point **522** is capable of generating a signal at the same time. In the simplest case, a signal is produced each time an object is positioned over a sensing point **522**. When an object is placed over multiple sensing points **522** or when the object is moved between or over multiple sensing points **522**, multiple signals are generated.

[**0066**] The number and configuration of the sensing points **522** may be widely varied. The number of sensing points **522** generally depends on the desired sensitivity as well as the desired transparency of the touch screen **518**. More nodes or sensing points generally increases sensitivity, but reduces transparency (and vice versa). With regard to configuration, the sensing points **522** generally map the touch screen plane into a coordinate system such as a Cartesian coordinate system, a Polar coordinate system, or some other coordinate system. When a Cartesian coordinate system is used (as shown), the sensing points **522** typically correspond to x and y coordinates. When a Polar coordinate system is used, the sensing points typically correspond to radial (r) and angular coordinates (θ).

[**0067**] The touch screen **518** may include a sensing circuit **524** that acquires the data from the sensing device **520** and that supplies the acquired data to the processor **502**. Alternatively, the processor **502** or a separate touch screen driver/interface **525** may include this functionality. In one embodiment, the sensing circuit **524** is configured to send raw data to the processor **502** so that the processor **502** processes the raw data. For example, the processor **502** receives data from the sensing circuit **524** and then determines how the data is to be used within the computer system **500**. The data may include the coordinates of each sensing point **522** as well as the pressure exerted on each sensing point **522**. In another embodiment, the sensing circuit **524** is configured to process the raw data itself. That is, the sensing circuit **524** reads the pulses from the sensing points **522** and turns them into data that the processor **502** can understand. The sensing circuit **524** may perform filtering and/or conversion processes. Filtering processes are typically implemented to reduce a busy data stream so that the processor **502** is not overloaded with redundant or non-essential data. The conversion processes may be implemented to adjust the raw data before sending or reporting them to the processor **502**. The conversions may include determining the center point for each touch region (e.g., centroid).

[**0068**] The sensing circuit **524** may include a storage element for storing a touch screen program, which is capable of controlling different aspects of the touch screen **518**. For example, the touch screen program may contain what value(s) to output based on the sensing points **522** selected (e.g., coordinates). In fact, the sensing circuit in conjunction with the touch screen program may follow a predetermined communication protocol. As is generally well known, communication protocols are a set of rules and procedures for exchanging data between two devices. Communication protocols typically transmit information in data blocks or packets that contain the data to be transmitted, the data required to direct the packet to its destination, and the data that corrects errors that occur along the way. By way of example, the sensing circuit may place the data in a HID format (Human Interface Device).

[**0069**] The sensing circuit **524** generally includes one or more microcontrollers, each of which monitors one or more sensing points **522**. The microcontrollers may, for example, correspond to an Application Specific Integrated Circuit (ASIC), which works with firmware to monitor the signals from the sensing device **520** and to process the monitored signals and to report this information to the processor **502**.

[**0070**] In accordance with one embodiment, the sensing device **524** is based on capacitance. As should be appreciated, whenever two electrically conductive members come close to one another without actually touching, their electric fields interact to form capacitance. In most cases, the first electrically conductive member is a sensing point **522** and the second electrically conductive member is an object **526** such as a finger. As the object **526** approaches the surface of the touch screen **518**, a tiny capacitance forms between the object **526** and the sensing points **522** in close proximity to the object **526**. By detecting changes in capacitance at each of the sensing points **522** and noting the position of the sensing points, the sensing circuit can recognize multiple objects, and determine the location, pressure, direction, speed and acceleration of the objects **80** as they are moved across the touch screen **70**. For example, the sensing circuit can determine when and where each of the fingers and palm of one or more hands are touching as well as the pressure being exerted by the finger and palm of the hand(s) at the same time.

[**0071**] The simplicity of capacitance allows for a great deal of flexibility in design and construction of the sensing device **520**. By way of example, the sensing device **520** may be based on self capacitance or mutual capacitance. In self capacitance, each of the sensing points **522** is provided by an individually charged electrode. As an object approaches the surface of the touch screen **518**, the object capacitive couples to those electrodes in close proximity to the object thereby stealing charge away from the electrodes. The amount of charge in each of the electrodes is measured by the sensing circuit **524** to determine the positions of multiple objects when they touch the touch screen **518**. In mutual capacitance, the sensing device **520** includes a two layer grid of spatially separated lines or wires. In the simplest case, the upper layer includes lines in rows while the lower layer includes lines in columns (e.g., orthogonal). The sensing points **522** are provided at the intersections of the rows and columns. During operation, the rows are charged and the charge capacitively couples to the columns at the intersection. As an object approaches the surface of the touch screen, the object capacitive couples to the rows at the intersections in close proximity to the object thereby stealing charge away from the rows and therefore the columns as well. The amount of charge in each of the columns is measured by the sensing circuit **524** to determine the positions of multiple objects when they touch the touch screen **518**.

[**0072**] The various aspects, embodiments, implementations or features of the invention can be used separately or in any combination.

[**0073**] The invention is preferably implemented by hardware, software or a combination of hardware and software. The software can also be embodied as computer readable code on a computer readable medium. The computer readable medium is any data storage device that can store data which can thereafter be read by a computer system. Examples of the computer readable medium include read-only memory, random-access memory, CD-ROMs, DVDs,