computing an average hand contact position from a post-calibration proximity image, wherein all hand contacts are weighted equally;

computing a weighted average hand contact position from a post-calibration proximity image, wherein each hand contact is weighted according to the ratio of its current proximity to its calibrated proximity;

computing for each post-calibration proximity image the difference vector between the weighted average hand contact position and the average hand contact position;

dead-zone filtering the difference vector to remove variations in proximity due to unintentional posture shifts; and

transmitting the filtered difference vector from each post-calibration proximity image as roll and tilt control signals to an electronic or electro-mechanical device.

**91**. The method of claim 90, wherein reference proximities slowly adapt to decreases in individual contact proximity.

**92**. The method of claim 90 wherein the ratio of current hand contact proximity to its calibrated hand contact proximity is clipped to be greater than or equal to one.

**93**. The method of claim 90, wherein an additional total hand proximity component is computed from the average of all current hand contact proximity to calibrated contact proximity ratios, and the total hand proximity component is transmitted to computing device.

**94**. The method of claim 90, wherein the computation and transmission of hand roll and tilt rotational axes are initialized by resting all five fingers on the surface, tapping palms on the surface, and then resting palms on the surface.

**95**. A manual input integration method for supporting diverse hand input activities such as resting the hands, typing, multiple degree-of-freedom manipulation, command gesturing and handwriting on a multi-touch surface, the method enabling users to instantaneously switch between the input activities by placing their hands in different configurations comprising distinguishable combinations of relative hand contact timing, proximity, shape, size, position, motion and/or identity across a succession of surface proximity images, the method comprising the steps of:

tracking each touching hand part across successive proximity images;

measuring the times when each hand part touches down and lifts off the surface;

detecting when hand parts touch down or lift off simultaneously;

producing discrete key symbols when the user asynchronously taps, holds, or slides a finger on key regions defined on the surface;

producing discrete mouse button click commands, key commands, or no signals when the user synchronously taps two or more fingers from the same hand on the surface;

producing gesture commands or multiple degree-of-freedom manipulation signals when the user slides two or more fingers across the surface; and

sending the produced symbols, commands and manipulation signals as input to an electronic or an electro-mechanical device.

**96**. The method of claim 95, wherein production of discrete key symbols or mouse button click commands from single finger taps or finger chord taps is accompanied by transmission of activation signals to a light or sound feedback generating device.

**97**. The method of claim 95, wherein accidental synchronous finger taps during typing are prevented from disrupting the typing session by not producing input signals to a computing device when the accidental chord tap is the first detected chord tap since the last detected asynchronous key tap, the chord tap occurs within a typing timeout interval subsequent to the last detected asynchronous key tap, and no finger slides have been detected between the last detected asynchronous key tap and said accidental chord tap.

**98**. The method of claim 95 wherein hand resting is tolerated by suppressing a generation of output commands when all or nearly all of the fingers simultaneously engage the multi-touch surface and remain substantially stationary.

**99**. The method of claim 95, wherein user handwriting activity is distinguished from other input activities by its unique pen grip hand configuration with the following additional steps:

establishing the finger or palm identity of each surface contact;

measuring the relative positions and proximities of the identified contacts to determine whether the inner fingers are pinched while the outer fingers curl under the palm exposing their knuckles to rest on the surface;

entering a handwriting mode for the hand if the above unique finger arrangement is detected;

producing inking signals from the motions of the inner fingers on the surface while in handwriting mode;

producing stylus lift signals each time the inner fingers lift off the surface while in handwriting mode;

sending the inking signals to an electronic device for capture, display, or recognition; and

leaving the handwriting mode after the hand has lifted and remained off the surface for a substantial time or if a non-pinched finger configuration is measured.

**100**. The method of claim 99, wherein while in handwriting mode but the inner fingers are lifted, sliding and tapping motions of the palm heels produce cursor manipulation and clicking signals which are sent to the electronic device.

**101**. The method of claim 99, wherein a stylus held between the pinched fingers touches the surface instead of the pinched fingers themselves to indicate pinch configuration, and wherein inking signals are measured from motion of the stylus.

**102**. The method of claim 95, wherein the layout of key regions defined on the surface is morphed to fit the user's hand size and current position, the method comprising the following steps:

defining a default key layout whose home row key regions lie roughly at predetermined default positions of the fingertips;

identifying what hand part each surface contact comes from;