

## Chief Judge Electronics Clinic

**Timing Equipment:** The FINA Facilities Rules (FR 4) addresses requirements and standards when using Automatic Officiating Equipment. It is worthy to note that there are different companies producing such equipment, and all are not the same in terms of how they operate: (for example)

**Omega:** By design, the Omega Electronic Equipment System takes its signal from the pressure of the swimmer at the top of the starting platform. Based on research, it is recommended that a tolerance of  $-0.03$  seconds in favor of the swimmer be allowed before a disqualification is called. For this reason, FINA accepts up to  $-0.03$  as legal in relay takeovers but  $-0.04$  as an early start.

**Seiko:** By contrast, Seiko Timing is engineered differently. The pressure is measured on the front of the pad rather than on the top. For this reason, there is no degree of tolerance with Seiko, so  $-0.01$  is considered as a disqualification.

Common Equipment used:

1. Omega OSM-6 timing console used for primary and secondary backup timing;
2. Omega "ARIES-21" and its accompanying Omega ARES software for primary timing. This is a new and enhanced computer-based system that has all the functions of the OSM-6 system with added features;
3. "Plungers" or push-buttons for semi-automatic backup timing;

To ensure proper functioning of the timing console, three plungers are to be used for each lane. If less than three plungers are used, the OSM-6 will delay its display of the times. This is because it waits a little while for the third plunger signal before it realizes it is not going to arrive. The OSM-6 will then display a "T" beside the lane on which less than three plungers were used. But the two times you receive are still valid times, as the actual swimmers' times are not delayed, only the display is.

To begin with, discussion of Automatic Equipment times can be equally applied to swimmer touches at the wall in individual events, relay events, as well as with electronic relay takeovers.

## Timing System Procedures:

**Rule references:** SW 11.1 (Fina Rule Book)  
SW 13.3 (Fina Rule Book)

### Definitions:

**Automatic Timing System:** An automatic timing system is a system that is activated by the Starter to give the signal to the swimmer to start the race, and will be **stopped by the swimmer** when touching the touchpad at the finish of the race.

**Semi-automatic Timing System:** A semi-automatic timing system is one that is activated by the Starter in the same way as the automatic timing system, but will be **stopped by an Official** using a plunger or stopwatch judging the arrival of the swimmer at the end of a relay leg or the end of a race.

However, as stated in SW 11.1 referenced above, having an automatic timing system will not ensure getting an official time for a swimmer if that swimmer fails to activate the system (ex: a light touch). Therefore, the need for a backup semi-automatic time from an Official.

**Swimmer's Official Final Time** is determined as follows:

1. If the Automatic Timing System is used as the primary system, the time recorded on that console will be the official time.
2. If the console operator (and/or Chief Judge Electronics) determines that the system has been faulty, that no time has been recorded on the console, or that the running time doesn't stop and the Aries operator doesn't receive a sound signal as the swimmer touches the wall, then the semi-automatic backup time (plungers or watches) are recorded as the official time.

### Relay Takeovers:

*When Automatic Officiating Equipment is used in any competition, the placing and times so determined and relay take-offs judged by such equipment shall have precedence over the timekeepers." (SW 13.1)*

When there is an automatic relay takeover timing system in place, the operator of the Aries console will receive a sound signal in his headset as he watches the incoming swimmer touch the touchpad that will confirm that the touch was made before the outgoing swimmer left the block. If the outgoing swimmer leaves the block before the incoming swimmer touches the touchpad, the console will indicate a negative reading greater than -.03 seconds. This will be reason to consider a disqualification for "leaving early". When there is no automatic relay takeover timing system in place at a competition, the most reliable judging method is the visual one done by turn judges over each lane.

**Light Touches:** If there is concern that the incoming swimmer in an individual event or a relay made a “light touch” and thus did not activate the touchpad, it would be identified by the console operator and Chief Judge Electronics. If they determine that there was a light touch in a given lane, it would be considered a “failure of the automatic equipment system”, and the semi-automatic times recorded (by plungers or watches) would be used.

*SW 11.1 In the event that a break-down of the Automatic Equipment occurs or that it is clearly indicated that there has been a failure of the Equipment, or that a swimmer has failed to activate the Equipment, the recordings of the timekeepers shall be official.”*

Semi-automatic times (plungers or watches) indicate when the incoming swimmer touched the touchpad, so it may be considered as a backup to determine when an incoming swimmer touched the wall. It does not, however, give any indication as to when an outgoing swimmer in a relay left the blocks. A block sensor does this. Therefore no comparison of an automatic time with a semi-automatic time (plunger or watch) can truly state if the primary automatic relay takeover time was good or not during a relay. It would, however, be helpful to compare the block sensor time indicating the time the swimmer left the block with the automatic equipment time and the backup time to clarify if there were any light touches.

