

Figure 1

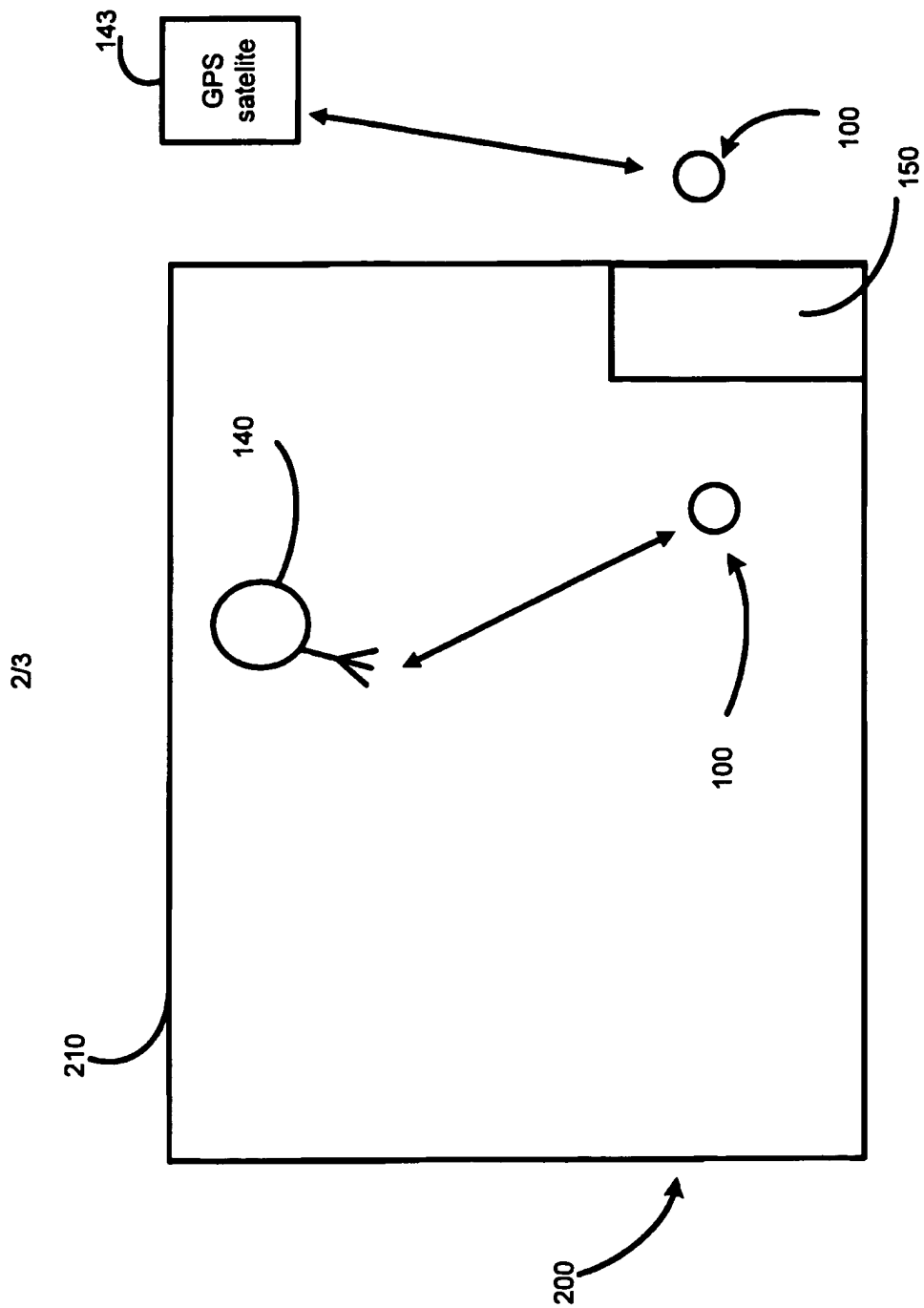


Figure 2

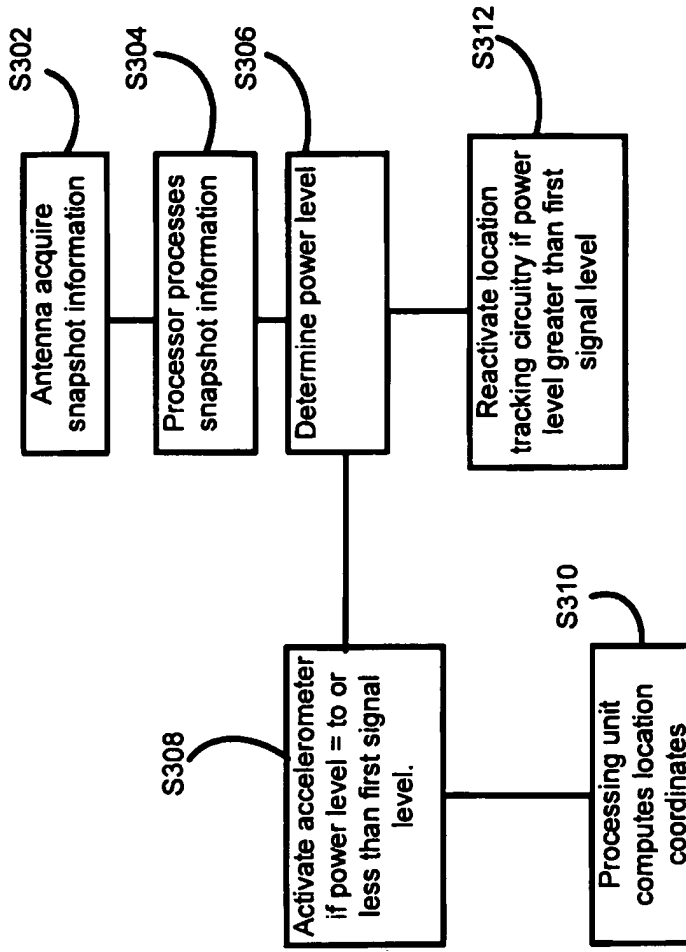


Figure 3

LBTECH.012A

PATENT

APPARATUS AND METHOD FOR DETERMINING LOCATION AND TRACKING
COORDINATES OF A TRACKING DEVICE

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Related Applications

This application incorporates by reference in their entirety: U.S. patent application Serial No. 11/753,979 filed on May 25, 2007, entitled "Apparatus and Method for Providing Location Information on Individuals and Objects Using Tracking Devices";
10 U.S. patent application Serial No. 11/933,024 filed on October 31, 2007, entitled "Apparatus and Method for Manufacturing an Electronic Package"; US patent application Serial No. 11/784,400 filed on April 5, 2007, entitled "Communication System and Method Including Dual Mode Capability"; US patent application Serial No. 11/784,318 filed on April 5, 2007, entitled "Communication System and Method Including
15 Communication Billing Options"; and US patent application Serial No. 11/935,901 filed on November 6, 2007, entitled "System and Method for Creating and Managing a Personalized Web Interface for Monitoring Location Information on Individuals and Objects Using Tracking Devices."

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Background of the Invention

1. Field of the Invention

The invention relates generally to the field of location and tracking communication systems. More particularly, the present invention relates in one embodiment to an accelerometer incorporated as part of portable electronic tracking
25 device for individuals and objects to improve monitoring by a wireless location and tracking system and/or wireless communication system (WCS).

2. Description of Related Technology

Accelerometers are conventionally integrated into electronics systems that are
30 part of a vehicle, vessel, and airplane to detect, measure, and monitor deflections, vibrations, and acceleration. Accelerometers, for example, may include one or more

Micro Electro-Mechanical System (MEMS) devices. In particular, MEMS devices include one or more suspended cantilever beams (e.g., single-axis, dual-axis, and three-axis models), as well as deflection sensing circuitry. Accelerometers are utilized by a multitude of electronics manufacturers.

