CLAIMS

1. A system for detecting the presence of objects and for estimating their direction and distance in three dimensions, comprising:

- a transmission device ~~(201, 301)~~ configured so as to transmit signals using a colored transmission method in a first plane,
- a reception device comprising at least two sensors ~~(211, 212, 311, 312, 411, 412)~~ arranged in a second plane perpendicular to the first plane, and
- processing means ~~(230, 330)~~ for processing the transmitted and received signals,

the detection system being characterized in that the processing means are configured so as to detect the presence of objects and estimate their direction and distance:

- in the first plane based on the signals received from at least one of the sensors of the reception device using the color of the transmitted signal,
- in the second plane based on the signals received from at least two of the sensors of the reception device,

and in that the transmission device and the reception device are separate, the reception device being raised with respect to the transmission device.

2. The three-dimensional object detection system as claimed in claim 1, wherein each <u>of the at least two sensors</u> comprises a radiating element that is omnidirectional in the first plane.

3. The three-dimensional object detection system as claimed in either of claims 1 and 2, wherein the first plane is a horizontal plane, and wherein the sensors ~~(211, 212, 213, 214, 215)~~ are arranged in a vertical plane.

4. The three-dimensional object detection system as claimed in claim 3, wherein the sensors of the reception device are connected by a cable and suspended under an airborne device ~~(221)~~.

5. The three-dimensional object detection system as claimed in either of claims 3 and 4, wherein just one sensor is used to detect the presence of objects and estimate their direction and distance in the first plane.

6. The three-dimensional object detection system as claimed in either of claims 1 and 2, wherein the first plane is a vertical plane, and wherein the sensors ~~(311, 411)~~ are arranged in a horizontal plane.

7. The three-dimensional object detection system as claimed in claim 6, wherein the sensors ~~(311, 312, 313, 314, 315)~~ are arranged in a row, the system furthermore having means for removing ambiguities regarding the position of the objects with respect to the sensors in the horizontal plane.

8. The three-dimensional object detection system as claimed in claim 6, wherein the sensors ~~(411, 412, 413, 414, 415, 416)~~ are arranged so as to form a triangle, the detection of the presence of objects and the estimation of their direction and distance in the horizontal plane being performed for each branch of the triangle, respectively, and then combined so as to remove ambiguities regarding the position of the objects with respect to the sensors in the horizontal plane.

9. The three-dimensional object detection system as claimed in one of the preceding claims, wherein the sensors of the reception device are connected to the processing means by a fiber-optic link ~~(220, 320)~~, the sensors furthermore comprising means for converting the received signals to optical signals.

10. The three-dimensional object detection system as claimed in one of the preceding claims, wherein the detection of the presence of objects and the estimation of their direction and distance in the second plane comprises implementing an interferometry method or a high-resolution processing operation on the signals received from the at least two sensors of the reception

device~~receive antenna~~, or by utilizing the directivity of an array antenna formed by the at least two sensors of the reception device~~receive antenna~~.

11. A method for implementing detection of the presence of objects and for estimating their direction and distance in three dimensions in a detection system comprising:

- a transmission device ~~(201, 301)~~ configured so as to transmit signals using a colored transmission method in a first plane,
- a reception device comprising at least two sensors ~~(211, 212, 311, 312, 411, 412)~~ arranged in a second plane perpendicular to the first plane, and
- processing means ~~(230, 330)~~ for processing the transmitted and received signals, the method being characterized in that it comprises separately positioning the transmission device and the reception device such that the reception device is raised with respect to the transmission device, and in that it comprises the steps of:
- transmitting ~~(601)~~ a signal using the~~a~~ colored transmission method in ~~a~~ the first plane,
- receiving ~~(602)~~ signals from the at least two sensors arranged in ~~a~~ the second plane perpendicular to the first plane, and
- determining the presence of objects and estimating their direction and distance ~~(603)~~ in the first plane by utilizing the color properties of the signal received by at least one of the sensors, and in the second plane based on the signals received from at least two of the sensors.