Procedures: When coaches request a review of the final times recorded in a race or a relay takeover, the referee should discuss the problem with the Aries console operator and Chief Judge Electronics to determine if there was any indication of equipment failure. It may be helpful as well to compare the semi-automatic times of the plungers or watches with the primary automatic equipment time on the Aries console printout to verify the validity of the incoming swimmer’s time, though this would not in itself be able to confirm whether the outgoing swimmer left early or not. The report of the official who is judging turns in that particular lane may also be helpful in arriving at the correct decision.

**Chief Judge Electronics: CSW 2.12.1.2**

- a) *Shall oversee the operation of any SNC approved Automatic Officiating Equipment*
- b) *Shall determine if the Automatic Officiating Equipment is in error and advise the referee of any malfunction or light touch*
- c) *Shall observe the touches of all swimmers and note any cases in which the Automatic Officiating Equipment fails to properly record the touch*
- d) *Shall be positioned with the Automatic Officiating Equipment near the finish end with an unobstructed view of the finish of each lane*
- e) *Shall be fully familiar with the rules of swimming and the operation of the Automatic Officiating Equipment*
- f) *Shall ensure that the Automatic Officiating Equipment is activated manually to obtain placing when the system has failed to be activated by the starting signal.*

- Equipment and supplies required
  1. Rule book for reference
  2. Pencils and sharpener
  3. Meet information package and heat sheets
  4. Tape rolls and paper for results printing
  
- Before the start of racing
  1. Ensuring the proper set up of the equipment
  2. Ensure synchronization of the timing devices
  3. Test the start devices, touch pads, and plungers
  4. Test the outputs for the timing devices such as the data to the recorder/scorer and any scoreboards, and the paper output.
  
- Arranging for proper location of the equipment to ensure view of the finishes
  1. Best location is at the side of the pool with a clear view of all lanes and all touchpads. The preference is to be on a raised platform so nothing will interfere with the view of the end of the pool. A secure room away from all disturbances by persons not directly involved in the operation of the electronics is the ideal location.
  2. You must be accessible to the referee to resolve any timing problems. A telephone or radio system can accomplish this satisfactorily.

***Electronics Operator:***

***CSW 2.12.1.3 Shall operate, or assist in the operation of any SNC approved Automatic Officiating Equipment***

- Review the process with the electronics operators
  1. Review the meet format
  2. Review the set-up of the timing equipment, anticipated problems and their resolution to minimize disruption of the meet (ex: paper tape changes)
  3. Agree on the decision making process in the event of timing discrepancies, light or missed touches, or other timing issues
  
- Briefing with the referee, meet manager, and other officials
  1. Determine how the referee wishes to be involved in the decision process in the event of timing discrepancies.
  2. Advise the referee of the circumstances where the quality of the electronic timing cannot be judged (for example, official splits at the far end of a 50-metre pool).
  3. Remind the referee that it is very important that his/her order of finish always be taken, since in the event of a failure of both timing systems or discrepancies between times and places of swimmers, the placing of swimmers is a critical determining factor in reaching finish decisions.

**SW 11.2** *When Automatic Equipment is used, the results shall be recorded only to 1/100. When timing to 1/1000 is available, the third digit shall not be recorded or used to determine time or placement. In the event of equal times, all swimmers who have recorded the same time at 1/100 of a second shall be accorded the same placing. Times displayed on the electronic scoreboard shall show only to 1/100 of a second.*

- If a scoreboard is in use, determine if the scoreboard times will be used as official times (referee approval of the scoreboard), and agree on the procedure for the correction of a light touch or disqualification initially displayed, prior to final approval.
- Clarify with the starter and referee the signal or scoreboard condition that will inform them that the timing equipment is ready for the start of a new race. The resetting of the running time to zero or the clearing of all times from the scoreboard usually signifies this.
- The referee must watch the clock after the start of the race in order to ensure that time is running on the clock. The absence of a running time usually indicates that the electronic timing equipment did not receive a start, so no times will be available at the end of the race. The race usually must be re-started.
- Review the flow of data and paperwork with the chief finish judge, the recorder/scorer, and the clerk of course, and the meaning of any symbols or warnings produced by the timing equipment

**NOTE:** in the case where the ARES 21 computer system is in use, it is possible to restore the start without re-starting the race. It is dependent upon the length of race and ability of the electronics operator. This situation must be clarified to determine procedures and notifications that will be used.

