static DC level, on one of its IO pins **92**, which is used in this case as an output. The signal is provided to a vertical stripe **94**. The vertical stripe **94** has a normally non-contact junction with horizontal stripe **96**, which in turn is connected to a pull down resistor **98**. As long as the vertical conductor **94** does not touch horizontal conductor **96**, pull down resistor **98** forces the input voltage on PLD input pin **100**, which is connected to horizontal conductor **96** to a low level. Finger pressure connects the vertical **94** and horizontal **96** stripes, causing the high voltage of the out pin **92** to be transferred to the in pin **100**. The high level detected at the PLD input is interpreted as touch detection.

[**0124**] Preferably, DSP **84** controls the configuration and status of the IO pins of the PLD **91**. The DSP **84** determines which of the pins currently provides an output or trigger signal and which is set for detecting input. That is to say it determines which of the I/O pins is set to '1' and which is set to '0' and it reads the level on the input pins. It should be noted that more than one output could be set to '1' at the same time, and likewise with '0'.

[**0125**] Reference is now made to **FIG. 9**, which is a flow chart showing a first preferred embodiment of a procedure for cycling through the touch detectors in order to detect simultaneous multiple finger touches. In accordance with the procedure of **FIG. 9**, multiple touch detection is achieved by looping over each one of the pressure stripes in one of the grid axes, one stripe at a time, and reading, one after the other, the signal on each one of the grid stripes on the orthogonal axis.

[**0126**] In more detail, one of the axes, either vertical or horizontal, is selected for triggering and the other for reading. In the axis selected for reading, say the horizontal axis, each stripe is set to input, which in practice means a low state, typically by means of a pull down resistor as described above. Then the first of the stripes in the orthogonal axis, say the vertical axis, is set to one. Each of the horizontal stripes is now read. The presence of a one on any of the horizontal stripes indicates a finger at the junction between that horizontal stripe and the first vertical stripe. The process is repeated one by one for each of the vertical stripes until the entire screen has been scanned.

[**0127**] The cycle, in order to achieve reliable results, is preferably carried out at a rate that is at least as high as the highest rate that fingers are likely to type over the screen. The disadvantage of the procedure of **FIG. 9** is the large number of detection steps. The procedure requires n*m steps, where n stands for the number of vertical stripes and m for the number of horizontal stripes, and it is hard to achieve the above described rate using such a procedure.

[**0128**] Reference is now made to **FIG. 10**, which is a simplified flow chart showing a faster procedure for detecting multiple touches. A signal, typically '1', is applied to a group of stripes on one axis. The group may typically be all of the stripes in that axis. Subsequently, inputs for each of the stripes on the other axis are read one after the other. Then, the same signal is applied to a group of stripes on the second axis, and readings are made at each one of the stripes on the first axis. If the groups used are the entire axis, then the procedure of **FIG. 10** requires n+m steps, a considerable reduction on that of **FIG. 9**. However, the procedure is unable to distinguish between all possible touch combinations and is therefore only partly reliable. In particular, if two or more signal detections are present in each axis then ambiguity arises.

[**0129**] Reference is now made to **FIG. 11**, which is a simplified flow chart showing a third preferred embodiment of a procedure for detecting multiple touches.

[**0130**] In the embodiment of **FIG. 11**, both the procedures of **FIGS. 9 and 10** are combined to produce a fully reliable detection algorithm. A first stage of the procedure of **FIG. 11** is simply the carrying out of the procedure of **FIG. 10**. Namely a first signal is applied to all of the stripes in one axis and a response is looked for on the other axis. Then, a second signal is applied to all of the stripes on the other axis while looking for a response on the first axis.

[**0131**] The results of the procedure of **FIG. 10** are used to determine whether an ambiguity exists and, if so, to decide which stripes can be considered as suspect stripes. An ambiguity is deemed to exist if both axes give more than one detection signal. A suspect stripe in such a case is any stripe which has given rise to a detection signal. In such a case the ambiguity is to be resolved. In order to achieve such a resolution, the algorithm loops over each of the suspected stripes in one of the axes, one after the other, and looks for a response on each one of the suspected stripes on the other axis. The procedure is thus able to provide unambiguous results at little cost to the processing time, since, unless an ambiguity is present, the number of steps remains at n+m. If an ambiguity is present then the number of additional steps that is added is simply the product of suspect stripes. In a preferred embodiment the axis selected for the loop is the axis with the smaller number of suspected stripes. Thus for p suspect stripes on the first axis and q suspect stripes on the second axis, the total number of steps is n+m+(q*p).

[**0132**] Additional objects, advantages, and novel features of the present invention will become apparent to one ordinarily skilled in the art upon examination of the following examples, which are not intended to be limiting. Additionally, each of the various embodiments and aspects of the present invention as delineated hereinabove and as claimed in the claims section below finds experimental support in the following examples.

[**0133**] It is appreciated that certain features of the invention, which are, for clarity, described in the context of separate embodiments, may also be provided in combination in a single embodiment. Conversely, various features of the invention, which are, for brevity, described in the context of a single embodiment, may also be provided separately or in any suitable subcombination.

[**0134**] Although the invention has been described in conjunction with specific embodiments thereof, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art. Accordingly, it is intended to embrace all such alternatives, modifications and variations that fall within the spirit and broad scope of the appended claims. All publications, patents and patent applications mentioned in this specification are herein incorporated in their entirety by reference into the specification, to the same extent as if each individual publication, patent or patent application was specifically and individually indicated to be incorporated herein by reference. In addition, citation or identification of any reference in this application