

# Tests for electronic 'kick stick' sensors

**NOTE:** It is proposed that these tests are inserted into a renamed S10 Annex 6 "GNSS Flight Recorders and other electronic devices". The exact method of insertion is at the discretion of the S10 Editor. This is draft 3, 28 Aug 2008.

When automatic devices are used to capture the time or validity of a kick to a slalom pole, the device shall conform to the following standard.

## GENERAL SPECIFICATION

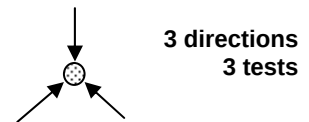
These tests are designed so manufacturers can create systems to a standard requirement, but are also designed to be so simple that it is possible to quickly demonstrate before, during or after a task that the system does indeed meet the minimum standard.

When a particular system is used for the first time in a championship, manual timing according to the standard rules for a 'strike' must also be done simultaneously with the electronic timing. If it can be demonstrated there were NO errors with the electronic system and it still passes the tests after the task, the system may be used without manual timing in future.

This specification shall only apply when the tests and the tasks are conducted using standard FIS (Federation Internationale du Ski) approved slalom poles.<sup>1</sup>

The device may be internal or external to the pole but it must be arranged such that there is little or no risk of the device injuring the crew or damaging the aircraft whilst an attempt is being made to strike the stick in flight.

Each of the three tests must be made three times from three equally divided directions. At least all nine tests must succeed consecutively but it is expected that in general use it will be reliable enough that there will be no device errors in a typical international championship. It is to be noted that reliability will generally be better in systems designed to easily pass these tests.



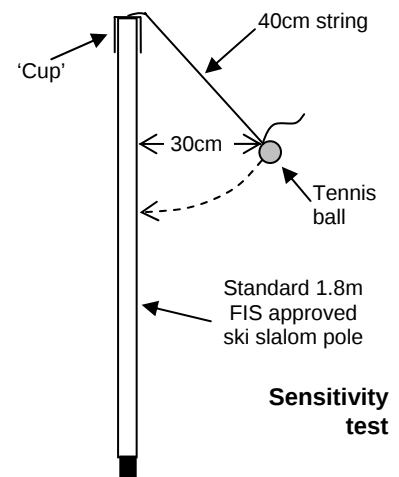
### 1. SENSITIVITY

*This is a test to establish that the sensor will reliably register 'the minimum strike' and no further secondary strikes.*

A 'cup and ball' device of the stated dimensions is fitted to the slalom pole.

With the pole in a vertical position, the tester pulls the ball away from the pole by holding the short string until it is 30cm from the pole, then releases it from a stationary position to swing and strike the pole. The device must register only the first strike of the ball on the pole.

The 'cup' may be made of any lightweight material of a size which fits reasonably well over the top of the slalom pole, eg an aluminium drinks can cut in half. The 40cm string derives from the centre of the cup to the ball which is a standard tennis ball. A third 30cm string may be fitted to the device as a measure of the distance from the pole that the ball must be released.



### 2. WAVING IN THE WIND

*This is a test to establish that the device will reliably NOT register a 'strike' when the propeller blast of an aircraft passing close by causes the pole to wave around in the wind.*

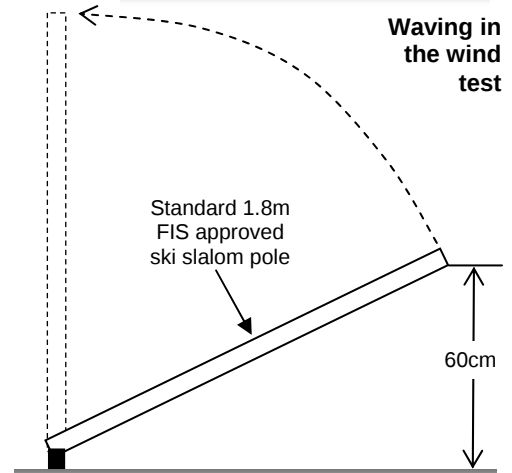
The vertical pole is bent over until the tip is 60cm from the ground; then the pole is released gently.

The device must NOT register any 'strike' on the pole between release and when it comes to rest back in the vertical position.

### 3. MULTIPLE STRIKE

*This is a test to establish that the device will only register the first 'strike' and not secondary ones, eg if the pole is struck sufficiently hard that it subsequently hits the ground one or more times.*

The vertical pole is struck with sufficient force by a hard object that it hits the ground after being struck. The first strike must register, the secondary strike(s) on the ground must NOT be registered.



<sup>1</sup> The full specification of FIS slalom poles can be found at <http://www.fis-ski.com/data/document/kipspeze.pdf>