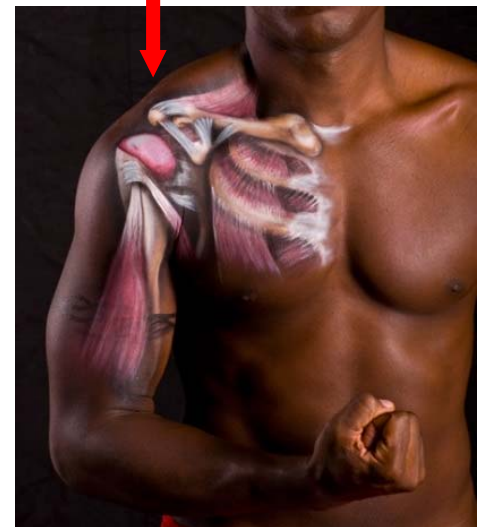
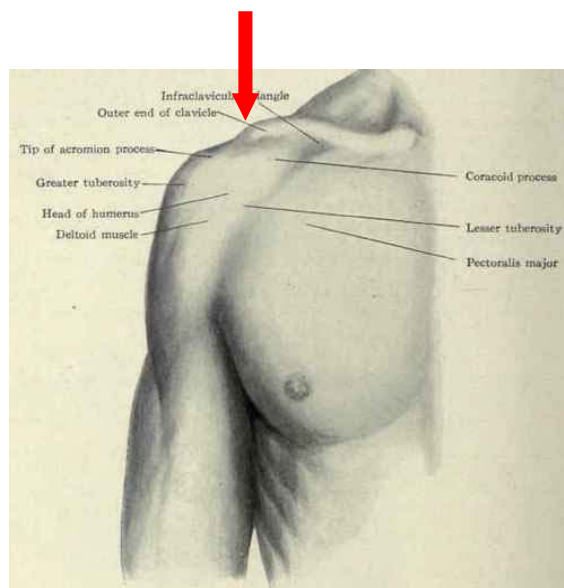
There are many ways to identify athletes in events finishing out of lanes, including hip numbers, transponder information, head-on camera and manual recording of the order in which athletes cross the finish line including those (lapped runners) who are not yet

finishing. All of these methods can be used to correctly identify the finishing order in a distance event.

- 3.2.4 ensure that all cameras are set to round up according to IAAF Rule 165.23.
- 3.2.5 ensure, when a wind gauge is operated from within the photo finish room, that it is tested and there is a non-zero wind measurement received by the relevant equipment in the photo finish room.

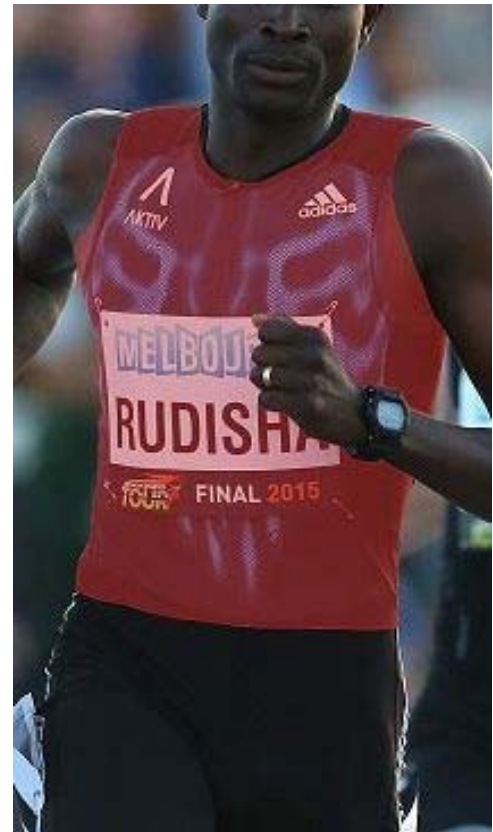
### 3.3 *During the Competition Sessions*

