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OFFICIAL COMMUNICATION

RELAY BREAK DETECTION IN SWIMMING

Automatic relay break detection was introduced by Omega for high-level competition at the Olympic Games in Los Angeles in 1984. This introduction was preceeded by a vast array of tests by Omega Electronics in Switzerland using pressure sensors, infra-red photocells and even photofinish equipment to justify the technology.

Unlike the start of a swimming event, the swimmer entering the water during a relay take-over has not actually started until he/she has lost all contact with the start block. For the actual start of a race, any kind of movement before the start signal is given is deemed a false start.

As such, during a relay take-over, the swimmer may be almost horizontal (that is, parallel with the water), yet with even with one toe in contact with the start block, the actual start has not taken place.

The method of detecting the start used in the OSB-6 and OSB-7 devices is the use of a contact built into the top of the block/platform in the form of 'anti-vibration mounting' giving the resilience against the movement of the swimmer. That is to say, it is the force exerted by the swimmer which operates the false start detection, not the pure movement.

The tests carried out in 1982, 1983 and 1984 showed very clearly that there was a small – yet very consistent – time difference between the force of the swimmer operating the contact, and the swimmer's toes finally leaving the block and this was in the region of 0.024 to 0.027 of a second.

For this reason, it was agreed during discussions between Omega Sports Timing and FINA that a tolerance of 0.03 seconds would be given in favour of the swimmer before a relay break (or relay 'false start') is identified.

Since 1984, there have been many claims, that the tolerance should, in fact, be 0.00. **THIS IS ABSOLUTELY NOT TRUE!**

The above explanation details precisely why this 0.03 tolerance is given and it is important to note that OSM-6 and ARES indicate the net relay take-over time and do not 'adjust' the time by a 0.03 second increment. As such, the time printed out from either ARES or OSM-6 is the <u>actual</u> relay takeover time. If the difference (Δt) is more than –0.03, then a relay break has occurred.
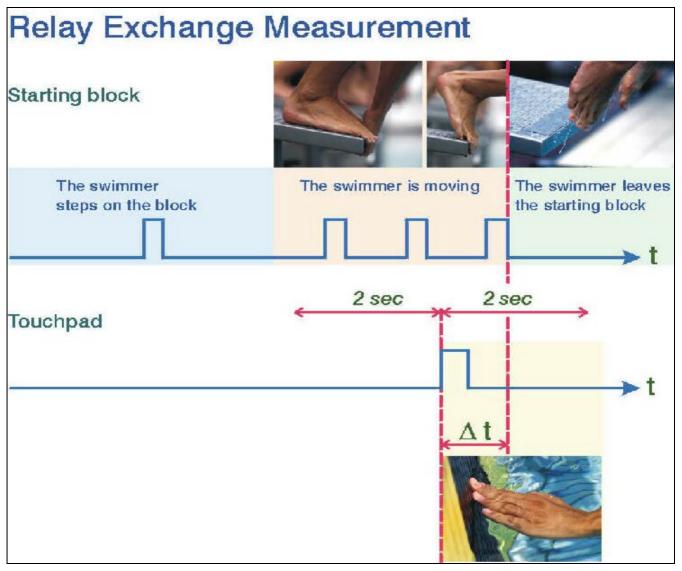
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Principle of relays measurements in Swimming with ARES

- All impulses from the touchpads and starting blocks are registered and memorized.

- At the moment the swimmer touches the pad, the ARES is looking for the last registered impulse from the starting block, within a window of 4 seconds, (from 2 seconds before the touch on the pad until 2 seconds after).

- The result (Δt) is issued 2 seconds after the touch on the pad.

- The result (Δt) is marked with a minus (-) sign if the swimmer has left the starting-block before his team mate has touched the pad.

Note: Both LEN (in 1995) and FINA (on 4.5.1998) have approved this process on the relay take over detection.