5 For instance, electronics gaming manufacturers exploit an accelerometer's deflection sensing capability, for instance, to measure device tilt and control game functionality. In another instance, consumer electronics manufacturers, e.g., Apple, Ericsson, and Nike, incorporate accelerometers in personal electronic devices, e.g., Apple iPhone to provide a changeable screen display orientation that toggles between portrait
10 and landscape layout window settings; to manage human inputs through a human interface, e.g., Apple iPod® touch screen interface; and to measure game movement and tilt, e.g., Wii gaming remotes. Still others including automobile electronics circuitry manufacturers utilize MEMS accelerometers to initiate airbag deployment in accordance with a detected collision severity level by measuring negative vehicle acceleration.

15 Other electronics manufacturer products, e.g., Nokia 5500 sport, count step motions using a 3D accelerometer, and translate user information via user's taps or shaking motion to select song titles and to enable mp3 player track switching. In another instance, portable or laptop computers include hard-disk drives integrated with an accelerometer to detect displacement or falling incidents. For instance, when a hard-disk
20 accelerometer detects a low-g condition, e.g., indicating free-fall and expected shock, a hard-disk write feature may be temporarily disabled to avoid accidental data overwriting and prevent stored data corruption. After free-fall and expected shock, the hard-disk write feature is enabled to allow data to be written to one or more hard-disk tracks. Still others including medical product manufacturers utilize accelerometers to measure depth
25 of Cardio Pulmonary Resuscitation (CPR) chest compressions. Sportswear manufacturers, e.g., Nike sports watches and footwear, incorporate accelerometers to feedback speed and distance to a runner via a connected iPod® Nano.

Still others including manufacturers of conventional inertial navigation systems deploy one or more accelerometers as part of, for instance, on-board electronics of a
30 vehicle, vessel, train and/or airplane. In addition to accelerometer measurements, conventional inertial navigation systems integrate one or more gyroscopes with the on-

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