- 3.3.1 take the opportunity, at an early stage in the first session, to check the comparability of times for a given athlete on both the “official” and infield camera and also between the “official” camera and any other being utilised as a back-up.
- 3.3.2 ensure that the Judge making decisions is quite clear about what constitutes the “torso” as far as photo finish is concerned. The exact location of the border line between the upper arm / shoulder and the “torso” would vary depending on the development of the upper body of an individual athlete and would not therefore be totally consistent. Based on anatomy, we can say that the endpoint of the torso is the outer end / articulation of the collarbone (clavicle). Normally, this is approximately at the border of the middle and outer third of the distance between the neck and the peak of the shoulder. On the below two images, the arrows show the endpoint of the torso.



Although the pelvic area is anatomically part of the torso, for consistency in photo finish judging, it is more practical to define the lower end of the torso as the horizontal cross section of the body through the hip line (an arbitrary line encircling the fullest part of the hips, between abdomen and crotch) – see the shaded area of the vest on the following images.





In close finishes and in instances where the upper part of the athlete's body is twisted, ensure that the cursor is correctly aligned. The read computer operator should wait for confirmation from the IPFJ as to the placing of the cursor and the athlete's number identity before sending the data.

- 3.3.3 ensure that the cursor is not placed on the outside of the number bib where it seems likely that the torso is not in direct contact with that leading section of the bib.
- 3.3.4 stop the operator from entering a competitor's number, if there is an obvious very close finish, irrespective of the length of the race, until it is confirmed that one athlete is in a lead position. If a decision has been made that it is not possible to separate the athletes for a place, then there is a tie. In this situation, the position of the cursor for the athletes concerned is the same. Confirm that the results show an equal place and also confirm that the operator from the results company is also aware of the situation and has notified the results control room of that fact. Ideally, ties will be displayed to the scoreboard and external media with both athletes identified together. It is essential that the IPFJ be closely involved in the decision-making process in the result of key races – sprint finals in particular – and in the positioning of the cursor on the torso of any athlete equalling or improving a world record time.
- 3.3.5 ensure in any events involving athletes with disabilities that the NPFJ is familiar with the rules relating to these events:
- in wheelchair events, that the position and timing is taken from the centre of the axle of the leading wheel.
  - in races for the blind, that the torso of the athlete reaches the leading edge of the finish line in advance of the torso of the guide. If this is not the case then the Track Referee shall be informed before the athlete is disqualified.
- 3.3.6 keep a personal record of the performances of the leading performers likely to qualify by time, in the case of events in which runners progress on a time basis. If there is a situation in which there are more non-place qualifiers than are being sought, have the image of the

athletes involved re-read to 1/1000th second. Be ready to have a print of those athletes in case of a protest or an appeal to the Jury. (See also 3.2.9.)

Also, in deciding if there has been a tie for a ranking position in the seeding for a subsequent round, consider the times to 1/1000th second and bring those times to the attention of those responsible for the seeding.

