The other significant factor influencing tag performance is polarity - the way the RFID signals are emitted from the antenna.

The aerials used in the ChronoTrack systems have linear polarisation. Linear polarised antennas must have a compatible RFID tag orientation. With ChronoTrack B-Tags for best performance this means the tag should cross the aerial's field in as close as possible to a vertical orientation.

Because we have differing body shapes, bib placement (**B**) has a significant influence on bib angle and consequently tag orientation.

Good reads | Reduced tag read strength | Poor reads

The above illustration indicates the impact of the orientation of the tag in relation to the orientation of the fields produced by the timing antennae.

All negative impacts from bib angle /tag orientation are in addition to any negative impacts on read strength caused from physical interference.

Having your competitors wear their bib as recommended in our guides and overleaf will ensure they enjoy the best possible B-tag read strength.

As we advise in our fitting guides, the bib tags can be damaged by folding or creasing the bib. Some triathletes and ultra distance runners in particular "crumple" their bib to make the bib "more flexible."

Once a tag is damaged no amount of care in placement of the bib will enable the tag to read.

We trust you and your competitors will have a great event.

Please contact us with any queries.

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ATHLINKS CHRONOTRACK CERTIFIED TIMER

the timing team
Sports Event Timing

Bib Tag timing: how it works

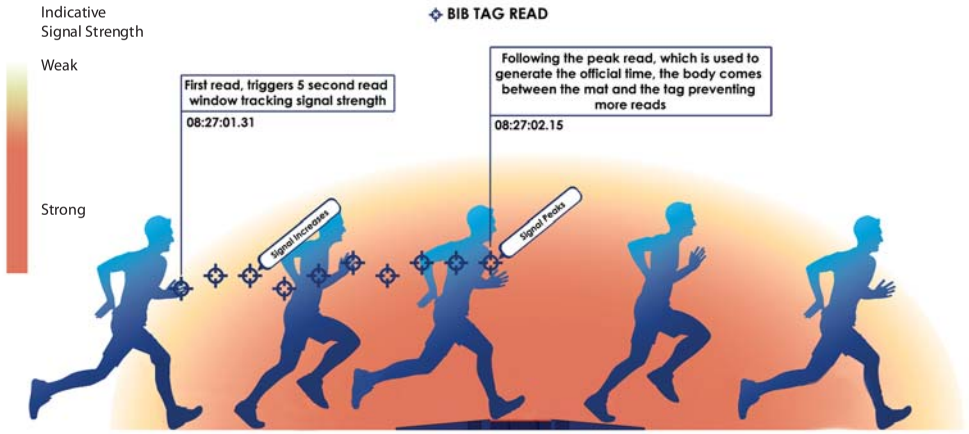
We want to help you get the best performance from your bib tags.

We use ChronoTrack bib tags for many types of events including running and cycling. We set up our timing system to get the best possible read rate from the tags. What the entrants do with their bibs has a significant impact on the performance of the bib tags.

We produce fitting guides for each event type using ChronoTrack B-Tags. Here we explain why we ask that these instructions be followed.

ChronoTrack's B-Tags are high performance Ultra High Frequency RFID (Radio-frequency identification) tags. RFID systems consist of three components: an RFID tag, an RFID reader, and antennae.

RFID tags contain an integrated circuit and an antenna, which are used to transmit data to the RFID reader (also called an interrogator).



CHRONOTRACK

ChronoTrack's B-Tags are passive tags. As passive tags they acquire energy from the RFID reader's interrogating radio waves. The tags contain electronically-stored information - a numerical code for the event, and the "bib" number. The tags do not contain any personal data about the wearer.

The data from the activated B-tag along with the "time stamp" is sent to the timing software.

The timing software integrates this data with the entrant data attributed to each bib number (B-tag) to enable results to be calculated.

UHF RFID tags will not read through water, and this doesn't just mean your hydration system.

The adult human body averages 50-65% water, so if you attach a bib to your back, your body is stopping the tag from receiving and responding to the UHF RFID signals.

For the same reason, if someone piggy-backs a friend over the finish line they stop their friend's bib tags from being read.

We all have differing body shapes: from variations on ectomorph through mesomorph through to variations on endomorph.

Body type can impact on RFID tag performance.

Any negative impacts of body shape can be mitigated by the placement of the bib as recommended in our fitting guides.

We aim to have the bib and tags in the highest strength read zone of the aerials. The images on the right show **(B)** how this can be achieved following our fitting recommendations

As there is more water in human bones than human fat tissue the impact of body shape on RFID tags is not restricted to those competitors with pronounced endomorphic profiles.

It is somewhat ironic that those entrants who cross their arms over their bib to punch the start and/or finishtime into their smart watch are those more likely to have a lower tag read strength than entrants who leave their watches alone.

Dense materials such as a wet hoodie covering bib and tags can also reduce read strength, as can a generous coating of mud.

Interference is why at cycling events we request not to attach a MTB numberplate with tag directly to handle bars, or wrap a seat post kit around a seatbag or seat post mounted drink bottles.

By following our fitting recommendations your participants will enjoy the full benefits of using a ChronoTrack B-Tag.