Explanation on the workings of the Virtual Chicane.

Date: 04.02.2023

Release: R2.0

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Purpose: To explain the use of an electronic means to slow competition cars during a Hillclimb or sprint event.

Chicanes are used to slow competitors as they approach a hazard on the course or to limit top speeds reached.

Workings of the system.

The following explanation should be read in conjunction with Figure 1.

Simply put the system consists of 4 electronic sensors placed at equidistant positions along the side of the road in the desired area. These sensors are monitored by a controller which can calculate the time taken for the competition car to pass between sensors. From this the speed of the car can be calculated. The system is accurate to nano second (nS) intervals.

The system displays the speed measured by means of a speed indicator similar in concept to that used by various county councils when entering villages and towns throughout Ireland. The version we have developed is different in that it is instantaneous and displays the speed in real time to the driver with no delay. In conjunction to the speed display we also use a pass (green lamp) / fail (red lamp) light system.

The White flag marshal at the virtual chicane (Judge of fact) will also have a visual indication. If the driver fails to reduce speed to the required level, the marshal will raise the white flag informing the driver that the run is forfeit. The White flag marshal will also record and then radio / Whatsapp the timing crew to inform the timekeeper that the run is forfeit for that car number.

We are using a lazer type sensor to detect the cars as they pass though the system and these are not effected by reflective tapes / sunlight / rain etc.

As per Figure 1, the distance between sensors is fixed at 10 m intervals and the required speed is set to 70 Kph. This will be the same for all events and will allow the drivers to get used to a braking strategy for the chicane.

Typical operation.

The virtual chicane will be sign posted as is common practice presently. The three, two, one signs will be at 3 x 50 m intervals (Hillclimb specification) coming up to the chicane.

50m after the ‘one board’ there will be a green board with white stripe. This denotes the start of the control or monitoring area.

As the driver approaches the virtual chicane, the system is off. On breaking the first beam of the detection zone, the red lamp facing the driver will turn on solid red, denoting that the system has started.

The vehicle must slow to under 70 kph between detection positions 1 & 2 / 1 & 3 or 1 & 4, i.e. the car must be measured below 70 kph at position 2 / 3 or 4. (See Fig.1)

As the car passes detect position 2, the speed the car is travelling is displayed on the speed indicator. As the car passes detect position 3 the speed shown on the indicator is updated to the new calcuated speed at position 3 and as the car breaks detect position 4 the speed is updated for the last and final time.

If the speed is measured below 70 Kph at position 2 / 3 or 4 then the red lamp goes off and the green lamp goes on.

The driver on achieving the desired speed is then free to accelerate. The driver does not need to drive through the chicane at 70kph, they just need to be below 70 kph at one of the detection points.

If a car fails to slow below 70kph on reaching the red board with stripe, then the red lamp will be on on leaving the control area and this driver will forfeit their run.