**SW11.1** *The operation of Automatic Officiating Equipment shall be under the supervision of appointed officials. Times recorded by Automatic Officiating Equipment shall be used to determine the winner, all placing and the time applicable to each lane. The placing and times so determined shall have precedence over the decisions of the timekeepers. In the event that a breakdown of the Automatic Equipment occurs or that it is clearly indicated that there has been a failure of the Equipment, or that a swimmer has failed to activate the Equipment, the recordings of the timekeepers shall be official. (SW 13.3)*

- During the meet
  - Observe all touches to judge their quality. The Electronics Operators commonly perform this function, but the ultimate responsibility falls to the Chief Judge Electronics.

- Check for failures of the equipment or incorrect operation and attempt appropriate corrections. This must be done in consultation with the referee to minimize delays in the meet, and to expedite corrective action.
- In the event that a start is not received by one or the other of the primary or backup timing consoles, the start can and must be inserted so that accurate times can be obtained. The procedures for this form part of the training for the electronics operators.
- If no start time is available, a manual start can be inserted, so that at least the electronic equipment can obtain the relative order of finish.
- On the receipt of information from an electronics operator of a failure of the Automatic Officiating Equipment to properly record a time, oversee the correction of incorrect times by examining the results produced by the backup timing device or consulting with the referee. The proper procedures for this are laid out in rule SW 13.

**SW 2.9** *Where Automatic Officiating Equipment is used to judge the finish of a race, the chief finish judge must report the order of finish recorded by the Equipment after each race.*

- Be available for consultation by the referee and chief finish judge in the event of a discrepancy or dispute over times or placings.
  - Must be able to interpret the information received from the two systems to the satisfaction of the referee and in the adjudication of protests.
- After the meet
    - Remain available to the recorder/scorer to analyze any problems with the results. Current types of software based timing equipment store the raw data from each race, so it can be retrieved after the event is finished.
    - Debrief the electronics operator to correct any problems during the meet.
    - Discuss with the referee and meet manager any difficulties that were encountered.
  - Relationship to other officials:
    - The rules require that the CJE should inform the referee of malfunctions or other problems during the meet, but in practice many referees leave it all up to the CJE.
    - CJE makes most of the decisions about times and places sometimes in consultation with CFJ or referee. The referee has final responsibility for all decisions. This practice results from CJE having more complete knowledge of the reason for incorrect times and places and of how the equipment operates.

- In the event that the electronics are deemed correct, or when primary is not valid but backup is valid and used, the chief finish judge has only to report the order of finish recorded by the electronics to the referee (SW 2.9.3).

### ***Qualities of a Chief Judge Electronics***

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| <ul style="list-style-type: none"><li>• thorough knowledge of the rules of swimming</li><li>• Good eyesight</li><li>• Excellent judgement</li><li>• Patience</li><li>• Ability to focus</li><li>• Attentiveness</li><li>• Diplomacy</li></ul> | <ul style="list-style-type: none"><li>• Strong understanding of and belief in computers and electronics</li><li>• Sense of humour (as is true for all swimming officials!)</li><li>• Basic understanding of electronics</li><li>• Familiarity with high pressure troubleshooting</li></ul> |
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### ***Automatic Officiating Procedure:***

- The following rules are used to determine the official times and placings of swimmers in a race where Automatic Equipment is used. Below the rules are some examples of the output of automatic timing equipment that show some of the situations that the Chief Judge Electronics may face. The determination of time and place for each swimmer is based on the application of the rules.
- The examples shown include a situation where the automatic and semi-automatic systems fail to provide a time or place for a swimmer. In that event, the Referee must be consulted and the finish place of the swimmers affected are determined by referee' decision (denoted as "RD" on the results). In the event of a complete failure of the electronic timing primary and backup systems (such as when a start signal is not received, and the race is allowed to be completed), the referee must be informed. In consultation with meet management, the referee will decide how the race will be redone so times can be obtained.
- As one can imagine, it is not possible to anticipate all of the timing situations that may arise during a meet. Regular consultation with the referee is necessary to resolve some of the more difficult issues that will be encountered.

