

# FIFA to test goal-line technologies

World governing body FIFA will put two rival goal-detecting technologies to the tournament test at the upcoming Club World Cup in Japan, with a view to using the most accurate system at the 2014 World Cup in Brazil

**GOALREF:** Low cost, works even in crowded goalmouth but no visual engagement with crowd or TV viewers

**Antennae:** 10 mounted on goalposts and crossbar

**Magnetic field:** Covers entire goalmouth

**Antenna exciter:** Partially below ground on goal line

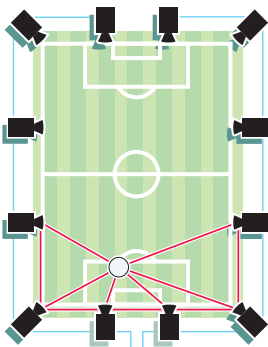
**Ball:** Three copper coils between bladder and surface panels

Antenna system activated when ball enters goal area – signal transmitted to referee in under 0.5 seconds once ball fully crosses magnetic field

## HAWK-EYE

**Cameras:** Six high-speed, high-resolution cameras around each goal area

**Position:** 3D location of ball calculated by triangulation from at least three cameras



**Trajectory:** Position of ball mapped for each frame to enable exact prediction of location within 3.6mm

Provides instant 3D TV replay, but ineffective if ball is obscured and installation costs are high