- 3.3.7 ensure that, in the case of a decision taken to 1/1000th of a second for a qualifying position as a fastest loser or in the case of a close finish for a medal position, an enlargement of the image(s) is produced and made available in the TIC where it can be inspected by the Team Management of the country(ies) concerned prior to any decision being taken about whether they should make a protest or an appeal. In the case of time qualifications it is acceptable to produce photographs showing times to 1/1000th second. Ensure that times read to 1/1000th of a second are reported to the terminal operator within the photo finish room so that this data can be included on the official result sheet relating to qualifiers.
- 3.3.8 ensure that arrangements are in place to record the passage of the baton across the finish line for the first three legs in the 4 × 400m relay heats and subsequent rounds, if requested by the Authorising Body / Organising Committee. Note that it is the position of the baton which is to be recorded. As there is an accepted formula for converting times on the first lap to an approximate 400m equivalent, it would be necessary to record each athlete reaching the finish line on the first leg even though the athletes in lane 8, for example, will have run well short of the prescribed 400m. Ideally, the infield camera could be used – as data entered there will not be automatically transferred to the output to the results computer. It is helpful if a request is made at an early stage that all athletes on all legs of the race wear leg / hip numbers for easy identification in this process. The completed data should be passed to the Authorising Body / Organising Committee.
- 3.3.9 ensure that proper documentation is produced for National and other records, which will usually be identified on the official result sheet obtained for each race from the results computer operator. It is desirable that where such a record(s) is identified a photograph is produced and passed through to the Technical Information Centre for distribution to the relevant country. In the case of an Area Record, then two copies of that photograph need to be produced. Similarly, for World Record performances, three copies of the photograph should be produced. Some nations do not require hard copies of the photo finish image for their national records. Check with the LOC prior to competition which (if any) records may require a hard copy produced for the Technical Information Centre.
- 3.3.10 ensure a digital or hard copy of the photograph showing the winner or any specifically requested athlete finishing the race is produced, if requested by the governing body.
- 3.3.11 ensure that the NPFJ has appointed an official to identify both athletes not appearing at the start of an event and any who drop out in the course of the race. It is essential that a careful check is made that these athletes are accurately recorded on the result as DNS or DNF as appropriate. The Track Referee decides if an athlete is disqualified. It is important to have good communication (through the NPFJ) to the Track Referee and Start Referee to speed the information flow on disqualified athletes.
- 3.3.12 endeavour to ensure, at the end of each session, that the NPFJ remains in the vicinity of the photo finish room until after the time allotted for protests following the last event of that session has passed, and that the photo finish reading computer remains fully operational until this time has elapsed (Rule 146.2).

### **3.4 After the Competition**

complete a report form as provided by the Authorising Body. There are usually two reports: one to assess the NPFJ(s) and the potential of one official to be considered in the future as a member of the IPFJ Panel. The other report concerns the technical arrangements for the competition including the facilities provided by the LOC and the equipment / personnel provided by the TSP.

It is advisable to obtain a copy of the report pro-forma prior to the start of competition, to ensure that all necessary information and details were recorded during the meeting.

#### **4** *Indoor Competitions*

Whilst almost all of the above can be considered relevant to indoor competitions there are perhaps a couple of areas where circumstances may be deemed to be materially different.

##### **4.1** *Camera Location*

At indoor facilities there is unlikely to be a camera located within the inside of the track. Normally the camera(s) will be located outside the track on each side. This gives the IPFJ the possible option of identifying either camera position as providing the “official” image to be used for reading. This will be clearly determined by the quality of the image produced by two (or more) cameras.

##### **4.2** *Lighting Output*

Under normal circumstances the lighting conditions on indoor tracks will not alter in the course of the day unless there is natural light available from above or from side windows that will influence the general lighting conditions.

Attempt to ensure during a preliminary visit that the light output on the finish lines is satisfactory.

Bear in mind that artificial lighting can take a considerable time to reach optimum output levels. Beware of an opening ceremony during which the lights are to be turned off or dimmed. It could be up to 30 minutes before the main lights are back to optimum output levels.

Access to camera positions in indoor facilities may be difficult and the need for automatic iris control becomes highly desirable in order to compensate for lower levels of light intensity until the normal level of output has been restored.

Additionally, it is likely that strobing across the image will be a problem throughout the indoor event, as it is outdoors once the main stadium floodlights are in operation.

#### **5** *Road and Cross-Country Competitions*

For events held outside the stadium (Rules 230 for events not held entirely in the stadium, Rule 240, Rule 250) it is acceptable to use an IAAF approved Transponder System to determine the official finishing order. Notwithstanding this, the TD(s) may decide that photo finish images and times will be used to declare the time for first place or another subset of results or as official times when Fully Automatic Timing (FAT) is in operation, particularly when the mentioned events start and finish in the stadium. FAT may also be used in relevant cases to declare a finishing order according to 165.24 (f) when there are close finishes, normally when athletes are separated by less than one second. Where FAT is used, the IPFJ will decide the finishing order. The IPFJ will work in cooperation with the Chief Transponder Timing Judge for events where both FAT and a Transponder Timing System are used.