***SW 13.1*** *When Automatic Officiating Equipment (see FR 4) is used in any competition, the placing and times so determined and relay take-offs judged by such equipment shall have precedence over the timekeepers.*

*SW13.2 When the Automatic Officiating Equipment fails to record the place and/or time of one or more swimmers in a given race:*

(This happen if there is an Electronic system failure or a light touch by the swimmer)

- *SW 13.2.1 Record all available Automatic Equipment times and places*
- *SW 13.2.2 Record all human times and places*
- *SW 13.2.3 The official place determined as follows:*
  - *SW 13.2.3.1 A swimmer with an Automatic Equipment time and place must retain his relative order when compared with the other swimmers having an Automatic Equipment time and place within that race*
  - *SW 13.2.3.2 A swimmer not having an Automatic Equipment place but having an Automatic Equipment time will establish his relative order by comparing his Automatic Equipment time with the Automatic Equipment times of the other swimmers.*
  - *SW 13.2.3.3 A swimmer having neither an Automatic Equipment place nor an Automatic Equipment time shall establish his relative order by the time recorded by the Semi-Automatic Equipment or by three digital watches.*

*SW 13.3 The official time will be determined as follows:*

*SW 13.3.1 The official time for all swimmers having an Automatic Equipment time will be that time.*

*SW 13.3.2 The official time for all swimmers not having an Automatic Equipment time will be the three digital watches or the Semi-Automatic Equipment time.*

- When electronics fail, use 3 watches or plunger times to get an official time.
- **Electronic Times, Plunger Times, and Manual Times are treated equally if there is a failure in the primary time and a secondary time is needed. It is then that an official manual time in one lane is treated as equally as an electronic time in another lane.**

- 1) Usual situation

PRIMARY				BACKUP			
PL	LN	TIME		PL	LN	TIME	
1	4	1:09.00		1	4	1:09.75	* no light touches indicated
2	6	1:09.63		2	6	1:09.81	* electronics judged as valid
3	3	1:09.97		3	3	1:10.08	* all times and places stand
4	7	1:11.01		4	7	1:11.21	
5	8	1:12.24		5	8	1:12.37	
6	1	1:15.60		6	1	1:15.75	
7	5	1:17.00		7	5	1:17.13	
8	2	1:17.10		8	2	1:17.20	

- 2) Light touches

PRIMARY				BACKUP			
PL	LN	TIME		PL	LN	TIME	
1	4	1:09.00 M		1	4	1:07.01	* light touch indicated by M
2	6	1:09.63		2	6	1:09.45	* manual touch put in by OSM 6 operator
3	3	1:09.97		3	3	1:10.08	
4	7	1:11.01		4	7	1:11.21	* backup time will be used
5	8	1:12.24		5	8	1:12.37	* check lane 5 - is the time valid?
6	1	1:15.60		6	1	1:15.75	
7	5	1:17.00		7	5	1:16.22	
8	2	1:17.10		8	2	1:17.20	

- 3) Light touches and change in placing

PRIMARY				BACKUP			
PL	LN	TIME		PL	LN	TIME	
1	4	1:09.00		1	6	1:08.91	* light touch indicated by M
2	6	1:09.63 M		2	4	1:09.00	* touch put in by primary OSM 6 operator
3	3	1:09.97		3	3	1:10.08	
4	7	1:11.01		4	7	1:11.21	* backup operator judges time is valid
5	8	1:12.24		5	8	1:12.37	* backup time will be used
6	1	1:15.60		6	1	1:15.75	* placings will be changed
7	5	1:17.00		7	5	1:16.22	
8	2	1:17.10		8	2	1:17.20	

- 4a) Light touches on primary and backup

PRIMARY			BACKUP			
PL	LN	TIME	PL	LN	TIME	
1	4	1:09.00 M	1	4	1:09.14	* light touch indicated by M on primary
2	6	1:09.63 M	2	6	1:09.99 M	* light touch indicated by M on secondary for lane 6
3	3	1:09.97	3	3	1:10.08	* lane 4 time difference indicates that electronics were probably good
4	7	1:11.01	4	7	1:11.21	* placing of lane 6 must be checked with referee
5	8	1:12.24	5	8	1:12.37	
6	1	1:15.60	6	1	1:15.75	
7	5	1:17.00	7	5	1:16.22	
8	2	1:17.10	8	2	1:17.20	

- 4b) Official results

Referee Placing		Official Times and Placing			
1	6	1	6	1:09.00 RD	* referee placing deemed correct
2	4	1	4	1:09.00 RD	* fastest electronic time used for both swimmers
3	3	3	3	1:09.97	* swimmers declared as having the same time
4	7	4	7	1:11.01	* Referee's Decision places lane 6 as first place, marked with RD
5	8	5	8	1:12.24	
6	1	6	1	1:15.60	
7	5	7	5	1:16.22	
8	2	8	2	1:17.10	