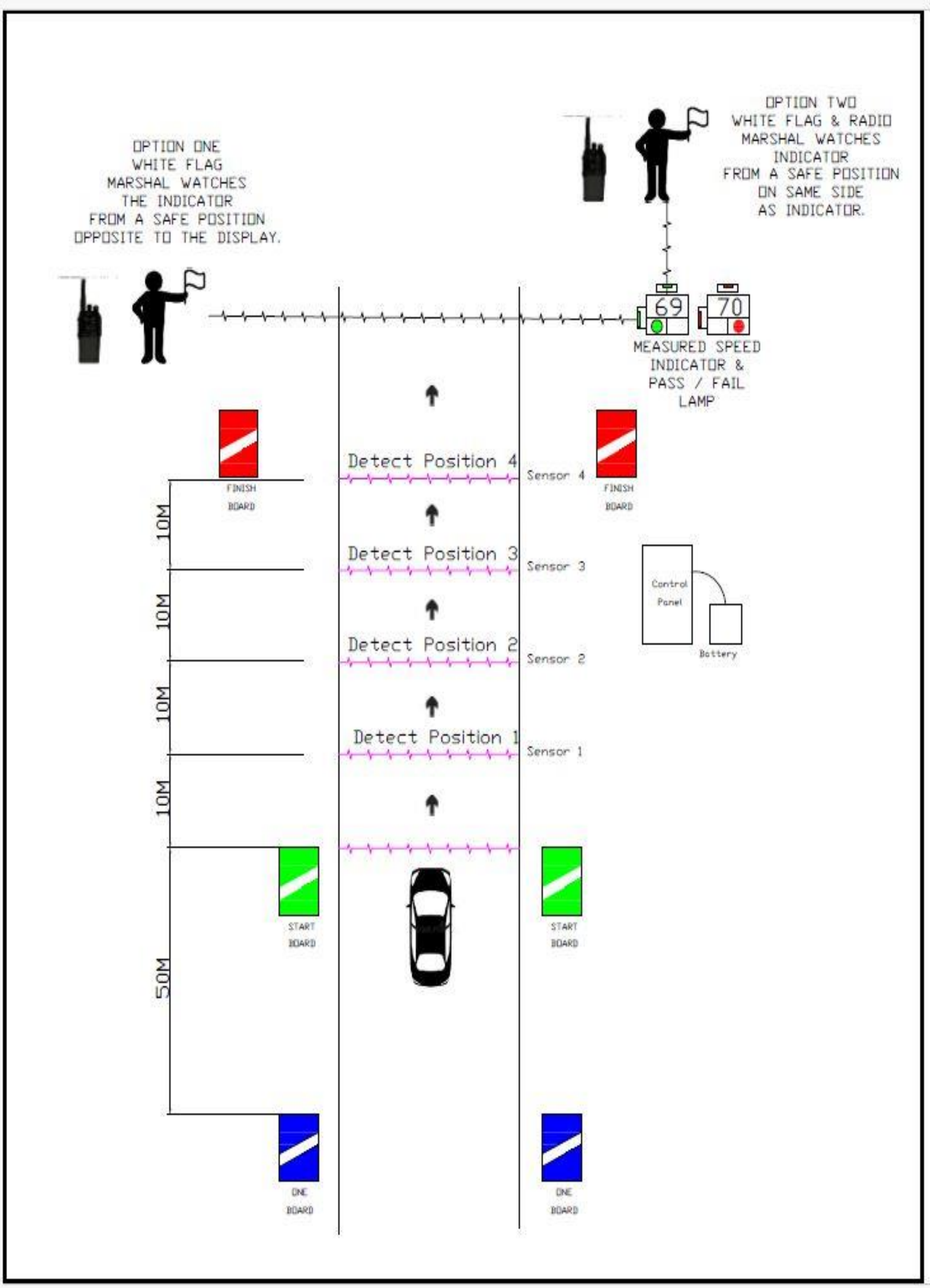
Two seconds after the car leaves the controlled area, the system resets in anticipation of the next car. If a car arrives into the chicane before it has reset, this should be treated as a baulked run for the second car.

Judge of Fact

The white flag marshal responsible for the chicane area will also have their own specific light and reflects exactly what the driver is seeing. If a competitor passes the final detection point and the lamp is not green, then the marshal should raise the white flag denoting the run is forfeit. He / she then contacts the timekeeper and the competitors time for the run is forfeit.

Depending on the geography of the location and a suitable safe location for the white flag marshal, the marshal can be on the opposite side of the road to the visual indicator or can be positioned further along the road on the same side as the visual indicator. (See Fig.1)

Figure 1: -


OPTION ONE
WHITE FLAG
MARSHAL WATCHES
THE INDICATOR
FROM A SAFE POSITION
OPPOSITE TO THE DISPLAY.
OPTION TWO
WHITE FLAG & RADIO
MARSHAL WATCHES
INDICATOR
FROM A SAFE POSITION
ON SAME SIDE
AS INDICATOR.
69
70
MEASURED SPEED
INDICATOR &
PASS / FAIL
LAMP
FINISH
BOARD
Detect Position 4
Sensor 4
FINISH
BOARD
10M
Detect Position 3
Sensor 3
Control
Panel
Battery
10M
Detect Position 2
Sensor 2
10M
Detect Position 1
Sensor 1
10M
START
BOARD
START
BOARD
50M
ONE
BOARD
ONE
BOARD